Atlantic Beach: Woman architect does man-size club...
DESIGNED BY ONE of America's few women architects, the Inwood Beach Club at Atlantic Beach, N. Y., incorporates varied accommodations necessary to a medium-sized club in an inexpensive, weathertight structure. The open plan is especially appropriate for a building whose use is limited to the summer months. Lobby, lounge, and cafeteria have folding doors which open the entire south front of the building to the ocean. The two-story portion of the building along the highway contains the public rooms and all services—shop, hairdresser, kitchen, etc.: the ocean front is given over to three types of dressing rooms—cabanas, de luxe bathhouses, and bathhouses. Cleverly included as part of the design is the existing boardwalk, which acts as a roof for the sea pavilion. In order that the supporting piles might not obtrude on the view, they have been given an octagonal sheathing, painted gray-blue.

The building rests on piling and is constructed of a number of materials. The major portion is wood-framed, with a special grooved siding; bay windows and glass-brick panel rest on a concrete substructure scored with concave round joints to match the wood; kitchen wing has an exterior finish of cinder block. Louvers, for ventilating de luxe bathhouses on the mezzanine, are of wood. The exterior is painted white, with the exception of the coping and entrance doors, which are marine blue, and the soffit of the canopy, which is yellow.
Vivid colors and use of nautical detail create an atmosphere of informality and gaiety essential to this type of building. The lounge (1), used for dancing and dining, is finished in knotty pine, stained; ceiling is of insulating board painted coral; red oak floor is stained to match walls. Cornice and trim around doors are real hemp rope. Focal point of the room is the bar (2) which features a mural painting and an illuminated glass-block panel. The counter is of coral linoleum with rope nosing; bar front is yellow Regal board, with wood reeded pilasters. Cabanas, flanking the side of the court (3) have a sheltering roof cantilevered so as to eliminate view-obstructing posts; separating the cabanas are hemp ropes, spliced and fitted over conventionalized capstans. Cabana doors are painted alternately blue, yellow, green, and red. Deck flooring is gray. The terrace (4) adjoins lounge and cafeteria. Chairs are white with blue or yellow backs and seats.
INWOOD BEACH CLUB

Accommodations for swimmers vary, but each compartment has its private shower. Cabanas (bottom) and de luxe bathhouses (center) include lounging space, whereas bathhouses (top) are intended for dressing only.
CONCRETE TRUSS SUPPLANTS PIERS IN NAVE OF ST. WENCESLAS

JOSEF GOCAR

Architect

“\textit{A consistent and apparent reality}” was the starting point for the architect in his design for the Church of St. Wenceslas in Prague, Czechoslovakia. With a congregation desiring a “structure which, first of all, had to express the function of the church truthfully and without ornamentation,” the architect was impelled toward a non-traditional solution. This, in turn, implied use of a modern structural system which immediately made possible a new form. Externally, the church dramatically exploits a hillside location, the tower serving as a focal point for the converging avenues below it and the auditorium (nave) rising with the grade in set-back clerestories. However, the silhouette of the auditorium is incidental, since its form is largely determined by internal requirements. Here Mr. Gocar’s design problem is not new—a spatially, finely and luminously accented sanctuary, a full view of the divine services and the center of all the liturgical orders of the church—but his solution is decidedly a novel one.

In terms of planning, the building is simple. Utilizing the rising terrain, the approach to the altar is a rising one and the convergent walls serve at the same time to increase its apparent length. By placing the choir and organ loft over the entrance, the architect takes full advantage of the horn-shaped auditorium section, so that both sound and light flood the congregation from above and behind.

The structural skeleton of the entire building is of reinforced concrete with masonry curtain walls. Of this skeleton, most novel feature are the concrete trusses in the framing of the auditorium walls (below, right), which eliminate the necessity for columns between aisles and auditorium proper. The tower is some 200 ft. high, with glass-brick panels running full height and surmounted by a huge cross in golden-yellow glass on a steel frame. The louvers of the bell chamber are designed to deflect the sound out and down.
Instead of the usual side wall fenestration, the architect has employed a series of transverse clerestories in the roof. Thus, he has not only made seeing easier for the congregation—by diffusing all daylight except in the apse—but also concentrated all attention on the sanctuary by removing all distracting detail from the side walls. Both materials and colors are modern: the windows of the apse are steel, glazed with both stained and painted glass; the sanctuary cross, rails, and trim are in stainless steel; the pews are of wood in natural finish; floors are concrete, with marble inserts, trim, and steps. The lower walls of the apse are in a red fabricoid, those of the nave in brown; the upper walls throughout are beige, the ceiling gray-green.
Auditorium, looking toward choir and organ loft

Auditorium, looking toward pulpit and altar
CHICAGO: FURS SOLD, STORED, FABRICATED IN NEW 3-LEVEL PLANT

DUBIN & DUBIN
Architects

In remodeling three floors of Chicago’s 19-story North American Building for the Evans Fur Company, the architects faced this design problem: “to provide selling facilities for 50 salespeople, storage facilities for 25,000 coats, factory employing 125 people, offices for a force of 50 people, and the necessary apparatus—integrated for ease of handling merchandise, rapidity of sales and service, and positive control.” Controlling factors were two aspects of the space itself—30,000 sq. ft. divided into 3 floors of 10,000 sq. ft. each, and a battery of 2 stairways, 1 freight and 7 passenger elevators along the north wall. The first dictated the housing of the company’s three functional divisions—sales, storage, and manufacturing—one to each floor. Remained, therefore, the central task of internal organization of each floor for maximum efficiency (see facing page).

The designer’s job was not made easier by a number of specialized requirements. For example, the entire job had not only to be air-conditioned but to maintain different standards on different floors (for human comfort in the sales and factory areas, for preservative purposes in the vaults). Similarly with lighting, both natural and artificial. In addition, all equipment for sterilization, cleaning, pressing, etc., had to be efficiently incorporated into the master plans. Finally, the entire job had to be fire- and burglarproof.
SALES (third floor): Aside from providing an appropriate background for sale of a luxury product, the problem of lighting determined the plan of this floor; for, while artificial light is adequate for display, natural light is essential to fitting rooms "D." The same windows "C" are cleverly used for street display.

STORAGE (fourth floor): Although relatively simple, the flow lines on this floor provide maximum control over merchandise traffic with a minimum of lost motion. Only entrance to storage vault "E" is through vault office "J." Note also that cashier's office "G" is directly above that on the third floor and connected by a spiral stair.

FACTORY (fifth floor): The factory is organized for "straight line" production from receipt of raw fur at "A" to shipping of finished product at "M." Daylight is supplemented by artificial illumination. General offices, lockers, and toilets ("P" and "Q") occupy the front portion of this floor; the factory offices is centrally located at "N."
RECEPTION ROOM (above): Serving on the one hand to connect elevator lobby and salesroom, it also gives privacy to the customers who are being fitted. Walls are smooth plaster, trim in stainless steel, floors carpeted with linoleum base. SALESROOM (right) provides adequate room for a large number of customers and salespeople. Finishes are the same as above, furniture in bleached mahogany and leather.
CASHIER'S WICKET (above): Handled as an architectural feature, the usual barred wickets have been replaced by an illuminated panel of stainless steel and opaque glass with a bleached mahogany counter. FITTING ROOM (right) shows emphasis placed on lighting. Finishes and furniture in both are similar to that used elsewhere on sales floor.
AMES, IOWA: SMALL DAIRY BUILDING FEATURES MULTIPLE USE

TINSLEY, McBROOM & HIGGINS
Architects

Incorporated in the plan for the Moore Bros. Dairy, Ames, Iowa, are all necessary provisions for a medium-sized dairy business—including a retail store for over-the-counter sales and fountain service—and four revenue-producing apartments. Compact planning makes possible a multiple-use building and at the same time provides for almost complete isolation of living from manufacturing areas.

The ground floor, devoted entirely to the dairy, is organized principally to facilitate receiving and shipping. Opening off the loading platform is the receiving room (1), where milk is weighed, and sent either to cold storage rooms (2) or to the milk room (3) for bottling. The ice-cream room (4) adjoins the salesroom, from which its equipment can be easily inspected by the customers; this salesroom also serves as business office. In the basement are locker rooms, high-pressure boiler, refrigerating machinery, and blowers for the heating plant.
REMODELED MAP SHOP HOUSES LARGE STOCK IN SMALL AREA

DAWSON & OLIVER
Architects

Transformed from a beauty parlor, this map shop for Rand McNally, in Rockefeller Center, New York, neatly solves the complex problem of displaying and storing in a small area a large assortment of maps, books, and globes. By removing the existing mezzanine, stairs, and partitions, recessing radiators under show windows, and arranging displays against the walls, the architects were able to accommodate the shop's normal stock which includes: 40,000 flat maps, ranging in size from 8 1/2 x 11 in. to 6 1/2 x 10 ft.; 2,400 folded maps, 4 x 9 in.; 200 rolled maps 3 ft. to 5 1/2 ft. long; 24 globes, 8 in. to 2 1/2 ft. in diameter; and 4,200 books, 5 x 7 in. (juvenile) to 21 x 33 in. (open atlas). In view of the fact that the store runs through from street to public corridor of the building, and therefore has two entrances, its capacity is the more remarkable. Specially designed cabinets, in light-colored woodwork, arranged along two walls, and judiciously placed in the open sales area, are the means by which this is possible. Merchandise is displayed in book racks which are integral with the cabinets. For decoration the shop relies on large maps hung on the walls (2) and globes placed on shelves (3). Removal of show window backs makes the shop's well-lighted interior visible from the street—a valuable advertising asset.
Walls are painted dark brown to reduce the apparent ceiling height and to contrast with the brilliantly lighted displays and light-colored cabinet work. Lighting is of two types: general and specific. The first consists of suspended luminaires and recessed ceiling units, the second of concealed lighting above display cases.
REMODELED VICTORIAN BUILDING GETS MODERN INTERIOR

Main entrance and exterior of stair hall

RECENTLY REDESIGNED and modernized, Taliaferro Hall was, before its rejuvenation, the only Victorian building left on the campus of William and Mary College, Williamsburg, Va. Last year it was decided to tear down this misfit; but the Department of Fine Arts volunteered to remodel the old building to house its various departments. Under the direction of Leslie Cheek, Jr., head of the Department, the work was accomplished. The exterior is Georgian enough to conform with other structures on the campus, but the interior is completely modern.

Incorporated in the building is this two-story wall fountain directly opposite the main entrance. It occupies an existing narrow stair well, which has been closed on three sides; the back wall is treated with a sculptured panel running the full height of the fountain. To protect this plaster sculpture from splashing, glass panels were placed against the wall between the water troughs. Water flowing from the top trough along the glass panels falls through the next trough, and so on down to a mirror-lined fish pool at the bottom. Plants and vines at either end of the troughs are in removable boxes.

In selecting a design for the fountain, the sculptor was confronted with the problem of unifying, in idea and design, the five separate panels into which these horizontal water troughs divided the wall; in addition, it was necessary to make each of the two major divisions (first floor and second floor) complete in itself. The familiar "Ars Longa, Vita Brevis" was chosen as appropriate to the purposes of the building. "I garbled mythology," says Mr. Rust, "to the extent of showing Aphrodite rising from the sea and bringing to life the three arts of architecture, sculpture, and painting, represented as children holding their appropriate symbols." The sculptured panels are indirectly illuminated by lights concealed under the troughs; in addition, further light is provided by means of a rayon diffusing panel above the fountain.

LESLIE CHEEK, JR., Architect
EDWIN C. RUST, Sculptor
British Architect Exploits a Roof

FREDERICK GIBBERD
Architect

To take full advantage of a view of the surrounding country, the roof of this seven-story apartment building at Pullman Court, Streatham, England, was designed as a garden; concrete flower beds, pergola, and shelters were included as part of the construction work. In the wall of the shelter is a round opening intended to frame the view as one emerges on to the roof; for minimum obstruction of the view the parapet around this portion of the roof is of tubular metal; elsewhere it is of concrete. The details (right) indicate the care and attention with which the architect has approached the problem of making the roof into a useful recreational area.
PROPOSED BUILDINGS

Mobile Walls, Ceilings Make "Precision Instrument" of Theater

G. S. INGLEFIELD and S. MOHILEYER, Designers

For complete acoustical control in auditoriums with a wide range of program (vocalist to symphony), maximum flexibility is required. Seldom, however, is control so complete or so flexible as in the design of this proposed auditorium. Involved in the project is the use of a variety of ingenious wall treatments which depend as much on form as on material for effect. The most flexible of these derives from the use of vertical columns, faced with absorbent material of varying efficiency, which can be rotated, and of fixed semicircular cylindrical diffusers. The rotating columns are finished with absorbent material of 20% efficiency on one side, and of 60% efficiency on the other. Thus, not only an infinite variety of absorbent control but an exactitude hitherto not possible can be obtained by rotating the columns to different positions. Further control comes from the use of the semicircular diffusers (faced with 20% absorbent material) which break up and distribute the sound throughout the auditorium.

Beside the wall treatment, the project provides a flexible ceiling in the form of suspended splays whose width is governed by the necessary reflecting surface. The back wall is left open to act as a sound absorbent; side walls are broken back every 50 ft. to prevent sound creeping. The stage is in itself an interesting example of flexibility: a variable platform at the rear can accommodate, by means of sliding units, a soloist or as many as 140 players; in front of this is a revolving stage, and beyond are 5 rows of seats which can be used as chorus seats when the stage is revolved.

Diagrammatic representation of arrangement of cylinders with variable diffusion absorbents (above) and with fixed diffusers (below)
NEW SYSTEMS

1. All incoming parcels are placed on a continuously moving conveyer...

2. ...which carries them to central distributing ring where clerks sort them onto radial conveyers.

3. On these belts, parcels travel to pigeonholes for storage until time for entrainment.

Belgian Post Office Speeds up Distribution with "Flow Lines"

The installation of a system of continuously moving conveyers increased the daily capacity of the South Brussels postal clearing house from 5,000 to 20,000 parcels. This system, employing equipment well enough known in America, solved the complex distribution problem of quickly canceling, sorting, and dispatching the parcels of a city of 200,000 population. Since both organization of parcel post service and transportation of parcels are under control of the National Society of Belgian Railroads, this clearing house is logically located in the South Brussels railroad station. Thus, truckage of packages subsequent to their arrival at the South Brussels station is unnecessary. The diagram (below) shows the flow-line installation. Trucks with packages from substations deposit their loads at "A"; trucks with packages picked up at residences (a service similar to that of the American Express Company in this country) are unloaded at "B." Since the latter have not previously been canceled, or marked for destination—a special speed-up feature of the Belgian postal system—the installation at "A" is designed to allow for this operation. From the unloading table at "A" and "B" packages proceed via conveyer belts to the central ring with its moving belts. Sorting clerks, stationed at "C," send the packages on radiating belts to the classified ring of pigeonholes according to their destination. Here, parcels, segregated into districts, remain until time to place them in mail bags, when they are delivered to trains on hand carts.
NEW EQUIPMENT

With this equipment, water in the boiler is given a slight electrolysis to produce a state of chemical-physical equilibrium in which there is no corrosion or formation of boiler scale.

Electrolytic action prevents corrosion on hot-water plants

A new means of preventing corrosion and boiler scale on hot-water plants, based on a slight electrolysis of water in the boiler by a low-voltage direct current, has recently been tested and found satisfactory, according to reports from Germany. Previous methods, based on the addition of chemicals, involved the use of complicated and expensive equipment to regulate the amount of chemicals according to consumption of water. The new process, in which the electric current is passed through the water at the point where it reaches its highest temperature, gives the heated water a chemical-physical state of equilibrium which corresponds with the maximum temperature to which the water is heated. As the electrolysis is carried out at the point of maximum temperature, the conversion takes place very rapidly—15 to 20 minutes after turning on the current—and neither corrosion nor deposits of boiler scale are discernible.

This state of chemical-physical equilibrium, produced by the electrolysis, exists in cold water, and is destroyed only by heating. In the case of soft water in which only a slight amount of boiler scale is formed, such a large amount of oxygen is released that it has a destructive effect on the boiler, piping, etc. In contrast to this, slight corrosion occurs in hard water, owing to the oxygen, and this constitutes the first condition for the formation of boiler scale. This is then followed by the continuous precipitation of carbonic acid salts, so that the layer of boiler scale grows quickly throughout the entire hot-water plant. The electrolysis will prevent the separation of lime in the form of stone. In addition to this, hydrogen is generated which wanders to the cathode, that is, to the walls of the boiler and piping, and thus prevents the oxygen, freed by the heating of the water, from attacking and destroying the boiler and pipes.

Essential component parts of the electric protective equipment are a source of DC voltage, yielding six volts and about one ampere continuously, and a positive electrode, composed of aluminum, which is insulated and placed in the boiler. The negative electrode is formed by the boiler itself. In the case of water which contains chlorine, the positive electrode is slowly used up, because chlorine attacks the anode metal; hence, the anode must be replaced after twelve months’ service.

Running charges on the electric protective plant are extremely low, as the power consumption amounts to about 10 watts. Where AC network is available, a rectifier of suitable output (dry rectifier) serves as a source of direct current; a rotating converter is used with a DC network.

Fireplace unit heats, pipes water to radiators

Combination fireplace and hot-water heater, the BAB fireplace unit heats water in its surrounding shell and pipes it through a regular hot-water system to radiators in adjoining rooms. Because of its simple construction, installation is easy in either new or existing fireplaces, according to the manufacturers, BAB Heating Co., Inc., Gloucester, Va. Open system of installation is recommended in all cases, new or existing, to avoid excess pressure; an expansion tank in the loft and an overflow tank running either to roof, or, preferably, to sewerage system, are further requisites. For heat conservation and allowance for contraction or expansion caused by extreme changes in temperature, insulation of asbestos paste 1 in. thick is advised.

The unit itself is of open-hearth, copper-bearing, welded sheet steel; an inner shell provides a jacketing of water 2 3/16 in. thick at top, bottom, and three sides of the opening. Outlets for connection of supply and return pipes are at top and bottom of the shell sides. Heat from the fire is absorbed by the steel shell and transmitted to the water it contains; as the heat increases, the hot water rises, and the suction created pulls cold water from the bottom of radiators into lower portion of the fireplace shell. According to the manufacturers, radiators begin to give off heat in less than 25 minutes after lighting of fire. A damper attached to the unit controls consumption of fuel and degree of heat.

Advantages claimed for the BAB fireplace are that it is, by reason of its construction, smokeless; economical to install and to operate, since it uses coal, coke, or wood; long-lived because it contains no cast-iron sections which might burn out or crack.

Inexpensive dehumidifier features calcium-chloride filter

Moisture reduction by means of Caloride, a calcium-chloride and carbon compound, is the feature of a new portable air dehumidifier, Arid-Fuser, manufactured by Aerofuser Products, Inc., Chrysler Building, New York, N. Y. Room air is drawn in at sides of the unit, and passes through the Caloride and a spun-glass filter. Filtered and dehumidified air is ejected from the top of the unit by a fan. The unit is capable of circulating between 20 and 150 c.f.m. through Caloride; total discharge of dehumidified and room air is 500 c.f.m. Arid-Fuser, priced at $119.50, f. o. b., Elmsford, N. Y., entails no installation cost, since it operates simply by plugging into an AC electrical outlet. Only maintenance cost is replacement of Caloride, which retails at $0.05 per lb.

(Continued on page 58)
Voice vibrations operate new batteryless phone

A batteryless telephone which depends solely on voice vibrations to move an armature in a permanent magnetic field as a current generator has been developed by engineers of the Bell Telephone Co. Design of the instrument follows that of the early telephone, which used no outside current source, but utilizes increased knowledge of highly magnetic materials and structure. Because of its independence of batteries and other external power sources, the instrument is portable, and hence of considerable use in such places as construction camps. In addition, it is light in weight, one model weighing less than two pounds. Portable units can be used as receivers or transmitters, but wall units contain separate receivers and transmitters.

Instrument measures moisture content in walls

Accurate and quick indication of actual moisture content in plaster, brick and concrete walls is possible by means of the Mars Moisture Detector, developed by William J. Delmonhorst, 90 West Street, New York, N. Y. This instrument, simple to operate, requires no electric circuit connection as it is battery-equipped. It consists of a direct reading meter of extreme sensitivity, and two pins connected by wire to the meter. A press button near the meter sets the mechanism in operation; when pins are applied to wall the meter registers the moisture content. Since the Mars Detector indicates subsurface moisture it is also useful for showing the extent and course of leaks, as well as their point of origin. For the various materials to be tested there are specific pins. The device retails for $18.50.

New bolt head does not weaken beams

A means for making quick attachments to beams or girders, the Safety Hook Bolt Head was recently introduced in this country. The product, in use for two years in England, can be used alone on a standard bolt or in combination with a deep washer, or two hook bolt heads may be used with a deep washer for fastening two I-beams together. This device is simple to use, and does not weaken beams, according to the holders of American and Canadian rights, The Fanner Manufacturing Co., Cleveland, Ohio.

High-pressure process produces steel at lower cost

A process which permits use of higher pressures on pig-iron blast furnaces is expected to affect materially the cost of steel, according to its inventor, Julian M. Avery of the research laboratories of Arthur D. Little, Inc., Cambridge, Mass. Higher pressure will reduce the ore and smelt it to pig iron and slag without the losses occurring with present methods. With Mr. Avery’s process, the steel industry will be able in normal times to use only its most efficient furnaces; less efficient furnaces can thus be held as stand-by equipment. By means of pressure operation, says Mr. Avery, a saving of $1 to $2 per ton will ultimately be possible; since pig-iron production in this country averages 35,000,000 tons per year, the new process represents considerable annual savings to the industry.

Diet kitchen unit generates no steam

A waterless diet kitchen unit for use in hospitals, restaurants, clubs, canteens, etc., has been developed by Prometheus Electric Corp., 25 Ninth Avenue, New York, N. Y. The unit is heated electrically, and, because it requires no water, generates no steam. Each food container is heated by an individual heating unit. This product is equipped with the Automatic Economizer, a device which automatically reduces the amount of current as soon as the desired temperature is reached. Adjustable controls on the front of the body permit regulation of each section, according to temperature desired. The unit is available in six base models, in stainless steel or Monel-metal finish.

Phone booths for noisy spots have acoustical lining

For use in moderately noisy locations where space is limited, acoustic phone booths have been developed by Burgess Battery Co., Chicago, Ill. A special lining of perforated metal backed by a soft sound absorbent prevents sound from interfering with the telephone user. The wall-type unit has a built-in electric light and shelf. Both types are built of steel and require no servicing.
Aluminum is new material for hand-wrought sculpture

Sculptured in aluminum without the use of molds or castings, this statue of St. John the Baptist for the Queen of the Holy Rosary Cathedral, Toledo, Ohio, is said to be the first hand-wrought statue of this material. Hammers, anvils, and chasing tools were the only means used for fashioning the three-foot statue, made at the Wendell August Forge, Grove City, Pa.

Methacrylate base produces lacquer for chrome protection

A transparent lacquer for protection of chromium and other metals from corrosion and rust is the most recent development from the new methyl methacrylate plastic. Unique because of its methacrylate base, Chrome Lacquer, a product of E. I. du Pont de Nemours & Co., Wilmington, Del., is characterized by its adherence to metals, quick-drying properties, and durability. It is colorless, will not chip or peel, does not affect the color or gloss of the metal, and is resistant to sunlight. The lacquer is expected to be of particular use on automobiles and boats, but can be applied to building hardware, store fixtures, and decorative objects. Tests conducted in Florida showed that protected panels of various metals were free from rust or corrosion in spite of eight months' exposure to salt air, and that the lacquer film was unbroken.

Asbestos fiber protects girders and cables from fire

A new material, molded asbestos, for protection of steel girders and electric cables from fire, has been developed by Newall's Insulation Co., Washington Station, Durham, England. This material consists of a white asbestos fiber capable of withstandng heat up to 2000°F, mixed with a binder, and molded to fit any girder section or built up in sheets with a special refractory adhesive on the joints. It also comes in suitable forms to protect electric cables singly or in groups. One inch of molded asbestos applied to structural steel will prevent its collapse for more than an hour, and two inches will protect it for more than two hours. In a recent demonstration at the Barking electric power generating station, two unprotected girders collapsed in 12 minutes at a temperature of 1100°F, while the temperature of two protected girders had reduced only 200°F. In another test, a 3-in. molded asbestos was subjected to temperatures which rose from 1450°F to 2100°F over a period of 4½ hours. At the end of this time the temperature of the stanchion was 850°F.

Raw materials now available from lignin

LIGNIN, waste product of forests, can now be converted into a number of valuable raw materials, according to the U. S. Forests Products Laboratory. Among the yield products are wood alcohol, a lacquer solvent which also has possibilities as a wood preservative, two compounds of possible use as thickening and toughening agents for varnish, and a clear glassy resin which has potentialities as a plastic material. The process by which this conversion is possible is hydrogenation: hydrogen atoms are added to the lignin solution by means of heat and pressure, and the dissolved lignin is thus changed from a dark brown to a transparent color. Different compounds can be created by this method and are removed by distillation.

Flexible wrapping film derived from bentonite

A new transparent wrapping film, said to be essentially fireproof, has been produced from bentonite, a clayey material sometimes used in construction for plugging holes because it swells when wet. The new film has shown itself in laboratory tests to be strong and tough but flexible, resistant to water, acids, alkalis, and oils, and to have properties of electrical resistance, according to a report made by Prof. Ernst A. Haner of Massachusetts Institute of Technology and Miss D. S. le Beau of the Dewey & Almy Chemical Company. Like cellulose, its nearest counterpart, the new film can be printed on. Application for a patent on the film has been filed.

Low-cost linoleum underlay adds life to floor covering

For use under linoleum and other resilient floor or wall coverings, an underlay made of birchwood and kraft paper bonded to both its surfaces with asphalt felt, has been developed by the St. Croix Lumber Co., Lakeport, N. H. The product, known as Tekwood underlay, comes in stock 4 x 4 ft. panels, and in two weights, standard and heavy duty. The latter is intended for use where the subflooring is particularly rough or contains gaps or cups; the former is for ordinary use. Since Tekwood must be laid with its grain at right angles to floor joints, each panel is stamped with an arrow indicating the direction of its grain. Installation is simple as the underlay can easily be cut. Cost is approximately $0.05 per sq. ft.
ON THE HOUSING FRONT

Work on Red Hook Houses officially gets under way with New York's Mayor La Guardia, Senator Robert F. Wagner, and USHA's Nathan Straus at the steam shovel.

Year-old USHA paves way for much-needed housing

In its one year of existence, the United States Housing Authority has earmarked all of its original $500,000 appropriation for slum clearance, received an additional $300,000,000, brought about the establishment of local housing authorities and the enactment of legislation necessary under the Wagner-Steagall Act (see AR, 9/37, p. 38), and begun construction of its largest project.

That so definite and widespread a program is a driving necessity is forcefully shown in statistics gathered by a recent U. S. Public Health Service survey. According to this report, which canvassed 703,000 households in the nation's principal geographic areas, small cities suffer as much from overcrowding as larger cities, though in different ratio. This is particularly true of the South, where 31% of families in cities under 25,000 reported more than one person per room. In general, says the report, the percentage of families with more persons than rooms rises as the size of the city decreases, in all areas except the East. For the country as a whole, the survey shows that 16% of the households visited had more than one person per room; 6% had more than one-and-a-half as many persons as rooms; 4% had twice as many persons as rooms; and 14% had no inside "flush" toilet, or, if such a facility was available, used it jointly with other families.

Meanwhile, the New York City Citizens' Housing Council has been preparing reports and recommendations for a minimum building program on a 20-or 30-year basis. A survey conducted by the Council indicates that with 600,000 families badly housed, New York City will have to build with government aid 29,000 new apartment or dwelling units per year (and 55,000 without government aid) over a 20-year period, or 19,000 units over a 30-year period. This is the minimum possible amount of building to eradicate slums, provide adequate homes, and check deterioration of large areas of the city. For such a program the Council finds that a combination of Federal, state, municipal and private funds would be required, and is now engaged in a study of methods of procuring these funds. New public building, the Council feels, will in no way conflict with the effective demand for private building if the former is carefully restricted in occupancy to the low-income group.

New York first to use USHA funds, sign with FAECT

Ground was broken late last month in Brooklyn, N. Y., for Red Hook Houses, the nation's largest slum-clearance project to date. The occasion marked not only the beginning of the first slum-clearance project to be built under the USHA, but the first agreement between the architects of such a project and the FAECT, a CIO affiliate. The contract specifies the FAECT as sole bargaining agent for the technical employees, provides for time-and-a-half for overtime work, full seniority rights, suitable grievance machinery, etc.

Red Hook Houses will consist of 25 buildings, in which there will be 2,562 apartments of various sizes. These will provide dwellings for 9,270 persons. Alfred Easton Poor is chief architect for the project; associated with him are William F. Dominick, William F. Hohausen, Electus D. Litchfield, W. L. McCarthy, Jacob Moscowitz, and Edwin J. Robin.
DESIGN TRENDS

Apartment-house tenants speak their minds...
... low buildings placed to assure abundance of sunlight and fresh air with spaces adequate for gardens or parks.

... proximity to transportation facilities but near a park or the edge of the city to assure freedom from noise, odor, and smoke.

... recreational areas and management services that offer greater opportunity than usually exists for community social activities.
What Tenants Want in Apartments

By THYRSA W. AMOS, Dean of Women, University of Pittsburgh

Do existing apartment buildings adequately meet the needs of tenants? In general the answer is "No", according to results of a recent questionnaire on the subject. Reported here are tenants' own suggestions for improvement. Next month the RECORD will include in the Building Types section a reference study on apartment-house planning and development standards.

"As a tenant, what improvements do you suggest for making apartment-house living more satisfactory?" This was the question recently put to 120 tenants of 25 apartment buildings in Boston, New York, Philadelphia, and Pittsburgh, ranging in size from the "largest in the world" to a 4-family house. A questionnaire on the location and arrangement of the building, on floor plans of individual units, on equipment and services, and on management was sent to these tenants, of whom there were four general types: (a) married and without children, (b) married with children, (c) spinsters and widows, and (d) bachelors and widowers. All were business or professional persons living in apartments ranging from one to eight rooms in size.

The letter accompanying the questionnaire and the questionnaire itself stressed the value of the opportunity to make constructive suggestions for better apartment-house living. Fifty-eight percent (70) of the questionnaires were returned with suggestions. Ten recipients of questionnaires substituted letters, each giving good suggestions. The total number of persons represented in the replies was 105.

Without exception, these tenants want apartment buildings near good transit-car and bus service, and at the same time far from city smoke, odor, and noise. They also want to be far enough from other buildings for adequate light and air and freedom from noise, odor, and smoke. Unanimously they ask that buildings be located advantageously for sunlight and prevailing winds, avoiding valleys and depressions. More than 85% asked specifically for buildings at the edge of the city, or near a park.

In general, the group prefers lower buildings, suggesting, in place of one large building, several separate units of five- or six-family capacity, spaced so that grass plots, flower beds, shrubbery, trees, and fountains may be provided. They deplore equally such eccentric designs as a series of apartments built in concentric circles in imitation of the pueblos of New Mexico. Many suggest that the single building be U-shaped only if the U is very wide and low, and faces the sun some part of the day. Many propose an L-shaped building properly set with regard to the sun. A few suggest apartments "lined or staggered to give sunlight to all apartments, thus providing on the building lot itself some garden or park space." Fifty percent stress the point that most single apartment buildings are too deep and too high, making too many apartments sunless and airless. All urge that buildings be planned from the inside out. The insistent demand for some aspect of outdoor living would be met partially for some 30 tenants of the group if balconies were provided; for 40 others, by roof-gardens.

Service and public spaces

Not one of the group wants to live on the first floor or in the basement. The first floor, in their opinion, should be given over to foyers, halls, office, game rooms, children's rooms, isolation rooms "for persons ill of common cold", attractive social rooms with kitchenettes and wood-burning fireplaces, kitchens where competent persons can cook and deliver meals to apartments, and small drugstores. Only three want stores or shops on the first floor. All others emphatically say that these detract from the dignity of an apartment house. In the basement they want swimming pools and gymnasiums, canned-fruit cellars with compartments for rent, large dustproof lockers for each apartment, trunk rooms with foolproof checking services, supply rooms where tenants can buy such things as soap and light bulbs, laundries, garages attached to the buildings, and covered unloading rooms near elevators.

The suggestions for socializing the first floor and the basement show a trend away from the isolation desired by tenants when the popularity of apartment-house living was at its height 10 years ago. Apartment-house living has been found too un-social, too perfect in its freedom from human contact and omission of neighborhood and community life. Fifty percent of the replies stressed the need for humanizing apartment houses both through provision of recreational and social rooms and through management services.

Foyers come in for unique and constructive comment. Ninety percent of the tenants reporting want small semiprivate entrances. Realizing that this is not always possible, they insist on small, well-furnished, dignified foyers. Almost as many ask for revolving doors. Large entrance halls are costly, not only in additional rental charge to the tenant and upkeep expense to the owner, but also in their effect on the social spirit of the building. Too frequently, one
tenant says, large and comfortably furnished foyers become gathering places for persons who like to gossip and watch the comings and goings of other tenants. “This is particularly trying to the tired business men and women residents of the building... especially when they run this gamut night after night.” This is probably an isolated case, but it touches on what a great many emphasize, the need for the foyer to serve only as an entrance hall.

In suggesting improvements for halls on upper floors, all want them wide and well-ventilated. They want good lighting here, and say “carpeted halls at best are unhygienic”, and at worst “dust bins, moth resorts and odor preservatives.” Halls, they think, should be colorful, hospitable, and sanitary, not “decadent, with dingy walls, faded carpets, or ugly doors.” Elevators are classed with halls. Only three persons desire manned elevators; all others want the automatic lift because “if it works well, it gives quick 24-hour service.” It also gives more privacy and is “less costly to tenant and owner.” Every tenant wants elevator interiors as cheerful as the halls. Many stress the satisfaction it gives a tenant to see “the state elevator inspector’s recently dated ‘OK’ hanging in the elevator.”

KITCHENS: A large floor area, work-saving layout according to scientifically established standards, and a wide range of mechanized equipment are wanted by the majority of tenants.

BATHROOMS: As in the kitchen, most tenants want high efficiency in layout and equipment, simplicity in finish and accessories. Both areas are susceptible to improvement over most current examples.

Size and layout of units
All want better arrangement of rooms, and larger rooms. All want them soundproofed and air-conditioned in summer and winter. Ninety percent want a two-floor arrangement even for a four-room apartment. These persons are “grievously offended by the bathroom-door complex” of the architect who places it either just off the living room, or in the living room in plain view. They suggest placing the bath upstairs with the two bedrooms where the “sleeping, bathing, and dressing privacy of the tenant can be assured.” The two-floor plans “ought to give more sunlight and air.” All want cross-ventilation in sleeping rooms. The living room and kitchen should constitute the first floor. “Unless the foyer can be sizable enough to receive guests, to contain a coat closet and a small closet for toilet and lavatory, it is best omitted and the space used for an attractive half-enclosed stairway in the center or at one end of the living room,” to quote one who says well what another ten suggest.

Dinette seems out of favor with most of the tenants reporting. They point out that they are usually ugly, too small, and, moreover, are waste space for most of the 24 hours. “Eating breakfast and lunch in the kitchen, and using the end of the living room next to the kitchen for dinner is preferable to any form of dinette service I’ve seen,” declares one tenant.

All tenants reporting want larger living rooms, 16 x 24 ft. being the usual request, with plenty of wall space and good window arrangement. The need for a view is stressed. The group wants fireplaces burning wood, coal, or gas. Artificial grates and log arrangements are held “cheap, tawdry, meaningless.” Most of the tenants want radiators removed from under windows, yet know what a factor that placement is in heating a room. A few would like floor lights in bedrooms to avoid stumbling and waking others sleeping.

Kitchens
Far more suggestions were made for the kitchen and the bathroom. Sixty percent deplore the small kitchen. One housewife makes a common criticism: “We have the last word in modern, perfectly equipped kitchens, yet no space to work. I have to put the dirty dishes on the floor under the electric stove, the refrigerator, and the sink.” The kitchen, as many explain it, uses more separate articles at the same time than any other room. It must be scientifically planned, lighted and heated, and equipped with ample cupboard.
cabinets on each side of the lavatory for linens, soaps, and other toilet supplies. Nonslip towel racks are the most frequently requested small item.

Management
There is no doubt that these tenants believe management the most important factor in apartment living. All agree that the chief business of the manager to keep tenants contented. They have a light touch in dealing with the business and professional class of tenants. This group wants managers who are not only pleasing in appearance, unassuming in manner, intelligent, sympathetic, and understanding in dealing with people, but also trained in management and personnel supervision.

These tenants appear to know well the general responsibilities of a manager. Given in order of the times mentioned, a good manager knows how to keep people contented, how to build a co-operative and appreciative spirit among tenants, and how to "keep house", how to keep records, how to show and rent apartments, and how to select and train employees.

Service
Many suggestions were made for improvement in services, such as more alert doormen, more careful telephone operators, more care in announcement of guests, better delivery service, and better-trained maids. All these services make an apartment a home, a heaven, the source of comfort and satisfaction. Many suggest glass walls, and rubber or cork floors for comfort and convenience. All want sunshine in the kitchen.

Bathrooms
The bathroom is equally important to this group. Here, too, the emphasis is on simplicity, spotlessness, cleanliness, and good equipment. None of the group wants bright coloring on walls or woodwork. Fifty percent want three walls of glass tile, and an outside wall of architectural glass. The large majority want shower stalls, built-in clothes hampers, and footwash water closets.

If the group is representative, the medicine cabinet must move from its place over the lavatory and give way to a long mirror with diffused lights on each side. The medicine chest, with an inside light, should be on a wall readily accessible, and should be low enough so that the top shelf is reached easily. Ninety percent of those wanting shower stalls ask for smaller tubs having one side bowed out to provide a seat. Many ask for

A calendar of dates for their use by individual tenants for private parties, or for house parties composed of congenial groups of tenants; advise on tipping; call on new tenants and help them become adjusted to the life of the building; edit a monthly house organ; organize house committees for community activity; provide for Christmas parties and New Year's Eve parties; improve in apartment house living, selection of tenants, and integration of apartment-house life with neighborhood life; give help in emergencies such as death or accident, and in general anticipate tenants' wants.

And more service
Sixty-eight tenants stress the social value of a house bulletin or paper which can (a) give the house directory of tenants and servants, (b) publicize house rules, (c) give house news, (d) list common social events. They want it even if it is provided merely in mimeographed form.

Sixty tenants want the services of a house decorator, as well as the services of a good electrician, a good plumber, a good painter. A two or three suggested that apartment-house managers in a given area join in employing one good decorator. The decorator would be expected to: individualize apartments, teaching tenants how to make their rooms look better; arrange for new decorations; supervise painting at house-cleaning time; suggest furniture arrangements; advise on the finishing of old furniture; keep in touch with new furniture; advise on furniture coverings and draperies, and give instruction in picture selection and picture hanging.

Ability to pay stressed
Gymnasiums, swimming pools, game rooms, and children's rooms call for the services of persons trained for such work. Here, too, except in the case of children's rooms, it was suggested that three or four apartment houses could be served by the same persons.

More than 92 percent of those reporting point out that they can readily suggest improvements but, unfortunately, cannot readily pay for them. The crying need is for lower and more equitable rents now, so that tenants can easily raise them. Owners can't spend without return," sums up this point of view. The emphasis now being laid on poor housing conditions everywhere is stressed by the whole group.

Combined with AMERICAN ARCHITECT and ARCHITECTURE
MOBILITY—A Controlling Factor in Design

Acceleration of industrial productivity during recent years has made mobility a factor of increasing importance in American life. Our population has changed from a comparatively stable group to an increasingly mobile one. Constant migration is creating, in every section of the country, new problems that have widespread social and economic significance.

These changes and the attendant problems have resulted largely from development and widespread use of mobile designs—trains, automobiles, airplanes. But mobility has been a cause, as well as a result of such developments. Industry has increased production by controlling the flow of its processes. The mobile assembly line has made possible lower costs and consequent wider distribution and use; and it has also demonstrated that mobility—both as cause and effect—is a production factor that conditions a wide variety of things to meet human needs.

The technique that is producing modern units of transportation is more and more being applied to production of materials, equipment, and services used in buildings. A flow of new products is rapidly replacing older elements of design—a process that involves mobility as measured by increasing rates of building obsolescence. The result is a continued change—mobility—in design forms as means to fill the needs of the constantly expanding range of human activities.
INCREASING SPEED and EFFICIENCY . . .

As speeds and available transportation facilities increase, distances shrink proportionately as suggested in the pictograph above. People become generally more mobile. In 1920, for example, the average travel per inhabitant was 500 miles per year. In 1929 it had increased fourfold to 2,000 miles per year. Among direct results of such increases in individual mobility is a decreasing isolation of areas, which implies an increasing development of localities offering variety of economic opportunity.

According to the National Resources Committee, "... there is every reason to expect a continuation of the spread of population out from the centers of metropolitan areas into surrounding satellite cities, suburban communities, and adjacent rural areas ... a trend toward greater individual mobility may be expected to follow the rapid improvement of means of communication and transportation. ... Extensive movements of population are essential to the economic progress of areas of relative overpopulation, with high reproductive rates. Interchange of population between other areas will facilitate adjustments to technological changes." (Problems of a Changing Population, page 117.)

Greater speed and efficiency of transportation units are as much a result of increasing individual mobility as they are a cause of it. And development of new forms springs directly from progressive obsolescence resulting from technological advance—a fact that is a true of buildings and building products as of transportation units. Thus, the problem of building design becomes that of integrating constantly improving elements of design to meet the increasingly complex requirements of an increasingly mobile society.
The general trend toward increasing mobility has a number of different aspects. Each can be charted as a trend in itself: for example, trend of population movement, increase in use of transportation units; expansion of mobile services (as mail, freight, deliveries); the spread of industrial technique based on a flow of parts to a moving assembly line. All, however, are related. Each acts upon the other and, in turn, is acted upon. And each involves in varying degrees a relationship of space (area, bulk, weight) and time (speed, coordination, efficiency).

Thus, the designing of any structure becomes a problem of integrating certain specific aspects of mobility. To the degree that space or consideration of the time element is involved, mobility is a controlling factor in design. Extent of such control depends upon the type of structure and the expedient circumstances that condition its fabrication and use.

1. Structures that are themselves mobile: Design of transportation units of all types calls for the highest degree of integration. Power and speed (time) must be correctly geared to size, weight, and form (space) and the whole designed in relation to a factor of economic mobility that involves the balance of financial return with total costs (initial, operating, and maintenance) over a calculated period of useful life. This last involves the mobility of obsolescence as an important factor of design. Witness the streamlined trains, which emphasize the technological obsolescence of former types.

2. Structures which promote mobility: These may be static (as a house, factory, department store). But insofar as they involve movement of people or things, the factor of mobility controls design, fabrication, and use. For example: a country-house is considered incomplete without a garage (for a mobile unit); and conservation of movement is one criterion in design of an efficient kitchen. A large store must handle crowds efficiently; hence, wide aisles, escalators, elevators, etc., to control traffic flows. In the industrial field, particularly, technical improvements are so rapid that structures are tending to become merely shells to house machinery, light in weight and simple in construction to make replacement easy and inexpensive.

References


MOBILITY OF SERVICES AND EQUIPMENT...

Opposed to the movement of people is the rapidly expanding mobility of services and things. The delivery wagon is familiar to almost every hamlet in the country. Industrialization has adapted its basic function to a variety of means and forms. Grocery, drug and hardware stores, commercial displays, scientific exhibitions and, of course, the circus—all are on wheels. Among others, mobility has come to the dentist's office (1); the public library (2); the telephone (3); the research and testing laboratory (4); and even the church (5) and A.R. (6) 11/37 pp. 32, 33.

... AND OF PREFABRICATED DWELLINGS

The automobile trailer—perhaps more than any other single unit—is symptomatic of increasing population mobility. As a traveling house it has created a new series of social and economic problems involving highway design and development of "trailer cities." These new communities spring from service needs of "demountable houses" (8 and 9). The trailer's influence on dwelling design is suggested in the prefabricated, transportable dwelling unit built by the Covered Wagon Co. (9). Application of mobility to houses, factory-built, but traditional in design and facilities (10) is still rare.
Modern American plumbing seems the best in the world. But research—started as a result of a dangerous epidemic—has exposed grave faults. At the same time it has established standards of safe design to eliminate back-siphonage as a menace to public health.

**Causes of water pollution**

Water-borne diseases which constitute a menace to public health usually develop from contamination of drinking water by sewage. Epidemics of enteric illness may be caused by pollution of the water supply, which does not involve any question of faulty plumbing. But the technique of water analysis and purification relative to standards of potability is well advanced. (See publications of Bureau of Agricultural Engineering, U. S. Dept. of Agriculture, and those of U. S. Public Health Service). Likewise, methods of sewage treatment and disposal have been perfected so that pollution of public drinking-water supplies need no longer be a problem of either research or installation.

Danger of pollution lies in plumbing installations themselves when the supply of drinking water is—or may become, through operation of the plumbing fixture—connected with the system of waste disposal. The cross-connections thus formed may cause pollution of pure water under three conditions:

1. When pure and impure water sources are separated (actually, joined) by a valve and pressure of the impure source is permanently higher, pollution may result from seepage through the valve.
2. When pressure on pure water is temporarily reduced below that of impure water, contamination may result from a gravity flow of the impure source.
3. When pressure of pure water

**Federal Building Plumbing in Detroit and New York**

<table>
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<tr>
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(From "The Ladie", February, 1938)

The table—partial result of an official survey of plumbing in Detroit and New York City Federal buildings—dramatizes the hazard to public health that may exist in modern sanitary systems. Building designers can help eliminate this hazard by adopting methods of plumbing layout and installation which research engineers have made available. Legally, the situation can be improved by revising existing plumbing codes to make these technical standards mandatory. Many cities, including New York and Chicago, have already accomplished this. Manufacturers of plumbing equipment are rapidly making available fixtures of all types that will meet requirements that research experiments have proved necessary for the prevention of cross-connections and back-siphonage. The plumbing trade is aware of existing dangerous conditions and is actively aiding in their elimination. Only by adherence to established technical standards by all factors involved can water pollution through plumbing fixtures be eliminated as a dangerous menace to public health.
supply drops below atmospheric, pollution from the waste system may take place from the vacuum thus formed. This process of water pollution is called "back-siphonage."

All cross-connections are potentially a menace to health. But all are not equally dangerous. Hydraulic and sanitary engineers recognize two types of cross-connections: direct, a continuous interconnection (involved in 1, above) as "between dual water-distributing systems, completely submerged inlets from water-supply lines to closed plumbing fixtures" (priming lines to pumps, tank-flushed water closets, etc.); and indirect, in which continuous interconnection is not present and completion of cross-connection depends on development of unusual conditions. Examples are: "water-closets with direct flush-valve supply—and other plumbing fixtures and equipment whose supply inlets may become partially or wholly submerged." (tubs, lavatories, etc.)

By far the greatest number of cross-connections are of the indirect type. But—as indicated in the Federal buildings survey—they may also be the greatest potential menace because, though fixtures may operate under completely safe conditions when pressures in supply and waste lines are normal, one or more abnormal occurrences may cause dangerous pollution without any outward evidence. Direct connections are relatively easy to recognize, control, and eliminate.

The "abnormal occurrences"—stoppage in waste lines, vacuums in either supply or waste lines, etc.—produce a siphon action in plumbing systems, which causes the contents of waste lines to flow back into lines supplying pure water. Investigation of these abnormal occurrences, the determination of their effect in plumbing systems, and the discovery of effective methods of preventing back-siphonage in plumbing fixtures of all types—these, in combination, have constituted the objectives of much research and recent experimental work. Results can be studied in complete form in the published material listed on this page.

**Control of back-siphonage**

In brief, prevention of back-siphonage—and therefore elimination of a widespread menace to public health—can be absolutely assured only by eliminating the possibility of cross-connections of whatever type. A number of factors may contribute to produce back-siphonage where cross-connections—actual or potential—are present. In many cases the simultaneous combination of occurrences necessary to cause back-siphonage through indirect cross-connections is so rare that opinions vary as to the relative danger of pure water pollution from this source.

Research engineers have shown, however, that conditions tending to produce back-siphonage are always present, to some degree, in all plumbing systems. Furthermore, they involve phenomena of pressure changes caused by liquid flows that are not subject to precise control. Therefore, all serious investigations of the problem have led to a common general conclusion: To prevent pollution from entering any part of the pure water piping system, design of individual plumbing fixtures must be such that cross-connections of any type are eliminated and some method incorporated to prevent formation of siphon-action from impure to pure water sources.

**Design of piping systems**

Formation of excessive vacuums—an important contributing cause of back-siphonage—and certain types of cross-connections can be eliminated by correct layout and installation of water-piping in both supply and disposal systems. Dawson and Kalinske state, in their recent report for the National Association of Master Plumbers (see references), that, "At least 90% of all vacuum formations, and therefore 90% of the hazards of back-siphonage, could be prevented if water-piping systems were sized and installed correctly."

This statement has particular force relative to piping systems in tall buildings where high velocities in waste lines may create vacuums in upper-floor pipes or flood fixtures on lower floors, if sizes of soil and vent stacks are inadequate. Also, the water of certain localities may cause pipe corrosion, particularly at valves; or it may line pipes with insoluble precipitates, which diminish flow from the calculated normal and therefore tend to develop abnormal and dangerous pressure changes. Air-conditioning installations may also become a source of pure water pollution unless extreme care is exercised to eliminate cross-connections between city water supplies and condensers, cooling devices, waste lines, etc. Many such installations utilize a water supply auxiliary to the city supply—a condition found all too too often in certain types of industrial plants which operate water-using equipment. Health hazards will exist through cross-connections between the two water-supply systems unless the potential danger of back-siphonage is recognized and guarded against in the design and installation of the piping systems.

**References**


RESIDENTIAL ENTRANCES
Early precedents that still appear contemporary: 1 is an entrance to a country house in Bucks County, Pa., that dates from 1760; 2, a town-house entrance, one of the oldest in Germantown, Pa.; 3, entrance of Revolutionary vintage in Newcastle, Del.; and, 4, one of many entrances in Nantucket, Mass., that are typical of early design in New England.
Contemporary entrances based on precedent: 5, a kitchen entrance, designed by John L. Volk, architect, at Palm Beach, Fla.; 6, at Gladstone, N. J., was designed by Perry M. Duncan, architect; 7, entrance to the library wing of a house in Bucks County, Pa., that dates from 1760; 2, a town-house entrance, Narbeth, Pa., designed by R. B. Okie, architect.
On facing page: 9, designed by Eugene J. Leng, architect for a house at Scarsdale, N. Y.; 10, main entrance to a Birmingham, Ala., house for which Warren, Knight & Davis were architects; 11, entrance to a small house at Evanston, Ill., designed by Perkins, Wheeler & Will, architects; 12, at Mill Neck, Long Island, N. Y., designed by Richard H. Dana, architect.

On this page: 13 is a small house entrance at Pasadena, Calif., designed by Donald D. McMurray, architect; 14, entrance designed by H. Roy Kelley, architect, for another small house at San Marino, Calif. 15 is at Palm Beach, Fla., designed by Treanor & Fazio, architects; and 16 is the main entrance to a small house at Seattle, Wash., designed by George Wellington Stoddard, architect.
17 is an entrance to a house at Manhasset, Long Island, N. Y., for which Roger H. Bullard was architect. 18 was designed by James C. Mackenzie, architect, for a small house at Falmouth, Mass. 19 is the main entrance to one of a group of houses at Riverdale, N. Y., for which Dwight James Baum was architect; and 20 was designed by Cameron Clark, architect, for a house at Fairfield, Conn.
21 is an entrance to a prefabricated house at White Plains, N. Y., designed by Holden, MacLaughlin & Associates, architects; 22, a garden entrance to a large house at Locust Valley, Long Island, N. Y., for which Bradley Delehanty was architect. 23 shows carved wood detail on an entrance at Milwaukee, Wis., designed by Grassold & Johnson, architects; and 24 was designed by Roland E. Coate for a small house at Bel-Air, Calif.
25 is a small house entrance at Madison, Wis., designed by Beatty & Strang, architects; and 26 was designed by J. R. Miller and T. L. Pflueger, architects, for a hillside house at San Francisco, Calif. 27 is in Tyler, Tex., and was designed by Hobart Plunkett, architect; and 28 is the entrance to a house at Hampstead, England, designed by E. Maxwell Fry, architect.
Current Trends of Building Costs

Compiled by Clyde Shute, Manager, Statistical and Research Division, F. W. Dodge Corporation, from data collected by E. H. Boeckh & Associates, Inc.

Curves indicate control trends in the combined material and labor costs in the field of residential frame construction, the monthly curves being an extension of the local cost averages during the years 1935, 1936, and 1937. The base line, 100, represents the U. S. average for 1926-1929.

Tabular information gives cost index numbers relative to the 100 base for 9 common classes of construction, thus showing relative differences as to construction types for this year and last.

Cost comparisons or percentages involving two localities can easily be found by dividing one of the index numbers into the difference between the two. For example: if index A is 110 and index B, (110-95)÷100 = 1.5. Thus costs in A are 15% higher than in B. Also costs in B are approximately 14% lower than in A: (110-95)÷110 = .14.

**CONSTRUCTION COST INDEX**

U. S. average, including materials and labor, for 1926-1929 equals 100.

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| CHICAGO  |         |         |
| Residences |        |         |
| Frame     | 105.9   | 107.7   |
| Brick     | 112.3   | 110.3   |
| Apartments |        |         |
| Br. & Wood | 106.9   | 108.9   |
| Br. & Conc. | 119.8   | 123.0   |
| Br. & Steel | 114.0   | 118.0   |
| Comm. & Fact. |    |         |
| Frame     | 109.1   | 110.7   |
| Br. & Wood | 116.1   | 127.9   |
| Br. & Conc. | 124.0   | 127.1   |
| Br. & Steel | 118.7   | 122.9   |

| BALTIMORE |         |         |
| Residences |        |         |
| Frame     | 91.3    | 92.1    |
| Brick     | 94.6    | 95.0    |
| Apartments |        |         |
| Br. & Wood | 91.8    | 94.3    |
| Br. & Conc. | 93.3    | 96.6    |
| Br. & Steel | 94.4    | 96.6    |
| Comm. & Fact. |    |         |
| Frame     | 91.4    | 91.8    |
| Br. & Wood | 92.0    | 95.9    |
| Br. & Conc. | 91.6    | 99.0    |
| Br. & Steel | 95.0    | 100.0   |

| CINCINNATI |         |         |
| Residences |        |         |
| Frame     | 102.9   | 99.6    |
| Brick     | 111.2   | 102.3   |
| Apartments |        |         |
| Br. & Wood | 106.1   | 102.1   |
| Br. & Conc. | 111.1   | 112.2   |
| Br. & Steel | 108.5   | 105.8   |
| Comm. & Fact. |    |         |
| Frame     | 103.1   | 98.9    |
| Br. & Wood | 108.4   | 104.3   |
| Br. & Conc. | 115.0   | 114.3   |
| Br. & Steel | 113.6   | 112.7   |

| BIRMINGHAM |         |         |
| Residences |        |         |
| Frame     | 81.8    | 86.4    |
| Brick     | 88.5    | 89.6    |
| Apartments |        |         |
| Br. & Wood | 86.1    | 92.3    |
| Br. & Conc. | 92.0    | 95.5    |
| Br. & Steel | 91.2    | 93.6    |
| Comm. & Fact. |    |         |
| Frame     | 79.2    | 83.1    |
| Br. & Wood | 92.0    | 96.7    |
| Br. & Conc. | 92.9    | 96.7    |
| Br. & Steel | 92.6    | 96.9    |

| CLEVELAND |         |         |
| Residences |        |         |
| Frame     | 106.0   | 105.9   |
| Brick     | 116.6   | 109.9   |
| Apartments |        |         |
| Br. & Wood | 110.9   | 109.6   |
| Br. & Conc. | 113.3   | 116.4   |
| Br. & Steel | 112.1   | 113.5   |
| Comm. & Fact. |    |         |
| Frame     | 109.7   | 106.7   |
| Br. & Wood | 111.4   | 110.4   |
| Br. & Conc. | 117.7   | 119.5   |
| Br. & Steel | 118.4   | 118.7   |

| BOSTON    |         |         |
| Residences |        |         |
| Frame     | 105.9   | 103.4   |
| Brick     | 112.0   | 109.0   |
| Apartments |        |         |
| Br. & Wood | 109.0   | 107.2   |
| Br. & Conc. | 112.0   | 112.9   |
| Br. & Steel | 110.9   | 111.3   |
| Comm. & Fact. |    |         |
| Frame     | 106.6   | 103.0   |
| Br. & Wood | 109.4   | 108.9   |
| Br. & Conc. | 114.6   | 115.3   |
| Br. & Steel | 116.8   | 115.8   |

| DALLAS    |         |         |
| Residences |        |         |
| Frame     | 89.0    | 91.9    |
| Brick     | 94.9    | 93.9    |
| Apartments |        |         |
| Br. & Wood | 92.0    | 93.5    |
| Br. & Conc. | 93.0    | 98.5    |
| Br. & Steel | 93.9    | 96.5    |
| Comm. & Fact. |    |         |
| Frame     | 87.5    | 91.4    |
| Br. & Wood | 93.9    | 93.9    |
| Br. & Conc. | 93.6    | 98.2    |
| Br. & Steel | 95.4    | 102.3   |
A alloys and metal magic

Because they help to provide innumerous necessities and comforts of today, alloys rule more of our lives than most of us probably realize. A suspension bridge is made possible by alloyed cable strands; and an alloy is the point that makes writing easier. Little-known metals as beryllium, tungsten, iridium, molybdenum, platinum, and many others have properties that amazingly change or reinforce those of ordinary materials as copper, iron, aluminum, and zinc.

Scientists say, however, that we still have hardly touched the possibilities of their use. They talk of alloys lighter than aluminum, far stronger than steel in comparable cross section, readily workable, and highly resistant to corrosion. As for research possibilities for their manufacture and use, extraordinary things are happening in scientific laboratories.

To study the basic physical properties of little-known metals and thereby to discover how they can be used industrially, Dr. Ralph H. Hultgren of Harvard has invented a new electron furnace to heat metals to 4850°F., or nearly half the heat of the sun.

Another Harvard man, Prof. P. W. Bridgman, has found a way to apply pressures of about three-quarters of a million pounds per square inch to produce allotropic forms of numerous substances, including metals.

Gold has been turned into radioactive mercury and copper into radioactive zinc by the modern alchemy of Dr. Lee A. Dubridge at the University of Rochester. He accomplished his experiments with a 5,500,000-volt atom smasher called a cyclotron. The metals were changed through disintegration by a proton beam. According to Dr. Dubridge, such experiments open up new fields of understanding the characteristics of metals and give new knowledge regarding possibilities for a vast array of new alloys, qualities of which could be predicted in large measure.

Today industry is laboriously searching for such new and better alloys. Pure science is no less active; and tomorrow we may be building far beyond our present dreams because of products made available through experiments of each. For example, Dr. Byron E. Eldred, president of the Engineering Society, has developed a method of casting metal by latent heat applied from within in contrast to the present method of applying heat from without. Dr. Eldred’s method may revolutionize the metal-casting industry, for it is said to produce, directly from molten metal, castings of vastly improved quality free from voids and defects.

Two metal products designed to simplify construction have recently been announced. One, manufactured by the K-M Building Products Co., of Milwaukee, Wis., is a furring anchor consisting of a malleable cast-iron bracket which fits into a sheet steel socket. The K-M anchor is adjustable and can be installed in both masonry and concrete construction.

The other device, made by the Faunzer Manufacturing Co. of Cleveland, Ohio, is a combination of a safety hook bolt head and deep washer to convert ordinary bolts into hook bolts.

EquiPPment

Oil-heating plants are now being simplified, made more efficient, more compact. Among recent announcements of new units are: 1. The “Model P. C. R. Odifurne”, a winter air-conditioning unit by the Timken-Detroit Axle Co. of Detroit, Mich. Built specifically for small houses, the unit heats, humidifies, cleans, and circulates air under fully automatic control, burning one gallon of oil per hr., at top capacity. The same company announces a low-priced rotary oil burner—“Model F” —rated at 525 sq. ft. of EDR steam and designed as a conversion unit for small houses, 2. The “Gilbarco Model PBSR90” by the Oil Burner Division, Gilbert and Barker Manufacturing Co. of Springfield, Mass. This unit is a low-capacity (80,000 B.t.u. per hr. at register) winter air-conditioning plant for small houses. A new summer portable air-conditioning cabinet—“Gilbarco GB90 Air Conditioner”—is available from the same company. Among the features is an adjustable 3-way directional air flow control.

A new gas-fired steam and hot-water boiler is announced by the York Ice Machinery Corp. of York, Pa., as one of a unit of complete line of heating and winter air-conditioning equipment that will be known as “Yorkaire Heat.” The gas-fired boiler is available in eight sizes and is completely automatic.

Another gas-fired unit is now available from the C. L. Bryant Corp., Cleveland, Ohio. The new plant combines a furnace and devices for complete interior air conditioning. Controls are automatic and the assembly has an efficiency rating of 80% according to the manufacturer’s announcement.

An air purifier which cleans and circulates air has been perfected by Airetemp, Inc., Dayton, Ohio. Called “Clean-Breeze”, the unit is designed for installation in an open double-hung window and can be operated by plugging into any light socket.

An electric door chime, designed with short tubes to conserve wall space, is now available from The A. E. Rittenhouse Co., Inc., Honeoye Falls, N. Y. Called “The Sentinel Model”, it is offered in both single- and double-purpose types.
Hospital institutions are generally spoken of as acute, chronic, and convalescent. There are no sharp demarcations between groups, but it may be said that persons afflicted with temporary but sharp illnesses are in the "acute" class. The average general, contagious or maternity hospital is an "acute hospital." Convalescents are those whose disease has been sufficiently arrested so as not to require active nursing and therapy. These are—or should be—cared for in custodial homes, sanitaria, "day camps," or clinics.

Who are the chronics?

Chronics are those who suffer from illness which lingers. Suffering involved may be no less acute, but the length of hospital stay may last from a month to three years, an average being three months. Chronic types are generally grouped as (1) psychiatric, (2) tuberculous, and (3) all others. In the last group are those suffering from cancer, neurological disturbances, diabetes, cardiac, digestive disorders or glandular disorders, and many other diseases. Mental and tuberculous cases, long recognized as special groups, have been more or less specially provided for.

Why emphasis on chronics?

Few private agency hospitals exist for specialized or general chronic types, so that a sharp disproportion between facilities for acute and chronic patients results. Most chronics, if they find their way to a hospital at all, find themselves in a general public hospital; in other words, in a hospital intended for acute cases. As the facilities of such institutions are limited the following evils result: beds intended for the acute are frequently occupied by the chronic; medical attention and research are concentrated on the more "interesting" acute cases, resulting in comparative, even tragic, neglect of chronics and in little scientific knowledge of the nature of chronic illness and how to combat it.

Recent surveys of hospitalization disclose a substantial need as far as the chronics are concerned.**

Evolution of institutions for chronics

For some time the average civilized community has recognized the insane and the tuberculous as chronic categories requiring separate institutions. With minor exceptions these remain the only types of special institutions. At first, even though specialized, they were primarily custodial in nature. Their chief therapeutic value lay in the fact that under proper management they provided conditions (food, rest, and fresh air) which aided natural recovery. Sanatoria for the tuberculous and sanitarium for the mentally ill were situated in the country, preferably in mountains or near the seashore. For the tubercular, some authorities believed only one or the other type of environment was conducive to "cure."

In the nineteen-twenties knowledge acquired of new forms of diagnosis and active therapy led to a new conviction applicable to various chronic illnesses. Remote sanatoriums are not convenient for more active forms of therapy, which require experts in the fields of roentgenology, surgery, serology, etc. Such experts are to be had and can be conveniently trained in large centers of culture—i.e., cities. Consequently, special hospitals have recently developed within or close to cities for treatment of chronic diseases. Sanatorium treatment is today preferred, either for those showing that they could not benefit from active therapy or for convalescents.

Most people—unless they are well to do—go to clinics or outpatient departments when they first observe signs of illness. Frequently, if their condition and home environment permit, they need not be confined to hospitals. Yet, if left to medication alone, hospitalization may become necessary. Particularly among children, malnutrition and other conditions exist which, if neglected, result in ultimate hospitalization. In short, many cases require something between a clinic and a hospital. A similar need is observed after hospitalization. Convalescent institutions are not always the best answer, and more frequently, are not available to the underprivileged. Day camps fill this need.

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*Information presented on pages 86-87, 83-90 and 104-107 was obtained from the New York City Department of Hospitals.

**Reports published by the United States Public Health Service state that in this country one person in six suffers from chronic disease. Families with incomes below $2,000 yearly average 16.5 days due to chronic illnesses. This indicates the need for chronic institutions.
GENERAL CHRONIC hospitals make provisions for many afflictions requiring highly specialized medical treatment. Design standards are, however, relatively appropriate to the various patient classifications.

**Location and orientation**

The site should be as open as possible, with pleasant views; permanence of these factors is important. Easy accessibility and clear transportation are desirable since visits from friends and relatives are encouraged, and most persons coming to the institution have relatively low incomes. These considerations point to a semirural location convenient to colley-car, bus, or subway lines.

Ward units should be placed so that patients’ quarters face the best view, preferably toward the south. Arrangements which force patients in the building to look into the rear of another building are to be avoided.

Administration units should preferably be centrally located with respect to ward units, but such accessory structures as heating plant, nurses’ home, etc., should lie preferably somewhat removed from the ward unit area, and so situated as not to interfere with the view and sun exposure of the ward units.

**Circulation**

Patients, visitors, and services should, if possible, each have separate entrances for ease of control, and avoidance of cross circulation, crowding, and confusion. Main circulation which traverses nursing units and other work centers interferes with hospital procedure. "Cul-de-sac" arrangements are preferable, with each department forming a dead end. This permits main traffic to bypass working units without interfering.

About 50% of chronic patients are ambulant; hence, for accessibility to grounds, ward buildings should be low. From this point of view two-story structures are considered ideal. If higher buildings are required because of land or other costs, four stories are considered desirable. In four-story ward units bedridden patients can be accommodated on the two top floors, half of the ambulant patients one flight of stairs from the grounds, remainder at ground level.

**Administration: check list**

Superintendent’s, nurse supervisor’s, assistants’ and secretaries’ offices; office supplies storage; doctors’ lounge and medical library, rest rooms for nurses and help, locker rooms; toilets for public and staff; information desk opening from main lobby; call systems.

**Housekeeping:** housekeepers’ office; general storage; soiled linen, clean linen, bedding, patients’ clothing and oxygen tank storage; male help’s, female help’s and nurses’ lockers; sterilizing room for bedding, clothing, etc.

**Treatment units: check list**

**Dental:** Waiting, extraction, operating and receiving rooms; dentists’ office; on upper floor. (See “Standards for Dental Offices”, Architectural Record, Dec. 1937, Building Types, pp. 116-118.)

**Therapy:** Waiting lobby and adjacent office; physiotherapy, hydrotherapy, occupational therapy rooms; library; exercise room; toilets; all usually on an upper floor.

**X-ray:** Waiting lobby; rooms for fluoroscopy, radiotherapy, cystoscopy, cardiology, deep and superficial radiotherapy; film loading, developing, viewing, storage and supply rooms; roentgenologist’s and secretary’s offices; all on an upper floor.
NURSING UNITS generally include: 1 large and several smaller wards; 1 or 2 isolation rooms; nurses' station, utility room, treatment room, serving kitchen, linen and locker rooms; patients' bath, showers, toilets; staff toilets.

Wards
Wards should be located on that side of building with best exposure.

Nurses' station
There should be one per nursing unit, situated to oversee as many beds as possible. Seating and counter space should accommodate two people. Minimum wall cabinets include two compartments: one for narcotics, one for ordinary medicines. All drawers and doors should be equipped with locks, particularly the narcotics cabinet.

Balconies, decks, terraces
Provide maximum areas of this type, some directly accessible from each ward; door openings and balconies approximately 5 ft. wide will permit beds to be moved out parallel to walls and will accommodate reclining chairs, etc. If beds are to be placed endwise to building, 10 ft. is required for each single row, 17 ft. for two rows plus an aisle.

TREATMENT ROOM
At least one treatment room per floor is desirable; one for each nursing unit is preferred; it may be located on north side of corridor. Minimum equipment includes hand-washing lavatory and instrument sterilizer. The equipment shown opposite is preferred for a treatment room used for teaching demonstration.

Utility room
Location should be as central as possible to beds served; one main utility room per nursing unit is required. If plan of nursing unit is elongated, one or more subutility rooms, equipped primarily for bedpan technique, may serve remote wards.

Ward laboratory
Routine duties of blood, urine and similar examinations are made for convenience, on the patients' floor. If the nursing units on one floor are small, laboratories may be placed on alternate floors.

Day room
Maximum window area is required. Rooms usually contain reclining chairs, small tables, magazine racks, etc. One day room per nursing unit is required, located to a good view.
TIME-SAVER STANDARDS

Operating Units

PLAN

INSECT SCREEN 16" MESH WIRE

COMMITTED

AIR CLOCK WITH SECONDS HAND

GLASS SCREEN

METAL PANEL BELOW

CONN. FOR AIR COND. UNIT

SECTION A-A

PLASTER CEILING

LIGHTPROOF SHADE

DIFFUSING GLASS SCREEN

SHTTERPROOF GLASS

METAL BRACKETS

RADIATOR COVER HINGED AT BOTTOM

GLASS BRICK

4" X 6" CONT. STEEL PLATE

ADJ. GLASS SHELVES

SECTION B-B

FIN. PLASTER CEILING

RECESS

GLASS DOORS

GLASS

ADJUST. GLASS SHELVES

TILE

SECTION C-C

SECTION D-D

HEAD OF WINDOW AS NEAR TO CEIL. AS POSSIBLE

TILE TO CEILING

TILE

METAL PANELS

GL

GL

OPEN

OPEN

OPEN

OPERATING ROOM: Scale, 1/8" = 1'-0"

This department comprises one or more operating suites; anesthetic room, instrument-washing and storage rooms; nurses’ work and saline solution rooms; doctors’ lockers; possibly waiting rooms for guests and blood donors. The department should be readily accessible to patients concerned, either by being on the same floor with them or by elevator. Location preferred is a “dead end” or cul-de-sac, the corridor of which is under no circumstances to be used as a thoroughfare. The top floor is preferable.

Operating rooms

At least one operating room is essential; two are desirable, one for clean and one for septic cases. The next addition would be a room for minor surgery. The number of operating rooms required depends not on the number of patients, but on the number of patients on the surgical service, the general nature of the surgical cases, the average length of time typical operations take, whether they are emergency operations or not, whether the operating staff is available at all hours or in limited hours, etc.

Sterilizing and scrub-up

One sterilizing and one scrub-up room for two operating rooms, should be provided. When operating rooms cannot be paired, each operating room must have its own scrub-up and sterilizing rooms. There must be, in addition, regardless of the size of the operating department, a workroom for nurses and facilities for sterilizing drums of gauze and large object facilities for doctors and nurses to change clothes, and to clean up and bathe.

Saline solution room

This room is included in extensive operating departments. Its purpose is the making of distilled water which is used for various purposes in the operating department and other departments of the hospital. It is used here principally for the preparation of saline solutions. The solutions must be kept in a warm cabinet. This room is also used for storing of equipment and for various minor purposes.
**SCRUB-UP AND STERILIZING:** Scale, $\frac{1}{8}'' = 1'-0''$

A. 12x22x10 in. instrument sterilizer
B. 24x30 in. utensil sterilizer
C. 35-gal. water sterilizer
D. Clinical sink
E. 18x24 in. blanket and solution warmer
F. 16x16 in. ceiling register
G. Surgeon's sinks

**OPERATING UNIT PLAN:**
Scale, $\frac{1}{16}'' = 1'-0''$
Capacities of hospital kitchens are dependent on three principal factors: personnel, planning, and equipment. This study is based upon usual requirements for a 300-bed hospital and is intended for use in preliminary planning only. In determining requirements for specific jobs, routine and practices of the institution and habits of personnel should be considered, as well as dietetic requirements of the particular type of hospital. Consultation with hospital superintendents, dietitians, and institutional kitchen specialists will provide data beyond the scope of this discussion. For instance, ice cream can be purchased but its consistency is not always dependable. It is not a luxury but an essential; numerous sherbets and ices are made part of the daily menu. The modern and simple facilities now available for freezing these products make it advisable to include them in the equipment.

Location and arrangement

Convenience for the reception of stores indicates the necessity for direct access to a service entrance, court, or drive; convenience for distributing meals indicates a central location from which all points of delivery are, as nearly as possible, equidistant. In multi-story hospitals, locations immediately adjacent to service elevators are desirable. Natural light and air are also advisable. In some cases, when kitchens are located in one-story wings, monitor roofs or skylights may be used, although the latter tend to raise kitchen temperatures during summer months. Arrangements of units composing the hospital kitchen may be compared to production lines of factories, each department contributing to the finished product, which is loaded in pans and tureens and placed on insulated serving carts for distribution. Issue of supplies is by requisition to the storekeeper. Daily records of pro-rata and per-capita meal costs are kept and checked.

Experience indicates that departments should be arranged in sequence of operation, contiguous to, and opening from, the cooking area, and that circulation should be extremely simple, with cross-traffic eliminated. Study of the accompanying typical plan indicates one method of accomplishing such a result. Note that serving carts have an extremely short distance of travel from cart-storage space to cooking spaces and diet kitchens where they receive food, and that on their return, dish- and cart-washing facilities are so located as to reduce travel similarly. Location of service elevators is determined in the same way. Washrooms, lockers, and dining rooms for kitchen help are placed with a view to restricting their users to the kitchen wing.

Kitchen departments and equipment

Dry stores include not only foodstuffs, but also general supplies such as brooms, brushes, mops, soap, and the many miscellaneous items required for household cleaning and maintenance.

Refrigerated stores include meats, poultry, dairy products, perishables, vegetables, fruits, and fish. As the refrigerator construction, cork insulation, cement exteriors, and tile interiors are recommended, using cold lofts where height permits.

Cooking apparatus is placed in two rows, back to back, in the center of the kitchen, divided by a low partition of sufficient length to accommodate all fixtures, and in close proximity to the butcher shop, vegetable room, and scullery. Gas and electric are equally satisfactory for ranges, broilers, and ovens. Stock and vegetable kettles are more economical operated by steam, but where power rates permit, these can be adapted to other services. A ventilating hood over cooking apparatus, extending two feet in length and width beyond ranges, ovens, and kettles, can be supported by the low partition and ceiling hangers. A large duct is connected with the exhaust system.
Typical Main Kitchen: Scale, 1/16" = 1'-0"

There should also be channels at the food base with drips carried to floor drains. A sunken pit or curved drain is usually provided under stock pots and steamers. This can be thin, high, and sloped to a drain.

Sinks of modern types have hooded top rims, corners, and bottoms pitched to outlets, all for sanitary reasons. Wall brackets can be used instead of legs. Quick-opening shelves, with levers located at the bottom, within easy operating reach, are available for use instead of waste bags. Monel or stainless steel sinks require greater initial investment but give labor costs in cleaning.

Pastry kitchen equipment. Bread kinking in a hospital of this size is not economical, but a pastry kitchen is essential to provide muffins, biscuits, rolls, and pastry.

Small utensils, molds, etc. A room for storing these is desirable; or space can be provided in the chef's office.

Serving equipment. In the main serving kitchen, prepared food is served on trays and placed in trucks, especially devised to segregate heated and unheated food to assure maintenance of proper temperatures. Requirements include Bain Maries; food and dish heaters; refrigerators for salads, dairy products, and ice cream; cabinets and shelves. Elevators to the upper floors can be located adjacent to the floor service pantries.

Auxiliary areas

Ward service. Each ward floor requires a serving pantry containing 320 sq. ft. and equipped with a separate dishwashing machine and tables, sink and drainboard, hot plate, egg boiler, toaster, coffee and milk urns, refrigerator, dressers with drawers, and wall cabinets. The most desirable type of cabinet and dresser is enamelled metal.

Nurses' dining rooms are served from cafeteria counters, equipped for waitress service or self-service, and include a steam table, cold pan, toaster, hot plate, egg boiler, dresser, wall cabinets, refrigerator, ice-cream cabinet, coffee and milk urns.

Officers' and help's dining rooms. These can be served from a pantry located between the divisions for men and women. This food preparation area is equipped with a steam table, coffee urn, refrigerator, dresser, and cabinets and dishwashing facilities.
**TIME-SAVER STANDARDS**

**Food Preparation (continued)**

### Help's Cafeteria Pantry
1. Clean dish table
2. Dishwasher
3. Soiled dish table
4. Sink and drainboard
5. Counter
6. Cold pan
7. Tray slide
8. Refrigerator
9. Cabinet
10. Coffee urns
11. Steam table

### Visitors' Cafeteria Pantry
1. Tray slide
2. Soda fountain
3. Cold pan
4. Steam table
5. Counter
6. Coffee urns
7. Toaster
8. Hot plate
9. Griddle
10. Sink
11. Ice-cream cabinet
12. Refrigerator
13. Dish tables
14. Dishwasher
15. Sink and drainboard
16. Cabinet

### Nurses' Dining Room

### Visiting Pantry

### Serving Pantry

### Staff and Nurses' Dining Room Pantries
1. Sink
2. Soiled dish table
3. Dishwasher
4. Clean dish table
5. Cabinet
6. Table
7. Sink
8. Heater
9. Cabinet
10. Bread and butter
11. Ice-cream cabinet
12. Cold pan
13. Shelf
14. Counter
15. Steam table
16. Heater
17. Urns
18. Hot plate
19. Egg boiler
20. Toaster
21. Griddle
22. Waffle iron
23. Sink
24. Back counter
25. Cabinet
26. Sink and drainboard
27. Table
28. Refrigerator
29. Tray table

### Typical Ward Serving Pantry
1. Dish tables
2. Dishwasher
3. Cabinet
4. Refrigerator
5. Cabinet
6. Sink
7. Drainboard
8. Egg boiler
9. Toaster
10. Hot plate
11. Ice-urn
12. Milk urn and warming
13. Counter

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**Auxiliary Kitchen Areas:** Scale, 1/16" = 1'-0"

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**Visitors' lunchrooms are now provided in modern hospitals. These can be located conveniently to the street entrance, and are fitted with a small steam table and items of equipment suggested for the other pantries in modified form, plus a soda bar.**

**Finishes**

Red Welsh quarry tile is recommended for the floors of the kitchen and its subdivisions. Floors should be provided with drains at practical points. Walls can be of ivory glazed tile with coved bases. All surfaces should be easily cleaned.

**Mechanical equipment**

Ventilation systems should be adequate to change the air every two minutes, and should include an exhaust system connected to hoods over ranges, kettles, dishwashing machines, and all fixtures emitting smoke, steam, or heat. When windows are not available, fresh-air intakes are necessary.

**Lighting** by natural means is the preferred method. Artificial light should be provided by any enclosed fixture which has a minimum of horizontal dust-collecting surface.

**Plumbing, gas, electrical and other service connections** are best studied in relation to the specific plant at the equipment selected. Data are available from manufacturers of all types of equipment and from specialists in the field.

**Refrigeration.** It is frequently expedient from the standpoint of both control and economy to adopt separate and group refrigerating units rather than central systems.

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Information contained in this Time-Saver Standard was prepared by Mr. George P. Alker, Nathan Strauss-Duparquet, Inc. It has also been checked by Miss Ella G. Ennis, Chief Dietitian, Department of Hospitals of the City of New York.
GENERAL CHRONIC HOSPITAL—1,500 BEDS

WELFARE HOSPITAL
WELFARE ISLAND, NEW YORK CITY

CHRONIC PATIENTS will be hospitalized in the four chevron-shaped structures. These, while retaining a southerly exposure, take advantage of the river vista and minimize the patients' view into the rear of the building in front. Convenience and accessibility determined the placement of the administration block in the center of the patients' accommodations. The shape of this structure is the natural expression of needs differing greatly from those of the ward buildings.

At the northern terminus is the mortuary and laboratory building. All buildings are connected by a covered passage and underground service tunnel.
Tuberculosis Hospitals

Requirements for treatment of tuberculosis have changed somewhat in recent years. In general, requirements, in addition to medical and surgical care, may be said to include:

a. Ample wholesome food
b. Fresh air
c. Regulated amounts of sunshine
d. Rest

Patients may be grouped into two general classifications: (1) inpatients, or those needing hospitalization, and (2) outpatients, or those who require treatment but who need not be confined to the hospital. As in a general chronic hospital, a noticeable percentage of inpatients are ambulant.

1. Inpatients

Admitting: receiving, examination, property, history and record rooms; observation wards broken into 2- or 4-bed units, isolation rooms; toilets and baths for male and female patients; toilet for staff; nurses’ station; linen storage; utility room and serving kitchen; stretcher space; dis- charge facilities.

Operating department: same as or general chronic hospitals, with addition of bronchoscopy room. This room requires, in addition to standard equipment, a 24-in. sterilizer.

Necessary, too, is space for the Drinker apparatus, or “Iron Lung.” (To frequent a postoperative tuberculosis patient suffers collapse of the lung. To restore breathing, the patient is placed in the artificial respirator, or supplied with concentrated oxygen.)

Dental suite: same as for general chronic hospitals.

Laboratories: for chemistry, bacteriology, serology, tissue and clinical pathology; media and sterilizing rooms; museum, record room, and pathologist’s office; ward laboratory, one per nursing unit or floor.

Eye, ear, nose and throat unit: sitting room, minor operating room, utility room, darkroom, history room, treatment cubicles.

Typical patients’ floor: 3 or 4 small wards (2 to 6 beds each) per large ward (approximately 24 beds); 2 isolation rooms, 1 utility room, nurses’ station, serving kitchen, linen closet; separate patients’ and nurses’ toilets, patients’ washroom with denial bowls and bath; at least one solarium per nursing unit; balconies or roof space directly accessible to each ward; location of wards and service rooms as in general chronic hospitals.

Screening between groups of beds extend to the ceiling. Six-bed wards are separated by doors. Ceilings in all of the wards are preferably soundproofed.

All the foregoing is desirable to prevent one patient’s coughing from annoying the others. Acoustical treatment also favors physical examination of the chest. Smaller wards, primarily intended for the very sick and postoperative cases, are equipped with aspirators for continuous suction of drainage of pus, etc. Aspirators operate on running water, much like dental drainage apparatus. Washrooms, in addition to the usual lavatories, contain flushing dental lavatories which are desirable for expectorating patients.

Treatment rooms: taps, fluoroscopy, and pneumothorax; one each in suite, per nursing unit or floor. Dressing and rest facilities are not necessary when patients’ beds are nearby.

Sputum technique: The expectorating patient has at bedside, or carries about with him, a metal sputum cup, fitted with a folding carton cup. Daily or, if necessary, more frequently, these are collected and replaced. Used cups are taken to the sputum room where the cartons are removed and deposited into cans prior to being burned. The metal cups are then washed, sterilized, and dried, fitted with fresh carton cups and returned.

The sputum room should therefore afford sufficient space and facilities for storing and sterilizing in accordance with this technique.

Occupational therapy, recreation, etc.: space for teaching such arts and crafts as medical condition permits; assembly room with stage and motion-picture facilities; small lending library; roofs and balconies, partially shaded; day camp similar to convalescent day camp.

Food service: general and diet kitchens are larger than for general chronic hospitals; because of special diets, large quantities of milk products, etc., which are served bedridden patients from ward kitchens, ambulant patients from cafeterias.

(2.) Outpatients

In this department the patient is examined and, if necessary, is admitted; or his case may warrant only periodic treatment and re-examination. Similarly ails may be arrested to a degree where further stay in the hospital is not indicated. Such cases may return home, but conditions may require further observation and treatment.

The tuberculosis “clinic” has features peculiar to itself. These include “fluoroscopy”, “pneumothorax”, and “taps” rooms; the last two may be interchangeable or combined. Artificial pneumothorax therapy consists of resting one or both lungs by insufflating air into the chest cavity. Prior to the induction of this form of collapse therapy, and periodically thereafter, patients are examined and re-examined under the fluoroscope. In subsequent treatment it is frequently necessary to remove the fluid or pus which may accumulate in the chest cavity. Treatment suites should be equipped with dressing booths and rest couches that can be curtained off. All other equipment is portable.

(3.) Inpatients and outpatients

Pharmacy: located conveniently to both in- and outpatient areas.

X-ray: located similarly to pharmacy; includes radiography, fluoroscopy, cystoscopy, barium preparation rooms; loading, developing, film storage and viewing rooms; roentgenologists’ offices; waiting room and stretcher space. An ample number of dressing cubicles are desirable in order that ambulant patients should consume the least possible time in disrobing for examination. (See “Radiographic and Allied Equipment”, Architectural Record, July, 1937, Building Types, pp. 149-151.)

Administration

Administration areas are the same as for general chronic hospitals.
TUBERCULOSIS HOSPITAL—550 BEDS
TRIBORO HOSPITAL, NEW YORK CITY

First Floor
1. Medical library
2. Unassigned
3. Office
4. Staff lounge
5. Staff locker room
6. Office supply room
7. Discharged patients
8. Main lobby
9. Alcove
10. Pneumothorax
11. Fluoroscopy
12. Taps room
13. Waiting room
14. Social service
15. History room
16. Examining room
17. Pharmacy
18. 3-bed ward
19. Nurses' station
20. Linen room
21. Isolation
22. Utility room
23. Serving kitchen
24. Office and history room
25. Record room
26. Nurses' lockers
27. Nurses' rest room

Basement
1. Clerks' dining
2. Help's dining
3. Cafeteria
4. Dish and glass washing room
5. Soiled linen
6. Locker room
7. Toilets
8. Staff dining
9. Serving room
10. Nurses dining
11. Private dining
12. Bedding storage
13. Fan room
14. Sterilizing
15. Patients' clothing
16. Medical supplies
17. General storage
18. Switchboard
19. O. T. workroom
20. O. T. supply
21. Pharmacy stores
22. Pharmacy work
23. Garbage refrigera-
tor
24. Destructor feeding room
25. Clean can space
26. Linen storage
27. Serving room
28. Office
29. Ice-cream room
30. Scullery
31. Help's dining
32. Bread room
33. Main kitchen
34. Bakery
35. Can washing
36. Butcher and vegetable prepara-
tion
37. Daily stores
38. Diet kitchen
39. Cart and utensil washrooms
40. Oxygen tank room
41. Food refrigerators
42. Telephone booth

BUILDING TYPES
A comparatively large open site permits minimum levels for patient accommodation. The adult nursing units are restricted to three floors and the children's buildings to one-story structures. Southern-exposed verandas and open balconies, considered essential to tuberculosis treatment, are provided on all levels and are directly accessible from each room. Supervision of wards and verandas is readily accomplished from duty room because of the openness of the units. Covered walks connect male and female areas to the common dining and recreation building.

Sputum destructors are distributed throughout the institution rather than centralized as in a more compact development. Here decentralization of destructors reduces the hazards involved in conveying sputum collections over long distances.
CHILDREN'S BLOCK: Duty room divides boys and girls. A covered walk connects both wings to the school, (upper right, facing page).

Children's Block and School
1. Teachers' room
2. Junior classroom
3. Senior classroom
4. Game stores
5. Covered walk
6. Quiet room
7. Day room
8. 2-bed ward
9. Veranda
10. Locker room
11. Special day room
12. Private room
13. Duty room
14. Consulting
15. Mattress drying
16. Switch room
17. Toilets
18. Dining hall
19. Stores
20. Larder
21. Ward kitchen
22. Scullery
23. Special case scullery
24. China and cutlery

Observation Block
1. Women's day room
2. Girls' day room
3. Duty room
4. Boys' day room
5. Men's day room
6. 2-bed ward
7. Single-bed ward
8. Nurses' lavatory
9. Larder
10. Kitchen
11. Linen
ADMINISTRATION BLOCK: between nursing units for men and women which flank either end.

RECREATION BLOCK: On first floor food preparation, storage and dining areas; on second an auditorium,ancel and stage at opposite ends.

ISERVATION BLOCK: for men, women, and children. This structure removed from the general patient bas and nursing units for maximum control. (Plan on facing page.)
This type of project is unusual among American medical institutions. Its function is directed to (a) prevention of light clinical cases from becoming acute hospital charge (b) after-care of post-hospital cases who, if left to their own devices might cease to improve.

Such a camp should be available to men, women, and children of several clinical classifications, referred to the camp by public hospitals and outpatient clinics, and by private agencies. Patients or guests arrive in the morning and depart late in the afternoon.

Welfare Island Camp

The main house provides administration offices, kitchen, and dining room. The seating capacity of the dining room is 350, but surrounding terraces double that during summer.

There are eight shelters. The indoor capacity of each, on the basis of all guests in reclining chairs, is 60 or 480 persons for the entire camp. By using terraces and grounds around the shelters, capacity can be doubled in summer months.

Shelters face southeast and are staggered to obtain a fair angle of vision of the river. The entire floor of each shelter consists of glazed doors and transoms. Shelters are heated and can be made comfortable under all conditions.

The landscaping scheme anticipates that each shelter may be devoted to a different clinical classification or to a different sex or age group. Separate yards or play spaces are provided for each shelter. Opposite the main building is a "splash" pool, intended primarily for children.
Psychiatric Institutions

PSYCHIATRIC INSTITUTION is not to be confused with the usual state hospital for the insane. It is the link between the immediate community and state hospitals. Its principal functions may be summarized as:

(a) Outpatient diagnosis and treatment
(b) Inpatient diagnosis and treatment
(c) Research and teaching

Patients to be treated here are divided into the following groups, and special provisions are made for each:

(a) Outpatients; (b) Criminals; (c) Inebriates; (d) Children (e) Adult disturbed other than criminal; (f) Adult semi-disturbed; (g) Adult quiet alcoholic

Any standards of planning may become inadequate because of changes in conception of psychiatric treatment once in rapid succession.

Space

The shape of the plan should be suitable to proper control. Male and male wings should be separated, from one another being, in a certain degree, limited. A typical U-shaped Y plan permits the nurse's station at the union of the three arms of the Y to have clear control of the entire nursing unit. The station faces the main services and the entrance to the unit. Cases can be diagnosed properly when patients are owed comparative freedom. This can be attained by locating entrance to each unit and allowing patients the freedom of the unit (excluding criminal and alcoholic areas).

Flow lines

The patient must be admitted to the hospital, moved within the building, and discharged in such a manner as to have him under constant control, avoiding the crossing of these lines by sick or other circulation.

Mission facilities

One solution of this controlled circulation locates the outpatient facing the street, while the admitting department faces an inner spital road: the first for convenient access, the other to prevent bibic scenes when disturbed patients are brought in. At the entrance is a first-aid room. Quiet patients wait in a large waiting room. Disturbed patients wait in special rooms. After the patient's history is taken, he is conducted through the examination room and bathroom, where he receives clean clothes. Finally, he is taken to his assigned ward. Some patients may be taken directly to operating room, quiet bath, etc.

Elevators

Two sets of elevators are mandatory, one for general passengers, the other for patients and services. The first set always opens on public spaces, while the latter always opens into patients' or treatment areas.

Discharge

Patients do not generally remain long in a psychiatric hospital (average stay: adults, 8 days; children, 30 days). Less than one-half of the patients are discharged, most others being committed to a state institution. Transfer of patients takes place at frequent periods, usually twice a week. The procedure necessitates a special discharge department in the basement with a separate ambulance drive.

Commitment

Necessary examinations should take place in one of the institution's conference rooms. Several conference rooms are also desirable for teaching, etc.

Mental hygiene

The mental hygiene clinic, or outpatient department, of a psychiatric hospital requires a series of small examination rooms: (1) psychiatric and medical, (2) psychological, and (3) social. Clinic rooms should be substantially built and acoustically isolated, as sounds (even whispers) are apt to upset patients and seriously interfere with the work. It is frequently convenient to diagnose behavior of small children while they play in a large children's common room. Alcoves permit observation. Windows between the observation alcoves and the children's room should prevent the observed from seeing the observers, but permit sound to pass.

Ward units

The principal difference between wards for quiet, semidisturbed, and disturbed is that there are required progressively more single rooms and increased provisions for pack and continuous-flow baths.

Prison wards are placed as high as possible to reduce possibility of escape or smuggling in of contraband. Doors from lobby to prison wards are bulletproof, with bulletproof-glass vision panels. Alcoholics are placed as low as possible, because turn-over is very high. This arrangement reduces use of elevators, etc.

Typical ward

A. Medical-administrative suite consists of four rooms assigned respectively to examiner, psychiatrist, secretary, and psychologist.

B. Serving kitchen. Since the up-patients will serve themselves, the kitchen is arranged for cafeteria and bedside service.

C. Normal or hygienic bathing and toilet facilities are distinct from therapeutic and pac facilities, and are so arranged that a nurse or attendant can see what is happening in all compartments. Compartment doors are omitted and the wall in back of the basins is low.

D. Typical single room is 8 ft. 6 in. wide in the clear in order to permit placing the bed with its long axis perpendicular to the partitions and for necessary access to three sides.

Educational and occupational therapy

In addition to day rooms in each ward, facilities are provided for both indoor and outdoor play. Roof terraces are protected with insurmountable fences. Areas are also provided for occupational therapy and class-rooms for both children and adults.

Details and finishes

The design objectives are:

(a) To prevent patients from injuring themselves unintentionally;
(b) To prevent patients from injuring themselves intentionally;
(c) To make the means for restraining patients as little obvious as possible;
(d) To avoid rough surfaces and projections which excite patients to destruction of their surroundings;
(e) To make finished surfaces and equipment indestructible.
PSYCHIATRIC PAVILION—350 BEDS
KINGS COUNTY HOSPITAL
NEW YORK CITY

The program for this building, as developed in 1936, included provision for 450 beds, divided as follows: 20-bed alcoholic ward for transitory, nonpsychotic cases; 40-bed children’s psychiatric ward; 30-bed prisoners' psychiatric ward; 20-bed prisoners’ medical and surgical ward; 40-bed disturbed male ward; 40-bed disturbed female ward; 40-bed semidisturbed male ward; 40-bed semidisturbed female ward; 40-bed quiet male ward; 40-bed quiet female ward; 100-bed ward or wards for neurosurgical cases. As now revised, the neurosurgical ward is omitted. The average sex ratio of patients is stated to be about 107 males to 100 females (not including alcoholics). Inclusion of the latter tended to increase the difference.

Disturbed wards are planned with as small room units as are economically feasible, and the program called for individual rooms for caring for physically ill patients within quiet and semidisturbed wards. Arrangement of typical floors is indicated by the third-floor plan. Rooms at seventh-floor level have cage enclosures.
HOSPITAL FOR THE CRIMINAL INSANE–288 BEDS
STATE HOSPITAL NO. 1
FULTON, MISSOURI

THIS BUILDING is a detention hospital for state prisoners who develop mental ailments after conviction. Some cases are mild, some extreme, but all require segregation. The hospital includes seven self-contained nursing units consisting of ward, day room, toilets, locker, bath, utility room, and isolation rooms.

Interior finish is devoid of unessential details and is comparatively indestructible. Surfaces are generally of terrazzo, tile, or painted concrete, plywood forms being used for the latter to secure smooth surfaces. Visitors and mild cases enter from the south, violent cases from the north, through the covered driveway.

First Floor
1. Ward
2. Isolation
3. Linen
4. Utility
5. Bath
6. Lockers
7. Toilets
8. Nurse
9. Day room
10. Photos and fingerprints
11. Waiting room
12. Office
13. Registration
14. Guard
15. Superintendent
16. Secretary
17. General office
18. Records
19. Switchboard
20. Staff dining
21. Attendants' dining room
22. Serving room
23. Dental
24. Dentist
25. Kitchen
26. Barber
27. Storage
28. Shop
29. Supplies
30. Steam entry
31. Transformers
32. Machine room
HOSPITAL FOR THE CRIMINAL INSANE

At top, interior of a typical day room. Walls and floors are surfaced with destructible materials, ceiling is acoustically treated, radiators are recessed and lighting fixtures are protected. Below, typical ward; coverts and birthing boxes are used at all corners. Dwelling partitions permit observation throughout the ward.

SCHEDULE OF EQUIPMENT AND MATERIALS

FOUNDATION
Concrete

STRUCTURE
Reinforced concrete columns and floors

EXTERIOR
Walls: Brick, concrete; cut-stone trim, Indiana Limestone Corp.
Sash: Detention windows, guards and screens, William Bayley Co.
Roof: Concrete deck, built-up roofing

INTERIOR
Floors: Tile, The Coates Co.; cement; aggregate finish, trap rock, Pilot Knob Ore Co.
Walls: Cement plaster; tile, The Coates Co.; marble, St. Genevieve and Carthage, Arkansas Marble Co.; X-ray proof material, Ray-Proof Co.

Ceilings: Plaster; acoustical treatment, Acousti-Celotex, Celotex Corp.
Millwork: McClelland & Co.

EQUIPMENT
Hardware: Sargent & Co.
Kitchens: Southern Equipment Co.
Heating: Radiators, Trane Co.; unit heaters, American Blower Co.; automatic temperature regulators, Johnson Service Co.
ONE OF THE MANY hospitals erected with WPA funds, this structure has double walls, and floor and roof slabs of Super-Rock concrete. Floors are finished with asphalt tile; walls are plastered. Conditioned air is supplied through ducts in corridor ceilings, with returns at floor level.

Though small, the building includes operating, ward, and other facilities located at "dead ends" of corridors, as commended for chronic hospitals.
10-BED EMERGENCY HOSPITAL AND HEALTH CENTER
BRADLEY MEMORIAL HOSPITAL
SOUTHINGTON, CONN.

LESTER BEACH SCHEIDE, INC.
Architects

PLANS: at right, first floor; below, basement

FOLLOWING a program prepared by Ira V. Hiscock, Professor of Public Health, Yale University, and Dr. Benjamin G. Hornig, Health Officer of the City of Hartford, Bradley Memorial is designed as a community health center, giving emphasis to preventive medicine, with emergency hospital provisions. This combination of facilities for chronic cases with those for acute patients brings under one roof the various public health agencies requiring separate buildings in large communities.
Schedule of Equipment and Materials

Foundation
- Concrete

Structure
- Structural steel, Carnegie Steel Co.; reinforced concrete, reinforcing steel, Republic Steel Co.

Interior
- Ceilings: Plaster; acoustical material, Norristown Asbestos Mfg. Co.
- Doors: Elevators and dumbwaiters, Dahlstrom Metallic Door Co.; interior wood, Crooks Door Co.; combination steel frames and trim, Reliance Bronze and Steel Co.; door louver, Ellison Bronze Co.
- Paint: Pittsburgh Plate Glass Co.

Equipment
- Screens, shades: Kane Mfg. Co.
- Venetian blinds: Acirema Metal Corp.
- Cabinets: Medicine, Charles Parker Co.; steel dressers, Art Metal Construction Co.
- Dumbwaiters, elevators: Otis Elevator Co.
- Transformers: General Electric Co.; Pyranol.
- Sterilizers: Wilmot Castle Co.
- Hospital furniture: Hill-Rom Co.
INDUSTRIAL CLINIC
DETROIT INDUSTRIAL CLINIC
DETROIT, MICHIGAN

The second story covers only the front portion of the building, and contains living quarters for staff members. First-floor plan at left shows clinical facilities.

SCHEDULE OF EQUIPMENT AND MATERIALS

FOUNDATION
Poured concrete footings and walls

STRUCTURE
Steel frame, brick and cement-block walls

EXTERIOR
Walls: Brick facing, two-story portion; Kittanning No. 2 face brick; one-story portion, sand-lime brick; glass masonry; Owens-Illinois Glass Co.; trim, yellow Kasota stone, Acme Cut Stone Co.; tabletts and name plates, aluminum, Detroit Mausoleum and Equipment Works.
Sash: Steel, Tuscon Steel Co.
Roof: Wood deck on wood joists; built-up roofing, Flintkote Co.
Metal: Aluminum, Sioux Metal Products Co.

INTERIOR
Floors: First floor, two-story portion, 4-in. concrete slab on earth; one-story portion, 2-in. concrete slab on steel joists; lobby finish, terrazzo; operating, dressing and sterilizing rooms, Magnasite, Wentzel Floor Co.; laboratory, darkroom, toilets, tile; all other first-floor spaces, rubber tile, Royelite, Fauji Co., or asphalt, Accotile, Armstrong Cork Products Co.; second floor, wood on wood joists.
Walls: First and second floors, painted plaster; tile in operating, dressing and sterilizing rooms.
Trim: Wood generally; some metal casings, Milcor Steel Co.
Ceilings: First and second floors, plaster on rock lath, insulated with 2½-in. rock wool fill on one layer of Air-O-Cel board, Air-O-Co Industries, Inc.

HEATING
Oil-burning direct-fired air conditioning complete with blower, filters, humidifier, hot-water heating coil; duct work, galvanized iron; 6-in. vitrified pipe in unexcavated masonry by Gar Wood Industries, Inc.

PLUMBING
Piping: Galvanized steel

EQUIPMENT
Kitchen: Parsons Co.
Incinerator: Detroit Incinerator Co.
MATERNITY BUILDING—109 BEDS
W. MINGTON GENERAL HOSPITAL
W. MINGTON, DELAWARE

G. MORRIS WHITESIDE, 2nd
Architect

Accommodations are divided as follows: for adults, 48 beds, including 14 private rooms, 26 semiprivate and 2 four-bed wards; bassinettes, 61, including a general nursery for 51, premature, 4, and isolation, 6. The planning consultant was Dr. Frank M. Houck of Johns-Hopkins.

First Floor Plan

BUILDING TYPES
MATERNITY BUILDING
WILMINGTON GENERAL HOSPITAL
WILMINGTON, DELAWARE

SCHEDULE OF EQUIPMENT AND MATERIALS

FOUNDATION
Poured concrete; metallic waterproofing, Master Builders Co.

STRUCTURE
Concrete; roof framing, steel, Bethlehem Steel Co.

EXTERIOR
Walls: Brick, cinder block backup; Virginia face brick; marble trim, Green Mountain Marble Corp.; sculpture, Joseph H. Beis
Roof: Slate on cement slab, Federal-American Cement Tile Co.
Insulation: Eagle-Picher Sales Co.

INTERIOR
Floors: Terrazzo generally, Vesta-Gloss finish; asphalt tile in basement; Durites: Sealex linoleum in corridors; Congoleum-Nairn, Inc.; ceramic tile in toilets, Penn Tile Works

Partitions: Gypsum block; folding partitions, Fairhurst Unifold Partition; bed screening, Day's Curtain Screening Equipment, H. L. Judd Co.


Ceilings: Acoustic plaster in corridors, waiting rooms, labor, delivery and isolation rooms, Gold Bond Macoustic, National Gypsum Co.

Interior doors: Wood, W. D. Crooks & Sons; millwork, Northeastern Lumber Co.; metal, Jamestown Metal Corp.

HEATING

PLUMBING

LIGHTING

EQUIPMENT
Venetian blinds: Western Venetian Blind Co.
Metal cabinets: H. D. Daugherty Co.
Clothes chutes: M. O. Sundellus
Elevators: Otis Elevator Co.
Hardware: P. & F. Corbin
Hospital equipment: Nurses' call system, Weeks & Co., Inc.; X-ray viewing box, B. X-Graph

BUILDING TYPES

ARCHITECTURAL RECORD