

↓  
"ARCHITECTURAL DESIGN OF A PRIVATE  
HOSPITAL IN BEIRUT."

May 1948

O. Senekjian

EPsm 56

T H E S I S

"ARCHITECTURAL DESIGN OF A PRIVATE HOSPITAL  
IN BEIRUT."

*J. Rasboun*  
*2/6/48*  
*Bilibingyan*

May 1948

O. Senekjian  
B.S.C.E

This work is completed under the  
Supervision of  
Prof. Khosrov Yeramian

(Professor in the Civil Engineering School  
of the  
American University of Beirut)

## INTRODUCTION

A new Acute General Hospital of 60 bed capacity is to be built on a site in Ras Beirut, including all the essential services and the installation of all the necessary equipment, fixtures, lighting and furniture for running it efficiently with maximum service at a minimum expense.

The Hospital is a four floor, T shape building with the following allotment of beds;

Private	17 beds
Semi Private	12 beds
Ward	33 beds

A number of reasons led me to choose this subject for my thesis.

The health of a community is the prime factor in the well being of that same community. Often the proverb "A healthy mind in a healthy body", has been stated emphatically for individuals. It applies to the community just the same. For promoting this idea of community well-being I took up the subject of planning an up-to-date hospital. Through the functioning of this ideal hospital, our people could be better instructed and educated along health lines so that they, the people, could promote the health of the community by using preventive methods. Thus the hospital would have a double purpose of treating the sick in the best way and at the same time instructing the people to promote health and prevent sickness.

The fact that Beirut is an educational center, where there are many schools and universities, many students come to it from the neighbouring towns and countries. Beside students, people come to Beirut as visitors, summer visitors or tourists. The proper hospital could impress these people with the same ideal, "A healthy mind in a healthy body", so that when these people go back to their communities they in turn help to promote the health of their communities.

Having worked in a hospital for several years I have come to realize how much suffering there is among the people, much of which could have been prevented if elementary principles of health were known to these people. I am convinced that a well planned hospital plays a major part in preventing suffering and at the same time promoting good health.

A.U.B. 1948

O. Senekjian

## CEDAR HOSPITAL

### General Discussion.

This hospital is a T shaped building of four floors, located on the main Hamra Street on a plot of land approximately 5600 square meters. The building itself covers an area of 658 square meters. The main body is 44 meters by 12.50 meters while the tail end is 13 meters by 7.25 meters.

A round ramp with 6.37% grade leads to the main entrance of the building. The ramp has a hard wearing surface to take care of cars coming up to the stairs. Near the street entrance there is a passage to the parking area which has a similar hard wearing surface. A secondary car passage to the back of the building is used for supplies, ambulance cases and removal of bodies.

The choice of the site of a hospital is very important. Great consideration has been given for the choice of the site of this hospital. It is necessary to have it as near to perfection and accommodation as possible for the prevention of unnecessary errors in the future. The location is such that it is easily accessible by both the Ras Beirut community and the people living in the town. The tram line is quite near from the northern direction, while small cheap cars running back and forth to the center of the town, are very near the southern approaches. The fact that it is on a main street makes it very easy for people to reach it by taxi cabs or private cars. No difficulty is encountered for parking space both on the street and inside the hospital grounds. The surrounding is very quiet, away from traffic congestion and noisy industrial, business, and school districts. The land is not on a hilly ground. Poor

people, especially if they are sick, will not be exhausted by walking.

It has all the public utilities on the main street, namely electricity, sewage system, and water. No atmospheric disturbances occur and no foul odor producing plants are around the site. The orientation is such that it receives sunshine all day long.

The cost of the land is another factor for consideration. In this locality land is quite expensive, but the foundation rock is not deep, leveling the ground is not necessary and clearance from the surrounding properties is excellent. All these factors put together make up for the additional initial cost of the land.

For a new hospital it is recommended that two experts consult each other for the plan of the building, the choice of furniture and equipment, the arrangement of fixtures and lighting, etc. An experienced architect in hospital construction makes the plans of the building and supervises the construction. Not only must he have this experience, but he must also be acquainted with the functioning of the hospital so that he can give the best possible plans. On the other hand a consultant is a representative or rather an executive of the governing body that is building the hospital. Being an experienced man, the consultant suggests to the architect the details of the planning, including allotment of space, coordination of the different services, information upon special plumbing, lighting fixtures, acoustical treatment and everything else which affect the utility of the structure for the highly specialized purpose for which it is intended. He is also the man to decide on the kind and specifications of the

furniture and equipment needed for the hospital. His experience in hospital work must also be very wide so that he could guide the construction in such a way that it will be up to the standards of national accrediting agencies. I do not know if there are any such bodies in the East. In American there is for instance, the American Hospital Association.

The building is a reinforced concrete frame structure with outside sandstone walls of 25 centimeters thickness and with inside partition cement block walls of 12 centimeters thickness. The ceiling height of all the floors is 4.08 meters, except for the laundry and boiler room areas which are 4.93 meters high. This is done to insure more ventilation, because the nature of the work requires the use of plenty of water and steam. Both outside and inside walls are plastered with a cement base mixture. The ceiling of the last floor is plastered with a heat insulating material in order to keep away the summer heat and the winter cold. Cream color white wash is used for the finish of the outside walls. The inside walls have an eggshell oil paint finish reducing glare. The private and semiprivate patients' rooms are painted in different light green, cream or blue color using a darker shade of the same color in the same room for the lower 1.50 meters of the walls. This arrangement breaks the monotony of the rooms. All the wards are painted in cream color on the two shade principle. The floors are covered with terrazo tiles to match the color of the rooms. A tile skirting is run along the walls.

Before the final designation of the location of the different departments, a fair consideration must be given for the two types of traffic, namely to and from the hospital traffic and inside the hospital traffic.



The main entrance of the hospital is in the front. Passing through the street entrance, over the ramp, up the stairs, <sup>through</sup> to the porch which has the main big entrance, one reaches the second floor. This entrance is for the ambulant in-patients arriving on foot or by car, the visiting public, the doctors and the professional employees. A second entrance on the first floor of the east wing is for the out patients, and Radiology patients. On the tail end of the building a third entrance is used for ambulance patients either as emergencies or regular sick patients who cannot walk. This same entrance is also used for sending out bodies of the deceased. It is kept locked. A fourth entrance provided on the opposite side of the tail end serves many fold purposes. Supplies are unloaded for the laundry, the dietary department and the general stores. Refuse is disposed through it. Non-professional employees use it under control.

The second type of traffic which is inside the hospital, is the more important. Some crossing of traffic streams is inevitable. Orderly internal traffic is facilitated by correcting relating facilities and services. Inter floor traffic is carried through the two stairs and the elevator. The main traffic streams are: (1) Incoming patients who must proceed from the admitting department to the wards, emergency room, X-ray department or other services; (2) out going patients who must leave the hospital from the wards usually by way of business office; (3) inter departmental patient traffic; (4) deceased patients who must be taken from the wards or emergency direct to the mortuary in as unobstrusive a manner as possible; (5) visitors who should be under surveillance to and from the wards and during their entire stay in the hospital; (6) staff members who ought to be routed

past the record library and the physicians in-and-out board, and who should be protected from contact with the visiting public as much as possible while in the hospital; (7) employees who must be routed past their time control station and locker rooms before being allowed in the hospital proper; and (8) the complicated traffic in laundry, supplies, foods, and wastes which must be completely isolated from all patient and visitor traffic if possible.

This inside the hospital traffic is planned according to principles laid down by the late Dr. S.S. Goldwater, the dean of hospital consultants in the United States, in the "report of the Committee on Hospital Planning of the American Hospital Association, 1924."

"At a time when building costs are extraordinarily high, the temptation is peculiarly strong to lower the standards of planning in the interest of an assumed economy. We are in the midst of such influences today, and the time seems opportune to direct attention to the underlying principles of hospital planning, namely, unity, diversity, facility of operation, flexibility, health and economy.

No. 1 UNITY. A well ordered hospital which is doing advanced and thorough work necessarily contains many clinical and other subdivisions. The specialized character of these subdivisions readily suggests the splitting of the hospital into many parts.

"Swayed by departmental interests, the architect is apt to be led away from the fundamental idea that the hospital is an organic unit which cannot function vigorously unless all of its departments function in harmony. The tendency of individual departments to detach themselves from the group should be combated in planning a general hospital and the unity of the hospital preserved.

No. 2 DIVERSITY. Certain principles of orientation, size, and arrangement are valid, respectively, for a particular department of a hospital, and these principles must be respected. If the architect considers separately each distinctive function and plans for it appropriately, a variety of structural outlines will emerge. If he then proceeds to build for each function, regardless of its place and relations in the general scheme, chaos will result.

"While the value of diverse forms must be recognized, the necessity of combining these forms into a practicable unit must not be overlooked. On the other hand, if a plan which is simple and which is selected on account of its correspondence to some particular hospital function, the resulting building may be satisfactory in part, but will not give satisfaction as a whole.

No. 3 FACILITY OF OPERATION. The degree of ease with which a hospital can be operated depends on the location of the site, the disposition of entrances and exits, the grouping in space of interdependent departments, and the arrangement or placing of working equipment. The accessibility of the hospital to its clientele is important, and in this connection, patients, visitors to the patients, the medical staff, and the nursing staff must be separately considered.

"Entrances and exits must be conveniently arranged for the groups just named, as well as for domestic employees, for goods, for

waste and for the dead Internal circulation, or transport and service lines, demand the closest study.

"For example, the wide separation of (a) the supply entrance from the kitchen, (b) the visitors' entrance from the elevators, (c) the visitors' elevators from the nurses' control stations, (d) the operating rooms from the surgical wards, (e) the out-patients' department from the admitting ward or from the radiographic department, (f) the ward utility room or the linen room from the center of the group of beds to which it is annexed, interferes with facility of operation.

"These few examples will perhaps suffice to show that an intimate knowledge of hospital service is indispensable in planning, and that the difficulty of applying such knowledge is especially great in the case of large and complex general hospitals, in which service lines cross each other many times.

No. 4 FLEXIBILITY. Experience has shown that the conditions which constitute the environment of the hospital are constantly undergoing modifications; social changes, community growth, and scientific discovery create new demands which the hospital is called upon to satisfy. Healthy hospitals are growing hospitals, but their growth is not necessarily symmetrical.

"New discoveries are constantly opening up new lines of medical treatment which call for new space-consuming therapeutic apparatus. Nursing standards are forever advancing. Novel forms of record keeping are devised, and presently are regarded as indispensable.

"A hospital which begins as a medical boarding house is eventually called upon to participate in health education, in the clinical training of medical students, in postgraduate medical teaching, in scientific research. A sudden windfall enables the hospital

to add a new or larger maternity department, an orthopedic department, a "tonsils clinic," a children's health center. Pressure is constant, from within and without, and the hospital must be in a position to accommodate itself to every reasonable demand. An inflexible plan is a forerunner of trouble.

No. 5 HEALTH. A hospital which is not rich in health values is a failure. Health values do not reside exclusively in smooth walls, smooth floors, and rounded inner corners. They are many and varied and include values which tend directly to the promotion of health. Some of these are proper orientation of wards, the sun exposure of balconies, grounds or flat roofs accessible to patients, effective ventilation, quiet bedrooms for night nurses, advantageously placed dormitories and recreation rooms for the resident staff, proper sleeping quarters for other resident employees, a cheerful and tonic outlook, and also features which tend to the prevention of disease or the mitigation of suffering, such as receiving wards, quiet rooms, isolation wards, sterilizing equipment of many kinds, sanitary construction, devices for noise prevention and restful colorings.

No. 6 ECONOMY in hospital construction includes economy in production and economy in use. It is a mistake to consider building cost apart from maintenance cost. Broadly speaking, economy in use is more important than economy in production. A metal door frame may be cheaper in the end than one of composition, a white metal faucet may be cheaper than a red, a copper cornice cheaper than one of galvanized iron. Durability is not extravagance.

"Extravagance in hospital construction resides in mere exterior decoration; in the use of interior finish of costly materials which are not especially durable or easy to care for;

in waste of space. Such extravagance carries with it the penalty of high maintenance costs.

"Generally speaking, a concentrated institution is cheapest to build and to operate, but extreme concentration and simplicity of design which disregard the diverse demands of varied functions ultimately defeat their own ends. When concentration and simplicity are carried too far, the hospital is forced either to live in a straight-jacket or to cast off its original garment and acquire a new and more appropriate one.

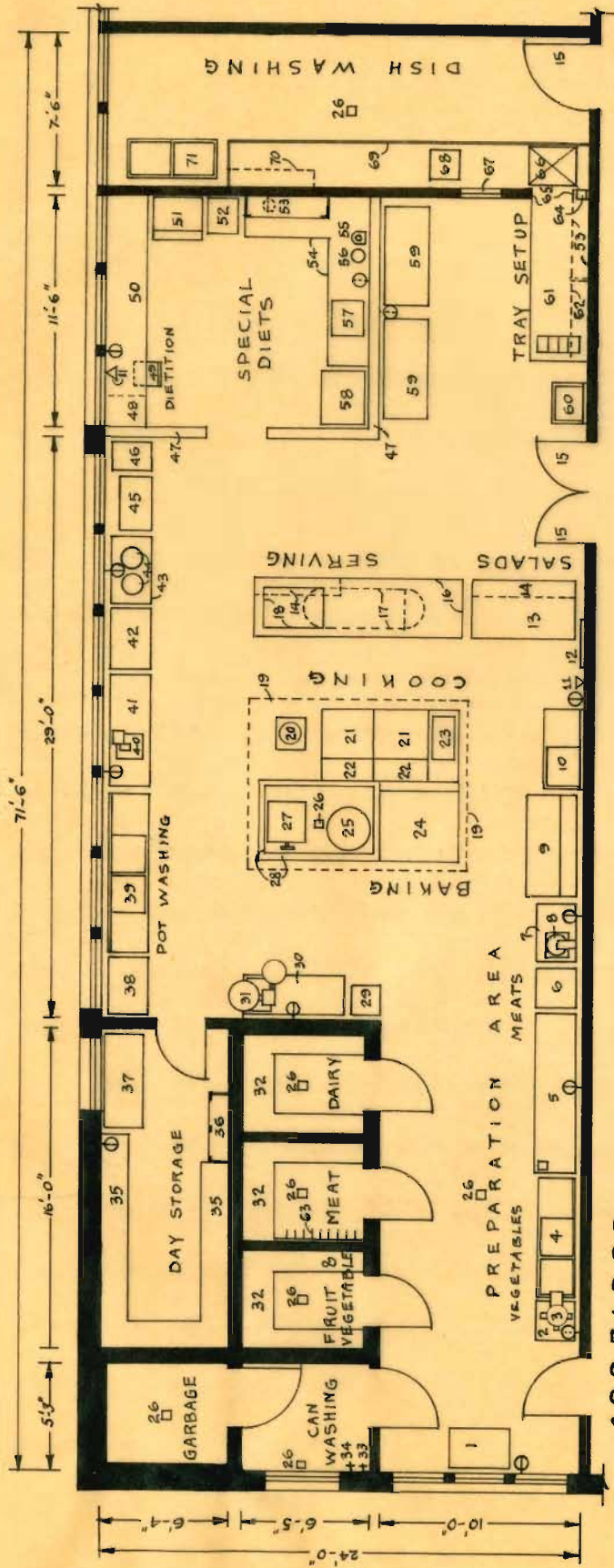
"To spend without the assurance of proportionate present or future gain is to be extravagant. An economical hospital is one in which every cubic foot of construction gives the maximum service attainable, under the given conditions."

### THE FIRST FLOOR

This is really the ground floor which is 27 centimeters higher than the outside ground. A number of departments are located on this floor.

#### DIETARY DEPARTMENT:

The Dietary department covers the major part of the west wing. The walls of the main kitchen, all the serving kitchens and the diet kitchen are tiled up to a height of 1.80 meters. White, glazed porcelain tiles are used for this purpose. The rest of the walls and the ceilings are painted with a washable white enamel oil paint. In addition to the natural ventilation, mechanical ventilation is put into the main kitchen. In good practice the areas, other than surrounding the ranges, are artificially heated so that all the kitchen has a uniform temperature. This is intentionally done for the benefit of the health of the workers, so that sudden changes in temperature are avoided.



## Kitchen for a 50-Bed Hospital Using Central Tray System

1. Platform scale 500 lb. capacity
2. Table, 24x24 inches
3. Peeler, 15 lb. capacity, bench type
4. Double compartment sink and drainboard
5. Work table 24x96 inches with vegetable bins and refuse can space below
6. Meat block 24 x 24 inches
7. Table, 24x36 inches
8. Food mixer, 20 quart capacity, bench type
9. Baker's table 30x60 inches with bins and drawer below space above
10. Sink and drain board
11. Telephone outlet
12. Bulletin board 26x24 inches
13. Refrigerator with wood work top
14. Shelf over
15. Vision panel
16. Cook's table, 36 x 120 inches
17. Pot rack

18. Bain Marie
19. Hood
20. Cereal cooker
21. Range with oven
22. Elevated broiler
23. Fryer
24. Roasting and baking oven (2 sections)
25. Kettle, 20 gallon capacity
26. Floor drain
27. Steamer (2 compartments)
28. Corp
29. Water cooler
30. Table, 24x60 inches
31. Food cutter 14-inch bowl
32. Refrigerator shelving
33. Hot water outlet
34. Steam outlet
35. Shelving, 18 inches wide, first shelf 36 inches above floor

36. Locked dish cabinet
37. Frozen food locker
38. Pot cabinet
39. Double compartment sink with cabinet below
40. Meat slicer
41. Table 24 x 60 inches with cabinet below
42. Bread box 24 x 42 inches
43. Urn stand 24 x 42 inches
44. Coffee Urns 5 gal. coffee, 10 gal. water
45. Ice bin cabinet 24 inches
46. Tray table 36x24 inches
47. Pull out cabinet
48. Pull out cabinet
49. Straight chair
50. Steam table
51. Domestic range
52. Wall cabinet

54. Counter, 36 inches high with cabinets below
55. Juice Extractor
56. Beverage mixer
57. Sink in counter
58. Refrigerator 6 cubic feet capacity
59. Tray trucks
60. Laboratory
61. Counter, 36 inches high, with open shelves below
62. Three shelves over
63. Meat hooks
64. Rack return slot
65. Open pass window
66. Dish washing machine, 2500 pieces per hour
67. Vision window
68. Freezer, 18 x 18 inches
69. Soiled dish table
70. Shelf for soiled glasses
71. Double compartment sink, 24x24 x 14 inches each

The main kitchen comprises all the food preparation space, pot washing area, serving area for the trays and storage space for the tray trucks. These are so located that the operation of the kitchen is done with minimum traffic interference and maximum turnover of work.

Food with different menus is prepared for private, semi-private and ward patients, staff, nurses and non-professional employees. Central tray service, system is used in the hospital. Individual trays are prepared in the main kitchen for all the patients. These are put into heated trucks that are carried to the floors. The trays are sorted out in the serving kitchens of the floors and then distributed to the patients. In the main kitchen the tray serving area is nearest to the elevator.

There are at least two cooking ranges with roasting ovens, hot plates, deep fat fryer, broiler, bain marie, mixing machine, slicing machine, meat chopping machine, peeling machine and a number of other minor machines. The vegetable preparation area has sinks for washing the vegetables, tables for depositing, cutting and peeling. The meat preparation area has a sink, tables for cutting and chopping. One icecream freezer is part of the equipment.

The main kitchen dish washing area is equipped with soiled dish slide counters leading into a mechanical dish washer, a glass washing and tray washing sink, a counter for clean dishes, and a rack and a cupboard for clean dishes and cutlery. The dish washing space is the noisiest in the dietary department. It is placed away from the dining rooms and the other areas where patients are taken care of. The same discussion holds true for the service kitchens of the floors. These should have moisture proof and acoustic treatments.



The diet kitchen is situated on the tail end of the floor. It has all the cooking facilities on a smaller scale. Special weighed diets are prepared for certain patients who are not allowed to eat everything in any quantity desired. Individual trays carrying the name and number of the patients go to the floor by means of the tray truck.

In the adjacent cool storeroom vegetables may be stored for several days. There is another grocery store room in the main kitchen area. It is equipped with plenty of shelf space and a number of bins for grains and other non-perishable supplies.

Three cold rooms are built in the main kitchen. In one meat is stored with a small box for fish. The other is solely for vegetables and fruits while the third is for dairy products.

The staff and nurses dining room is adjacent to the main kitchen. A counter connecting the two is used for serving the food. It has enough tables and chairs to accommodate all the personnel in two sittings.

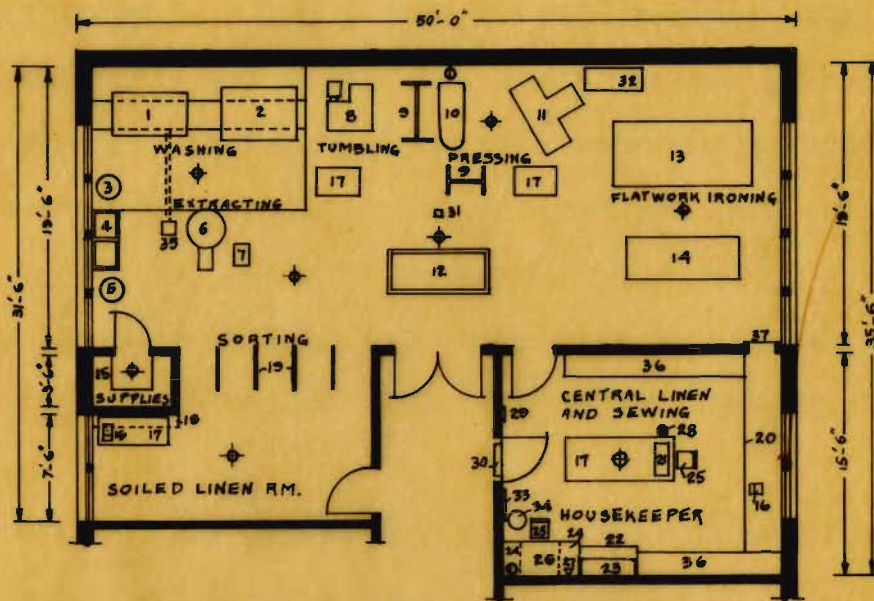
A toilet and a locker room are provided for the use of workers in the dietary department.

All over the kitchen areas grease trap drains are provided.

#### HOUSEKEEPING DEPARTMENT

The laundry covers one part of the west wing. Its access to the elevator does not cause any traffic interference of the other services.

The process of washing soiled linen is carried out through the following machines in their order of sequence: Washmachine, extractor, dry tumbler, flat work ironer, presses and hand irons. The starch cooker and the water softener form another part of the equipment. The steam boiler which is installed in an adjacent room, is the source of steam used for heating water, boiling soiled linen, disinfecting



Laundry for a 50-Bed General Hospital

1. Metal washer, 24 x 36 inches
2. Metal Washer, 36 x 36 inches
3. Soap tank, 30 gallons
4. Double compartment laundry trays
5. Starch cooker, 15 gallons
6. Extractor 26 inches
7. Platform scale
8. Tumbler, 36 x 18 inches
9. Uniform rack
10. Ironing board
11. Press, 51 inches
12. Shakeout table with sloping sides
13. Flatwork ironer, 100 inches
14. Table, 36 x 66 inches
15. Shelving
16. Marking machine
17. Tables, 2-24 x 36 inches, 1-24 x 60 inches, 1-36 x 90 inches
18. Shelf over table
19. Sorting bins
20. Counter, 36 inches high with shelving below.
21. Sewing machines
22. Counter, 30 inches high with cabinets below
23. Wall cabinet
24. Filing cabinets below counter
25. Straight chair
26. Counter 30 inches high, open below with drawers
27. Telephone outlet
28. Floor outlet
29. Hook Strip
30. Dutch door
31. Floor drain
32. Compressor
33. Bulletin board, 26 x 24 inches
34. Waste paper receptacle
35. Sump.
36. Shelving with bins
37. Pass window

linen and drying wet clothes. The high pressure steam sterilizers of the operating rooms and work rooms draw their heat from the same boiler. A powerful boiler can even supply all the rooms with running hot water. In winter it could feed steam to the central heating system.

Soiled linen is slipped down through a chute into a room situated at the laundry unit entrance. The chute has an opening on every floor specified for this purpose. From this room soiled linen is carried to the laundry where it is sorted out and put into the washing process.

Clean linen is kept in the central linen room which is adjacent to the elevator. Distribution is carried out to all the floors from this room.

On the west tail end of the floor a locker and toilet room is assigned to the non-professional employees.

#### MORGUE

Combined morgue and autopsy room occupies the east corner of the tail end. It has all the facilities for autopsy work, namely an autopsy table, a work table, cabinets, an instrument sterilizer, a floor drain and a lavatory with running hot and cold water. It has a two body mortuary refrigerator where bodies are kept for a limited number of days.

#### INCINERATOR

The incinerator is located on a small area near the center of the floor. Infectious garbage and dressings are collected in specially marked covered cans. These are emptied into the incinerator several times during the course of the day. A high temperature flame burns them up. This procedure is carried out from the janitor's room. A chimney, passing through all the floors and the roof, carries out

the smoke and the foul odor.

#### EMERGENCY ROOM

On the east wing across the corridor is the emergency room. Two emergency beds, cupboard containing sterile dressings and instruments, a sink with running hot and cold water, complete the furniture of the room. In this room first aid care is given to the emergency cases. Easy passage to the X-ray department is necessary for taking pictures.

In this room patients are identified whether they should go home or be admitted to the hospital depending upon the seriousness of the case. If immediate operation is needed the patient is taken directly to the operating room. The toilet facilities in between are jointly used by the X-ray department and the emergency room.

#### RADIOLOGY DEPARTMENT

The radiology department is composed of a big room for radiocopy and fluoroscopy, with provision for complete darkening and another dark room for film development. It has one entrance for the out patients and another for the in patients. Dressing room cubicles or closets, are provided for patients to change their clothes. The department is fire proofed and X-ray proofed. The walls and the ceiling are lined with heavy lead sheets for this purpose. A special electrical current source for radiology is arranged with separate power lines to prevent current fluctuations. The unit has adequate natural ventillation. A special arrangement makes it damp proof.

#### GENERAL STORES

Across the corridor is the general store room where all the medical and the surgical supplies are kept. Supplies are issued to the different nursing units once a week. The control and distribution of the supplies comes under the administration department.

The second entrance is meant for the out patients who wait in the lobby to take their turn on the principle "First come first served." This is the room for examination and treatment. It has a sterilizer, a supply cupboard, an instrument cabinet, special lighting equipment, a liquid soap dispenser and an all service sink. An examination table and a desk are provided. People come to this clinic during certain designated hours for physical examination, treatment, tests of different kinds and X-rays. There is a visitors toilet with a lavatory in one corner of the lobby.

#### THE PHARMACY AND THE LABORATORY

On the other side of the lobby one room is taken by the pharmacy and another adjacent room is taken by the laboratory.

The pharmacy is equipped with a refrigerator, a water still, a safe for narcotics which is kept under lock, a sink with drain board, tables, and plenty of cupboard space. Its purpose, in small hospitals, is to serve as a dispensing unit for both the out patients and the in patients. A dutch door separates it from the lobby in order to keep the public out of the room. Solutions are prepared in the pharmacy but they are sterilized in the nurses' work room.

The laboratory is equipped with birch wood table tops of acid proof finish. Special glass washing equipment is provided. One of the essential requirements is a properly ventilated hood which carries away the corrosive fumes. The plumbing fixtures, sinks and drains are made of acid resistant material. Running hot and cold water, compressed air, vacuum, gas and electric outlets are part of the equipment. A refrigerator, an incubator and cupboard space complete the essential requirements. A dutch door similar to that of the pharmacy is used for the room.

Both of these services are easily accessible through the corridors, stairs and elevator to all the nursing services.

THE SECOND FLOORADMINISTRATIVE SERVICES

The main entrance leads into the main lobby and waiting room to which the administrative offices are adjoined. Ample sitting and standing space accommodates the public. It has easy passage to the patient areas, the stairs, the corridors and the elevator, but access to these areas is controlled by the information desk. In case of necessity the public can pass into the business office and the administrator's office. Two toilets, one on each side of the tail end, are intended for public use. One is for men and the other for women. A water cooler is provided in one corner. In the other corner a public booth has a telephone for outside calls. Acoustic treatment helps to reduce the penetration of sounds into the adjoining offices and rooms.

The business admission, and information offices are all combined into one room with a large window opening to the main lobby. It is not necessary to have a room for examination of patients because they would have seen the doctors in their private clinics or in the out patient unit. There are desks and filing cabinets. One large safe takes care of the cash and the valuables of patients.

Next to the business office is the administrator's office. It has one door which leads into the corridor and the business office through a small vestibule. All necessary filing cabinets desks and furniture are provided. Next to this room there is a combination of board room, staff room, conference room and medical library. The running of the general stores comes under the administrative department. The store keeper has all the necessary card system for controlling the supplies. He also controls the entrance of the non-professional employees.

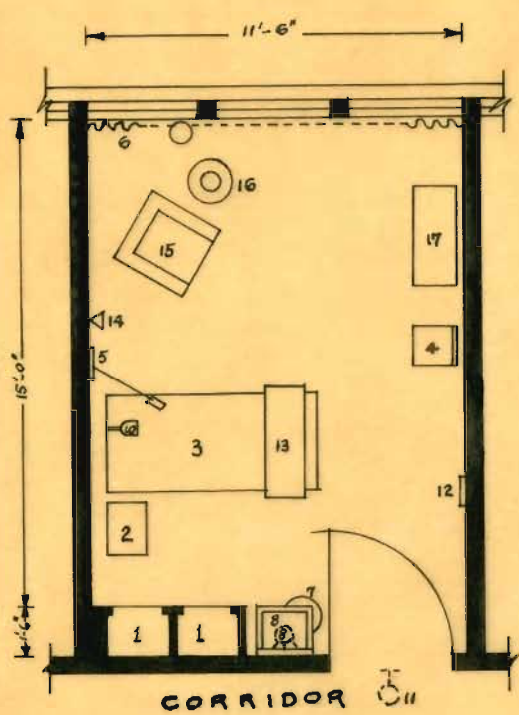
The living quarter of the administrator is on this floor. The entrance from the corridor leads into a hallway. Facing the hallway is the bath and toilet room. In the hallway there are two built in closets. On one side of the hallway there is a bed room and on the opposite side a living room.

### NURSING SERVICES

Two nursing units, one on each of two wings, occupy the rest of the floor. Two nurses stations are alcoves off the corridor. These control the visitor entry by the stairs and elevator. In every nurses station space is provided for a chart desk and rack as well as an extra desk for the use of nurses and interns writing up the charts. To complete the equipment a nurses' call annunciator board, a medicine cabinet with separate locked section for narcotics and a separate section for poisons, other cabinet space, an acid resistant sink below the cabinet with running hot and cold water, a bulletin board and a telephone are furnished.

On this floor only ward patients are admitted. One wing is devoted for surgical ward patients and another wing for medical and eye, ear, nose and throat patients. In all there are 26 patients' beds, 6 rooms of 4 beds each and 2 individual isolation beds. The isolation rooms are also used by the privates as the need arises.

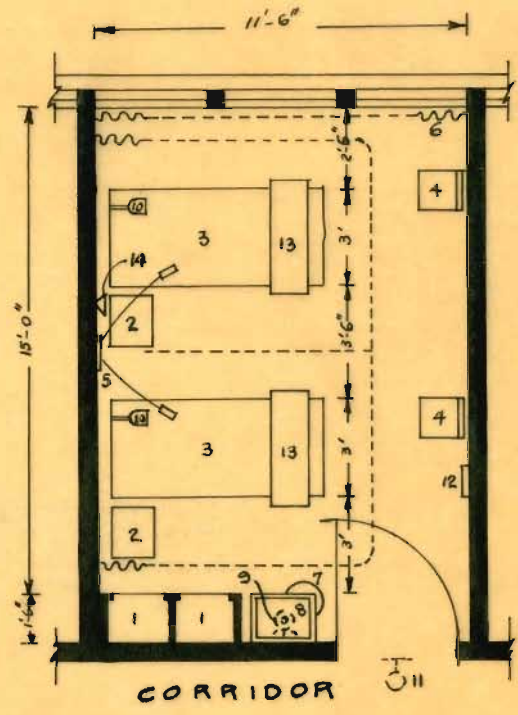
Two sets of bath rooms with two tilets and one lavatory each are for the two nursing units. Nurses' call bells are installed in the bath rooms and the toilet rooms of the patients. Other single room space for the two nursing units are one utility room, one linen closet one supply closet and one serving kitchen.



CORRIDOR

Typical One-Bed Room

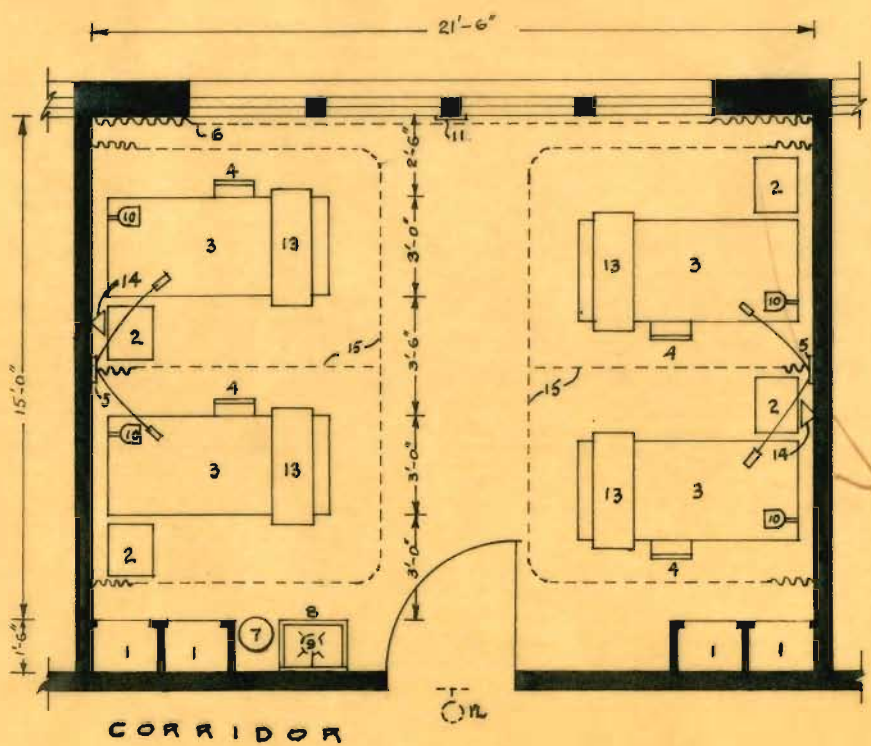
- |                                    |                                   |
|------------------------------------|-----------------------------------|
| 1. Built-in locker                 | 9. Wall bracket light             |
| 2. Bedside cabinet                 | 10. Bed light                     |
| 3. Adjustable hospital bed         | 11. Corridor dome light.          |
| 4. Straight chairs                 | 12. Night light switch controlled |
| 5. Nurses calling station          | 13. Overbed table.                |
| 6. Sliding window curtain          | 14. Telephone outlet              |
| 7. Waste paper receptacle          | 15. Easy chair                    |
| 8. Lavatory with goose neck spout. | 16. Foot lamp                     |
|                                    | 17. Dresser                       |



CORRIDOR

Typical Two-Bed Room

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1. Built-in locker                | 9. Wall bracket light             |
| 2. Bedside cabinet                | 10. Bed light.                    |
| 3. Adjustable hospital bed        | 11. Corridor dome light           |
| 4. Straight chair                 | 12. Night light switch controlled |
| 5. Nurses calling station         | 13. Overhead table                |
| 6. Sliding window curtain         | 14. Telephone outlet              |
| 7. Waste paper receptacle         | 15. Cubicle rod and curtain       |
| 8. Lavatory with goose neck spout |                                   |



CORRIDOR

Typical Four-Bed Room

- |                                   |
|-----------------------------------|
| 1. Built-in locker                |
| 2. Bedside cabinet                |
| 3. Adjustable hospital bed        |
| 4. Straight chair                 |
| 5. Nurses calling station         |
| 6. Sliding window curtain         |
| 7. Waste paper receptacle         |
| 8. Lavatory with gooseneck spout  |
| 9. Wall bracket light             |
| 10. Bed light                     |
| 11. Night light switch controlled |
| 12. Corridor dome light           |
| 13. Overbed table                 |
| 14. Telephone outlet              |
| 15. Cubicle rod and curtain       |



NURSING SERVICES (CONT'D.)

The utility room is used by the nursing service for the preparation of medications and treatments and for the cleaning of equipment. It has ample counter space, cupboard, instrument and utensil sterilizers, sink with drain board, running hot and cold water, clinical sink and utensil cabinet, one crushed-ice box for non beverage ice and one hot plate. Acoustic treatment is recommended for this room.

The serving kitchen is located in the center of the tail near the elevator for moving the tray trucks with minimum traffic interference. As furniture it has cupboard space, a work counter, a sink with running hot and cold water and a dumb-waiter to issue out the individual patient food trays.

One individual toilet is kept locked for the use of the nurses only.

THE THIRD FLOOR

This floor is assigned for private patients of all the services except the maternity which occupies the fourth floor. There are eight private rooms with individual toilets. Every 2 of these adjacent private rooms use the same bath room. There are six more private rooms without individual toilets or bath rooms. These patients use the tail end bath rooms and toilets. Eight semi-private beds <sup>are</sup> distributed in four two bed rooms. These also use the end toilets and bath rooms. No pediatric beds are assigned. Pediatric cases are cared for in private rooms with individual toilets and baths. Adult beds are replaced by cribs.

### THE THIRD FLOOR (CONT'D.)

Small hospitals use this system for pediatric cases.

In the middle of the wing a nurses rest room with couches, tables and easy chairs give distraction and rest to the nurses. A big waiting room is adjacent to it. Both have doors to the terrace. Acoustic treatment is applied to the waiting room. The tail end rooms of this floor are the same as those of the second floor.

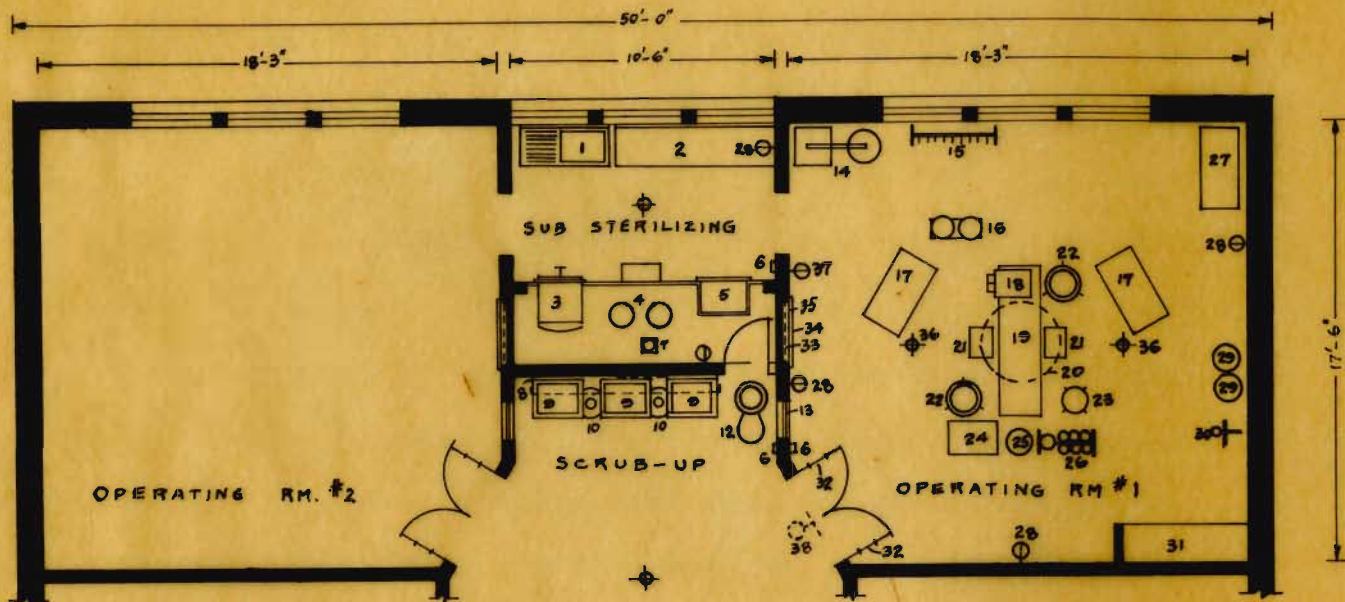
### THE FOURTH FLOOR

This is a complicated floor which has the maternity, the delivery, the nursery and the operating room units.

One wing has the maternity beds as one nursing unit. It has 2 private rooms, 4 semi private beds in 2 rooms and 8 ward beds in 2 wards. One nursing unit has one bath and 2 toilets, one utility room and one serving kitchen. The rest room in the tail end is for the nurses and the doctors. One individual toilet is for the private and the other is for the nurses.

### OPERATING SUITE

The operating suite covers all the other wing <sup>which is</sup> away from the rest of the hospital traffic. It is in a dead point so to speak, It has two operating rooms, one substerilizing room and one scrub room in between. One of these operating rooms is used for cystoscopy and plaster work as well as for minor operations. The operating rooms are air conditioned keeping a constant temperature of 19.2° centigrade and a constant humidity of 60%. No circulation of air is allowed. A patient under operation is liable to catch pneumonia or some such disease if he is exposed to air current. Every operating room is equipped with one operating table, a number of instrument and dressing tables, one anesthesia apparatus, anesthetist's table, basin stands,



## Operating Rooms

- |   |  |
|---|--|
| 1. Sink and drainboard                          | 21. Footstool                                      |
| 2. Counter, 36 inches high, open below          | 22. Kick bucket                                    |
| 3. High speed pressure sterilizer, 16x24 inches | 23. Single basin stand                             |
| 4. Water sterilizer 16 gallons each             | 24. Anesthetist's table                            |
| 5. Blanket and solution warmer                  | 25. Anesthetist's stool                            |
| 6. Mercury switch                               | 26. Anesthesia unit                                |
| 7. Floor drain                                  | 27. Pack table                                     |
| 8. Glass shelf over scrub sinks                 | 28. Explosion proof electric outlet                |
| 9. Scrub sink                                   | 29. Adjustable stool                               |
| 10. Soap dispenser                              | 30. Irrigator stand                                |
| 11. Clock                                       | 31. Adjustable open shelving 18 inches wide        |
| 12. Alcohol dispenser                           | 32. Vision panel                                   |
| 13. View window, clear glass                    | 33. Clock and interval timer                       |
| 14. Portable emergency light                    | 34. Double recessed view box                       |
| 15. Sponge rack                                 | 35. Aspirator below view box                       |
| 16. Double basin stand                          | 36. Flush ceiling fixture for general illumination |
| 17. Instrument table, 24x48 inches              | 37. Explosion proof calling station foot operated  |
| 18. Mayo table                                  | 38. Corridor dome light.                           |
| 19. Operating table                             |  |
| 20. Operating light                             |  |

OPERATING SUITE (CONT'D.)

stools, drum stands, instrument cabinets, one overhead operating light, one emergency light, one clock with second hand, one solution warmer, one suction machine and one view box. For eye, ear, nose and throat operations, one of the operating rooms is equipped with dark curtains that could be easily drawn to darken the room completely. The other operating room where plaster cases are treated has a plaster sink. One anesthesia room is provided. While one patient is under operation another patient is given anesthesia. By the time the operation of the first patient is over the second would be completely anesthetised. This saves the surgeon's time. An anesthesia table, one large cupboard are kept in the room. It is fire proofed and explosion proofed. Similar treatment is given to the operating rooms. Spark proof and electrically conductive floorings are used. The equipment, the anesthetist and the patient are all grounded to direct the static sparks to the ground harmlessly. These static sparks are developed by the rubbing of clothes against hard surfaces. Explosion proof electric switches and outlets are used. Motors and rheostats are enclosed. Even light bulbs are guarded against such dangers.

The scrub up facilities are in the corridor of the unit between the operating rooms. It consists of 3 scrub sinks with running hot and cold water, which are either controlled by the knee or the elbow. To complete the sterilization of the hands alcohol dispensers are used. A clock is provided on the scrub-up room wall.

The sub-sterilizing room is between the two operating rooms behind the scrub up sinks. It has a small high pressure sterilizer, an instrument sterilizer, a utensil sterilizer, a water sterilizer and distiller, a blanket warmer and an instrument sink with counter.

The central sterilizing room provides sterile goods to the operating rooms and the rest of the hospital. In one work room, equipped with tables and shelves, unsterile packages are prepared. Solutions from the pharmacy are brought to this room. Two large high pressure sterilizers, placed in the next room have doors to this room. Unsterile packages are filled in. Once the sterilization is over the sterile packages are removed from the other doors into the sterile supply room. This system avoids the mixing of the sterile and the unsterile packages. Linen supply to the work room comes from the surgical linen room which in turn gets the supply from the laundry.

Two dressing rooms complete the unit. One dressing room is used by the nurses and the other by the doctors. In every dressing room there is a shower, one toilet and several lockers.

#### MATERNITY SUITE

The maternity suite, the new born nursery and the delivery suite are segregated from the rest of the hospital to prevent the spreading of infection by visitors and personnel moving about. There are 2 private, 4 semi private and 8 ward beds in this suite. A private or semi private room is used for isolation cases. One case out of 15 needs this method of care.

The maternity suite consists of one delivery room, one delivery and labor room and one nursery for 10 new born babies. The delivery room is equiped like the operating rooms. In addition it has a baby resuscitator and a heated crib. The labor room has the same equipment as a private room plus a portable light and one clock with second hand. The whole unit has acoustic treatment. Even though this unit receives its sterile supplies from the main supply room, yet it has its own water sterilizer, small high pressure sterilizer,

MATERNITY SUITE (CONT'D.)

instrument sterilizer, utensil sterilizer, blanket warmer, work counter and sinks with running hot and cold water. The labor room and the delivery room each have a door to the corridor of the floor.

The nursery of the newly born babies falls between the delivery room and the labor room. It has doors to these two units, but it has no direct exit to the corridor. The 10 bassinets are placed in the middle of the room. A viewing window permits the visitors to watch the babies. Air conditioning is suggested to the room as the babies cannot stand neither cold nor heat. One of the ten bassinets is used for premature babies. This unit has an examining table, linen cupboard, sink with drain board and partitioned tables with protection for bathing. Two isolation chambers are specified for the under precaution cases.

SPECIFICATIONS

The room arrangement for privates, semi-privates and wards on the different floors are the same. The suggested size of the rooms vary from 13 feet to 16 feet in depth and from 9 1/2 feet to 12 feet in width. The minimum room area allowed is 150 square feet. It should be put in the form of 20 square feet of room area per bed.

Private rooms have one bed, one double closet, chairs, bedside cabinet, screen and a lavatory with running hot and cold water. Every bed has a nurses bell cord and a controlling light over the door with a number registering the patients room number on the annunciator board hung over the nurses' station. A light goes in the utility room and the service kitchen at the same time that the light goes on on the door of the patient's room. Lighting of patients' rooms is indirect. A night light for every room is controlled by a switch placed on the corridor side of the doorway.

Semi-private or 2 bed rooms are provided with the same equipment. In addition to these, cubicle curtains are used.... The lavatory is usually behind the door. Neither individual toilets nor, bath rooms are furnished for these rooms. The common toilets and bath rooms are used.

Wards are made to take 4 beds. They are furnished with clothes closets, a lavatory with running hot and cold water and with cubicle curtains.

The windows of all the rooms are made in one size, namely 1.00 meter by 1.40 meters. The windows of the individual private room toilets have another size 0.65 meter by 1.40 meters. The windows are recessed from the <sup>outside</sup> walls by 5 centimeters. Through out the building double sash windows are used. All windows are screened with double sash sliding frames to keep out flies, mosquitoes and other insects. The screens are made movable for cleaning purposes. The windows are made high enough from the floor so that patients can look out from the beds.

Corridor doors are made in one size 1.00 meter by 2.20 meters. Bath room doors are made 0.80 meter by 2.00 meter and toilet room doors are made 0.70 meter by 2.00 meters. It is imperative to make the patient's room doors 1.00 meter wide, so that beds may be rolled out through them. Patients' room doors are supplied with friction hinges or door check and holder combined. Others, such as the utility rooms, serving kitchens, and bath rooms have double action doors. These have vision panels to look through and avoid accidents. All the patients' room doors open in. They are hung on the wide side of the room so that the patient is protected behind the open door. Usually doors opening into the corridor are put nearer to the corner. This is marked in private and semi-private rooms.

The corridors are made 2.40 meters wide. Acoustic treatment is given to them all. Light comes in from the extreme end windows. In a convenient corner of the corridor one drinking fountain is installed for the use of visitors as well as walking patients. The width of the landings to the corridors and the width of the stairs are made 1.10 meters wide minimum. The size of the elevator is 2.40 meters by 1.60 meters.

The plumbing is very important. It is designed to avoid back siphonage. The toilet, bath, serving kitchen, lavatory facilities are directly above one another on successive floors. The pipes are big enough for stops. They are of such a quality that no dirt sticks inside and no acid corrodes them. Water tight and air tight joints are used so that there are no leaks and no foul odors filling up the building.

#### CONCLUSION

The building no matter how perfectly constructed, satisfying all the minutest details of the specifications and the requirements, will not in itself serve the purpose for which it is planned. The personnel has a great deal to do for the proper running of the hospital. Much depends upon the ability, character and efficiency of the doctors, the nurses and the administrative employees. Even the behaviour of the non-professional employees influence the ideal of the hospital.

"The care of the patient is the focus of the entire hospital."



