A TEACHING HOSPITAL FOR THE UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE

By

JACK DONALD JACKSON

Bachelor of Architecture

Oklahoma State University

Stillwater, Oklahoma

1959

Submitted to the faculty of the Graduate School of
the Oklahoma State University
in partial fulfillment of the requirements
for the degree of
MASTER OF ARCHITECTURE
August, 1964

A TEACHING HOSPITAL FOR THE

UNIVERSITY OF OKLAHOMA

SCHOOL OF MEDICINE

Report Approved:

Report Adviser

W. G. Chamberlain

Pasqual T. Astore

Robert MacVicar

Dean of the Graduate School

TABLE OF CONTENTS

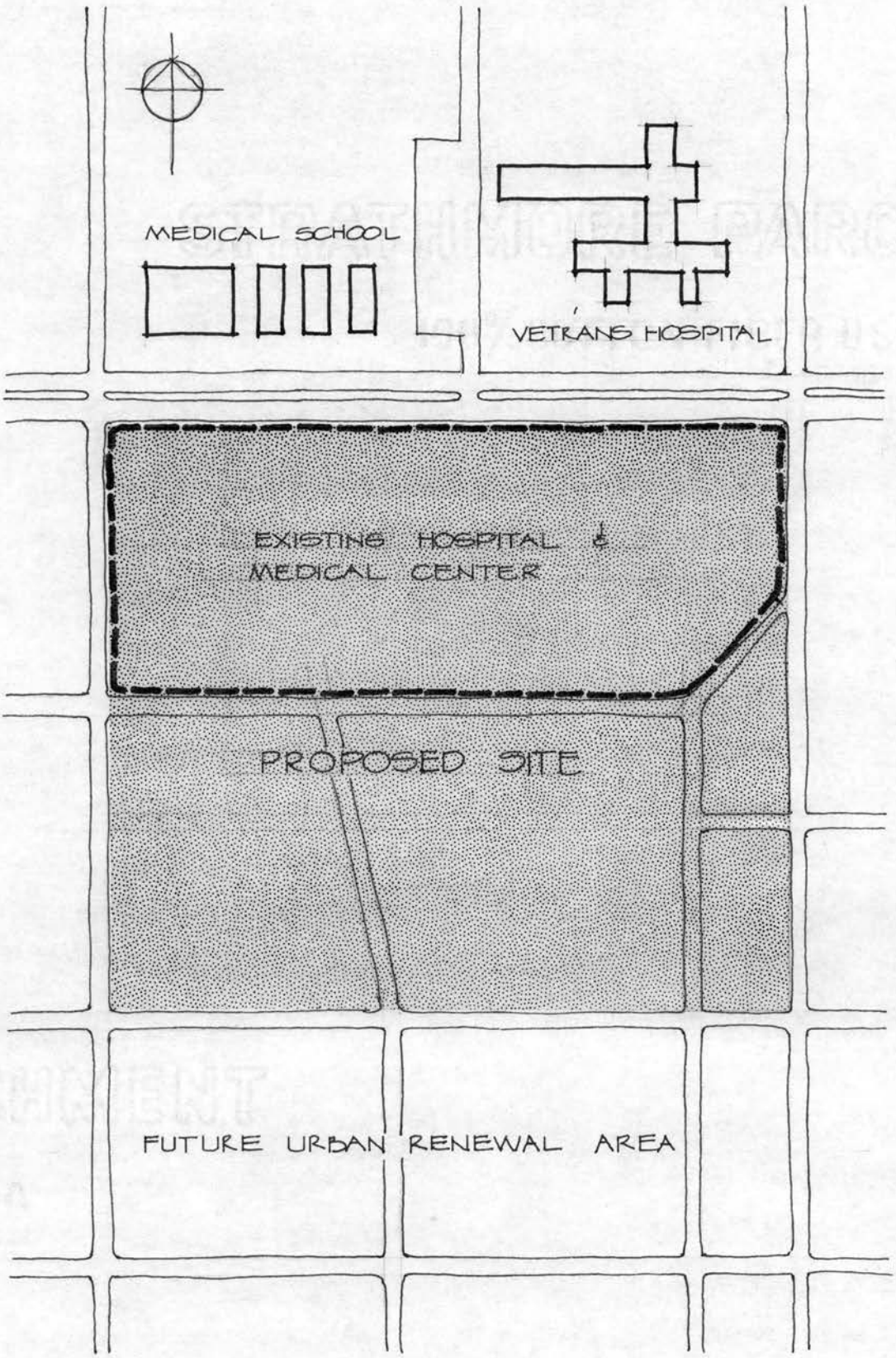
LIST OF FIGURES

CHAPTER I

INTRODUCTION

This report is a study of a specific and real problem which is now before the Board of Directors of the University of Oklahoma Medical School. The Medical School is now operating at full capacity and if it expects to keep pace with the increasing demands for physicians, trained in and with the knowledge of the most modern medical technology, it has to expand its facilities. Fortunately, the School has been successful in obtaining the necessary funds for construction of the additional space needed to house the desired expansion. The actual expansion program consists of the utilization of the existing medical facilities as an outpatient clinic and of the construction of a new 500 bed hospital. The new building would also house the adjunct facilities and related teaching facilities.

For the purposes of this report, we have assumed that the entire medical center, except for the purely academic area across the street, will be replaced with new buildings. Therefore, the study consists of a 500 Bed Teaching Hospital for the University of Oklahoma School of Medicine which will be constructed on a site already owned by the School. (See Illustration 1). The bases for design of the complex are the actual notes of the Building and Construction Committee of the Medical School. These notes are a record of more than two years of discussion between


MEDICAL SCHOOL
VETRANS HOSPITAL
EXISTING HOSPITAL &
MEDICAL CENTER
PROPOSED SITE
FUTURE URBAN RENEWAL AREA

the Committee and the architectural planners. With the exception of the assumption we made concerning the replacement of all of the medical buildings, the notes serve as a reasonably firm program for this design. However, when we anticipated another approach to some problem or function, the design was altered to permit further study beyond those decisions or opinions expressed in the meeting notes.

In other words, the opportunity was taken during this report to consider the committee notes as an actual client and by working with them, provide as nearly as possible an architectural solution of the complex. The thoughts leading to the design of the hospital are recorded in this report.

CHAPTER II

HOUSEKEEPING

Kitchen and Eating Facilities

The preparation and serving of food falls into two major categories, the serving of food to bedfast or wardbound patients and all others who are ambulatory, work in the hospital or are visiting there. The food prepared is also in two major classes; that of dietary nature and that to be used for general consumption. These two types of foods should be prepared in the same location but in a slightly separate area. This is due to the different types of preparation required of special foods. A close proximity is desirable, however, because of the duplication of storage facilities, personnel, areas and the dispensing technique of the food (Figure 1).

When the food is prepared and ready to be taken to the wards, it is covered and placed on a serving cart which is then sealed and taken on a service elevator to the specific ward. In a hospital of this size, a specific area should be used for the assembly of the food from the different preparation areas. Here the diet of each patient can be controlled and recorded. This type of record is becoming increasingly important in hospital administration.

From the diet control area the serving carts are taken to a ward pantry where liquids, condiments and silverware are added to the service. Each ward has an aide who escorts the cart for her specific ward, assembles

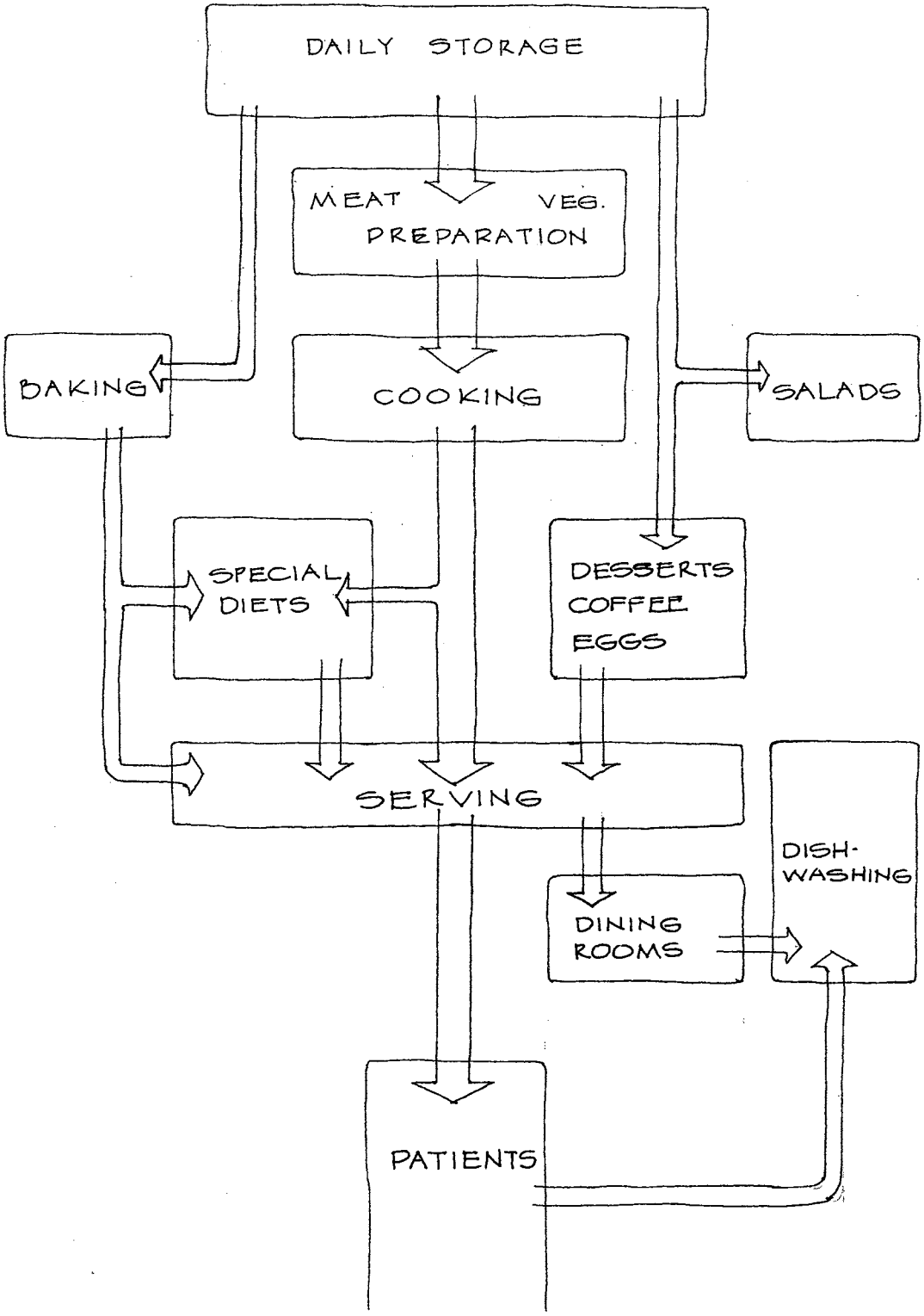

DAILY STORAGE
MEAT
VEG.
PREPARATION
BAKING
COOKING
SALADS
SPECIAL
DIETS
DESSERTS
COFFEE
EGGS
SERVING
DISH-
WASHING
DINING
ROOMS
PATIENTS

Figure 1

the additional items at the ward pantry and supervises the distribution of the food to each patient. After a meal, this same person collects the soiled service and returns it to the cart to be sent back to the dishwashing area. There the cart is completely sterilized as is the dinner service before reuse.

Central Stores and Storage

The two classifications of holding areas for hospital supplies are stores and storage. They both service basically the same function but contain completely different items.

Central stores receive the deliveries of items of continuous invoice and hold them in a proper place until distribution to the appropriate departments can be arranged. Usually these items consist of food, medicines or perishable supplies. A major consideration of the planning of the stores is an area for receiving and inspection of deliveries before they are taken into the storage areas. Since perishable items are considered here, refrigeration is provided for items which are not immediately taken to their specific departments.

Most modern hospitals utilize a central oxygen supply with outlets in each necessary location throughout the hospital. When a manufacturer of liquid oxygen is convenient, it is stored in large tanks away from the building. At any rate, the storage of oxygen is a special consideration because of its highly reactive potential.

Central storage is an area where all reusable items are kept. These items are not kept in their respective departments because of infrequent use, awkward size and so forth. These items must be stored,

maintained, and catalogued for immediate use. This space must be completely flexible for storage of utensils, hardware or paraphernalia of any size or description. Sterilization equipment is located in the central storage department as well as a small workshop.

It is apparent that accessibility to the central transportation core is essential to both of these items.

Laundry

The laundry is handled in general in this hospital by a system of separation of clean and dirty linen by means of vertical circulation. This is done by the use of a dumbwaiter for the clean linen and a chute for the soiled linen. The vertical laundry circulation extends from the tower containing the nursing units and ending in the basement where the laundry department is located. The laundry department is best suited to a lower floor as the equipment would be best on bedrock, contiguous to vertical transportation with outside delivery.

To insure proper handling and minimum expense, all the laundry is handled in the hospital proper.

Production of soiled linen in a hospital can safely be put at 3.3 pounds per bed per day. This includes all the linen to be washed in the hospital laundry, not only hospital linen, but also nurses', doctors' and students' linen and any private linen of the patients.

Facilities must be provided for the following functions: sorting, laundering, mangling and sewing. The laundry items must then be sorted and made ready for reuse (Figure 2).

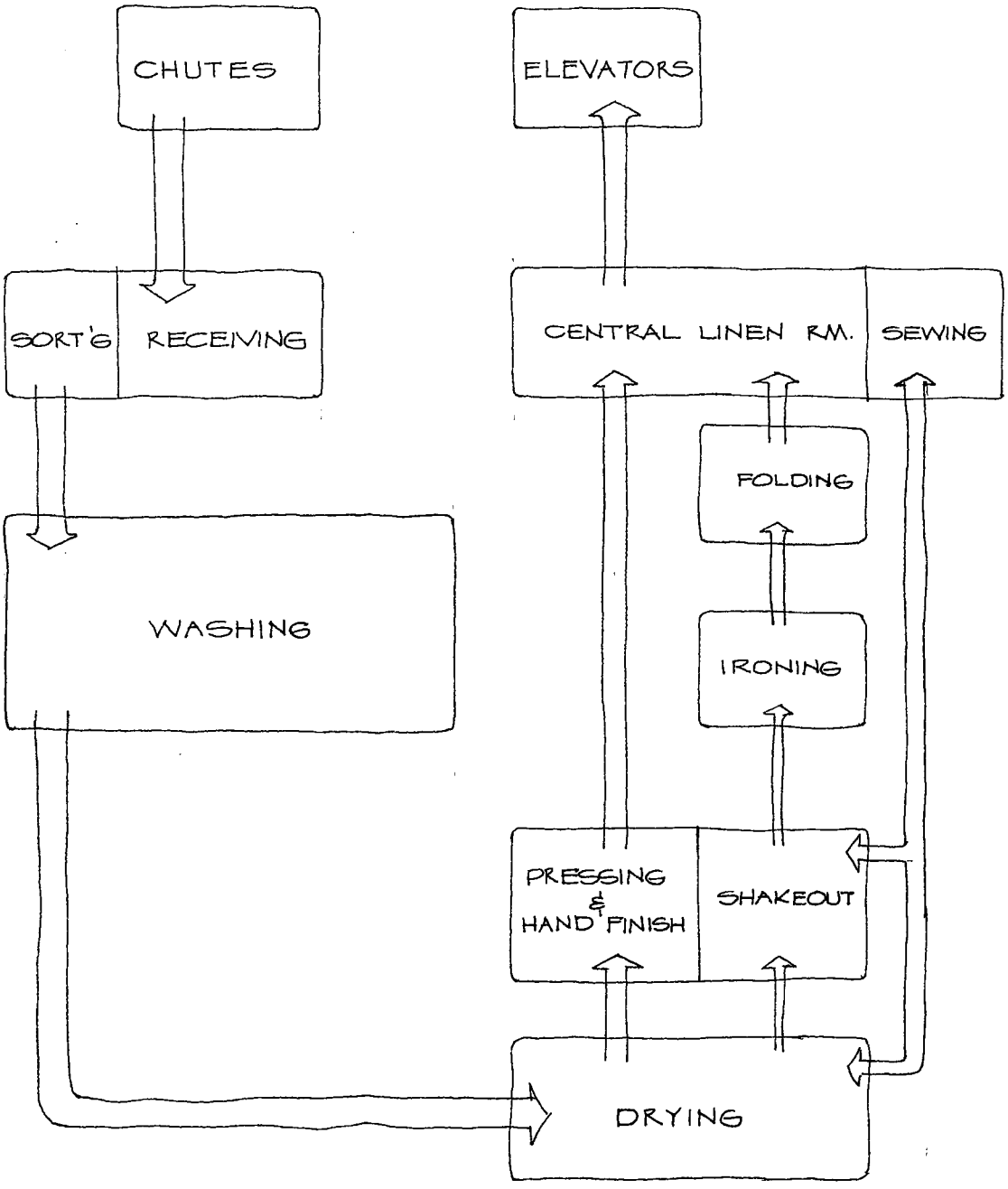

CHUTES
ELEVATORS
SORT'G
RECEIVING
CENTRAL LINEN RM.
SEWING
FOLDING
WASHING
IRONING
PRESSING & HAND FINISH
SHAKEOUT
DRYING

Figure 2

Building and Equipment Maintenance

Housekeeping services are located throughout the hospital and clinic areas at convenient locations to facilitate the usual cleaning work and sterilizing activities of the housekeeping staff. This is generally janitorial work and does not include any repair, maintenance of equipment or other work which would require specialized service or trades. Supplies are stored locally in service areas and supported from the central stores.

Maintenance requires a specialized area and personnel who have the responsibility of repairing and maintaining the building and equipment. Here is required a shop for woodworking, metal work, painting and other odd jobs. Storage for tools, maintenance supplies and equipment is included in one area.

Maintenance of the mechanical equipment is also a specialized activity and requires elaborate equipment and trained personnel. This area is immediately adjacent to the mechanical equipment. Easy access is recommended to the outside for service to heavy equipment.

Employees' Facilities

All floors, except the nursing units, are equipped with toilets, lounges and dressing room facilities for the employees which includes 350 square feet in each group. This group of personnel is classified in a one position category and has very little to do with the medical functions of the hospital. They are supporting factors such as janitors, maintenance men, and general repair personnel. These employee facilities

were planned to lessen the area's need for a large number of people on the floor at which the majority of their work is done.

Similar facilities are provided for the professional employees and staff. At each nursing floor an area is planned for nurses' lounge and locker room.

CHAPTER III

OUTPATIENT DEPARTMENT

This facility is first of all a medical school, and draws most of its patients from welfare clients. For the treatment of these welfare clients, it must provide a large outpatient department. An outpatient department's function is to educate students as well as the public, prevent illness and surgery, diagnose illnesses and follow up on cases which have been dismissed. Basically, free or nearly free, medical service is given to people who are financially unable to obtain this service from a private doctor or hospital. The bulk of the medical examinations and treatments are done by student doctors and nurses, and supervised by the professional staff of doctors who volunteer time to the hospital or medical school. Not too much has been written about outpatient department design and planning until recently. Even now, exact figures are impractical to predict because of the various functions and services offered by each hospital and medical school.

One of the most overlooked features of an outpatient department, even though its service is free to indigent people, is an atmosphere of dignity and self-respect. Large, attractive waiting areas are desirable because a great deal of time is spent by the patient waiting for treatment or examination.

The solution as presented here has the different clinics of the

department on the three main floors. Each clinic has its own waiting area adjacent to the clinic's nurses' station. These smaller areas are surrounded by a large general waiting area on each floor.

When a person enters the outpatient department for the first time, he is faced with a reception clerk who determines the proper place for him to begin the admitting procedures. In the case of a seriously ill person or one with a contagious disease, he is taken immediately to the proper hospital ward or clinic and records are made and information is taken later. Otherwise, the person is shown to the admitting office where procedures are initiated for admittance.

After a patient is dismissed from the hospital, other appointments may be necessary to complete a series of medical treatments. In this instance, the patient will be familiar with the proper clinic for his treatment and it will be only necessary for him to check in with the admittance desk before going there. The desk then notifies the records department and the patient's medical history is sent to the proper clinic by a vacuum tube delivery system (Figure 3).

All outpatient clinics usually consist of approximately the same general requirements: waiting area as discussed, nurses' station for service and control, examination rooms which contain the specific equipment for that particular clinic, and an area for student discussion and supervising doctors' critique. Storage areas and circulation also vary with the needs of the examination and treatment techniques.

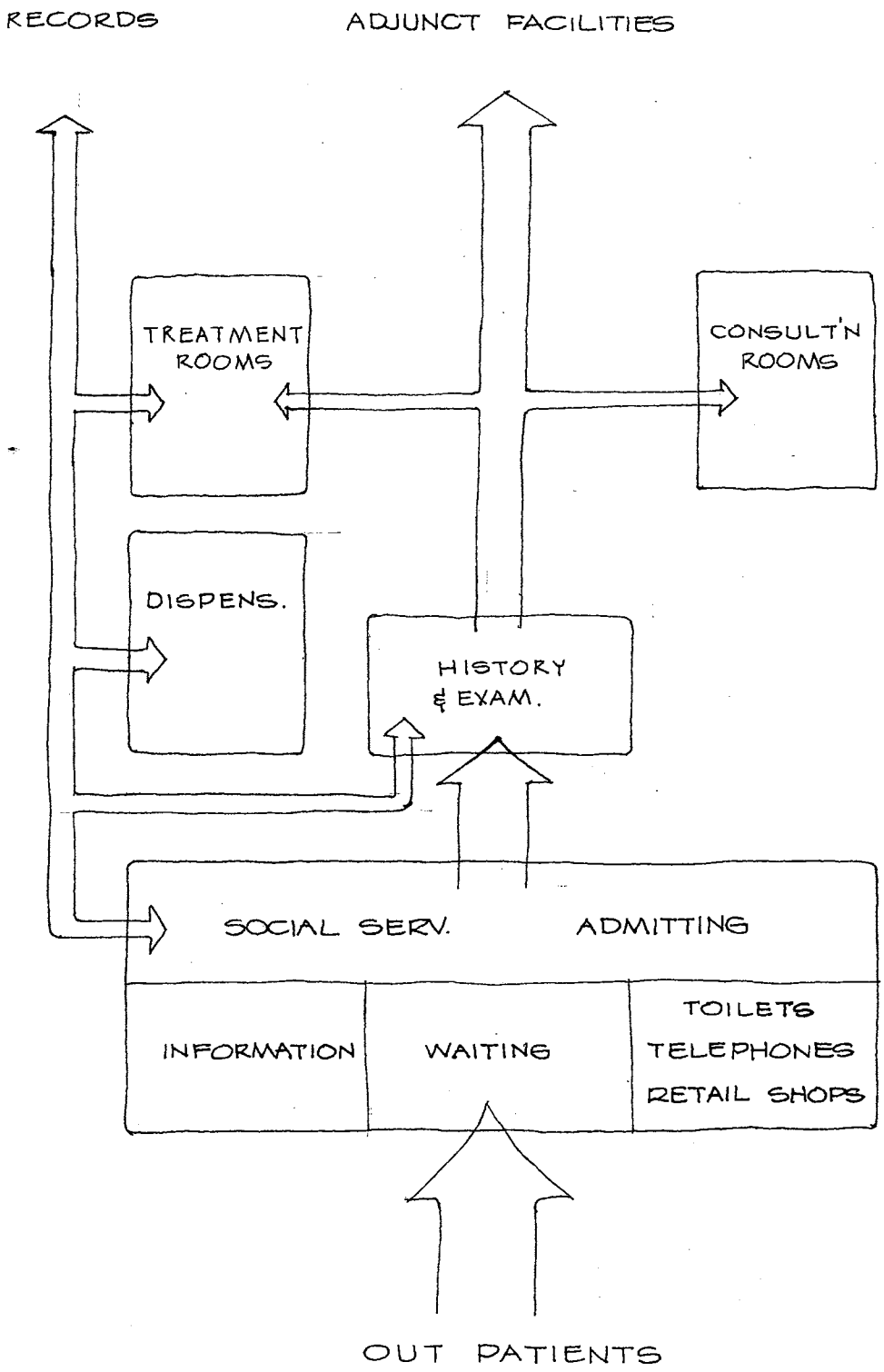

RECORDS
ADJUNCT FACILITIES
TREATMENT ROOMS
CONSULT'N ROOMS
DISPENS.
HISTORY & EXAM.
SOCIAL SERV.
ADMITTING
INFORMATION
WAITING
TOILETS
TELEPHONES
RETAIL SHOPS
OUT PATIENTS

Figure 3

CHAPTER IV

CLINICAL LABORATORIES

The functions of the laboratories in a hospital are concerned with the investigation of some specific physiological action or reaction of human organs or cells. Basically the laboratory work falls into three main categories:

1. Chemistry
2. Pathology
3. Radiology

The laboratories are related closely with the inpatient and outpatient areas since their services are necessary to both. It is not necessary to group them all together in a large hospital scheme because of the space needed by each of them. In a small hospital, however, grouping is desirable because some common equipment can be utilized by their similar testing procedures.

Chemistry

The chemistry laboratories consist mainly of the chemical investigation and analysis of cells and organs. Small labs are equipped for the specialities of bacteriology and serology and general chemistry labs. All of these labs are a number of small rooms equipped for flexible laboratory functions. These labs should all be accessible to common storage and supply, sterilization rooms, controlled temperature rooms, library,

classrooms, and offices for instructors and supervisors.

Pathology

The department of pathology is found operating in all patient service areas of the hospital. The department is broken down into the divisions of necropsy and histology.

Surgery has a small frozen section lab located within its own suite. This lab provides a quick analysis of tissue taken from a patient to assist the surgeon in his decision of the extent of an operation.

The histology lab provides a more thorough study of human tissues than the small frozen section labs. It is located near the other labs and requires nearly the same services and conveniences (Figure 4).

Otherwise, the operation of the pathology department is mostly concerned with investigations of corpses. The morgue and autopsy rooms are desirably placed in a secluded location away from patients and the public because of their morbid function. The space requirements include rooms for class observation and participation of autopsy and post-mortem techniques, storage of bodies, and offices for staff and instructors. Much of the medical student's time is spent in this area and space should be generous and flexible.

Chemical investigations of body tissue and excretions are usually handled in the chemistry labs but because of the teaching functions here, chemical labs are desirable as part of the pathology department.

Radiology

Functionally, the department of radiology can be viewed as having two parts, diagnostic (referred to as radiography), and treatment

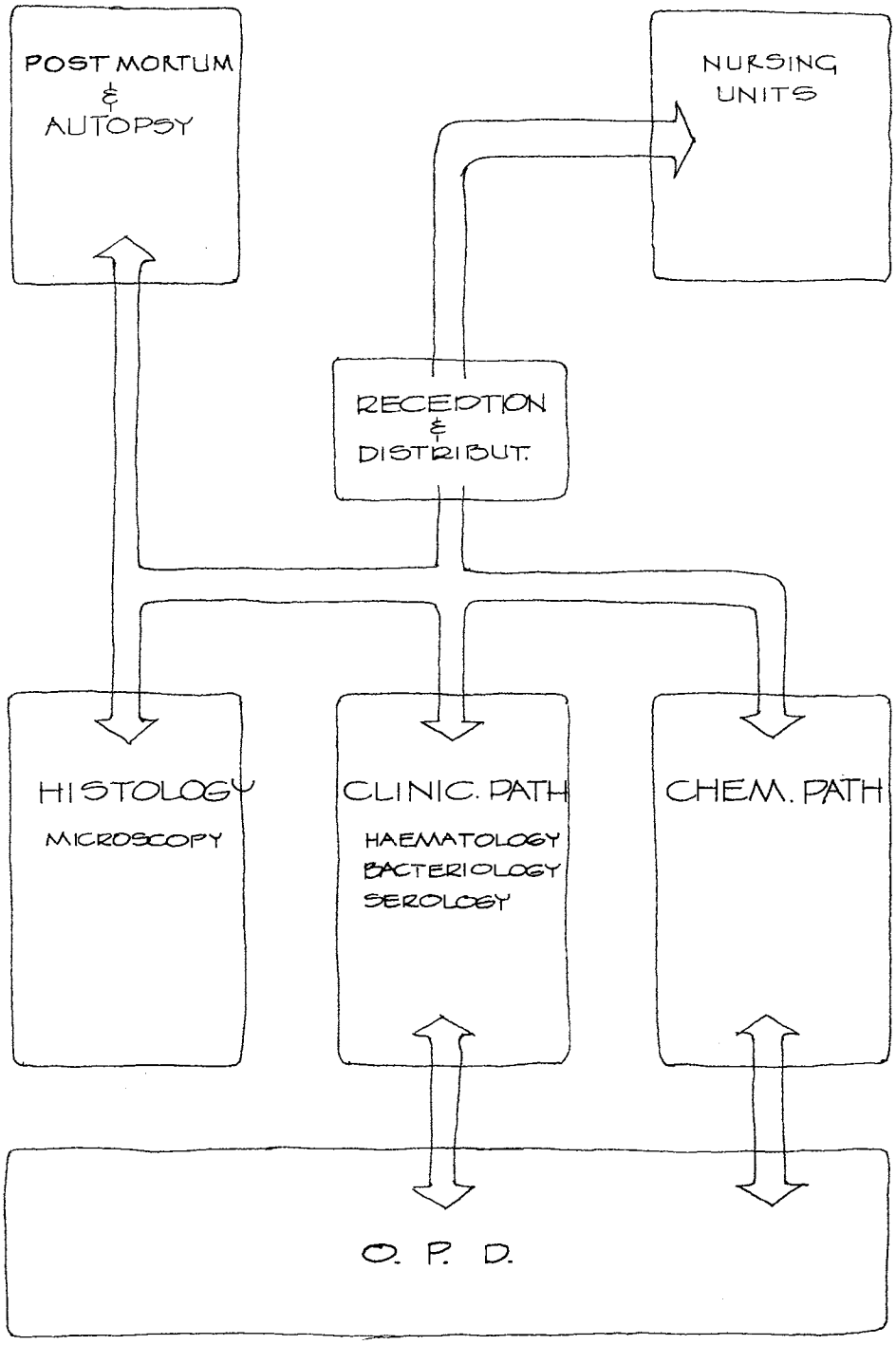

POST MORTUM
&
AUTOPSY
NURSING
UNITS
RECEPTION
&
DISTRIBUT.
HISTOLOGY
MICROSCOPY
CLINIC. PATH
HAEMATOLOGY
BACTERIOLOGY
SEROLOGY
CHEM. PATH
O. P. D.

Figure 4

(referred to as radio-therapy). The most critical location concerns the diagnostic radiology. This should be easily accessible to both inpatients and outpatients, but can't be located in the main patient thoroughfare. Desirability of short lines of communication for patients, doctors, students and technical workers within the department, easy access between the diagnostic and therapeutic departments for the personnel, and adequate storage space for films are requirements (Figure 5). In the past five years this load has averaged 100,000 films per year. Approximately 3,000 square feet are required for these films.

There are also two major factors involved in radiography, or diagnosis, which may be briefly expressed as follows:

1. Radiography is the exposing of an X-ray film to obtain a permanent record, referred to as the X-ray plate or radiograph. The taking of the radiograph is carried out by the radiographer while the reading or interpreting of it is undertaken by the radiologist.
2. Fluoroscopy is the direct viewing and observation of the workings of a person's internal organs which has been made possible by X-ray. This viewing is undertaken for the most part by the radiologist and/or the doctor or student in charge of the case.

The radiology department is located schematically between the inpatient and outpatient departments, to function as an outpatient department but still be accessible to the inpatients. Also, the radiology department needs easy access to the surgical department. The vertical transportation system in the hospital permits this. Because of the

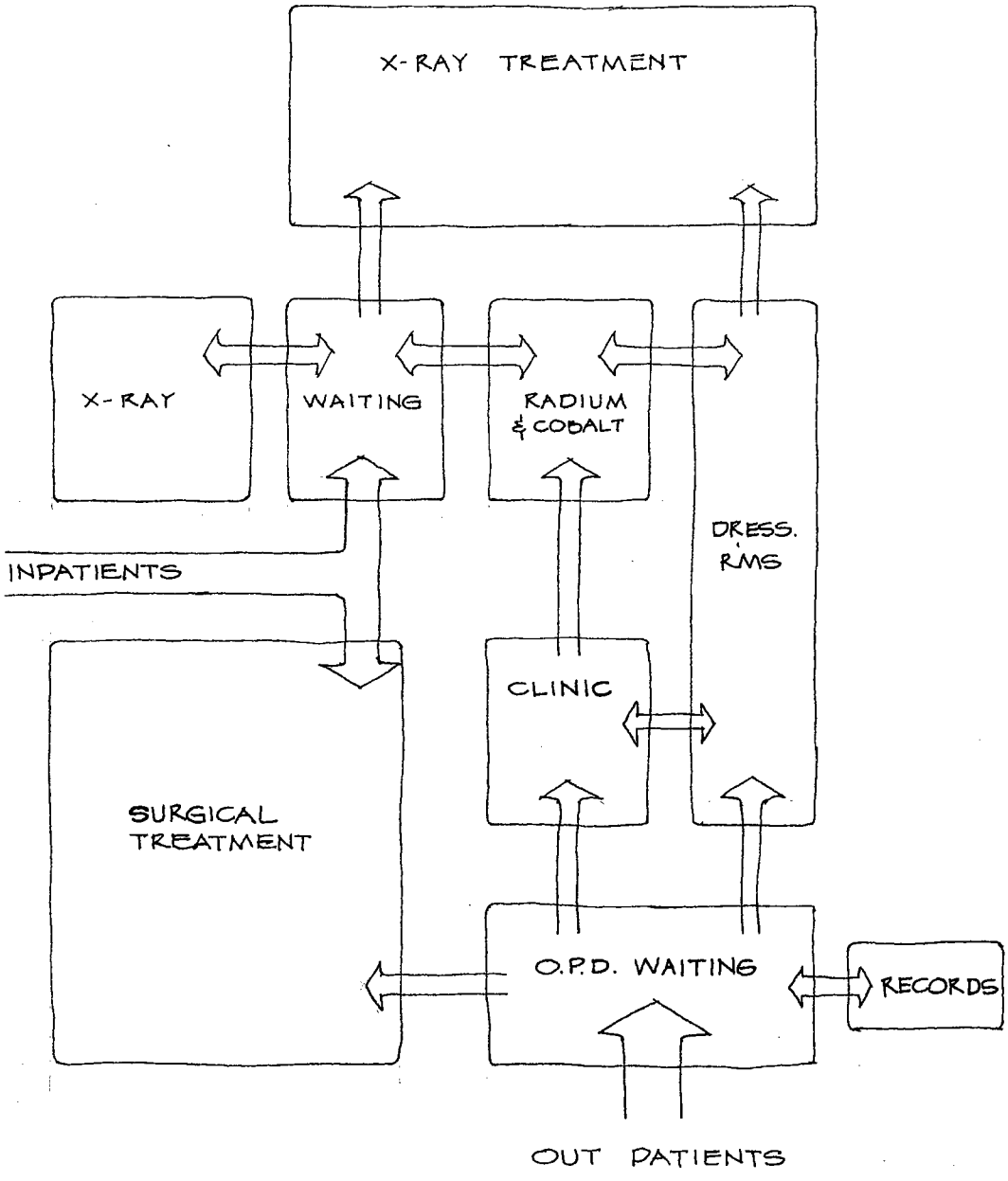

X-RAY TREATMENT
X-RAY
WAITING
RADIUM & COBALT
DRESS. RMS
INPATIENTS
CLINIC
SURGICAL TREATMENT
O.P.D. WAITING
RECORDS
OUT PATIENTS

Figure 5

enormous weight of some of the radiological equipment, location on or near the ground level is desirable by reason of structural economy.

CHAPTER V

DISPENSARY AND PHARMACY

In normal hospital operation, the dispensary is charged with the responsibility of supplying to all departments the necessary medications to treat its patients and carry on its own operation. A double responsibility is inherited by this hospital program because of the outpatient department. The dispensary must, aside from its usual duty of medicant supply, provide a pharmacy service for outpatients and welfare cases. This second activity, however, does not greatly alter or add to space allotments. The only added space is the necessary record keeping area at the issuing facility.

The location of the dispensary is near the central transportation cores so that it may serve readily all departments of the hospital, and at the same time be served by the receiving area. In this particular instance, a system of vacuum tube delivery is coordinated with all departments of the hospital so that emergency supplies can be obtained immediately. The system of once a day delivery is still the main means of distribution for general prescriptions and supplies in the hospital and is only complimented by the pneumatic delivery system (Figure 6).

In addition to the usual space for the preparation, storage and issuance of medicine, an office for the dispensor is necessary for him to keep records, confer with doctors with special needs, and interview

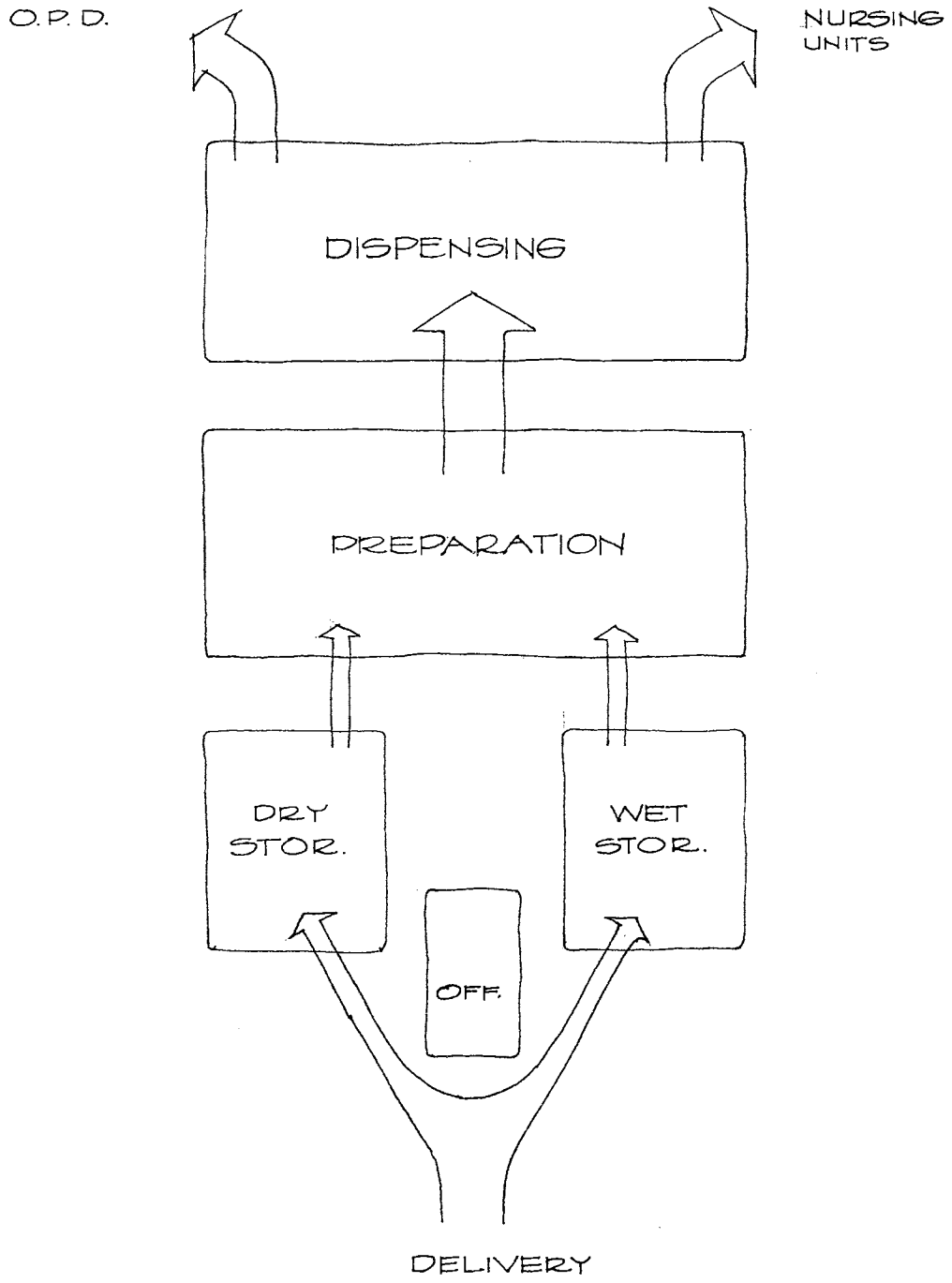

O.P.D.
NURSING UNITS
DISPENSING
PREPARATION
DRY STOR.
WET STOR.
OFF.
DELIVERY

Figure 6

salesmen. He also needs a small chemical laboratory located adjacently for his own analysis of medicines. In the area of the dispensor, a small library is necessary for use by the medical staff to study new medicines and medicant techniques.

CHAPTER VI

ADMINISTRATION

The administration of any modern hospital has always been the real "behind the scene" power of hospital organization and function. This office maintains accurate accounts of how many people are to be fed, who is where, why they are there and how financing is to be arranged. Records of equipment purchases, quantity of supplies, food, and salaries of personnel are only a suggestion of the real responsibility of the administration department.

Admitting

When a patient is admitted to the hospital for the first time, certain information is taken from him for use in various departments. His medical history is started and he is then referred to the department which his physical condition suggests. There a more complete history is made.

A decision is made here as to how much, if any, a patient is able to contribute to his care, treatment and drug needs.

This area is generally an interview-type space since records are initiated here. Accessibility is necessary to the record storage area and, of course, the waiting room (Figure 7).

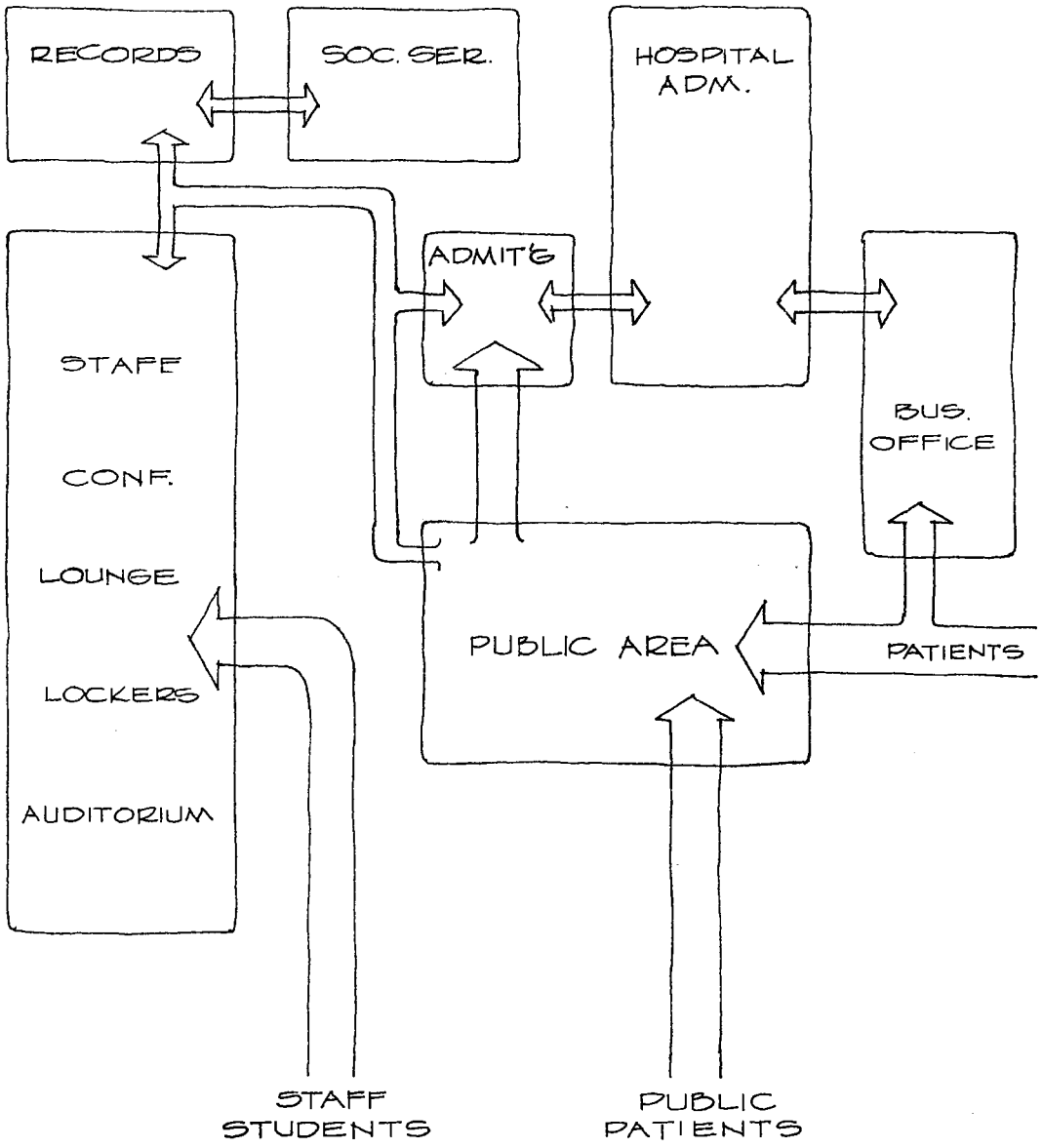

RECORDS
SOC. SER.
HOSPITAL ADM.
ADMIT'G
STAFF
CONF.
LOUNGE
LOCKERS
AUDITORIUM
BUS. OFFICE
PUBLIC AREA
PATIENTS
STAFF STUDENTS
PUBLIC PATIENTS

Figure 7

Bookkeeping

Bookkeeping space for ten accountants and their record keeping duties is desirable for a hospital of this size and also which accommodates an outpatient clinic of this size. The implications of welfare patients increase the accounting duties.

Records Storage

Storage is provided for both the medical records of patients and records regarding administrative functions. Administrative records are kept in close proximity to the accounting space. On the other hand, medical records can now be handled between storage and interested personnel by the pneumatic delivery system. This system of tubes is capable of delivering a set of records from a central storage room to a distant point in the hospital in a matter of seconds. This alone allows the records storage to be placed in an inconvenient location.

It is desirable, however, that the records storage area have adjacent to it a library for students, doctors, social workers and insurance adjustors.

Social Services

This office functions as a liaison between the public, the patients, the interested civic agencies, and the hospital. Records of admittance, discharges, deaths and births are kept here. Blood donations are arranged, volunteer aides are recruited, clergymen are informed and news information is released. Social services care for the patients' personal and social needs instead of their physical illnesses.

Waiting

A welfare hospital has such a large demand on kinds of desirable waiting space that each department is allocated an area according to its own needs.

Telephones and a PBX are adjacent to the waiting and public information desk. Public toilets are here as well as near all waiting areas.

Directors' Offices

Departmental directors have office space in the administration area. These people must be conveniently located to the main administrator and their own respective areas of responsibility.

Minor bookkeeping is done here since these people serve in a supervisory capacity on behalf of the chief hospital administrator.

Staff Lounge, Library and Conference Rooms

Members of the staff are usually provided a lounge or lunchroom space for break periods. Somewhere near the administration area a medical library for periodicals, journals and reference books to be used by the staff and students is provided. This library is convenient to some conference rooms and study areas.

CHAPTER VII

EMERGENCY

The facilities included in the emergency room are a waiting room, twelve examining rooms, staff sleeping facilities with nursing station, and a holding ward adjacent to the nursing station with six to eight beds.

The emergency area is one of the lesser functions of a teaching hospital. The emergency cases, although not turned away, are generally routed to other hospitals in the city. There are several possibilities which arise in the emergency areas:

1. The patient is admitted, treated and then released.
2. In the case of persons who need surgical or maternity service, they are sent straight to their respective areas of the hospital.
3. The patient is admitted, treated and held for 24 hours in the special holding ward.

The design of the emergency area complies with all of the above conditions and also is related to the other parts of the hospital upon which it relies such as X-ray, outpatient department, and the hospital admitting offices.

CHAPTER VIII

SURGERY

Unlike a general hospital, the surgical suites in a teaching hospital must provide enough room for the students as well as the staff. On the norm, the size of an operating room is around 150 square feet, but for use as a teaching facility 200 to 300 square feet are required.

In conjunction with the operating room, a sterilization room and clean-up rooms of approximately 120 square feet each are required. One set of clean-up and sterilization rooms is to service two operating theaters. Also servicing two suites are scrub-up areas which are located out of the major traffic flow and adjacent to the air sluths where the surgeon dons his gown and gloves just prior to entering the surgical areas. The sluths, although not necessary, are used in this problem because of the larger number of personnel going into the operating room.

The operating rooms are divided into four suites of four rooms each with two suite areas. The two suite areas are used for contamination operations and are separated from the bulk of the theaters.

The surgeons and nurses are completely segregated from the patient traffic after entering their dressing rooms. The dressing rooms are equipped with showers, lockers and lounges.

No provision has been made for recovery areas because of the large amount of recent criticism against such an area. One of the major factors against it is the fact that the operations of today are far more successful;

therefore complications arising after operations are very uncommon. A great deal of psychology has been established on having the patient recover in familiar surroundings such as the room in which he left before the operation.

The control of the operating suite is very important because of the degree of contamination that could arise from a large percentage of non-surgical traffic.

The students, exclusive of those scrubbing and going into the theater, are given visual facilities above the operating rooms, therefore keeping them out of the operating area. All services are routed through the control desk giving the surgical supervisor the knowledge of who and where everything is in the suite.

One important factor is that the plan of the unit as a whole has segregated the non-sterile areas from the sterile areas. This is probably one of the most important factors in the prevention of contamination.

The most drastic departure here from normal surgical suite design is the consideration of the operating room itself as a non-sterile area and the supply sources to the operating room as the sterile area.

CHAPTER IX

DELIVERY

The delivery suite and nursing units are located on the same floor but separated by the student and service facilities. The delivery rooms have ready access to elevators, the postpartum areas, both clinical and private, and the nursery. A fathers' waiting room is located just away from the delivery and labor room areas. In the delivery suites, four delivery rooms and six labor rooms with bath and showers have been planned. The delivery suite also includes washrooms, doctors' locker room and lounge. Students use the areas provided for them in the center core. Nurses' locker and lounge rooms and control center with small clinical laboratory are also included, as well as sleeping quarters for two residents who are on duty during the evening.

The newborn and premature care areas are located adjacent to the delivery area because of the necessity for the child to be placed in these areas as soon as possible after birth. The nursery requires a formula room, sleeping quarters for interns and nurses along with an examination and clean-up room. The nursing unit is the same as the typical unit except for the addition of the nursery unit.

In most hospitals the delivery area is in direct conjunction with the surgery suites. Because of the size and functional differences of the separate departments of this hospital, this was not done. When the

surgery and delivery areas are adjacent, chances for infection of the infant and mother are greatly increased. Isolation of the entire maternity ward is usually quite desirable.

CHAPTER X

NURSING UNITS

The entire effort of a hospital is culminated in the patient care areas of the hospital. Regardless of the major type or size of any hospital, it exists only to serve people who are ill or injured. In the patient care area, or nursing unit, a person can be cared for, regardless of his injury or illness, treated or served by trained physicians, nurses, technicians or other service personnel. This service entails not only medical attention but food, clean linen, and other services which may aid his recovery such as recreation, therapy or spiritual guidance.

The essence of the planning of a nursing unit is the coordinating and controlling of the flow of goods, services, patients, staff and public into and from the area so that they blend harmoniously, and give maximum support without distracting from another's activities. (Figure 8).

Nurses' Station

The nerve center of all this activity is the nurses' station. This station is the space which houses all of the coordinating and treatment activities with which the nurses are charged, except for the caring of the actual patient which is done in the patient's room. The nurses' station should always be located in a position of maximum visual contact with the patients' rooms and within a minimum of steps to each bed. Ideally for the nurse, continuous visual contact with each patient would

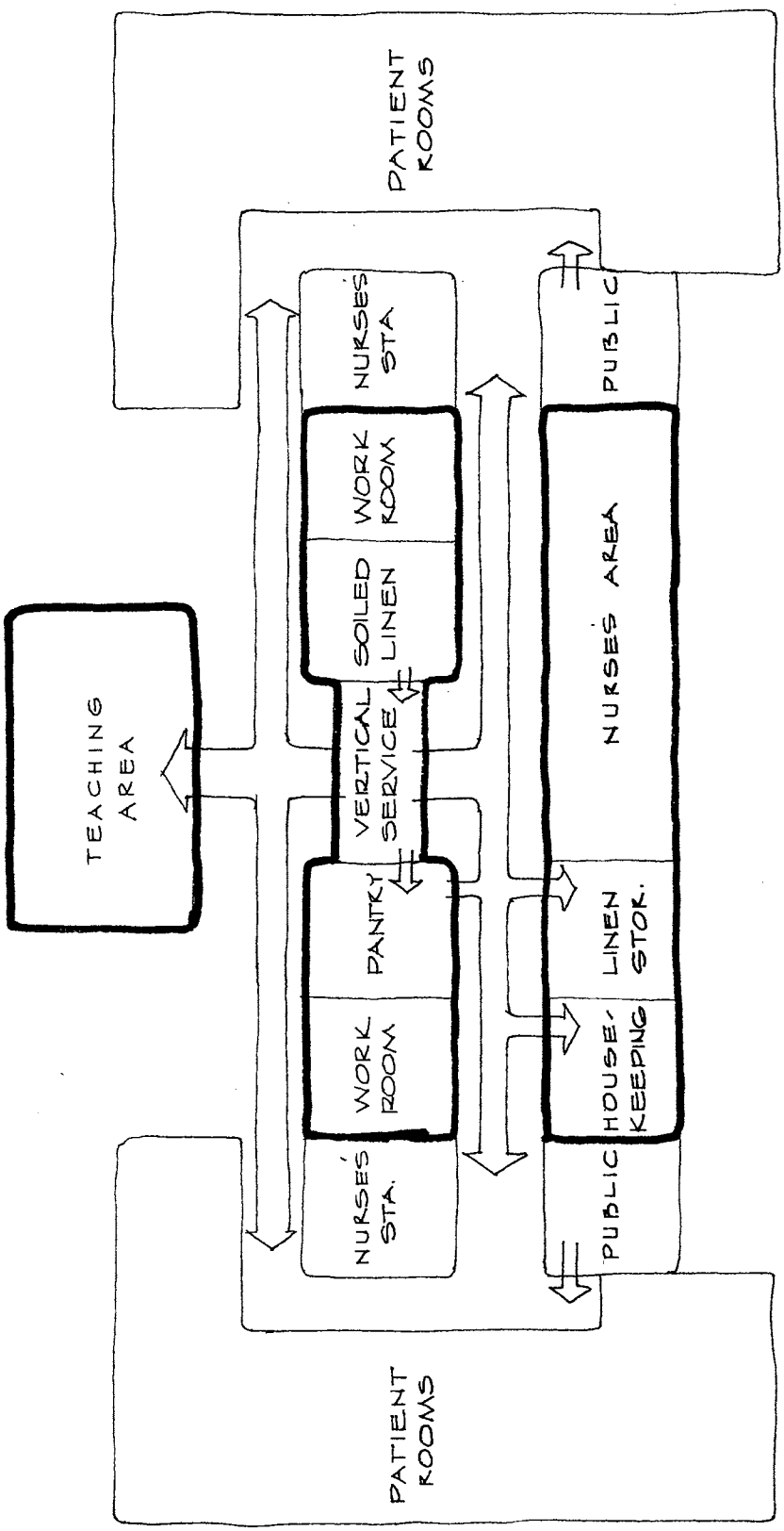

PATIENT ROOMS
NURSES STA
WORK ROOM
SOILED LINEN
VERTICAL SERVICE
PANTRY
WORK ROOM
NURSES STA.
TEACHING AREA
PUBLIC
NURSES AREA
LINEN STOR.
HOUSE-KEEPING
PUBLIC
PATIENT ROOMS

Figure 8

save many steps each day just in answering calls by patients which could be eliminated by unobstructed sight. We believe that the scheme used in the design solution has placed the nurses' station in such a location as to have a maximum amount of visual control and remain within a minimum radius.

The location of a nurses' station should also be in a position to coordinate the flow of traffic into the patients' areas of staff, services and public. In short, nothing should happen in the patients' area that does not have the prior approval or knowledge of the nurses.

The nurses' station is a rather complex area in itself. Other than the work counter are several small areas where records are kept and surveyed, patients are treated and examined, the head nurse has an office, supplies are stored, patients' baths are located, and medicants and dressings are prepared.

Charts are kept in the usual manner by the nursing staff. The only other activity which has to be considered in a teaching hospital is the additional space necessary to accommodate an extra 10 to 20 students having to study these charts. The chart space shown allows the students to sit down and write as well as study.

Occasionally it is necessary to prepare minor medicants right on the nursing floor. For this reason, working room is provided for the dispensing of medicines, preparations of dressings, and storage of patients' medical needs. In a sense, this room serves not only the patients but the treatment room by storing supplies for doctors to use there. The preparation and storage of surgical dressings generally forms a great bulk of the work done there.

The head nurse of each ward has a small office for her own use. Here she keeps records and does the bookkeeping which is increasingly demanded by newer hospital administrative techniques. In this office she can confer with doctors about special needs of a patient. Here also, she will keep a locked storage cabinet of narcotics and other special drugs or supplies.

A small room for the use of doctors to examine a patient in private is provided. Here special dressings are applied as are treatments which require a more sterile room or more stationary equipment than can be provided in the patient's room.

Throughout the patient care area a constant awareness should be kept of the fact that between 10 and 20 students are sometimes on hand in a ward to observe a patient or treatment or some other phase of medical technique.

Storage in a nursing unit must be adequate to service the activities of the nursing functions and also serve the needs of the patients. Areas allotted for patient care functions depend almost entirely on the individual hospital administration, organization and type of principle service. Storage should be provided for items which are necessary for treatment and care of a patient as well as space for storage of his own personal belongings. Larger items such as guerneys, wheel chairs and patient handling equipment which are kept at the ward must also be accommodated, not necessarily in a storage room but near at hand.

Patients' Rooms

Each nursing floor contains two nursing stations and some of the supporting facilities which should be located close at hand. Each nurses'

station serves 11 patient rooms, 9 of which contain 2 beds and the remaining 2 rooms contain 4 beds. This criteria was taken from the meeting notes of the Committee on Construction of the University of Oklahoma Medical School. Because of the special problems involved with operation of a hospital of this nature, the Committee felt that absolute flexibility must be maintained in the design of the patients' rooms. This flexibility, they felt, could be best served by using a majority of two bed accommodations. The ultimate of economics was not found in this solution but a satisfactory compromise was reached with patient care considerations.

The two bed room offers definite advantages from the patient's point of view. A patient has the companionship of another person and this mutual contact is known to have good psychological effects on recovery rates. Many times a class of students is brought to the ward to observe or discuss a particular patient and this sometimes offers a source of embarrassment to that person when he is among several other patients. The two bed room minimizes this situation. Another advantage of this arrangement deals with isolation. If a patient is found to have a contagious disease, the room can be used as a one bed room without sacrificing more than one bed space. This applies also for seriously ill persons who need privacy.

Each room has a closet for each bed with a storage cabinet for personal belongings. A dressing counter has been provided with a lavatory, mirror and light. This dressing counter is set about 30 inches from the floor to accommodate a patient who is in a wheel chair. Two rooms share the toilet and shower. The doors to this room open out and

latch from the inside but they can be opened from the outside with a key which usually is carried by the nurses and orderly. The room should be equipped with grab bars and other aids to assist patients in moving from wheel chairs or just maneuvering about.

The four bed room is identical to the two bed room except for the increased space for the two additional beds. This room offers a solution for patients who are more ambulatory and can use more activity and less privacy.

Above each bed is a console which contains the nurses' call control, intercom, bed light, outlets for oxygen supply, vacuum and radio jack. This center will probably be used in the future by new techniques of patient observation as an outlet center for monitoring devices (Figure 9). At present some experiments are being carried on by using television for visual contact between the patient and nurses' station. It is not unreasonable to expect in the near future more accurate observation of a patient's physical condition with the use of electronic metering instruments which could be attached to the patient's body. A device which would read a person's symptoms could be fed into a computer system to make a diagnosis, keep a record of symptoms and effects or even warn when a dangerous condition arises. In the event of such techniques of patient observation, a station console would certainly be required at each patient's bed.

Service Core

On every nursing floor there is a central service core which contains supporting services for the nursing unit and its personnel. This

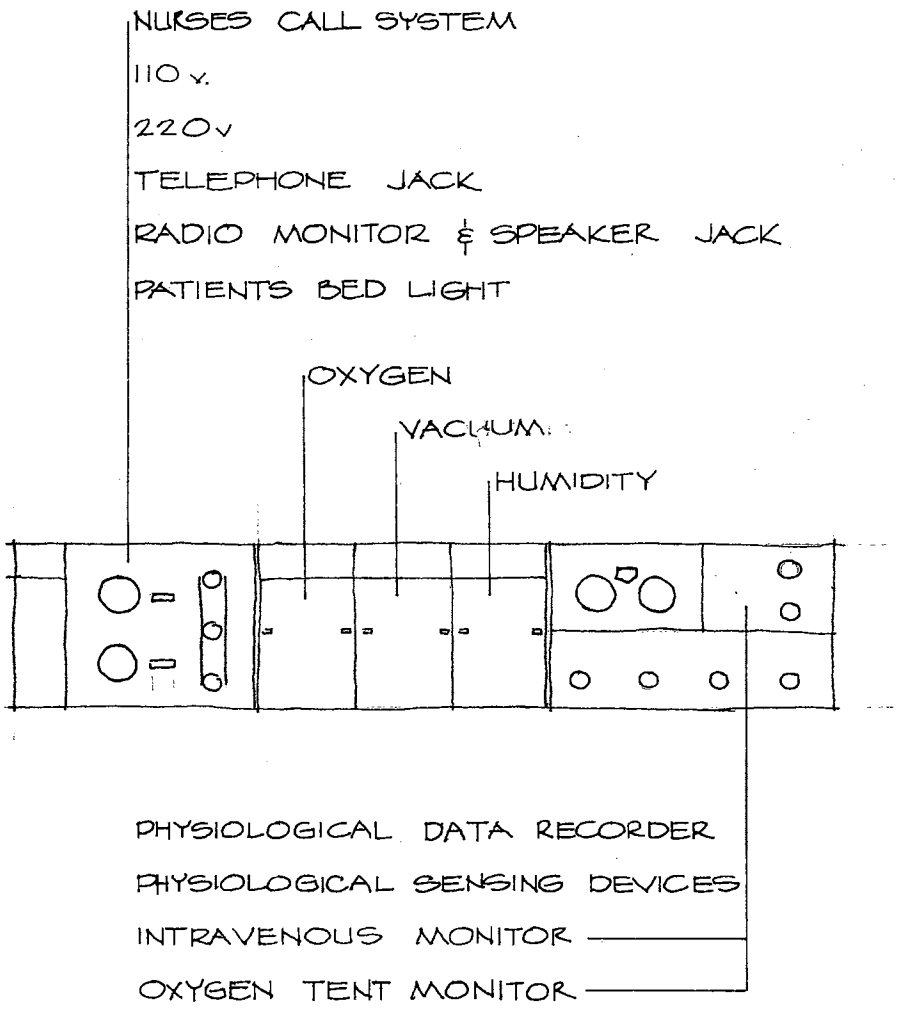

NURSES CALL SYSTEM
110 v.
220v
TELEPHONE JACK
RADIO MONITOR & SPEAKER JACK
PATIENTS BED LIGHT
OXYGEN
VACUUM
HUMIDITY
PHYSIOLOGICAL DATA RECORDER
PHYSIOLOGICAL SENSING DEVICES
INTRAVENOUS MONITOR
OXYGEN TENT MONITOR

Figure 9

core provides elevator service for supplies, food, staff, patients and students.

One of the more complex services which is located in the service core is the laundry supply. It is not that the traffic is so complex for the laundry but, being a sterile item and a potential source of cross infection, clean and dirty linen must be well protected from bacteria which are borne from any source. To guard against the contamination of clean linen, it is packaged in sterile wrappers and taken to each clean laundry room on each floor. Here it is stored until needed and then distributed to each patient as needed.

When the linen is soiled, it is taken from the patient's room in a clean bag and returned to a soiled linen room. Here it is sent to the laundry sorting room by an enclosed chute. This soiled linen room is considered a major source of infection and is therefore restricted to most personnel, especially the patient-handling staff.

A lounge is provided in each core for the use of the nurses. This area contains lockers, showers and a sitting room. Here they may change to and from their street clothes before and after duty hours. During duty they have a pleasant place to take a break and relax. This area serves both nurses' stations. Here again, the organization of the hospital dictates the number of nurses to be considered.

All housekeeping equipment and supplies are kept in the service core. Here the custodial staff is supplied with any of the cleaning supplies they may need. Larger items for maintenance or repair are kept and supplied from the maintenance department.

A utility room is required for the disposal of all faecal matter and the sterilizing and storage of bed pans and urinals. One of these

rooms is located near each nurses' station to minimize the walking distances for the nurses. Some hospitals even go so far as to organize regular bed pan times during the day to avoid so many trips by the nurses. For this system, a cart with pans and urinals is taken from room to room to distribute them to each patient. When used, the pans and urinals are returned to the cart and taken back to the utility room for sterilizing and storage.

The central core provides a bathroom for each nurses' station. This room accommodates a tub and space for one or two attendants.

Teaching Facilities

Also included in this central core is the individual teaching facility for each floor. This area houses the activities of the students as they are engaged in their patient studies.

Three examination rooms are provided with a small waiting area. These rooms are easily accessible for students and supervising staff. A lab is necessary for the students' study of a sample which has been taken from a patient. This lab is equipped for general analysis by students only. Generally, lab work which is not necessary for the student's use in his studies is taken to the appropriate laboratory. A lecture room for 20 students is necessary but this room should have a flexible seating arrangement to accommodate larger classes when an important case occurs and other classes would be concerned. In addition to the classroom, a large examination room is necessary for a class discussion or observation of a patient. The supervisor of this teaching unit has a small office for his own use in studying records of patients

or counseling students. Toilets and lockers are provided the students because they are usually on the floor for the entire day.

At present the Medical School expects to accommodate approximately 20 students on each floor. This may change in the future but the anticipated teaching procedures seem to function best with this number of students.

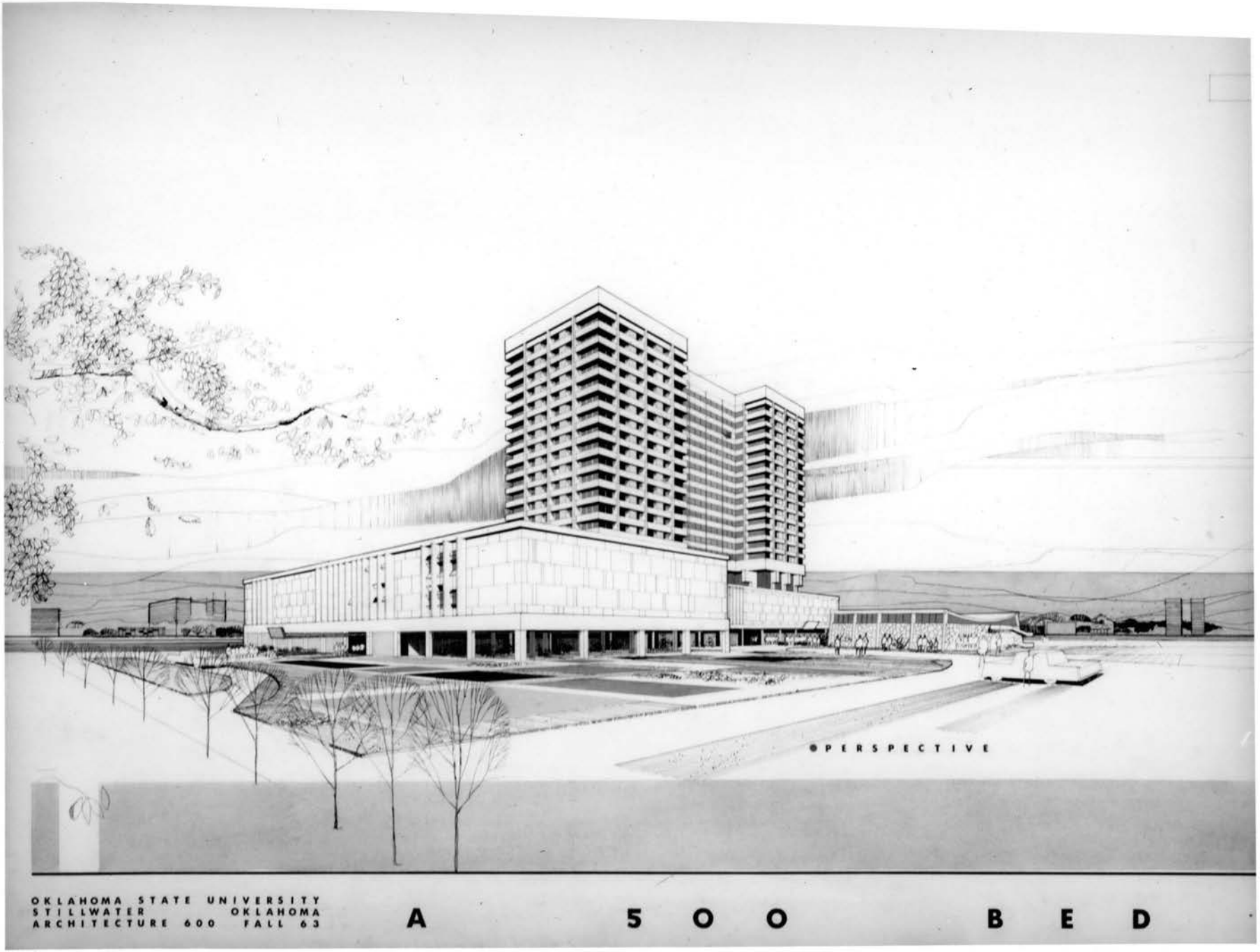
CHAPTER XI

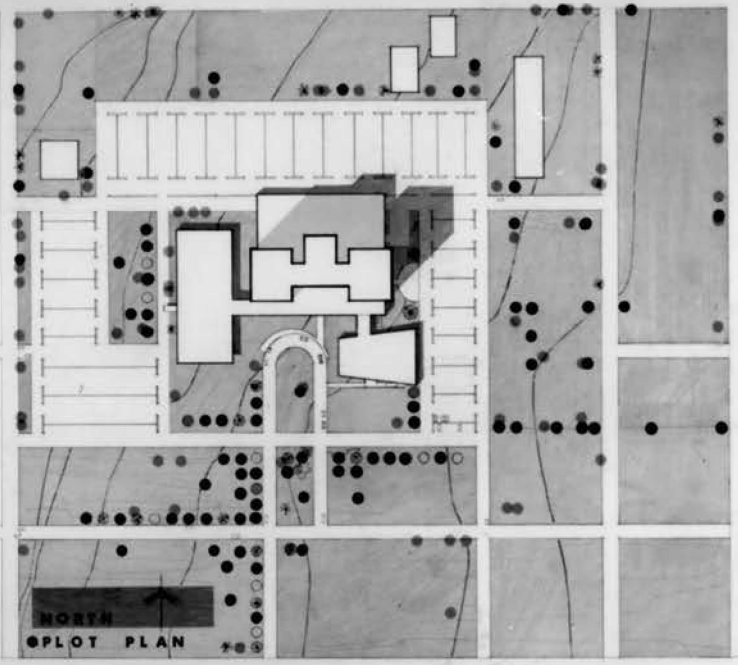
THE GRAPHIC PRESENTATION

The process of designing this hospital has encompassed three specific stages. First of all, the needs of the hospital were analyzed and put into a program form so as to establish a basis for architectural conception. This program reflected the Building Committee notes, meeting with the hospital staff, and conferences with architects. The actual designing and graphic presentation of the hospital was a result of the first stage and completed the second.

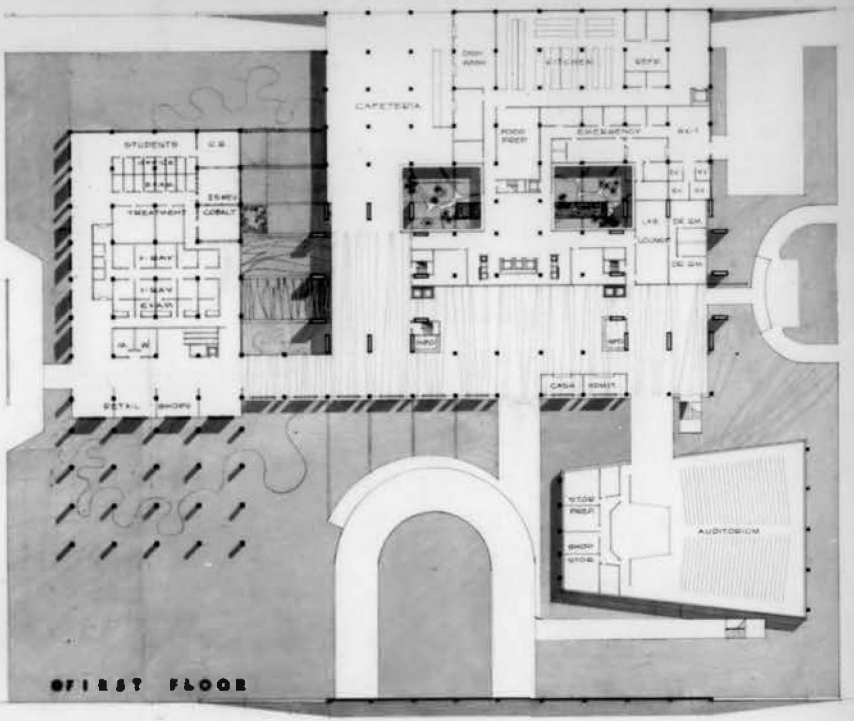
The third stage is presented here within this report. It consists of a discussion of the hospital as programed and the graphic solution as presented in the second stage.

In actual architectural practice, the design would now be further modified to include information gained in later discussions and study. The revising of the design should, in fact, be continued throughout every phase of the hospital construction from conception through construction in order to gain a more responsible architectural solution.


PERSPECTIVE
OKLAHOMA STATE UNIVERSITY
STILLWATER OKLAHOMA
ARCHITECTURE 600 FALL 63
A 500 BED

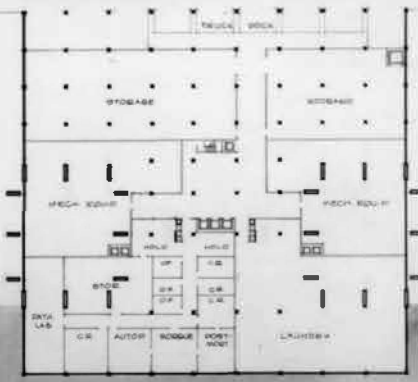


PLOT PLAN



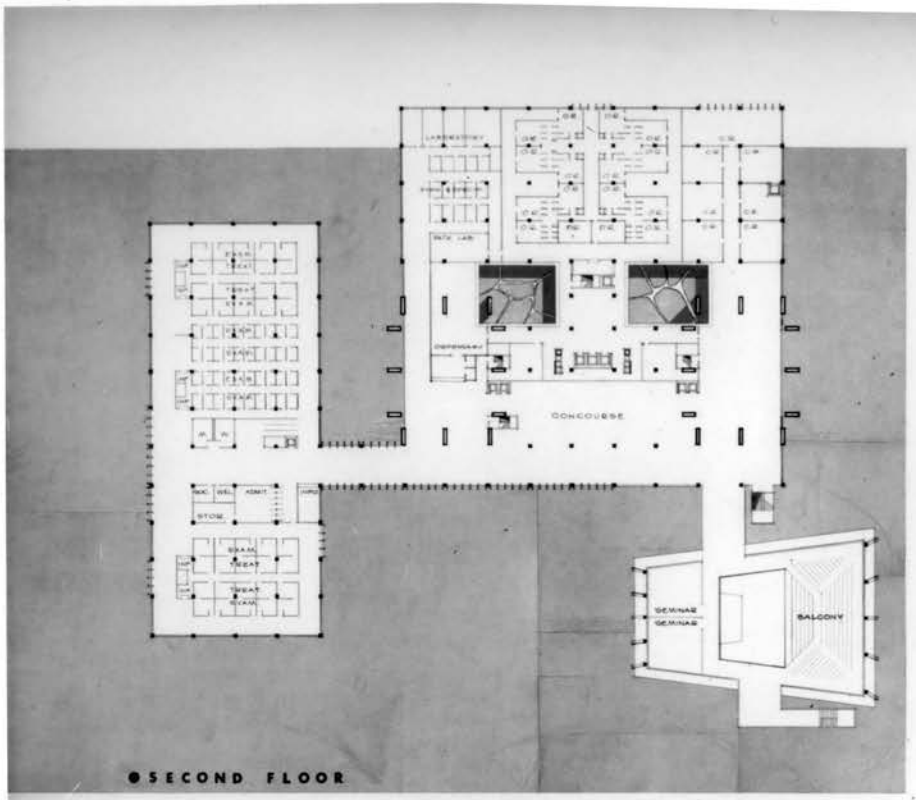
FIRST FLOOR

PERSPECTIVE

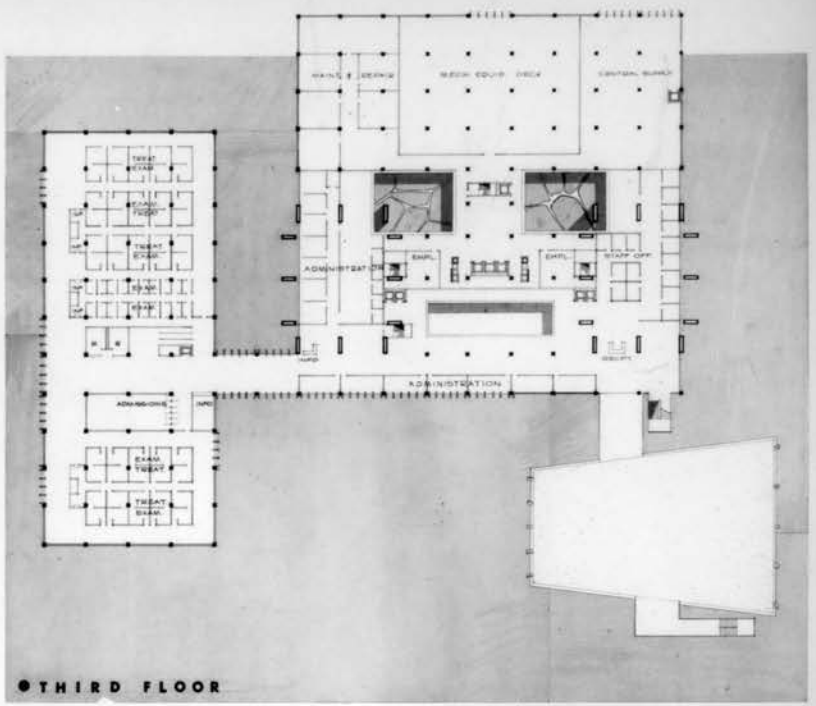


BASEMENT

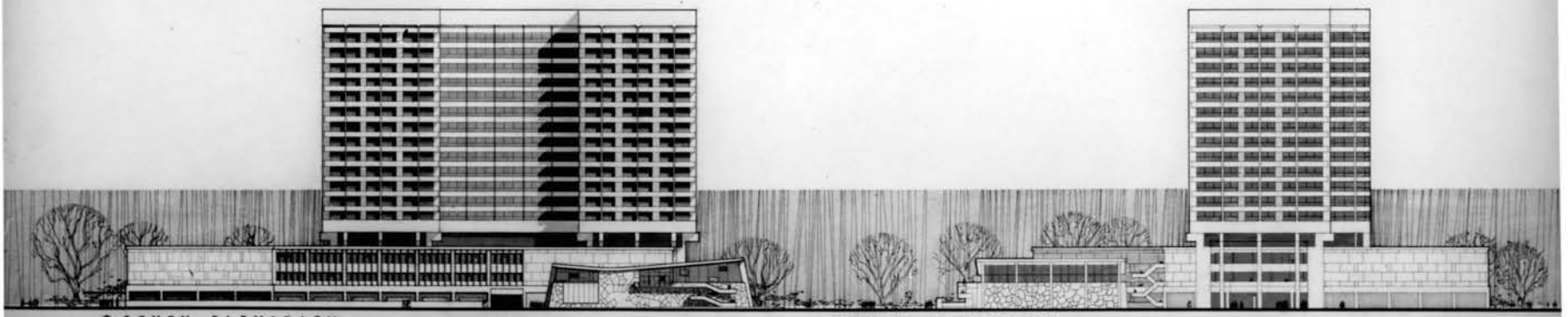
TEACHING HOSPIT



● SECOND FLOOR



● THIRD FLOOR

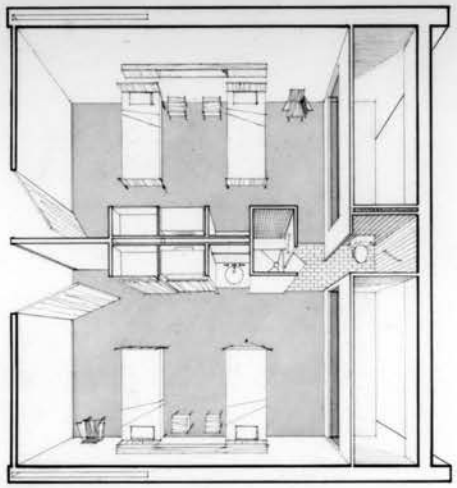


● SOUTH ELEVATION

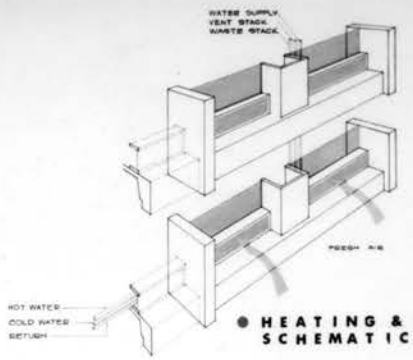
● EAST ELEVATION

L F O R U N I V E R S I T

● NURSING FLOOR

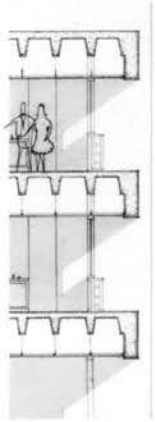


● TYPICAL PATIENT ROOM

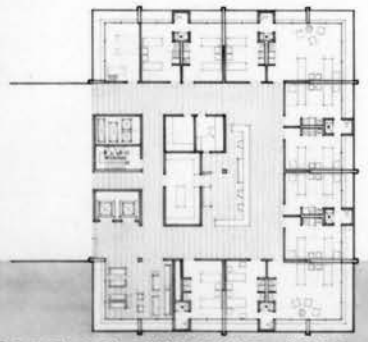


● HEATING & COOLING SCHEMATIC

● OB-GYN TYPICAL FLOOR PLAN



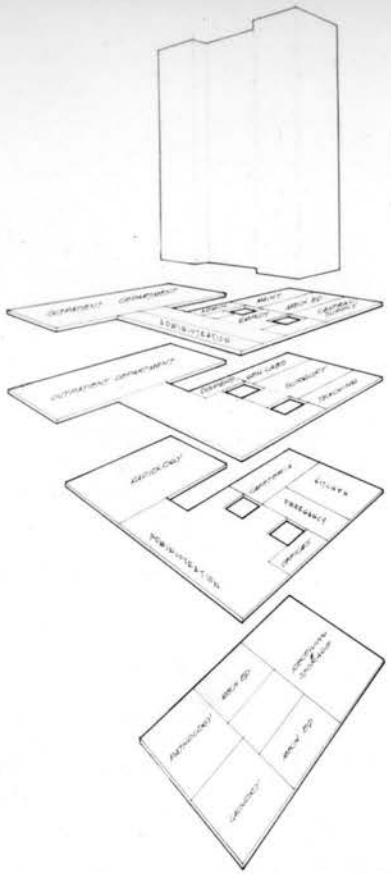
● WALL SECTION



● TYPICAL NURSING UNIT

● NORTH ELEVATION

Y O F O K L A H O M A



NURSING TOWER

TWENTY-TWO NURSING UNITS (654 BEDS)

TEACHING LABS, STUDENT EXAMINATION AND TREATMENT AREAS, AND CLASSROOMS.

OBSTETRIC AND GYNECOLOGY DEPARTMENTS AND DELIVERY SUITES (28 BEDS)

THIRD LEVEL

EQUIPMENT MAINTENANCE

MECHANICAL EQUIPMENT FOR SURGERY SUITES

TEACHING AREAS AND TELEVISION TEACHING FACILITIES

ADMINISTRATION

SECOND LEVEL

GENERAL LABORATORIES

SURGERY SUITES

CENTRAL SUPPLY

MAIN LEVEL

CAFETERIA

KITCHEN

EMERGENCY

BASEMENT

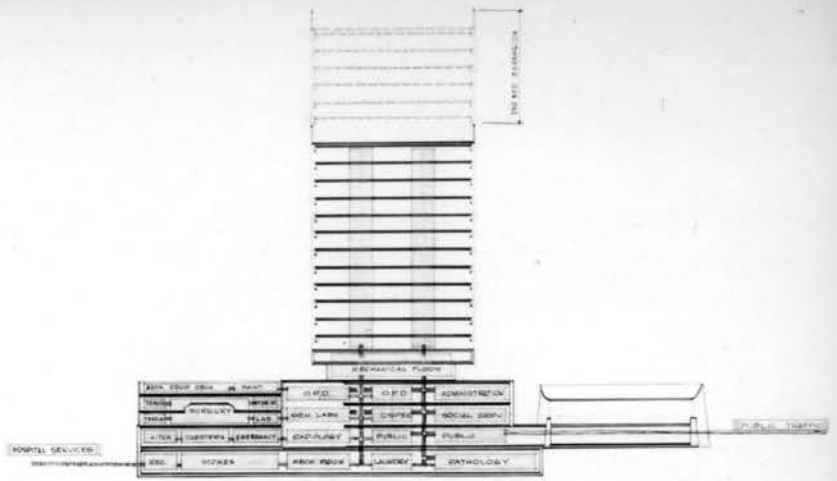
RECEIVING AND STORAGE

MECHANICAL EQUIPMENT

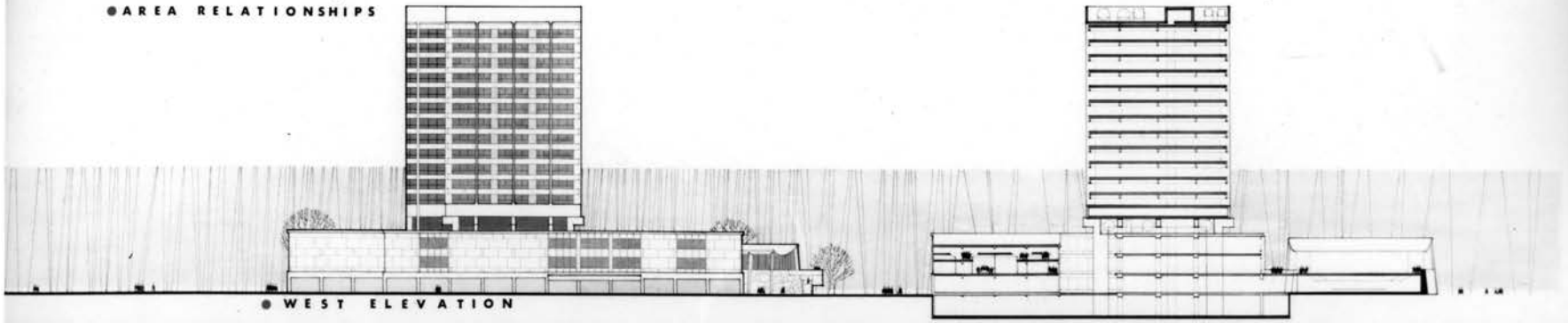
PATHOLOGY DEPARTMENT

LAUNDRY

● AREA RELATIONSHIPS



● VERTICAL FLOW DIAGRAM



● WEST ELEVATION

MEDICAL SCHOOL

CHAPTER XII

SUMMARY

The planning of a hospital entails for the most part a great deal of investigation into what each department needs to function and the providing of those needs without curtailing the function of any other department. During the design of this hospital, we were fortunate to have as reference the meeting notes of the Committee on Construction of the University of Oklahoma School of Medicine. Using these notes as a guide, each department was analyzed and provided with its own space requirements and relative location to any supporting facilities which it may find necessary for optimum operation.

The major planning solution was arrived at only after many compromises and re-evaluations of each department. The additional activity of 150 medical students had to be reflected which further complicated the relationship of the elements.

The philosophy of operation of a medical school and hospital complex is an ever changing thing, but the requirements of the University of Oklahoma School of Medicine are illustrated in the detailed plans which, together with this report, represent the thinking and decisions upon which the design was based.

SELECTED BIBLIOGRAPHY

Aldis, Guy. Hospital Planning Requirements. London: Sir Isaac Pitman & Sons Ltd., 1954.

Architectural Record. Hospitals, Clinics, and Health Centers. New York, N. Y.: F. W. Dodge Corp., 1960.

Birch-Lindgren, Gustaf. Modern Hospital Planning in Sweden and Other Countries. London: Constable & Co. Ltd., 1951.

Bouwcentrum. General Hospitals - Functional Studies on the Main Departments. New York, N. Y.: D. Van Nostrand Company, Inc., 1961.

Committee on Construction of the University of Oklahoma School of Medicine. Meeting Notes. unpublished meeting notes. 1964.

International Symposium on Hospital and Medical School Design, edited by George H. Bell. Vol. 1. London: E. & S. Livingstone Ltd., 1962.

Rosenfield, Isadore. Hospitals - Integrated Design. 2nd ed. New York, N. Y.: Reinhold Publishing Corporation, 1950.

U. S. Department of Health, Education, and Welfare. Medical Education Facilities. Washington, D. C.: Public Health Service Publication No. 1180-A-1b, 1964.

_____. Design and Construction of General Hospitals. New York, N. Y.: F. W. Dodge Corp., 1953.

VITA

Jack Donald Jackson

Candidate for the Degree of

Master of Architecture

Report: A TEACHING HOSPITAL FOR THE UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE

Major Field: Architecture

Biographical:

Personal Data: Born in Oklahoma City, Oklahoma, December 7, 1934, the only son of Altie and Opal Jackson.

Education: Attended grade school in Oklahoma City and graduated from Classen High School in 1952; received the Bachelor of Architecture degree from Oklahoma State University in August, 1959; completed requirements for the Master of Architecture degree in August, 1964.

Professional experience: Employed as designer for Warren Gilbert and Associates; draftsman for Victor Gruen Associates on shopping center and retail sales projects; project architect for Kite and Overpeck on hospitals and medical centers; four years experience in office practice.

Name: Jack Donald Jackson Date of Degree: August 8, 1964

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: A TEACHING HOSPITAL FOR THE UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE

Pages in Study: 49 Candidate for the Degree of Master of Architecture

Major Field: Architecture

Scope of Study: The planned operation of a hospital and medical school complex reflects an investigation into the internal activities of each department in the complex. This investigation includes the philosophy of operation of each of these departments and their relationship to each of the departments which they affect or by which they are affected.

Findings: The required relationship of each of the major elements of a teaching hospital and their organization into a sound architectural solution is illustrated by the detailed plans.

ADVISOR'S APPROVAL