CHILDREN HOSPITAL FOR SOKOTO

BY

A THESIS PRESENTED TO THE POSTGRADUATE SCHOOL, AHMADU BELLO UNIVERSITY, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF S CIENCE IN ARCHITECTURE.

D E P A RTMENT OF ARCHITECTURE FACULTY OF ENVIRONMENTAL DESIGN, AHMADU BELLO UNIVERSITY, ZARIA.

JUNE. 1984

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D E D I C A T I O N.

This piece of work is dedicated to

MY PARENTS

AND THEIR GRANDSON

BASHEER.

ACKNOWLEDGEMENTS

This work was inspired, sometimes by the interest of the unsolved problems themselves, sometimes by the stimulus of controvertial opinions. I owe much directly or indirectly to many sources and authors.

I am particularly indebted to my Mentor and Head of Department Professor E.A A deyemi who patiently guided me all through the period of the thesis despite his departmental responsibilities

I am also grateful to the following who have in one way or the other helped towards the success of this piece of work:- First and formost is my loving wife Fatimah Usman Yandu (Asabe) who had to be waken up in the middle of the night to meet the demands of the project; Professor Ola Daniel C.M.D. Sokoto University Teaching Hospital, David Osei, Records Officer, Dr. Taqi A.B.U. Teaching Hospital, Dr. Opara, Mrs. Adeyimi, Dr. De Mrs. CHERIAN , SANI MOHAMMED ABUJA, USMAN UMAR, ISA BALA, ,YUSUF YUNUSA, KABIR MURTALA, USMAN BARAYA, SHEHU MOHAMMED ARZIKA, UMAR AUTA, IDI WALI and Numerious others.

I am also thankful to the Sokoto State Government for providing financial Assistance.

S Y N O P S I S

CHILDREN HEALTH, TOMORROWS' WEALTH

M.Sc. (Architecture) Thesis Abstract

CHILDREN HOSPITAL FOR SOKOTO

(TOWARD PEADIATRIC TREATMENT IN DOMESTIC SETTING)

BY

AHMED MOHAMMED SAMA.

DEFINITION

This Thesis Centres around providing Health Care Delivery for the children under the Age of 15 years.

Problems Statements and Purpose

The main problems connected with child health care delivery is lack of adequate mother and child health Education. This basic Education is so important that without it health care for the mother and child will always be in Danger.

IN Nigeria today Not more than 20% of biths occur under medical supervision.. This is so because not more than ⅓rd of pregnant women receive any prenatal care[1]. The mother for instance has to understand that her child should be immunized before she takes him for Immunization. This vital Education is generally lacking in Nigeria; the result is that 2000 children die daily in Nigeria 30% of them due to lack of Immunization 30-40% due to dirrhoea.[2] OF the 4,000,000 babies born Every year in Nigeria a substential amount of them die before their 1st birthday. Out of Every

1000 children born in this country 150 die before their 1st birthday. The result is that 60% of the total death in this country are children below the Age of 15 years. Another problem is that of Congenital malformations; 12,000 children are born with malformed hearts in the country[3].

These problem can be reduced in the author's View if clinics and health Centres (Hospitals) specially for the children are built in all major towns of the Federation. These hospitals will be the medium through which lectures and treatment are given to that Community. The hospital should have both treatment and prevention facilities to enable it achieve its desired objective of arresting or reducing the infant mortality rate and sound health for all children.

Aims and Objectives.

1 - To provide the child (patient) with medical and surgical treatment in a setting which is almost the same as his own house.

The Idea here is that the sick child in the hospital finds himself in an atmosphere Unnecessarily different from that of his own house, this often have negative effect on his recovery. This can be achieved or greatly improved by such means of providing Cubicle partitions within the Nursing

Units provision of play areas and integrating the mother in all aspects of Design. This will reduce the anxiety and acute distress of separation of the child from his mother.

2 - To Control or minimize the spread of Infectious by providing Effective Circulation pattern.

This can be achieved by controlling traffic routes reducing overcrowding and ensuring Cross Ventilation in all useable spaces.

"Bad Nursing situation is not brought by the Nurses themselves but by Bad Sanitation, bad Architecture and Bad Administrative Arragement." Florence Nightingale

3 - Control the spread of Excitement. This can be achieved by keeping in mind that children are bound to be submitted to Injection and various handling which produce crying or in some cases screening So Sound proofing the treatment Rooms or keeping it absolutely out of Hearing.

SCOPE:

The Scope of the thesis will cover Five main Departments. They are: The Out Patients Department which consists of 1. Records Section, 2. Clinics. The Dignostic and Therapentic Department which covers:-

1. The Operating Theatre.

2. Radiology

3. Pathology.

-Nursing Units.

Medical Nursing Unit

Surgical Nursing Unit

Intensive Care Unit

Isoloation Unit Neonata or Nursery and

Mother's Hostel.

Supporting Services and Administration.

Laundry.

C.S.S.D.

Pharmacy

Central Stores

Mortuary Incinerator and Boiler House

Maintenance Base.

Kitchen (Catering Department).

Among these, Mortuary, Incinarator, Laundry Maintenance and Boiler House will not be designed due to time limit but full detailed designs of the rest will be produced.

SITE: The Hospital will be situated in Sokoto at the Eastern part of the town. The site is opposite the School of Nursing and Midwifery. This land was earmarked for the

now suspended proposed Murtala Mohammed Memorial Hospital.

LAND AREA:

The land Area of the site is about 330,000 m^2 with ample area of expansion with the surrounding areas being open and that farm lands.

Sponsors of the project will be the Sokoto State Government through the State Ministry of Works.

Suitability as a thesis Topic.

Children health as the saying goes is the wealth of the nation of tomorrow. This in itself proveds the challenge of the whole project.

It is also a point to note that in the whole of Sokoto State (Except for the new National Children Hospital proposed at Shagari) There is not a single Hospital specifically meant for the children The Paediatric wards that exist in current hospitals cannot cope with the teaming number of children that frequent them. They are to the author's opinion of low standard and not well equiped.

The Author therefoer feels it is the role of Architects to make their own contribution in this field.

Schedule of Work Plan

Data Collection - Dec - Feb.

Data Analysis - Feb - March

Concept Dev. - April-May

Final Design - Jun - July 1984.

Foot Notes and References

1. Journal of Tropical Pediatrics, Vol.28 Dec.1982

2. Unicef - State of the World children, 1984

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2. AHMADU BELLO UNIVERSITY TEACHING HOSPITAL, ZARIA PAEDIATRIC DEPARTMENT.
3. ARGUNGU GENERAL HOSPITAL PA EDIATRIC WARD.

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INTRODUCTION.

This Thesis centres around providing effective Child Health Care Delivery in Sokoto and its surroundings. It is the intension of the Author to make a research into the designs and functions of Children Departments in existing hospitals and thereby design a Children Hospital for Sokoto in order to make his own contribution in the field of Architecture and planning.

The author has therefore made a documentary study of Paediatric Departments of two (2) Teaching Hospitals and a General Hospital to identify the existing needs and problems for child health care delivery today.

Hospital planning principles and short history of child health care as well as site selection criteria are discussed in the first chapter. Chapter 2-4 deal with main hospital facilities; chapter 5 deals with hospital support services; chapter 6 deals with site climatic characteristics as well as geographical setting of the people of the planning area. Chapter 7 deals with the Design Concept adopted while eith and the last chapter deal with the Schedule of Accommodation

CHAPTER I

HOSPITAL PLANNING

"PLANNING IS NOT MERELY THE PROCESS OF DETERMINING THE MOST EFFICIENT WAY TO ACHIEVE CERTAIN GOALS; IT IS A PROCESS IN WHICH WE KEEP ASKING WHETHER THE GOALS ARE VALID. IT IS A PROCESS IN WHICH WE KEEP RAISING THE POSSIBILITY OF ALTERNATE GOALS TO MEET THE NEEDS OF A RAPIDLY CHANGING WORLD, WHERE YESTERDAY'S GOALS MAY NO LONGER BE VALID" John C. De Doar.

INTRODUCTION.

The children hospital is a specialist hospital catering for the medical health care delivery of the child It is a complex organisation utilizing combinations of intricate specialized scientific equipment and functioning through a corps of trained personnel educated to the problems of modern medical science all welded together for the common purpose of restoration and maintenance of good hea lth.

The hospital as an organisation, provdes special facilities and trained staff to enhance the work of physician in his primary position involving care of patient who is the focal point about which all activities of the hospital revolve.

In the delivery of medical services to the patiens therefore, the medical and associated technical staff of Nurses Dietetitians etc become a most important factor.

Since primarily the hospital consists of five main components that is to say;

Out Patients Department, Diagnostic and Therapeutic Departments, Administration, Nursing Units and the hospital Support Services. The main challenge of the Designer is then to intergrate these departments so as to provide the most efficient flow of both staff, visitors and patients; In order to facilitate ease of work.

1.1 PLANNING

This is both functional and Architectural, since the Designer will present to himself the problems he desired to solve and then translate these problem into a workable and acceptable building design.

The Elements of functional planning are:-

(1) Community Survey(to identify the extent of needs)

(2) Climatic Data.

(3) Survey of Existing intrastrucural facilities.

1.2 DESIGN PRINCIPLES:

COMMUNITY NEEDS.

Although in Hospital planning the prime Emphasis is on Inpatients the frontier of the hospital has extended from the sick child in the hospital bed to the potentially sick child in his normal living situation. Hospitals have been assuming more and more reponsibility for programs of preventive medicine. Hospitals can in this respect serve as a medium in communities through which the professional staff and official health agencies put up their efforts towards improvement of public health.

Problems of health have always been primary and decisive for the well being and well feeling of man and society. Medical treatment, cure and hospital climate are therefore important to every designer; the sick their families the Nurses and Doctors.

"Entering a hospital one (especially the child) becomes depressed seeing the white walls, the uniformed Nurses and the shiny furniture and equipment".

It is the challenge of Architectural design as a whole to make the hospital volumes spaces and interiors more benign, wholesome and humame.

Before any hospital is designed a survey must be carried out of the existing needs of the community. Data on existing population and degree of Urbanization; this is so because ability to serve the community need is one of the most important functi ns of the hospital. Developing and projected trans portation and access patterns, availability of staff and capital funds, controlled land use projecrs and adequacy of site for future growth are all necessary Data required for a hospital planner.

HOSPITAL SIZE

This is commonly indicated by the number of beds, this is so because with each bed is the common facilities to serve it. The number of beds dictates the size of Supporting Services. It also has the largest single space demand within the hospital premises.

Relative number of beds required for any given hospital can be calculated thus:-

Number of beds = Beds/1000 of Head of population

x population of Catchment Area.

This varies from community to community because of population growth rate, age distribution, marital status, sex distribution, degree of Urbanization Educational attainment etc.

FLEXIBILITY.

Hospital Design should be flexible to accommodate ever increasing changes in the near future without altering the basic functional balance of the structure concerned

Simple structures capable to extend in small increments should be preferred. The Structures should have a life span of at least 100 years. Where modular design is employed wide span structures should be avoided.

PROVISION FOR GROWTH.

This should be well thought of Community needs increases with the growth of such communities, and modern scientific research and findings. Since hospital Efficiency is determined by its relationship with the community it serves. So the function must go with the community needs.

SITE SELECTION CRITERIA.

This is a very important stage in planning of hospital. it is important that the site is selected before any serious planning. The selected site must justify it's suitability.

Hospital site needs to be big enough to provide space for fututure expansion or to have space along side which it will be possible to obtain later for expansion. It should have good access for traffic both vehicular and pedestrian and gradients, should be such as to avoid difficulties of access or wasteful earth moving and structural works.

The site should also be sited away from noisy and industrial areas and busy streets. It should also be sited away from areas with obnoxious odours areas biable to flood and volcanic emption.

1:3 HISTORY OF CHILD CARE.

Child care has been since time immemorial. History showed that in the early period common sense was used in the case of the sick among the primitives. Magic was also used in an attempt to control forces which the primitive man did not understand. Very little magic was ofcourse used for children because they were not valued very highly. Infant mortality rate was high but the primitive people did not think it is unnatural since they were accustomed to a high death rate among all forms of young animals life.

In the Ancient civilization the importance of the child was recognised: the philosophy of that time dictated the degree of social responsibility. Egyptian mothers were encouraged to cloth the child loosely and feed him at the breast. It was also in Egypt at about 1800 B C that preparations for childhood diseases were formed. The Hebrews had also recognised the importance of Nutrition and had some ideas about the control of communicable diseases. It was in this time that Hippocrates who is reffered to as the father of medicine wrote a book on the diseases of children.

The middle ages brought new theory about the child. In this theory each child was valued as an individual, care of the weak and ill was emphasised, provision for foundlings and Orphans were made family life was emphasized under feudal system but some problems still existed such as war, diseases and lack of obstetric care, which results in death of many mothers; so b roke families and deserted children were common. Epedimics and mortality rate in children was greater than 50%.

The Industrial Revolution resulted in growths of cities, where children were treated as adults in labour markets. This child labour was the major cause of mortality and morbility among the children. Epedemic was common so also were the social problems.

The modern tend is that the child is highly valued by the society. Total needs of the child are always considered. There are physical emotional developmental intellectual and spiritual. The focus is now on prevention rather than in treatment of uness. Roles of the Nurse in child health maintenance has expanded Programs of prevention of illness are well provided by private physicians hospital clinics, schools and other agencies. When the child is ill or hospitalized the emphasis is now on family centred care; Family teaching is now an Integral part of Nursing care of the child.

Foot Notes and Refrences

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1.4 CONTROL OF HOSPITAL INFECTIONS.

"There cannot surely be a greater contradiction in the Nature of things than a disease produced by a hospital".

Dr. John Aikin 1771 -[1]

The most important single factor causing out breaks of hospital infections is over-crowding In all types of infections man himslef is the source of infection either during the acute phase of the infections, during convalescence, or as a chronic carrier of a causaul agent of a disease. In certain diseases the reservior of infections is animals and the method of transmission is by insects. Staphy lococal disease in hospital can menifest itself in a variety of clinical forms covering wound sepsis in the surgical wards, skin sepsis in new born babies, food poisoning in a ll types of wards and pneumonia in the medical ward.

METHODS OF TRANSMISSION

1. Direct contact from source of infection to the side of introduction of the germ in the patient
2. Indirect contact from source to hands of staff or instrument and so to the site of entry of germ in the patient.
3. Air transfer from the nose of the chronic carrier to upper respiratory tract of patient during coughing and sneezing.
4. By Dust transfer from bedding etc to the susceptible patient.

Many children are admitted to hospital with (or incubating) community acquired infections and consequently the proportions of infected patients in a children's ward is usually considerably high than in adult wards. Children are also more susceptible to community acquired diseases than adults and they may not have developed an immunity to the common infectious fevers. Patient discipline is understandably rather lax in children's departments and care must be taken to avoid the escape of children from isolation cubilces and misplaced generosity in sharing of toys etc.

Food if often prepared in the wards provides a further potential hazard.

METHODS OF CONTROL.

1. OPERATION THEATRE SUITES.

Six Basic requirements can be adopted:-[2]

(i) Separation from the general traffic and air movement of the hospital.

(ii) A sequence of increasingly clean zones form the entrance to the operating and sterilising areas.

(iii) Easy movement of staff from one clean area to another without passing through dirty areas

(iv) Removal of dirty material from the Suite without passing through clean areas

(v) Air flow from clean to less clean areas.

(vi) Heating and ventilation to ensure safe and confortable conditions for patients and staff.

NURSING UNITS:

Single rooms for the isolation of suspected cases of hospital infections in which Barrier Nursing can be conducted.

There is evidence that frequent and prolonged visiting by parents to their own children does not have effect in infection rates but some protection may bee be provided for parents.

Adequate washing facilities must be available in each cubicle and also a weighing machine. Each ward should have a play room and a separate examination room. Dirty utility room is also necessary in which diressings and soiled and foul linen can be collected for removal. No sluicing should be done in the wards as this is responsible for dissiminatin in to the air enormous number of potentially pathogenic bacteria. Partetion in the cusicles should extend upto ceilings to arrest air bone bacteria. Uses of DDT, insecticides and mestri for diseases transmitted by insects.

OUT PATENT DEPARTMENT (O.P.D.)

Avoidance of congetion and over crowding can be achieved on a well organised system of traffic flow aided by appointment system.

LAUNDRY:

Avoidance of contamination of washed items of linen and clothing. Separated staff for handling clean and dirty item of linen and clothing.

KITCHEN

Special care should be taken to provide access to facilities for hand washing.

INTENSIVE CARE UNITS

Infection is one of the principal hazards to which patients in intensive care units are exposed. A patient requiring intensive care may be defined as one who requires support of a vital function until the disease process is arrested or ameliorated, such patients have poor resistence to infections in addition to being susceptible, they are exposed in the intensive care Unit to greater hazards of contamination and cross infection than most patients in ordinary wards. Each patient in the intensive care should preferrably be admitted into a single room to minimize the risk of cross infections.

FOOT NOTES:

1. Nuffield provincial hospital trust 1957 - Studies in the function and design of hospitals London New York Toronto

A.J. No.3403 Vol.132 July 1960 - Control of Hospital infection, DR. T. Sommerville.

CHAPTER II

THE OUT PATIENTS DEPARTMENT:

This department serving ambulatory patients emerge as a result of the recognition that 20-30% of patients admitted to the hospitals do not require the full professional care normally affordedto acutely ill patients. The department therefore caters for both Casual and Emergency patients who may not require admission to the Inpatients Units.

II.1 THE OUT PATIENS CLINICS.

This is the centre for consultations diagnosis and treatment usually conducted by a Consultant or group of Consultants, with Nurses around to assist in administering treatments etc.

The Number of clinics provided by a hospital depends upon its size and speciality. In the Children hospital there are for main clinics:-

1. Medical Clinic.
   - general medicine
   - dematology
   - Cadiology
   - Pulmonary disorders etc
2. Surgical
   - general surgery
   - special surgery
   - orthopaedics etc
3. Special
   - Ophthalmology
   - E.N.T., dental etc.

4. Under fives clinic (Young fives clinic)

- mainly as a preventive medicine clinic.

Administration of the clinics is run by sisters In-charge with a team of trained Nurses. They are responsible for assigning patients to various consulting suites within the clinics.

Each Consulting Room should have two examination and treatment rooms or cubicles. The treatment cubicles should be sound proof since this will minimize the speed of excitement of children during treatment.

The number of Consulting suites required by the hospital for all cases can be calculated using the following formulae:

If "M" is the average weekly demand for consultations; then the critical number of sessions "y" which should always be exceeded in practice is given as

$$y = \frac{mxt \cdot 1}{s}$$

Where t = average consulting time in minutes
s = average length of session in minutes

This formulae have been adopted by the Author.

II.2 GENERAL DESIGN PRINCIPLES.

Flexibility and Adaptability. This Unit should be organised such that Doctors can freely arrange their consulting times at their own convenience and future arrangement done without major structural changes.

With the passage of times some functions within the out patients may increase while others may reduce. The need to design in such a manner that one accommodation can be used by almost all specialities within the unit.

OTHER PLANNING REQUIREMENTS:

The Entrance to this Unit should be from the main flow of the traffic into the hospital. It should also be accessible to the radiology, surgery, pathology and physical medicine and convenient to other ancilla ry and special services. The out patients unit should flexibly serve all scheduled and non-scheduled patients.

Facilities within this unit include:- Patient waiting Area, which should be easily accessible to the Control desk A records Section where records of new patients are taken, and old patients are checked for assignment to various clinic areas. Toilets should be provided adjacent to the waiting area.

EXAMINIA TION A ND TREATMENT ROOM:

These combination of rooms are to be used for all clinics, the location and design of this are should permit expansion without distruption of patients service; privacy is also essential.

DENTAL ROOM:

Each Dental room should contain all necessary dental equipment such as Dental chair lavatory oxygen outlet etc

A dental darkroom and prothetic lab. should be provided.

E.N.T.

Privacy is as important in these facilities as in dental area. Sound proof cubicles should be included (Audiometry room) sure must be taken that sound is not transmitted into cubicle from the sorrounding are.

EYE LANE AND REFRACTION ROOM:

Space should be provided for this special equipment and procedure.

II.3 EMERGENCY SERVICE UNIT.

This Unit must be planned to serve the Emergency case with all its life saving equipment to the patient. There are accident patients and those with severe case of dehydration requiring drips.

LOCATION AND ENTRA NCE:

It should be located ideally on the same level with the rediology and surgery departments and convenient to the laboratory and special services. If possible it should have its own entrance, and it is most desirable to have it located adjacent to the general out-patients unit.

Facilities to be provided within this unit are:-

Emergency treatment rooms -designed and equiped for complete first aid including suturing.

Examiniation and treatment rooms - preferably place in line or tier between the Emergency Unit corridor in order to provide flexibility in use incase of serious desaster or mass.

OBSERVATION, RECOVERY OR HOLDING ROOM.

Divided into cubicles for holding patients admitted for emergencies who may or may not require hospitalization after a period of observation. This area should be a self containeed Nursing Unit. Other facilities include waiting area mobile X-Ray unit, Emergency operation theatre and interview room. Ambulance Entrance to this unit is of paramount importance. There should also be a wheel chair and strecher storage area.

II.4 THE CHILD HEALTH CLINIC: UNDER FIVES CLINIC OR THE YOUNG CHILD CLINIC.

In Nigeria and other developing nations the population of children under the age of five years contitute 1/5th of the total population. The exact population of the under fives in Sokoto township alone is 16% of the total population, which is a substantial amount compared with se of the age of 55 and over (6.12). This is the group most prone to infectious and it is in this group that death and diseases take their highest toll, which is largely due to preventable diseases: Infant mortality rate is high. It is the toddler (pre-school age) child that suffers the brunt of the killing diseases, not in Nigeria alone but almost every where in thedeveloping regions of the tropics. The most dangerious being pneumonia, Diarrhoeal disease, and protein and calorie malnutrition. The others are tuberculosis, whooping-cough, measles, intestinal helminths,

malaria, accidents and anaemia, Eye disorders (Keratomalacis, Conjuctivitis, trachoma), Skin diseases, (Scabies, ringworm, pyoderma) are highly important conditions. Services must be aimed at solving the problems that are dorminant in the particular area. The diseases to be prevented must be those that are common and serious. (Data can begathered - to achieve this).

The young child poses a very high proportion of all the problems in health and medical care In the developing areas there are three major disorders which make up the bulk of illness among children. Dirrhoea respiratory disorders, and malnutrition. These are all interdependent; a great many cases of malnutrition discovered from dyspepsia (maldigestion), diarrhoea andabsorption while respiratory disease is often a terminal condition.in those who are malnourished.

1. <u>BASIS OF THE UNDER FIVES CLINIC</u>.

The Basis of much practical work for young children is health supervision which permits preventive measures to be put into practice. Example is Nutrition Education and immunization which permits infectious diseases to be recognized and treated early by examinations and regular weighing. So that appropriate measures may be taken. These purposes may be summarized as:-

1. Early recognition of the child with a medical problem who with appropriate management will achieve his potential and live a full life.

2. The early recognition of children with problems which may not be open to remedy so that their parents may be given necessary advice and support to provide them with a stimulating and comfortable environment.

3. To avoid the birth of unnecessary prolongation of life of those infants with disorders which severely limit their potentia ls.

Morley made a research in western Nigeria before and after the introduction of the child health clinic of the infant mortality Rates. His figure shows sharp decline of I.M.R. after the introduction of the C.H.C.

I.M.R.	Before (1957)	After (1962)
	295	72
1 - 4 years M.R.	70	31

This shows that an effective YCC can lower the mortality and ensure good health of the community served.

2. SEQUENCE AND UNES OF FLOW

Young child clinic should be orgasied to run in a certain sequence from one station to the next, often in the following order:

1. Registration -2.
2. Weighing
3. Nutrition Education by group discussion - demonstration
4. Examination, counsilling and treatment.
5. Immunization.
6. Issue of Food supplement and/or medicine (if required).

If facilities exist for simple laboratory tests as may

occationally be the case a separate station should be set for this purpose

REGISTRATION:

The system of records used should be simple and functional. It is ususally helpful to have a book at the clinic in which the names of those attending can be recorded each visist, together with a biref note of any procedure, advice or decision on management (for example, home visiting required for a child 'at risk' reguster is very useful). The mother should keep a card with the name and clinic number so that records can be found.

EDUCATION:

The clinic is an excellent site for education both for individual parents and in well planned group discussion - demonstration. A model garden, and house adjacent to the clinic can be more valuable than any other form of visual aid.

EXAMINATION A D CONSELLING:

Children attending the YCC should be examined naked for signs of malnutrition and relevant infectious. Basic laboratory tests should be available for haemoglobin estimations, stool examination etc. Advice to indiviual mothers concerning their children's health, diet and need for supplemantary food, immunization or medicine is an important educational aspect which may also benefit other waiting mothers who happen to be listening.

IMMUNIZATION:

This will depend on the Immunization activities of a particular programme and on the methods used.

FOOD SUPPLEMENTARY:

Supplies of food supplements should be available for issue to selected children who require them. This may take the form of dried skimed milk or other protein supplement, etc.

TREATMENT:

Drugs available for treatment depends on local problems and needs. Some of which are those for

1. Eye infections, skin disease, ear infections, various infections (including pneumonia, diarrhoea, cough, malaria intestinal worms etc.).

Treatment should be as uncomplicated as possible if certain conditions are particularly common there may be need for special facilities for instance a rehydration room an injection room, or on the spot first treatment for scabies if any drugs are to be issued, the dosage scheduled and method of administration will have to be learned.

3. HOME - VISITING

Treated children in the clinic should be frequently visited at home when discharged to ensure the maintenance of their health. The health Nurse or doctor must have priorities:

New born babies sick children everybody else The "at risk" register must be carefully maintained

New born babies should be visited as soon as possible after birth in the home or after return from the hospital. This early postnatal visit is most important. Unless the nurse or doctor knows the house and its other inhabitants, it is very hard to give practical advice about care to be given to the patient. Health workers who never visit in the homes are at a serious disadvantage. They should also be able to advise on the care of the patient.

FOOT NOTE

1. A.J. July 1982 Building update hospital
   SAID HAMZA 1983 Arch Press London
   Wudil Rural Hospital

2. Mother and child health

CHAPTER III

DIAGNOSTIC AND THERAPEUTIC FACILITIES.

These parts of services in the children hospital have the functions of assisting to confirm or determine the physicians, or medical personnel's diagnosis, and they include:

1. The Surgical or operating theatre suite
2. The Radiology Department and
3. The pathology department with the Blood Bank.
4. Physical medicine.

III.1 The Surgical (operation theatre) suite.

This is the area where surgical operations both major and minor are carried out for patients requiring them. The United States public health service recommends one operation theatre for every 20 surgical beds; while in Britain it is 20-30 surgical beds.[1] Todd E. Wheeler give the following formulae for determining this number.

OPY - Number of operations carried out per year.

DY - Day per year surgery is in operation.

OPRD - Operations per room per day.

Number of operating rooms

$$= \frac{OPY}{DY \times OPRD}^{2}$$

Since in the author's opinion the first two methods can be eraneious expecially with regards to the Nigerian situation the third alternative will be adopted.

PLANNING AND LOCATION.

The Ministry of Health's departmental Committee on cost of Hospitals in Britain Summarized the requirements for an operating threatre suite.[3]

That to ensure quite and to minimize air-borne infection, the whole suite should be planned as a Cul-de-Sac, off the main hospital corridor;

That an anaesthetic room should adjoin and communicate with each theatre;

That all rooms should open into a central enclosed area.

That the scrub up room, sink room and sterilizing room should adjoin the theatre with open communications and there should be direct access to the outside of the building for soiled linen bins

Preferable location of the surgical suite is close to the Emergency, radiology, central supply and pathology departments. The minimum size of the operating theatre is 510 x 510 cm with a temperature of 18 $^{o}_{C}$ $\pm$ 2 induced by mechanical ventilation of 20 air changes per hour; relative humidity of 55% $\pm$ 10 and lighting level of 480 lux plus other special lightings.[4]

Facilities provided within the suite include:-
Anaesthetic room, sink room and sterilizing room scrub up room and exit rooms, changing rooms and offices for both Doctors, Nurses and ancilliary medical staff should be provided.

The recovery room in the surgical suite should act as an Independent Nursing Unit with-in which post operative patients are observed before finally moving to the intensive care unit. Adequate waiting area should beprovided for patients relatives. Stores and strecher alcoves are other necessary functions within the surgical suite.

III.2. THE RADIOLOGY DEPARTMENT.

This is one of the busiest department with-in the hospital because substential number of outpatients and inpatients frequet the department daily.

The two major functions of the X-ray department are:-

1. Diagnostic Radiology: where X-rays of patients are taken and types and nature of diseases of patients are contrasted on a film or fluoroscopic screen

2. Therapeutic Radiology: Where effected organs of body are treated by radiation therapy; this is often used for treatment of tumours such as cancers.

Due to the level of the technological advancement of our country the hospital will in the Author'sview be mainly occupied with the first function.

PLANNING

The primary planning of X-ray department should be based on patient traffic; which included accessibility, promptness of attention, comfort convenience, privacy, thoroughness of examination or treatment and courteous assistance to the exit. The next if film flow, technician traffic and achieving most effective traffic pattern for the radiologist, and professional staff so that they may interview, examine and treat patients quickly and thoroughly

The number of X-ray rooms required can be calculated using the following formulae.[2]

DTY - Determination Per Year

DW - Days per week in operation

Wks - Weeks per year in operation

DTRH - Determination per room per hour.

$$\text{No of X-Ray rooms required} = \frac{DTY}{DW \times WKS \times HD \times DTRH.}$$

The best location for this department is near the Emergency and Accident Deparrment, out patients department and clinic; near the operating room, Laboratory and Pharmacy. It must be readily accessible and located such that to get to it one must not go through some other departments, or inturn one must not have to go through it to get to some other departments IT IS IMPORTANT TO NOTE THAT X-RAY BEAM CARRY INHERENT DANGER TO LIVING CELLS. Proper shielding of all procedure rooms is of prime importance.

III.3 THE PATHOLOGY DEPARTMENT.

The Oxford dictionary defines a laboratory as a place used for scientific experiments. The laboratory in the hospital department however performs three main functions.[4]

1. To assist in the establishment of a diagnosis or to assess progress to control therapy.
2. As a place where tests can be performed to detect the spread of epidemic dieseases: particularly cross infection in hospital.
3. It provides an area where investigation frequently becomes the routine test of tomorrow

LOCATION:

Position of the pathology to other hospital departments should be:-

- Sited such that all areas are easily accessible since the pathology obtain its specimen from all parts of the hospital.
- It must be adjacent to the out patients department
- It should also be near the Mortuary.
- It is particularly importa nt that the pathology have direct access to the operating theatre Suite.

SIZE: of the pathology depends upon the amount of work provided from the whole population and the number of hospital beds. it also depends upon special investigation required for a hospital which has beds devoted to a particular speciality.

PLANNING:

This includes the Administrative area of the laboratory which house the pathologist, Secretary and Clerks. This area should be centrally located and adjacent to the main patient Corridor.

- Laboratory Areas where actual testing of specimens is carried out. These areas should be designed on a modular basis, sothat future changes can be accommodated. Modular Cabinet work and benches are also recommended.

The Laboratory areas should include spaces for:-

- Haematology - where special study of the blood in particular the enumeration and classification of the cells of circulating blood etc is done.

BACTERIOLOGY: sited at the far end of the laboratory yet near the glass washing and sterilizing area to minimize the risk of infection to other staff; since the main purpose of Bacteriology is the identification of or g anison causing disease.

HISTOLOGY - The purpose of this section is primarily to process tissue removed from the living or dead body, so that it can be examined by microscopy.

This area should be near the pathologist office for easy supervision.

BLOOD BANK: Very close to the patients entrance and reception point but should have a definate connection with Haematology.

SERVICE AREAS - Should be convenient to all laboratories and contain glass washing and sterilizing areas.

PATIENT AREAS - should contain blood donating room and recovery room, interview, waiting and reception areas.

III.4 PHYSICAL MEDICINE:

This should also be located at the same level with the general out-patients Unit. This department would include physical and corrective Therapy since the hospital will mainly cater for the children.

> "To ignore the development of rehabilitation service within general hospitals is to guarantee the continual deterioration of many of the less severely disabled category. The neglect of disability is far more costly than an Early aggressive program of rehabilitation which restores the individual to the highest possible level of physical economic social and emotional self sufficiency."
>
> Rusk and Taylor in Rehabilitation medicine[7]

LOCATION AND PLANNING:

The best location of this department should be centrally so as to enable it to be both accessible to the In-patients and Out-patients departments. This is so because while the Out patients are brought from their homes; Inpatients (especially surgical cases) will also be frequenting the department.

Facilities to be provided within the department includes physiotherapy room - which helps to restore functions of limbs after sickness or injuries - through:-

(i) Manupulation of various parts of the body by message and movement of joints

(ii) Hydrotheraphy bath pool.

(iii) Free movement by means of gymnastic apparratus.

Corrective theraphy should also be proviced in the case of delinquent children. Offices for administration should be provided which should be used for patient examination. There should also be waiting and reception area. Treatment rooms should be better divided into cubicles.

FOOT NOTES

1. American Association of Hospital Consultants (1951) Functional planning of General Hospital edit A.B.U. mills

2. SAID HAMZA (1983) Wudil Rural Hospital.

3. Joseph De Chiarra and John Colender - Time Saver Standard building types 2nd Edition.

4. B.M. Kleczkowski and R.P. Boklean - Approaches to planning and Design of Health Care facilities in developing areas. WHO publication.

CHAPTER IV

NURSING UNITS (WARDS)

No single element in a hospital has a greater bearing on the built form than the ward. Reactions to the wards by patients, their visitors and the Nurse and doctors largely give a hospital its image, be it efficient, homely clinical or daunting. This emotional reaction is as fundamental to the success if a hospital in its community as good diagnostic and treatment facilities.[1]

In planning accomodation for inpatients the problem to reconcile maximum economy in provision with proper condition for medical care and adequate amenity for the patient including sufficient privacy

Medical Requirements are that beds must be sufficiently for apart to reduce the risk of direct cross infection from patient to patient. The children Hospital will provide Nursing Units in the following Categories.

i) Medical Nursing Units
ii) Surgical Nursing Units
iii) Intensive Care Nursing units
iv) Isolation Nursing Unit
v) Neonatal or Nursery.

Medical Nursing Unit

This Unit of the inpatient care cater for all medical cases that are not infections and since this is a childrens ward, in the Authors view they will

not be as large as Adults wards since children need more care. As Every child is a potential carrier of disease that could be transmitted to another child the nursing unit will be seperated by partitions. The max number of children in each portion will be four. These partitions will be of glass to ensure visual contact of the patient and Nurse.

IV.2
Surgical Nursing Unit

This unit of the in patient care will cater for these patients who have under gone major or minor operations, but do not require inter give care. Fracture and burns patients are also catered for in this unit. This unit will also be partitioned for the some reason as for medical unit and for the purpose of privacy maximum number of patients in a Cubicle will be also

Facilities to be provided in these Nursing units are:-

Treatment Rooms:- This is because the Risk of cross infection will be reduced, if most treatmen procedures are done not in open wards where the danger of scarttering bacteria is un avoidable but in the more strictly controllable conditions of a special room. Patients and who ever treats him will also benefit from the more convenient, facilities and privacy and other patients in the ward need not disturbed or distressed by wailings and crying of the patient under going treatment.

Clean Utility Room[3] These are chiefly used in preparing to give treatment. e.g. for sterilizing bowls and instruments laying up dressing trollap and packing surgical dressing drums.

Dirty Utility Room[3] Used for Emptying and cleaning such untensils as bedpans, urine bottles, and sputum mugs, disposing of used dressing and similar materials, Testing specimen of urines and cleaning and where necessary disinfecting all grossly soiled or contaminated objects not to be thrown away.

Food Preparation Room - largely for mecing the formulae used in the treatment of protein - calorie malnutrition.

Nurses Stations, With a view of as much of the ward as possible. This area should be centrally located.

Play Room - Play is an important part of the young child's life. Play promotes physical, mental social and Emotional Development. Safety factors should always be guarded when choosing play objects, all play objects should be boilable as children tend to put what ever they have in their mounths.

Other amenities may include:- Sisters Room Nurses Room, Clean linen Room, Class room, Mother days space, Toilets and Baths. Peadiatric unit should be decorated with children in mind, such as the use of bright colours, pictures and plaques.

Since children are most susceptible to separation problem between the age of 8 months - 4 years as they cause reactions similar to adult grief parents should be encouraged to stay with them to decrease these problems.

IV B

INTENSIVE CARE NURSING UNIT

This unit will accomodate all patient medical or surgical requiring intensive care; serious bruns patients will also be accomodated in this unit. It is important that the patients are within view of the nurse. Facilities to be provided within this unit are:- Clean and soled utility rooms. In the interest of good visibility through out the unit, clean utility should be in an open areas, from which the nurse can see into patients cubicles. In the Authors opinion a centrally located counter area with sink and shelving can be utilized. While the soiled Area should be enclosed because of contamination but with preferably a glan portion and medication should be located area within the Nurse station. A sisters Room. A nourishment Room is also derirable for intraVenously fed patients, linen Room, storages, Toilets for both staff and patients and Baths, Also desirable is visitors waiting area and Lounge.

IV: 4

ISOLATION NURSING UNITS

This part of the Nursing units caters for these patients who harbour infectious disease or are suspected to be cariers of infectious diseases like, measles, tuberculosis, paliomyhtis and the like they will be catered for in single and double rooms cubicles. Patients needing both intensive care and isolation will be left in the intensive one. Facilities provided in this unit will be the same as for that of intensive care unit.

Advantage of Single Room Nursing Technique

1. Complete flexibility in the use of patients areas.
2. Psychologic factors:- that is the patient may not be burden with the distress of seeing his neighbour. Dying or undergoing painful treatment.
3. Patient care can be improved on the basis of single room accomodation program becuase under this procedure, personal are alterted to the techniques required for a particular condition.
4. Safety of Personel - Proper toilet handwashing, disposal and sterlization facilities are available the factor of safety to personnel therefore increases.
5. GROUP nursing opportunity of patients in isolation.

6. Cross infection probability is reduced if already debilitated patients are not brought together in isolation unit.
7. Hazards are reduced when we do not risk exposure of the all the diseases present in the multi bed isolation ward unit.
8. The risk of contamination from the patient transfer process is reduce.

Dis-Advantages

1. Nursing competence:- It can be fairly stated that the individual room isolation program requires a higher level of competence among Nursing personal. But there is little reason why better prepared personel can not be completely flexible in terms of assignment within the hospital Nurssing service Author's Observation has shown that the trend Now is in rotating Nurses in training in all types of Nursing units so as to enable them handle all kinds of cases with professional competence. So in the Author's view this may not be A very good reason.
2. Danger of Bore dom and loneliness especially with long stay patients. This may be argued from the fact that frequant visiting and sore times stay in by the mother's or relative can greatly reduce this risk.

3. Large plan areas therfore more expensive this is true but cort should not be allowed to over-rule the well being of the patient.

IV. 5

NEONATAL (NURSERY)

This unit will in the children Hospital House reactes. That is to say infants of between 0 - 8 months of births. These babies may be well but under weight well but premature, sick babies and suspected of harbouring infectious diseases. Sick babies suffering births trammas are also catered for in this Nursing unit. Abandaned babies may also be catered for until such a time that they are deemed fit to be transferred to the orphanage. As one of the areas in the hospital where patients are most prone to infection, the nursery should be planned to provide the best means for care, safety and well fare of the infacts.

BASIC RECOMENDATIONS FOR PLANNING INCLUDE:[2] Limiting the number of infants in each nursery, wide spacing of bassinets with in each nursery, separation of bassinents bu cubicle portions; promoting the use of Aseptic techniques, and individual care by providing among other things, ample space and hand washing facilities limiting the number of bassinets served bu one nurses station, seperating facilities for premature infants and for observing infants

suspected of having infectious conditions; and providing optimum conditions of temperature relative humidity and ventilation.[2]

Facilities to be provided in this unit will include:-

Nurses, station, work space, Treatment area physicians Scrus area, Formula Room, Nursh locker rooms Demonstration room, changing Room storage, and Toilets

As mothers will not be allowed to stay in with their children, mothers Hostel will be provided near the children with full facilities; like:- Kitchen, Baths and Toilets etc.

IV B

The mother in Hospital

In many, but by no means all, tropical hospital the mother or other relative is admitted with the sick child. This practice is often frowned at by Western trained Senior Nursing Staff, who feel that a hospital can only function well if mothers are kept out and the ward assume an austene atmosphere of regimentation. It is true that there are disadvantages and problems for both families and hospital when mothers are admitted with their children Because the rest of the family will have to make other arrangements for the preparing of meals and the feeding and carrying for remaining children left home. But the extended family system can often

absorb these types of demands. In the Hospital mothers can be, noisy, untidy and disruptive of ward routine. Petty Theft of such items on soap, happies and spoons may accumulate into a size able financial loss. They may interfered with treatement by pulling out intra gastric tube, or may contnue obliviously to give herbal medicines to their children; Lastly and of great importance when limited finance is a problem espedially in our current Economic doom, the admission of mothers implies the expenditure of capital to provide for sleeping, bathing, washing and toilet facilities for them for food and cooking.

Despite all these, the benefits of having mothers in the ward with their children far out weighs the disadvantages. For any child, especially these from different background as the hospital, needs the mother's reasurance in this strange, disconcerting atmosphere during what is often a frightening and painful episode, with her the child will rest sleep and feed better. They help to undertake some important, less-skilled Nursing, such as feeding, bathing and coketing samples of urine and sloosh and aslo drawing early attention to physical changes in their conditions or abnormalities in treatment. With instruction and supervision, mothers may learn to carry out these task better and to widen their range of activities. It may be possible to avoid having to give parenteral fluids by having the mother sit with the baby in her lap patiently given teasponnsful of saline glucose (oral rehydration).

In case of young children particularly infants, the mother obviously need to be admitted if the baby is being breast-fed. or the child is subsequently to die if diarrhoea - marasmus because the mother's lactation has not been continued.

Another very important aspect of admitting mothers to the ward is that they are a " target" group" for health education, which if their children are "Covering may perhaps be susceptible to new ideas, gained by observation of ward routine, by individual discussion and conselling and by planned group discussion and demonstrations.

Another advantage is that the mother is immediatly available when it is devided to discharge the patient She will then be able to receive instruction on discharge with details of home therapy and of the line and place for countinuing supervision at a health centre or in an out-patients department as the case may be: this elements the waste of several days while the parents are being sought for, to take the child home, during which time the bed is blocked for use by other children therefore in the Authors opinion where ever posible methors should be admitted with their young children, at least until the age of 5 years this the author has mentained in his design

F O O T N O T E S

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2. O. Bernard Lves Nurseries for New Born in general Hospitals, Washington D.C

3. Nuffield Provincial Hospital trust. Studies in the function and design of Hospital London, New York, Toronto

4. American Association of Hospital consultants (1981) Functional Planning of General Hospital. Edited by A. B. Mills

CHAPTER V

Hospital Supporting Services

To those unfamiliar with the Hospital environment it would seem as though the hospital consisted of the chemical Department and Nursing Units only. Actually the Clinical Departments would not be able to function with out the supporting services.[1] These include:- The Administration plus Records the Central sterile supply Department the kitchen and Laundry Maintaannance and Engineering Department Pharmacy, Motuary and Incinerators.

V. 1 The Central Sterile Supply Department

This is a Centralized unit which provides professional supplies and equipment (Sterile and Non Sterilyed) to all specilized Departments.

Location

I deal location of the C.S.S.D should be central in relation to the areas requiring the greatest utilization of its services. It must also be considered that the C.S.S.D must be able to receive large quantities of linen from the Laundry, surgical drening from the stores rooms and large shipment of sterile in travenus fluids if there are not manufactured by the hospital. If an ideal central location is not readily available, then resort must be made to utilize certain types

Conveyor and preumatie tube system.

Advantages

1. Econ0my in the provision of Expensive servicing equipment.
2. Saving in Nurses Time
3. Better care and so longer life of Instrument and untensils and fewer loss of materials because of better control at all stages.
   But these advantages lies principally in the provision of facilities which make best use of the most reliable aseptic techniques.
   the Area or Departments that mostly make use of the C.S.S.D are:-
   The Nursing units
   The out patients Department
   Surgical suite, Pharmacy and laundry.

V.2 The Pharmacy

The speciallity of hospital pharmacy has been defined as follows:-

The Department or service in a hospital which is under the direction of a Professionally Competent, legally qualified Phamacist, and from which all medications are supplied to the Nursing units and other services, where special prescrptions are filed for patients in the out patient Departments where pharmacenticals are manufactured in bulk where Narcotics and other prescribed drugs are dispensed,

where biological specimen are stored and dispensed, where injectable preparation should be prepared and sterilized, and where professional, supplied are often stored and dispensed.[1]

There is no set rule as to the best area to locate an out-patient dispensing Pharmacy. This is evidenced by the fact that in today's practice three equally suitable provisions are made for this area.

1. A Separate out-patient Pharmacy in available
2. A Cobined in - Patient and out-patient unit with service provided from the same window.
3. A combined in patient and out patient unit with service provided from separate windows.

The Authors prefer the third case.

V.3 CATERING DEPARTMENT (KITCHEN)

In planning the food services system for a hospital, we have to begin at the begining, that is to say what standard of services do the patients and frustels needs? It is often taken for granted that the hospital will gave palatable nutritions food to patients, but what about patient satisfaction with the food? The first decision the hospital trustees must make is what standard of food service they want. Then the desgn layout and construction can proced from this desing.[2]

The Traditional food service functions are composed of a series of furtions.

1. Planning menus, organisation, scheduling
2. Control and supervision - quality control and Services supervision.
3. Purchasing - buying what is needed to specification
4. Recieving - checking quality and quantity
5. Storage - dry, refrigerator, freezer.
6. Production - Pre-preparation and finishing.
7. Service - Portioning aseenshing and distribution.
8. Evaluation - Patient visit, waste, Patients comments on menu.

The best method of evaluation is for the dietition to make regular rounds, not why to find from patients what they do not like, but to arrange for foods they do like. The persons responsible for food quality control and supervision in the main kitchen should have a work space centrally located in the main kitchen.

Foods should be served to the Patients Hot and platable, Two methods will be adopted by the Author in the case of this hospital, they are:-

- Food will be moved to the patients bed side, in the case of non - ambulant patients.
- Those patients who are ambulant will have their food in the play room to encourage social interaction.

Two methods are used in hospitals for patient food service. They are:-

1. Decentralized system where food is prepared in the main Kitchen and placed in bulk into heated certs, (usually a cert per Nursing Unit) the cert then goes to the ward pantry where it is distributed to the patients. This method has the disadvantage of being uneconomical, so it will not be used by the author.

2. Centralized system - where the patients meal is portioned out and his tray assembled in the main kitchen, the tray is then delivered to the patient with out any added temperature control the temperature is maintained by insulated container and dishes; or Heated and Refrigerated trucks. The advantages of this are: Less food waste because of portion control. Better supervision of each tray as it is loaded in one central area.

- It reduces personel strength by up to 25%
- Valuable space may be saved by the elimination of ward kitchens.
- Less noise in the Nursing units.

This method has been adopted by the Author.

V.4. Administration

Because of high traffic volume and relationship between the personel and Employees, the administration may be located near service entrance. Some planners suggest a close relationship between the

it

maintainance department.. It include offices for the Chief Medical Director, Hospital secretaries e.t.c.

V.5. LAUNDRY

The dis covery of the extent of cross infection has caused a complete change in the method of handling washing in the hospital, involving the transference of work from the ward to the Laudry and creation of a clear out division between clean and dirty within the Laundry. At the same + the need for greater efficiency has led to the adoption of production flow method. It is so often thought of as a large wash ouse requiring little, if any skill to run and a big simple shed like building to house the washing machines.

The Laudry must be divided into two distinct area which can be referred to as "clean " and "dirty" the dirty area comprises

1. Reception of soiled linen
2. Classification or serting of soiled linen into suitable quantities for processing
3. - washing Area

The clean Area comprises

Drying

Finishing and Despatch.

Each Area should have separate changing and canteen facilities for clean and dirty staff

The building should permit a straight through production

Serving and linin room should be provided in case of turn linen.

Location

The laundry should be located away from the Nursing units Kitchen and main patients areas to reduce risk of infection but it should be reasonably close to the boiler house and C.S.S.D.

V.6. MEDICAL RECORDS

Every hospital is required to maintain adequate medical records on their patients. There must be accurately documented, readily accessable and can easily be used for retrieving and compiling information.

The purpose of the medical Records:-

1. To serve as a basis for planning and for continuity of patient care
2. To provide a means of communication among the physician and any professionals contributing to the patients' care.
3. To furnish documentary evidence for the course of the patients illness and treatment during each hospital stay.
4. To serve as a basis for review, study and eva evaluation of the care rendered to the patient

5. To assist in protecting the legal interest of the patient, hospital and responsible practitioner

6. To provide data for use in research Education

Developing trends in out patients care suggest that from a practical stand point, the medical Records department might more effectively serve if it is nearer to the outpatients facilities. Several factors influences the size and arrangement of the space in the medical Records department. But reducing old records to micro films or tapes reduces the storage space.

The medical record complex should provide offices for records officer, clerks and Appointment officer, medical secretary.

V.7. Central Stores

This is the operating unit which does infact centrally handle and distributes all supplies and equipment. To accompolish this efficiently and economically is the task of planning. Being the nerve centre of the hospital it follows that planning for a functional operation it should be such that all supporting services can move goods for processing and distribution. Pharmacy, linen distribution (CSSD) and perhaps dietary should have a close functioning relationship.

V. 8. Motuary, Incinarator and Boiler

House:- are also essential components of the hospital. Dead bodies of patient are transfered to the motuary where they will either be claimed by the relatives of passed to the incinarator for cremeting if unclaimed. The motuary should have lockers for body storage, as well as freezers, waiting areas Officer and toilets for both staff and patients. The boiler house will serve the laundry with Hot water which it uses for washing of soiled linens. There area should be located away from the main out patients area but not very far away from the impatients unit. The service road should be able to serve their functions.

FOOT NOTES

1. W. E. Hassan 1981 Hospital Pharmacy

CHAPTER VI

THE CITY AND SITE

VI.1 Location and physical setting

Sokoto the main centre of political, cultural and Economic activities in the North Western part of Nigeria lies geographically 13° North and 5° East It has historical ties which links it with the old trans - Saharan trade routes, North and south while the contemporary Economic linkages in is with other members of the Economic comunity for west African States (ECOWAS). Culturally the seat of the Sultan of Sokoto who is considered the spiritual leader of the Nations muslims community. As the capital of Sokoto State, it serves as the Centre of State government activities supported by the pheripheral tow ns of Gussau, Talata Mafara, Kauran Namoda, Gummi, Illela and Zuni.

VI.2 Road And Transport Net work

Sokoto is well serviced by both National and local Roads. Route Ai in the National arid system connects Sokoto with Ilorin, Ibadan and Lagos to the South, and extends North to Konni in the Niger Republic. On the East-West grid system highways connects Sokoto with major Northern Nigerian cities such as Zaria Kano, Kaduna and Maiduguri.

A complex pattern of state and local roads provides good connections between Sokoto and the immediate North Western Region.

Sokoto is linked to other major cities in Nigeria by a twice daily schedule of Nigeria Airways from Lagos via Kaduna and Kano.

The New Sokotoa Airport located at Argungu Birnin Kebbi road is of international standard, this has enabled Sokoto develop international connections to Niemy in the Niger Republic and direct flight to Jeddah in Saudi Arabia during pilgrimage period. The Nearest railway connection is at Gussau some 220km to the South - East. Sokoto is not directly connected to the Nigerian inland waterways system but after the completion of the Kainji Dam the river Niger became Nangable for the greater part of the year from the coast up to beyond Yelwa in the state.

VI.3 CLIMATE

Sokoto Area has a semi-arid climate type which is characterized by relatively wide and rapid change in temperature and humidity. The Dry season microchmate is characterized by very hot dry air with afternoon temperatures ranging between 30°-40°C Might temperatures drop to between 14°- 20°C. Associated to this dry season temperature conditinns the relative humidity rarely reaches 50% such clear cloudlen skys do little to reduce the intensity of of solar radiation. Since the dry season is

characterized by law relative humidity and the prevalance of North-Easteady winds (harmattan) which are accompanied by a semi - permanent dust zone; they contribute to the drying out of soils and vegetation and the hardning of topsoil, left bare after harvest Wind erosion occurs during storms which are most common at the end of the dry season. In the closed settled zone the very low Density form trees does little to check the effect of high minds which remove the top soil. The overall effect of this micro-climate is that the dry air, low humidity and low rainfall discourages plant life, but since temperatures rarely falls below 15°C plants can still survive all the for round. The Dusty ground reflects the strong sunlight, producing uncomfortable ground glare.

During the wet season the humidy ranges between 60-90% reaching a peak in mud August. The prevailing winds come from south Westerly direction with Secondary winds from the West. The low clound cover and longest day length causes relatively high solar radiation. The rainfall is short but intensive (about 60 - 70 days) the main average rainfall in Sokoto is 732.5mm but this concel a large fluctuation both in annual and monthly totals. Example the 10 years from 1951 - 1960 annual totals ranged between 550 - 900mm and between four - Six months of the year recieved less than 1mm of rain.

VI. 4 Climate and Design

The climate characteristics have important implications on planning. They are critical to the understanding of creating a comfortable environment within which people can function efficiently some of the most important considerations are:-

i) Buildings should be compact, so that houses or parts of buildings are naturally shaded

ii) Combinations of dry and still if during the dry season results in noise problem, because sound is transmitted over great distances unless impeded by buffer either natural or man made such buffers could be trees water bodies etc.

iii) Foot -, Paths and acrades should be shaded by planting or by buildings, so as to protect pedestrians from the sun.

iv) Areas of fairly dense vegetation are necessary to improve the micro-climate and it is generally prefarable for residential areas to have many small green areas than a few large open spaces.

v) Large unused areas are to be avoided because they are unlikely to be used for recreation due to the intensive solar radiation

Using the manual of tropical Housing and Building the following points are taken into considerations in the detailed design.

i. Lay out: buildings should be oriented along the East - West axes in order to minimize exposure to the hot sun, with a compact court yard type of planning. This may of course be affected by best approach zone.

ii. Air movement: Rooms should be single banked with permanent provision for air movement by means of cross-ventilation.

iii. Openings: The walls openings are to be of medium size.

iv. WALLS:- both internal and external walls are to be thick with short time lag.

v. Roofs: a heavy roof, with substantiala thernal capacity giving a time leg of at least 8 hours

VI. LAND SCAPE

The undeveloped part of the area is desert like with hardly any vegetation. The native tree are the acacia type which requires little rains. In the built up areas, there are many types of shade providing trees planted along the streets and inside the compounds. The river valley have many species of trees, mainly fruit trees like Mango and guava. Some areas along the river valley above the flood plains are potentially suitable for market gardening.

V1.6 GEOLOGY AND HYDROLOGY

The oldest rocks are of the pre cambrian Basement Complex exposed over much of central and Eastern area flanked by younger sediments to the North, west add South the North part is mantted by wind blown deposiats, while Alluvum occurs extensively in the valleys of the Njer riveraw its major tributtions, much of the area lies between 50-170m elevation and prolonged erosion has resulted into a generally subdued relief and a high proportion of a relatively infertile soil uplift of the in late creataceous tines was followed by local subsidence, resulting in the deposition of the Dangeo Kelambaina and Gundu sediments in the Northwest part of the area. Alternating line stones and shales of the Danage depsits are limited in out crop, but the kelan baina lime stones and mud stones form a well defined, ironstone copper scarp East of Sokoto, while Gwandu deposits combine massive clap, grits and cross bedded saind stone with ironstones layers an influx of wind blown sand from the north during several and periods made muhh of Sokoto covered by Grasse textturned superficial deposits with subdued relief.

Hydrogeologically, the basement complex and the middle Njer and Sokoto basins are the pannapal sources of significant ground water. In the basement complex the quality of the ground water makes it ideally souted for drinking and irrigation purposes.

V1.7 Soils

The soil is yellowish or readdish brown over most of the area, weekly developed and acidic in Nature.

They are divided into four types.

1. Fadama soils
2. Fartile brown and black upland soils
3. Upland soils on blown sand
4. Iron rich upland soils

The Fadama soils are generally fertile, extremely heterogenous and considerable soil variation within an individual profile. They are typically high in organic content.

The Brown and black upland soils are also fassly fertile because of slight weatering and teaching the upland soils form on blown soils are dominated by acid sands they var from reddish brown to yellow though of low fertility they are used for cultivation of millets and corn.

While the iron rich upland such are susceptible to drought and are readily eroded when exposed thgy are also cultivated under wet season agriculture in spite of their comperative infertility.

V1.8 General land form

This is divided into four zones based on top ography and surface water drainage patterns.

1. Sokoto and Rima River velley and flood plains
2. Major tributtary valleys
3. Sandy plane
4. Undulating upland plains and ridges.

Number 1 form the most visibly significant topographic feature of the area the two river join at about 8Km NE of the city the width of the flood plain varies between 1 and 3km the greatest wiedth being at the confluence.

Sandy plain constitute the largest part of the areas, it lies between 250-300m in elevation and consist of layers of sand, under which lies an impermeable layer of laterite. Sandy soil is quite poor but when intermixed with clay it can be made fertile and sustained wet season cultivation.

VI. 9. LAND USE

Residential land use area are generally comprised of dwellings, resident law with in each plast and access roads over 50% of the urban area is devoted to residential use, most of which is located in the old city where the spatial pattern in organic, high densities and mostly traditional buildings; low density building are located to the south in the historical GRA with alter opposite the new Sokoto University teaching hospital. The medium density is at the Runjim Sambo area. Commerce and services are of four types department stores, markets, whole sales and mixed retail it occupies about 2.7% of the urban area with the exception of the Sokoto University. Governmenta facilities such establishment as Federal and state ministries e.tcc.

occupies 4% of urban area services includes all banks, insurance companies as well as places of workship, hotels etc. occupies 5%. Industries occupies 2.3 concentrated at the North West part of Sokoto Roads and Transportations occupies 8% of the urban area. Grean Area have been devoted 4% of the Land use.

VI. 10 Cultural and socio-Economic Considerations

The knowledge of now the economy works, what the structure of inter-personal and intergroup relationships is and what are the deeply held values of a people, can and mus t have considerable bearing upon any plans for their future. The final success of any "physicla plan" depends largely upon its acceptance by the people; and this inturn judged according to its relevance to the way of life.

A. ECONOMIC STRUCTURE

[illegible] settings

The improved linkages between Sokoto and Kontagora connects it to Ibadan and Lagos and thus creatinga a variable trade links between this people so also the Zaria - Kano - Kaduna link.

B. Population

Recorded data show that the population of Sokoto bases upon the 1952 and 1963 census figures was 51,986 and 89,817 respectively this shows an annual growth rate of 5% for the period 1952-1963 Estamates of the population of an

an independent census by Dar al Handesah consultants give Sokoto a population of 137,000 this indicates an annual growth rate for the period 1963-1973 to be 4.3% population census by Bema, Associates in 1982 gave a figure of 249,470 this gives a growth rate of 5.9% from 1973 1982. Adopted growth rate is 4.3%

Population projections of Sokoto

Year	Rate of growth	Population
1983	4.5	261,195
1988	4.5	325,496
1993	4.3	401,760
1998	4.1	491,157
2003	4.0	597,568

C AGE - SEX STRUCTURE

The % distribution of Age and sex shows a relatively greater number of males in the 15 - 30 years of age which is probably due to greater immigration of males over females in this age range. There is still a slightly high proportion of females to males in the population. The population also displays a largely youthful profile. 43% of the total population in below the age of 15 years.

D. Religion

Sokoto is basically a muslim city moslems account for about 80% of the population with Christian constituting about 15% the christinns and other non - classfied religious are largely immigrants

with about 54% of the christian population being recent migrants to Sokoto.

B Ethnicity

Studies reveal the following ethnic break down in the Sokoto urban area.

Hausa	70%
Fulani	11%
Yoruba	6%
Ibo	8%
Others	5%

The traditional city is largely dominated by the Hausa/Fulani ethnic grouping, while other groups tend to live on the fringes of the traditional city in the more recently developed areas.

F Level of Educational Attainment

While 88% of the population can be said to be literate in either Arabic or Ebglish only 50% can be said to be literate in the latter. the table below shows thus:-

Level	% of total house hold head
Koranic school	38
Primary School	18
Pot Primary School	20
Post Secondary	12
None	9
No response	3

6 Health

Sokoto General Hospital located on sultan Abubakar Road in the only such facility in Sokoto It provides general medical and surgeical services both for in and outpatients.

The 450 bed in patient care facility staffed by 33 doctors, 121 staff Nurses and mi wives and 6 Pharmacits. In support of this are 13 Basic health centres located with in the urban area. Each staffed by a doctor and dispenses. Other health facilities include mother and child health centres and leprosy clinics.

VI.11 SEARCH FOR SITE

Three sites were selected by the Author for secrutiny and final adoption for sitting of the children Hospital there are:-

SITE 1 - Opposite the school of Nursing earmarked by the Sokoto state government for the construction of the now suspended Murtala Mohammed memorial hospital.

Site - 2 - along Birnin Kebbi road close to the New Teaching Hospital now under consitruction

Site-3- Near the Destitute camp Earmarked for a proposed children centre.

SITE NO.2 has the advantage of being close to the New teaching hospital which services the new children hospital may require, it also has good transport

Network with the remaining town. But it has the disadvantage of each of adequate area of Expansion and located along a very busy street which may pose some dangers to the patents of patients and patients themselfes. It is also fairly for away from the main city centre. It was therefore dropped by the Author.

SITE NO 3 has the advantage of having a large area of Expansion. But it has the disadvantages of being located very for away from the proper location centre; and close fo the industrial area which may pose some danger of gaseons polution.

SITE NO 1 located at the North - Eastern corner of the town toward the out skerts of the town near Gagi village and opposite the new school of Nursing. It has the advantages of having wery la rge area of Expansion. Site area is about 350,000m^2 required by the state government for the now suspendee Murtala Mohammed memorial hospital The site is close to the main centre of population it is served by good transportation nextwork to other parts of the town. The site is form lands barely treeless and gently sloping towards the North-East, so there wont be very much problems of land compensations String and dusty Hormattan winds prvails Oct - March the site is also characterised by Excessive glare and serve healt reflection due to direct sun and lack of trees

R E F E R ENN C-E S

1. Benna Association - Sokoto master plan 1983 - 2003

2. Mohammed Shehu Arzika 1983 Sokoto Central Shoping Complex

CHAPTER VII

THE DESIGN

Every Designer has certain concepts he wants to adopt in his planning and designs there are usually tied around certain factors, It is in this light that the author also set down certain factors that influence his design these factors are:-

Flexibility and Growth, Environmental factors, social Factors and lastly material and mode of construction.

VII.1

Flexibility and Growth

Hospital volumes and spaces are not static they grow and expand and certain functions will have to change with time. The author has looked into these problems and noted the kinds of changes most likely to be in the needed various parts of the Hospital.

1. Nursing units

The same ward plan has been adopted for medical and surgical Nursing unit in order to make easy inter change from one department to the other, with out any structural change. The isolation, intensive core and Nursery are also of the same plan type to the same kind of inter-changebility. To have high occupance rate the

ward have been subdivided into units of max if beds. Since the site of the hospital is large enough, the Nursing units can expand with out any problem The Author in his design of the units have two floors weight for medical and surgical ward units other ward units can also expand vertically to a floor higher; but it has already stated that there is ample expansion area for these units.

2. Out Patients Department

As the out patients Department consist of clinics for each speciality, the Author found it most suitable to adopt single storey building; coupled with a simple, general purpose consulting suite which can provide accomodation for a wide variety of consultative clinic. Hence suites can be alloted to different clinics with out any structural changes. In order to ensure maximum flexibility in use there clinics have convenient access to radiology, pathology dispensary and the operation theatre. Direct access has been provided to this department from the public road.

3. Diagnostic and Therapentic Departments

Research has shown that these departments are continously being modified by advances of medicine as such the author finds it most suitable to house them on single floors and separately but yet close to each other to allow some alterations in any department independent of the rest.

4. The support services departments - are also grouped together on one side, built

VII.2 On Single Storey with ample area of expansion

Environmental factors

The Basic micro-climate of the site is characterised by servere heat reflection, excessive glare due to direct sun, and strong dusty Harmmattan winds. Heat loss rather than Heat gain is the objective here. Glose building arrangement around an internal court yard planted with greenaries are adopted in order to imporve the micro climate. Since bright colour contrast are in agreement with the general character of the region they will be used all through the desing. Openings here are of medium s size and they are oriented to towards the NE - SW axis to catch the air masses. Natural cross rentilation will be used through out the Hospital (especially in the Nursing Units) except in the operation theatre, X - ray, pharmacy and the C.S.S.D where functions dictates the used of induced mechanical ventilation for this reason courtyard system has been well developed by the Author in all parts of the hospital that require Natural cross ventilation (see plans). Day lighting is very important as it has been proved to have bactericidal effect, as such Natural day lighting is utilized especially in the wards. Trees are

planted in open areas of the Hospital to check the effect of the dusty harmattan winds. green areas are also provided to reduce glore. Sun shades (both the horizontal and Vertical) are also provided where necessary.

V11.3 Social Factors

This being A child Hospital the main objective is to try as much as possible to eliminate the institutional atmosphere, and create a homely environment and humance scale. The Sokoto culture are familiar with one storey structure, courtyard planning, Dome, Arches Squese and Rectangles: All these have been carefully inter woven in the design to make the atmosphere homely.

Since a homely atmosphere can best be achieved for the child by bringing his mother, the author has designed conciously with the mother in every step and aspect of design with both needs of the mother and child.

V11:4 Material and construction

The level of our technological attainment dictates the kind of constructional met od one uses in erection of his structures. It is because of this fact that the author adopts simple structures and local materials. All materials of construction can be got locally as such, cort can be reduced by saving transportation cost. Main material are

concrete, Aluminium or zinc sheets, cement glass and timber. The main roofing structures are concrete, timber and zinc. The technology of construction can be attained by semi skilled labour, which can be easily mobilized.

CHAPTER VIII

Schedule of Accomodation

V111.1

BED CALCULATION AND ESTIMATION

CAPACITIES OF SOKOTO STATE GENERAL HOSPITAL PEADIARIC NURSING UNITS.

TOWN	BEDS
ARGUNGU	30
BIRNIN-KEBBI	42
GUSSAU	42
KOKO	30
ISA	30
TALATA-MAFARA	30
SHINKAFI	30
YAURI	30
ZURU	30
TOTAL	294

SOKOTO population 1983 = 261,195[1]

Growth rate = 4.5

Projected population 1984 = 272,948

Children population 1984 = 38% of total population
= 103720

The World Health organisation and Nigerian medical Association Recomends 3 beds/Every 1000 heads in the urban Area.[2]

$$= \frac{103720}{1000} \times 3 = 311 \text{ beds}$$

Subtract 84 beds for the present general Hospital

= 227 beds

Assume 10% Refferals from other Nine (9)
General Hospitals in the STATE = 30 beds

227+30 = 257 beds

About 300 beds will be provided to enable the hospital can cater for future needs. There beds will be sub-divided into the following order:-

Medical Nursing Unit	=	104 beds
Surgical Nursing Unit	=	78 beds
Intensive care Unit	=	24 beds
Isolation care Unit	=	24 beds
Neonatal (Nursery)	=	46 beds.
	TOTAL	276 beds

VIII.2. Medical Nursing Unit

There will be four of such floors for medical patients, containing maximum of 26 patients sub-divided into 2 - 4 beds rooms, 4 - 2 bed rooms 4 - mother and child room and 2-3 bed rooms.

Accomodation Needed for one floor

Space Designation	No of rooms Required	Size of each room in m^2	Total area m^2
(mother child Rm)			
Single Bedroom	4	$12m^2$	48
2bed room	4	$19.44m^2$	77.76
4 bed room	2	32.4	64.80
3 bed room	2	$29.16m^2$	58.32
Treatment Rm	2	12.96	25.92
Clean utility rm	2	10.8	21.60
Dirty utility rm	2	12.96	25.92
Nurses station	2	10.8	21.60
linen Bay (clean)	2	3.84	7.68
linen Bay (Dirty)	2	3.84	7.68
Store	1	8.64	8.64
Cleaner's store	1	8.64	8.64
Wards pantry	1	8.64	8.64
Mother's Day space	2	29.16	58.32
Trolley/wheel door buy	1	5.76	5.76
Sister's room	1	10.8	10.80
Nurses locker room	1	10.8	10.80
Doctor's room	1	10.8	10.80
Play room and Dinning Atea	1	41.76	41.76
Reception and waiting Area	1	25.92	25.92
Toilets	8		32.40
Bath room	4		15.12
TOTAL AREA			$596.88m^2$

Number of sessions held weekly = 6

:. Critical Number of consulting suites

$$= \frac{25.15}{6} = 4.25$$

Since this is a critical Number which should always be exceeded, 8 consulting suites will be provided.

Another method is to assume 50 patients per consulting room daily; and since Expected daily attendence

= 368 = Patients

$$:. \frac{368}{50} = 7.36 \quad - \quad 8 \text{ Consulting suites}$$

These will be divided into;- 4 - general clinic
2 - special clinic
2 - under Fives clinic

Accomodation Required Records and Waiting

A

Space Designation	No of Rooms Required	Size of Each Room in m^2	Total Area in m^2
Waiting Area	1	210	210
Reception/ Information	2	7.6	15.2
Card Issue	2	7.6	15.2
Card Room	1	108.24	108.24
Admission officer	1	7.2	7.2
Records officer	1	10.8	10.8
Records Clerk	1	10.8	10.8
Office	1	7.2	7.2
Patients Toilet	8	-	46.16
Staff Toilets	3	-	10.8
TOTAL AREA			441.6

(9) GENERAL CLINIC ACCOMODATION REQUIRED.

Space Designation	No. of rooms Required	Size of Each Rm in m^2	Total Area m^2
Reception/Sub waiting	1	34.56	34.56
Waiting	2	24	48
Sisters Rm	1	10.8	10.8
Clean Utility	1	10.8	10.8
Dirty utility	1	12.96	12.96
Consultation Rm	4	12.96	51.84
Exam/TreatmentRm	8	10.8	86.4
Cleaners sto	1	8.64	8.64
Staff toilet	2	-	8.64
Patients Toilets	4	-	17.28
Nurses Rest Rm	1	23.76	23.76
TOTAL AREA			313.68

C. SPECIAL CLINIC Accomodation REQUIRED

Space Designation	No. of rooms Required	Size of Each Rm in M^2	Total Area m^2
Reception/sub waiting	same on G/clinic	same place	same place
Waiting area	2	24	48
sisters Rm	1	10.8	10.8
Clean utility Rm	1	10.8	10.8
Dirty Utility Rm	1	12.96	12.96
Consulting Rm	2	12.96	25.92
Audiometry Rm	2	11.52	23.04
Dental work Rm	1	17.28	17.28
Dark Rm	1	17.28	17.28
Recovery Rm	1	11.52	11.52
Refraction Rm	1	12.96	12.96
Exam/Dressing Rm	2	10.8	21.6
Staff Toilets	2	-	8.64
Patients toilets	4	-	17.28
Cleaners Store	1	8.64	8.64
TOTAL AREA			246.8

D

Accident and Emergency Unit Accomodation Required

Space Designation	Number of rooms required	Size of Each room in m^2	Total area m^2
Reception point	1	8.64	8.64
Interview Room	1	10.8	10.8
Emergency Treatment	2	12.96	25.92
Emergency Operation T.	1	36	36
Prep/semb Up	1	8.64	8.64
plaster Room	1	28.8	28.8
Recovery Rm	1	22.68	22.68
Emergency Drip unit	1	20.16	20.16
Sisters Room	1	10.8	10.8
Doctors Room	1	10.8	10.8
Waiting area	2	24	48
Strecter Alcove	1	7.2	7.2
Wheel Chair Alcove	1	6.24	6.24
SUB-STERILIZING	1	6.24	6.24
Toilets		-	8.64
Cleaners Store	1	5.4	5.4m^2
TOTAL AREA			264.96

VIII.3

SURGICAL NURSING UNIT - 3 FLOORS

This unit consist of 3 floors each containing the same number of patients with the medical Nursing unit. They have the same facilities and same sub-divisions of bed.

Area required for one floor is therefore the same which is equal to ;=

VIII.4

This unit has total of 24 beds divident 4 single rooms for patients requiring both isolation and intensive care, and multi bed space (2 boys) containing 10 beds per Bay.

Accomodation Needed for one floor

Space Designation	No of rooms required	Size of Each room in m^2	Total Area in m^2
Single bed rm	4	15.84	63.36
10 bed bay	2	81.6	163.2
Nourishment statim	2	10.8	21.60
Treatment	2	12.96	25.92
Dirty Utility	2	12.96	25.92
Clean utility rm	2	10.8	21.60
linen Bay	2	7.68	15.36
Store	1	8.64	8.64
trolley and wheel chair	1	5.76	5.76
Staff Changing rm	1	19.44	19.44
Visitors changing rm	1	19.44	19.44
Interview Rm	1	17.28	17.28
Sisters Rm	1	10.8	10.8

Continue

Nurses locker	1	10.8	10.8
Doctors Rm	1	10.8	10.8
Nurses station	2	10.8	21.6
Reception/waiting	1	25.92	25.92
Toilets	6	-	25.92
Bath/showers	3	-	10.80
Cleaner store	1	8.64	8.64
TOTAL			532.8m^2

VIII.5

This unit also has a total of 24 beds sub-divided into 4 rooms single beds and 10 rooms duble beds

Most of the facilities in the intemsive care will also be required in the isolation unit.

Accomodation Required for one floor

Spacd Designation	No of rooms Required	Size of Each room in m^2	Total Area in m^2
Single bed Rm	4	15.84	63.36
Double bed room	10	15.84	158.4
Treatment Rm	2	12,96	25.92
Dirty Utility	2	12.96	25.92
Clean Utility	2	10.8	21.60
linen Bay	1	7.68	7.68
Store	1	8.64	8.64
trolleys/	1	5.76	5.76
staff changing	1	19.44	19.44
Visitors changing	1	19.44	19.44
Interview Room	1	17.28	17.28
Sister's room	1	10.8	10.8
Nurse lockers	1	10.8	10.8

Continue

Doctors Room	1	10.8	10.8
Nurses station	2	10.8	21.6
Rec-wainting	1	25.92	25.92
Toilets	5	-	29.52
Bath/shower	2	-	14.4
Cleaners	1	8.64	8.64
TOTAL AREA		=	505.92m^2

VIII:6 Accomodation Required NURSERY

Babies will be brought to this Hospital after delivery. Doctor's semb up facilities is provided in every cohort Nursery, As cohort Nursery system has been adopted. Every cohort contain Four Bassinets For well babies. Four Bassinets for premature babies and 3 for observation Nursery. Ample space has been providdd within each chort to enable all needed functions.

Full term bassment = 32

Premature bassments = 8

Observation = 6

Space Designation	No of Rooms	Size of Each room in M^2	Total Area in m^2
4 cribs cohort	8	17.28	138.24
4 incubators pre-mature	2	17.28	34.56
3 bassiments/ heustition premature	2	17.28	34.56
Staff changing	1	19.44	19.44
Visitor changing	1	19.44	19.44
Demonstration	1	17.28	17.28
Nurses locker	1	10.8	10.8
Sisters Rm	1	10.8	110.8
Doctors Rm	1	10.8	10.8
Nurses station	2	10.8	21.60
Rec/waiting	1	25.92	25.92
Equip sto	1	10.8	10.8
linen sto	1	10.8	10.8
staff toilets.	3	-	14.4
TOTAL AREA			379.44

VIII.6a

Mothers Hostel

This unit of the children Hospital caters for those parents and relatives who for some reason may not be allowed to stay in the Nursing units. It has 29 rooms Each containing two beds, spreds in two floors.

Accomodation Needed for single floor.

Space Designation	No of Rooms Required	Size of teach rooms m^2	Total area m^2
2 beds Room	29	12.96	375.84
House Keepers Room	1	9.72	9.72
Reception and visitors waiting areas	1	30.24	30.24
Kitchen	3	10.8	32.4
Store	1	10.8	10.8
Toilets	4	-	17.28
Shower/washing	-	-	28.08
Total area		=	504.36

VIII.7

OUT PATIENTS DEPARTMENT

Case studies conducted at the Sokoto University Teaching Hospital Peadiatric Department by the Author shows:-

Average daily attendance of 320 patients

Average weekly attendande of 1969 patients

Average consultation time of 3 minutes

Total length of session of 360 minutes

These figure can be slightly adjusted to arrive at the required no of consulting suites. In order to meet for future expected demand plus the inclusion of the under fives clinic the number of weekly attedances

will be

2264 pa tients and 368patients Daily giving an Average consulting time of 4minutes the total Number of sessions will remain the same because of the Nature of the area = 360 minutes

:. Required Number of consulting sints will be calculated thus:- -3

$$\frac{2264 \times 4}{360} = 25.15$$

Of the Nurse in child health maintainance has expanded. Programmes of prevention of illness and accidents are well provided by private physicians, hospitals clinics, schools and other agencies. When the child is ill or hospitalized the emphasis is in family centred care, parents are encourgaed to become involved in their child's care. Family teaching is now an integral part of Nursing care of the child.

E

Accomodation Required Under Fives clinic

Space Designation	No of Rooms Required	Size of Each in m^2	Total Area m^2
Reception/waiting	1	69.6	69.6
Weighing Rm	1	28.8	28.8
Immunization Rm	1	34.56	34.56
Exam/Consultation	2	12.96	25.92
Counselling	2	12.96	25.92
Food Issue supplement	1	28.8	28.8
Nutrition Education and Demonstration	2	57.6	115.2
Patients toilets	4	-	15.12
Staff Toilets	2	-	8.64
Cleaners store	1	8.64	8.64
Store	1	8.64	8.64
TOTAL AREA			266.16

VIII:8 Accomodation Required Physical medicine

Space Designation	No of Rooms Required	Size of Each Room in m^2	Total in m^2
Reception/Records	1	10.8	10.8
waiting	1	14.4	14.4
Consultation	2	12.96	25.92
Hydrotherapy&whil pool	1	36	36
Tank Room	1	36	36
Physiotherapy	1	50.4	50.4
Store	1	18	18
Patients Toilets	2	-	12.96
Staff Toilets	2	-	8.64
Changing Rm	2	-	10.8
TOTAL AREA			223.92

VIII 9

Accomodation Required Radiology Department

Space Designation	No of rooms Required	Size of Each in m^2	Total Area in m^2
Reception/Regestration	1	11.52	11.52
Waiting/film collection	1	34.56	34.56
Film store/Archives	1	17.28	17.28
X-Ray Rooms	3	25.92	77.76
Changing Rms	6	3.84	23.04
Radiologist Office	1	14.4	14.4
Secretary	1	7.2	7.2
Asst. Radiologist	1	14.4	14.4
Clerks	1	23.04	23.04
Dark Room	1	15.12	15.12
Sorting and viewing	1	15.12	15.12
Staff Toilets	3	-	14.4
Patients Toilets	3	-	10.8
Wheel chair Alcove	1	5.76	5.76
TOTAL AREA			265

VIII:10

Accomodation Required Central Store

Space Designation	No. of rooms Required	Size of Each in m^2	Total Area in m^2
Printed forms store	1	23.04	23.04
linen store	1	23.04	23.04
Used Equipment	1	50.16	50.16
New Equip	1	84.96	84.96
Store keeper	1	10.8	5.76
Office (Assistant)	1	10.8	5.76
Toilet	1	5.76	5.76
TOTAL AREA			198.30

VIII:11

Accomodation Required Pathology Department

Space Designation	No. of Rooms Required	Size of Each Rm in m^2	Total in m^2
Reception/Registration	1	11.52	11.52
Waiting	1	34.56	34.56
Interview Rm	1	10.8	10.8
Bleeding Room	1	30.24	30.24
Recovery Room	1	10.8	10,8
Blood Bank	1	9.72	9.72
Staff Changing	1	10.8	19.8
Asst. Pathologist	1	10.8	10.8
Clerks Office	1	12.96	12.96
Biochemistry	1	20.16	20.16
Heamatology	1	20.16	20.16
Histology	1	20.16	20.16
Uninalysis	1	20.16	20.16
Bacteriology	1	20.16	20.16
Glass washing	1	19.44	19.44
and stenlizing	1		
Media preparation	1	10.8	10.8
Staff Toilets	2	-	8.64
Patients toilets	2	-	8.64
Store	1	-	8.64
TOTAL			299.16

VIII:12

SURGICAL SUITE

Space Designation	No of Rms Required	Size of Each m^2 Room	Total in m^2
Rec./Waiting	1	40.32	40.32
Dirty Utility	1	17.28	17.28
Anaesthetic Rm	1	23.04	23.04
Appliance Room	1	23.04	23.04
Clean Utility	1	17.28	17.28
Recovery Rm9	1	16.08	46.08
Doctors Rm	1	17.28	17.28
sisters rm	1	17.28	17.28
Doctors Rest Rm	1	25.92	25.92
Nurses Rest Room	1	46.08	46.08
Nurses changing Rm	1	25.92	25.92
Doctors changing Rm	1	25.92	25.92
Strecher alcove	1	9.36	9.36
Visitors Toilet	2	-	8.64
Operating Rm	2	43.56	87.12
Scrub up Rm	3	-	27.00
Sub-sterlizing Area	2	-	28.8
Prep Rm "In"	3	9	27.0
Bed changing "out"	2	-	27.0
Plaster Room	1	43.56	43.56
TOTAL			555.12

VIII:13

Accomodation Required Pharmacy.

There will only be one central Pharmacy which will serve both "in" and "out patients"

Space Designation	No of rooms Required	Size of Eah room m^2	Total Area in m^2
Bulk store	1	90	90
Inflamable gases	1	10.56	10.56
Chargable Inquids	1	14.4	14.4
D.D.A	1	10.56	10.56
Bulk preparation	1	15.84	15.84
Wash up area	1	10.56	10.56
Dispensing and Issue area	1	56.16	56.16
Receiving/waiting	1	56.16	56.16
Offices	3	10.8	32.4
Toilets staff	2	-	8.64
Toilets patients	4	-	18.48
TOTAL			323.76

VIII: 14

Central sterile supply Department

Space designation	No of Rms Required	Size of Each room in m^2	Total Area in m^2
Trolleys and Carts alcove alcove	1	12.6	12.6
Collection Area	1	12.6	12.6
Sorting Area	1	32.4	32.4
Unsterile Store	1	21.6	21.6
Work Room	1	60.48	60.48
Sterile Liquid	1	7.2	7.2
Office	1	9	9
Sterile store	1	69.12	69.12
Sterilizing	1	56.16	56.16
Toilets	3	-	12.60
TOTAL Area			293.76

VIII:15

KITCHEN (CATERING DEPARTMENT)

This Department will be solely serving the inpatients Unit.

Accomodation Required.

Space Designation	No of Rms Required	Size of Each Rm in m^2	Total Area in m^2
Recieving Area	1	23.04	23.04
Bulk Food Store	1	72	72
Cold store	2	6	12
Vegtable Store	1	9	9
Cooking Area	4	10.8	43.2
Preparations	1	25.92	25.92
Dish washing	1	25.92	25.92
Trolley and Carts	1	10.8	10.8
Offices	2	10.8	21.6
Female changing and Toilets	1	17.28	17.28
Male changing and Toilets	1	14.4	14.4
Toilet	1	5.76	5.76
Refuse	1	23.04	23.04
TOTAL			303.96

VIII:16

LAUNDRY Accomodation needed.

This unit has not been designed due to time factor

Space Designation	No. of Rms Required	Size of Each Room m^2	Total Area m^2
Collection/sorting	1	24	24
washing Area	1	81	81
Work area	1	36	36
Sewing Area	1	10.8	10.8
Changing Rm	1	14.4	14.4
Offices	2	12.96	25.92
Storage Area	1	10.8	10.8
Toilets	2	8.64	17.28
Staff Rest Room	1	17.28	17.28
TOTAL AREA			237.48

VIII:17

MORTUARY

Accomodation Needed Also Not Designed.

Space Designation	No. of Rms Required	Size of Each room in m^2	Total Area in m^2
Rec/Records waiting	1	27	27
Body storage	1	36	36
Body washing Area	1	10.8	10.8
Autospy room	1	25.92	25.92
Store	1	10.8	10.8
Coroner	1	10.8	10.8
Cleaners	1	10.8	10.8
Trolleys	1	5.76	5.76
Toilets	2	8.64	8.64
Shower	1	5.76	5.76
TOTAL			152.28

VIII:18 ADMINISTRATION

Accomodation Needed

Space Designation	No of rooms Required in m^2	Size in Each rm in m^2	Total Area in m^2
Hospital Administrator	1	23.04	23.04
Secretary	1	11.52	11.52
Chief medical Director	1	23.04	23.04
Committee Rm	1	28.8	28.8
Pantry	1	14.4	14.4
Conference Rm	1	28.8	28.8
Library	1	44.16	44.16
Staff Rest Rm	1	34.56	34.56
Hospital Secretary	1	17.28	17.28
Asst Hospital Secretary	1	17.28	17.28
Chief Nursing Officer	1	17.28	17.28
Principal Nursing Officer	1	17.28	17.28
Snr. Nursing Suprintendent	1	17.28	17.28
General Store	1	17.28	17.28
Cleaners Store	1	11.52	11.52
Mail Office	1	17.28	17.28
Paymaster	1	17.28	17.28
Accountant	1	17.28	17.28
Finance Officer	1	17.28	17.28
Purchase Officer	1	17.28	17.28
Stationary Store	1	17.28	17.28
Telphone Exchange	1	34.56	34.56
Nursing Suprintendent	1	17.28	17.28
Snr. Nursing Sister	1	17.28	17.28
Nursing sister	1	17.28	17.28
General Office	1	34.56	34.56
Toilets	12	-	57.6
Reception/Inquiries and waiting	1	44.16	44.16
TOTAL			591.88

VIII:19 Engineering And Maintainance Department
Also not Designed

Accomodation Required

Space Designation	No of Rmss Required	Size of Rm in m^2	Total Area in m^2
Chief Enginer's	1	18	18
Clerks Office	1	21.6	21.6
Head Security office	1	10.8	10.8
Foreman	1	10.8	10.8
Capenters Rm	1	12.96	12.96
Electrician Rm	1	12.96	12.96
Plumbers Rm	1	12.96	12.96
Painters Rm	1	12.96	12.96
Masons Rm	1	18	18
Ambulance Parking	4	24	96
Generator House	2	12.96	25.92
Toilets and changing Rm	1	18	18
			270.96

VIII:20

INCINARATOR AND BOILER HOUSE

This unit of the hospital is just assigned space due to conflicted Nature of its planning.

Assume an arwa of $120m^2$

SOKOTO UNIVERSITY TEACHING HOSPITAL

PEADIATRIC DEPARTMENT

CASE STUDY

This Department of the teaching Hospital consist of the (1) Out patients unit

(2) Nursing unit (Medical and Surgical)

(3) Nursery

OUT PATIENTS DEPARTMENT

This unit of the department has two (2) consulting suites a dispensary, medical Records office and the waiting area for the outpatients.

ATTENDANCES		
AVERAGE DAILY	AVERAGE WEEKLY	AVERAGE YEARLY
	1969	
		81,076
320		

Hours per day in Operation = 6 hours

Days per week in operation = 6 days

Average consulting Time = 3 minutes

No of consulting suites = 2

No of Consultants (Doctors) = 3

Comments

If the number of out patients is compared to the number of the consulting sultes, One will find

that at least 150 patients will be seen by one consultant which in the Author's Opinion is an over burden to the Consultant; This will also result into not getting a thorough examination and therfore treatment the patient. It should also be noted that examination and consultation is done in the same room.

Todd. E. wheather gave a formulae for the calculation of required Numbers of consulting rooms using this formulae the Authors also find the Number of consulting rooms as in adequate.

IF M = average weekly attendance

T = Average Consulting time in minutes

S = Total length of Each session in minutes

$$= \frac{1969 \times 3}{360} \times 16.4$$

If R is the No of session held weekly = 6

Critical number of consulting suites which should always be exceed $= \frac{16.4}{6} = 2.7$ Rooms

The ideal number of consulting Rooms from this calculation starts from 4 Rooms.

NURSING UNITS

Medical and Surgical

This is a single ward Block divided into two wings (Medical ans Surgical) by the offices of Doctor, Sistors Clean and dirty Utility and Reception Area. It contains approximately 50 beds divided in cubicles of 3 - 10 beds. There is also a Nutrition Education Room at one end of the ward.

STAFF STRENGHT

2 Nursing Sisters

6 Staff Nurses

1 Nursing Assistant

4 Auxilliary Staff

Students Nurses and midwives usually help when they come for ward Training Experience. There Number is not definate.

Average Daily bed occupancy	=	52
Available Beds	=	49
% Occupancy	=	106
Admmission for last year	=	1716
Discharges (This death)	=	1572
Actual Deaths	=	180
Average lenth of stay	=	6days

Comments

1. No seperate unit has been provided for patients needing lsolation.
2. The intensive care unit is just one bed and not properly situated.
3. The toilet is provided in just one wing of the Nursing unit, thus increasing walking distance of the patients, which the author find undisirable, since this encourages cross infection.
4. There is Neither the provision for mothers day space nor adequate provision for overnight stay.
5. Number of Admission is low compered to the Number of the out patients that frequent the clinic daily. This the Author observed to

because of the in adequacy of beds in the Nursing unit. One ward is therfore grossly in adequate for the Hospital.

NURSERY (NEONATAL) UNIT.

This unit is located near the meternity unit.

STAFF STRENGHT

1 NURSING SISTER

2 STAFF NURSES

1 AUXILIARY STAFF

INDETER MINATE NUMBER OF MIDWIVES

Maximum capacity = 35 infants.

Monthly Attendence 34

YEALY AVERAGE 374

UNITS IN THE NURSERY =6

Abandoned Babies = 9cots

Sick Babies Unit = 5cots

Well babies unit = 12cots

Premature unit 8 incubators

Special care baby unit 3 incubators.

There is no provision for changing facilities within the Nursery; And the type of partitions mates Nursing care difficult. The place is other wise clean.

OPERATION THEATRE

Days per week in operation = 6 days

Number of Peadiatric operations performed in one year = 140 /

Hours per day in operation = 6 hours

Emergencies are entertained 24 hrs a day all the year round.

Number of operation Rooms = 3

STAFF STRENGHT.

1. SENIOR NURSING SUPRINTENDENT.

1. Nursing Suprintendent

2. Staff Nurses

4. Auxilliary Staff

2. Nursing Assistants (theatre)

Required Number of consulting suites can be checked using Todd. & W's formulae for the calculation of surgical suites.

$$= \frac{\text{Operations performed per year}}{\text{Days per year surgery} \times \text{operation per room per day}}$$

$$= \frac{140}{365 \times .3} = 1.28 \text{ Rm for peadiatric}$$

In rwality the surgical suite caters for all patients (not only peadric)

:. For general cases

-3

$$\frac{1964}{365 \times 2} = 2.7 \text{ Rms.}$$

This Number should be exceed in reality so that the number of operating Rooms in this department is fairly alright, but i deel number would have been 4 Rooms.

X - Ray

Caters for all patients

STAFF STRENGHT

1. Chief Radiographer

1. Asst Chief Radiographer

1. Secretary

2. Clerks

1. Receptionist.

No of X - ray Rooms = 2

Pediatric X - ray taken in a year = 6557

Days per week in operation = 6

Weeks per year in operation = 52 weeks

Hours per day in operation = 6 hrs

Determination per room per hour = 3

$$\text{X - ray Rm} = \frac{6557}{6 \times 52 \times 6 \times 3} = 1.16^{-3}$$

Two X-ray Room provided are therefore Adequate. But there is no provision for wanting and changing Facilities.

AHMADU BELLO UNIVERSITY

TEACHING HOSPITAL ZARIA

PEADIATRIC DEPARTMENT

CASE STUDY

This Department of the Hospital consists of

1. The out patient service department (OPD)
2. Emergency Peadiatric Unit (EPU)
3. SURGICAL UNIT
4. MEDICAL UNIT
5. NURSERY.

ATTEDANCES		
AVERAGE DAILY	AVERAGE WEEKLY	AVERAGE YEARLY
150	1003	74885

STAFF STRENGHT

Doctors including Dietry officers = 27

Number of consulting Rooms 2

Hours per day in operation = 7

Days per week in operation = 7 days

Average consulting time = 4 minutes

NURSING UNITS

Medical

This is a single block containing 45 patients with no definate cubicle partition to control the spread of excitement fear, and infection.

2 NURSING SISTERS

6 STAFF NURSES

8 ATTENDATS

5 AUXILLIARIES

STUDENTS NURSES ALSO HELP OUT WHEN THEY COME FOR WARD TRAINING EXPERIENCE.

Average Daily bed Occupancy = 30

Available beds = 45

% occupancy = 67.2%

Admission for 1983 = 786

Discharge (Plus Death) = 689

Actual Deaths = 113 patients

Average length of stay = 13.8 days

SURGICAL

A block containing about 34 beds divided in bay of six beds. The height of partition is about 1.2 metres high.

STAFF STRENGHT

2 NURSING SISTERS

8 STAFF NURSES

7 ATTENDANTS

3 AUXILLIARIES

A Number of students Nurses on Ward experience.

Average Daily bed occupancy = 30

Available beds = 34

Addmission for 1983 = 370

Discharges =350

Actual Deaths = 15

Average length of stay =3weeks

One interesting thing about this Nursing unit is that the ward is Decorated nicely w th paintings which gives the children a good usual confort, There is also a televisions set in the Nursing unit.

EPU

This is a large Hall of about 12x16m and accomodating 40 beds, and Isolation Area of about 12x5m. These two units have no cubicle partition what so ever.

STAFF STRENTGHT

NURSING SISTER	1
STAFF NURSES	4
ATTENDANTS	6
AUXILLIARIES	3

Average Daily Bed occupancy	55 beds
Available Beds	= 31
% Occupancy	176.7
Addmission for 1983	4077
Discharges(plus death)	3732
Deaths	332
Average length stay	5days

One can clearly see the result of over crowdy in this ward from the number of deaths. The Nursing unit has also the dis advantages of being too big in scale compared to the patients in it. It has no was hand ba basins in the unit and no provision for mothers day or sitting Area. This is so for the worst ward plan the Author has come across in his research.

X - RAY DEPARTMENT

This Department also caters for all classes of patients.

Peadiatric X-ray conducted in a year	=	12840
Hours peer day in operation	=	6.5hours
Determination per room per hour	=	5
W Weeks in operation per year	=	52 weeks
Ideal Number of X ray Rooms	=	

$$\frac{12840}{52x6x6.5x5} = 1.26Rm$$

This Hospital Department has 3 x - ray rooms, and since the calculation should always be exceeded the Rooms are adequate.

OPERATION THEATRE

STAFF STRENGHT

2 SENIOR NURSING SISTERS

2 STAFF NURSE STAFF MIDWIVES

3 STAFF NURSES

4 NURSING AIDS

3 ANCILLIARY STAFF

This unit has 3 operating suites. And it functions for 365 days of the year.

301137

GENERAL COMMENT

This department is scarttered all round the hospital which makes it very difficult for the mothers to locate the O.P.D, wards and other services. lack of proper intergration of the mother in the design can also have a serious consequence on the child. since without the necessary Education she will acquire while in the ward patient is unlikely survive after disharge from hospital.

ARGUNGU GENERAL HOSPITAL

PEADIATRIC HNIT

CASE STUDY

In this Hospital the peadiatric Nursing unit is a conversion of one wing of the female medical Nursing unit. As such it is an open ward containing approximately 30 beds. Since No partitions are provided within this Nursing unit the main hazard will be spread of infections. All cases are admitted into the ward with out any measure for isolation.

The whole hospital is a modern design with dear n and well defined zoning of functions. The oeprating theatre operates on appointment basis and Emergencies due to shortage of personal. The X-ray department operates on daily basis but exact figure of children using the department is difficult to determine due to in accute records.

OPD NURSING UNIT

ATTENDANCES		
AVERAGE DAILY	AVERAGE WEEKLY	AVERAGE YEARLY
33	194	8832

No of consultants = 2

Average consulting Time = 3 minul

Hours per day im operation = 6 hrs

Days per week in operation = 6 days

Available beds = 30

Daily bed occupancy = 10 beds

% occupancy = 33%

Admission last year = 676

Discharges plus death = 520

Deaths = 62

Average length of stay = 7 days

The Opd is serviced by two consulting rooms.

The contyard kind of planning adopted in this hospital encorage crosss ventilation and Natural lighting. But their is no adequate waiting space in both the Reception point and clinics this results in over crowding during the peak hours of the morning.

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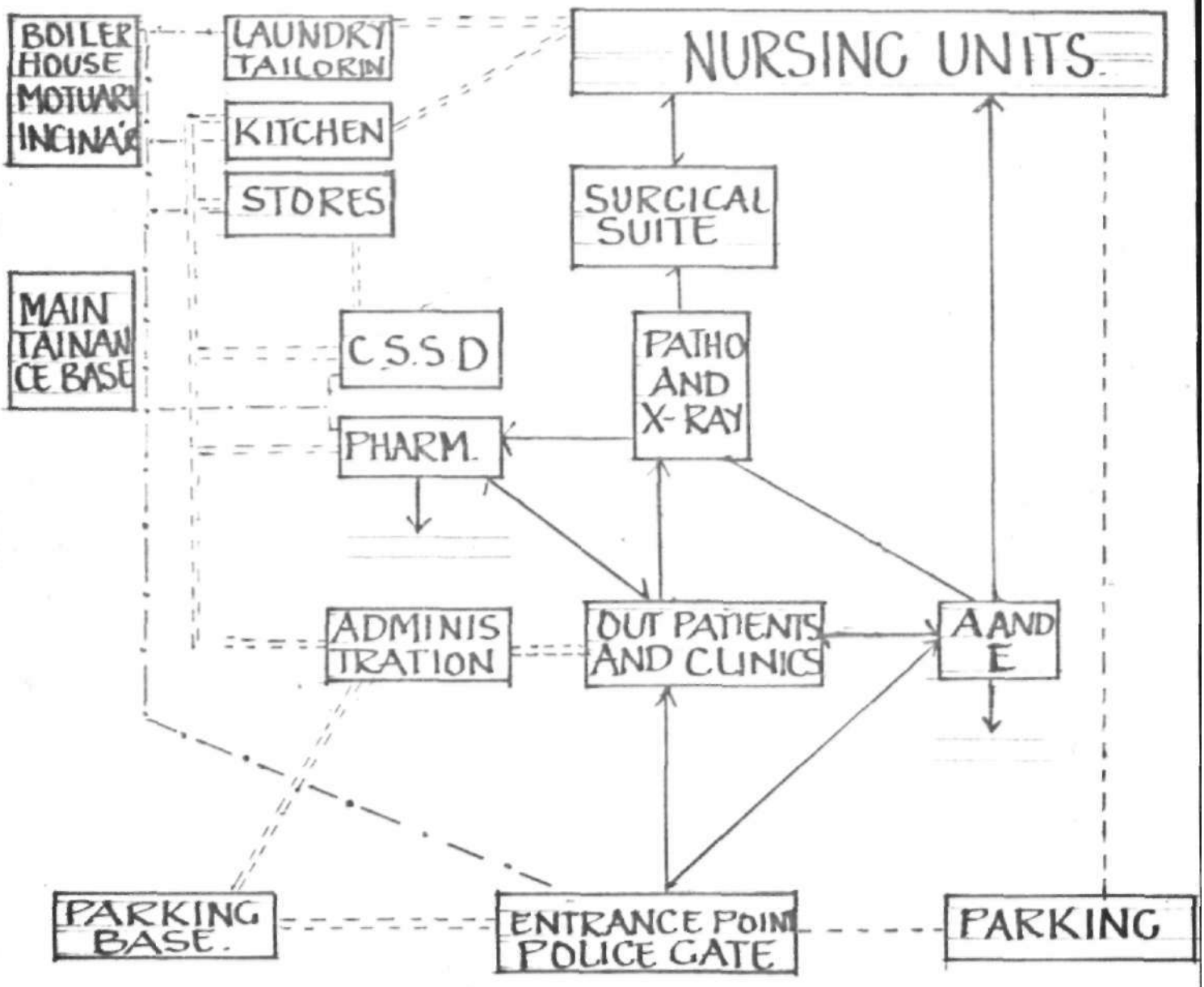
CHILDREN HOSPITAL SOKOTO

FUNCTIONAL FLOW DIAGRAM.



ROUTES

——————— PATIENTS

- - - - - - - VISITORS

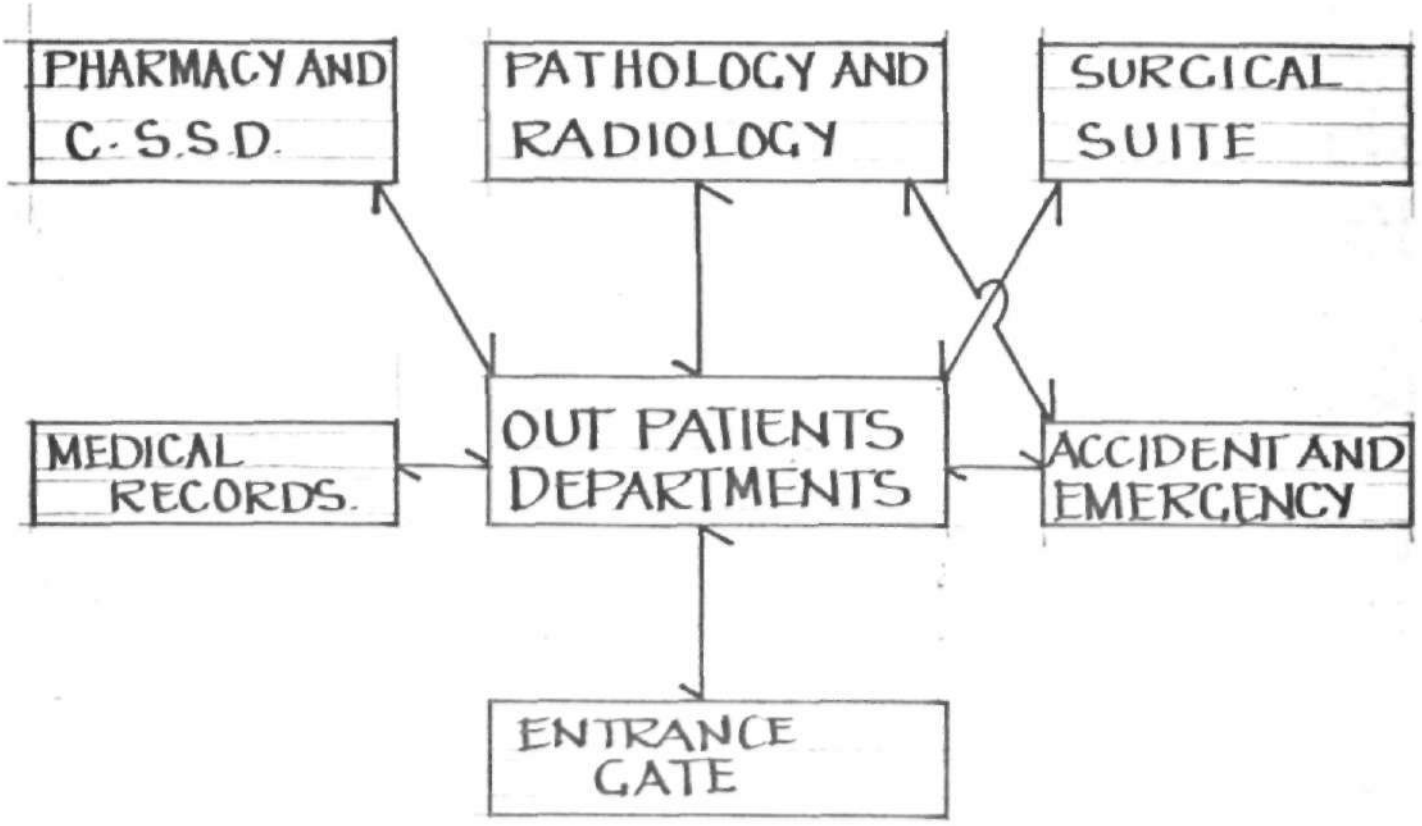
= = = = = = = STAFF

—— — ·— — SERVICES.

FIG. 1

DEPARTMENTAL RELASHIONSHIPS

O.P.D



C.S.S.D.

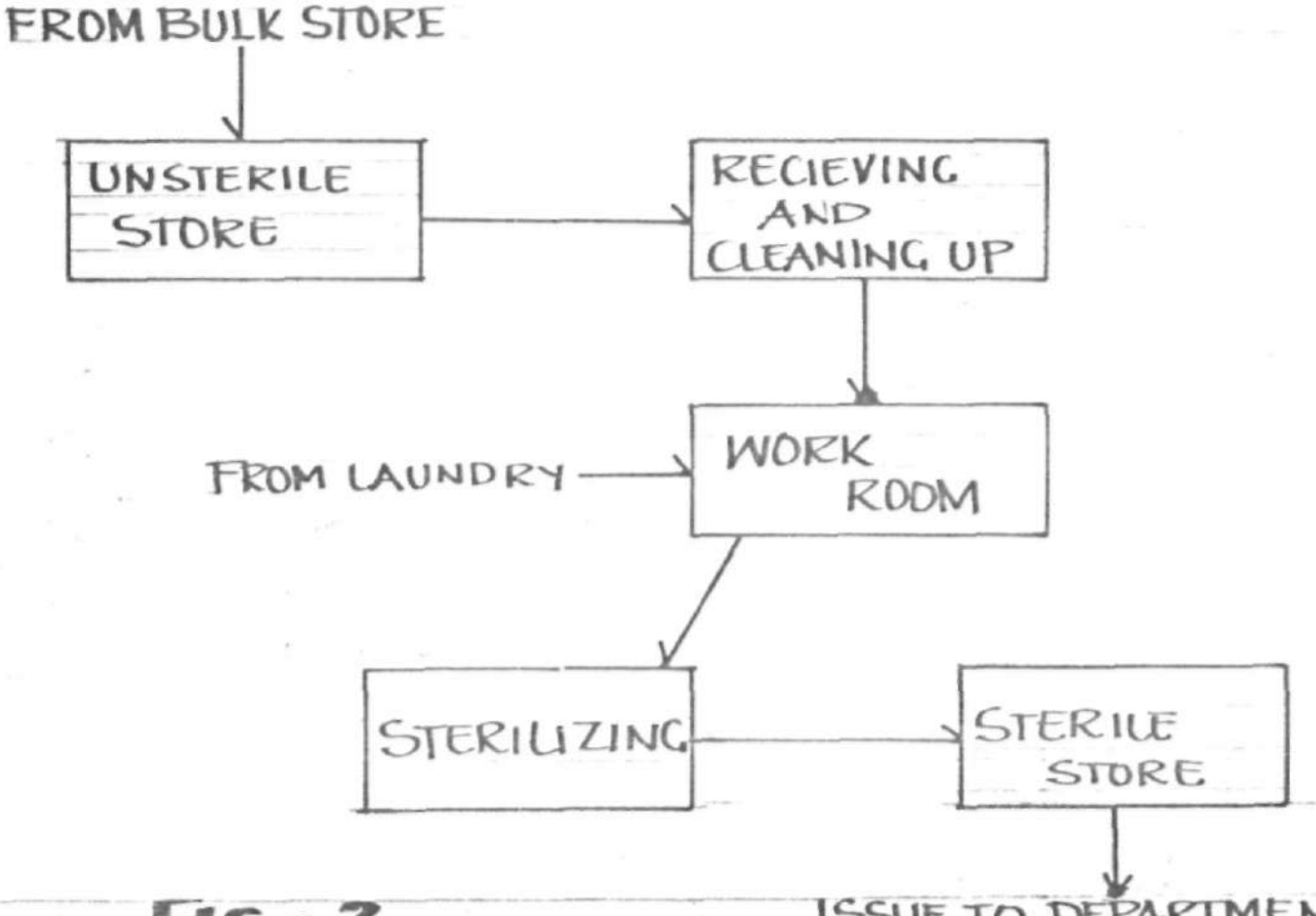


FIG : 2

SEQUNCE OF FLOW
THE UNDER FIVES CLINIC.

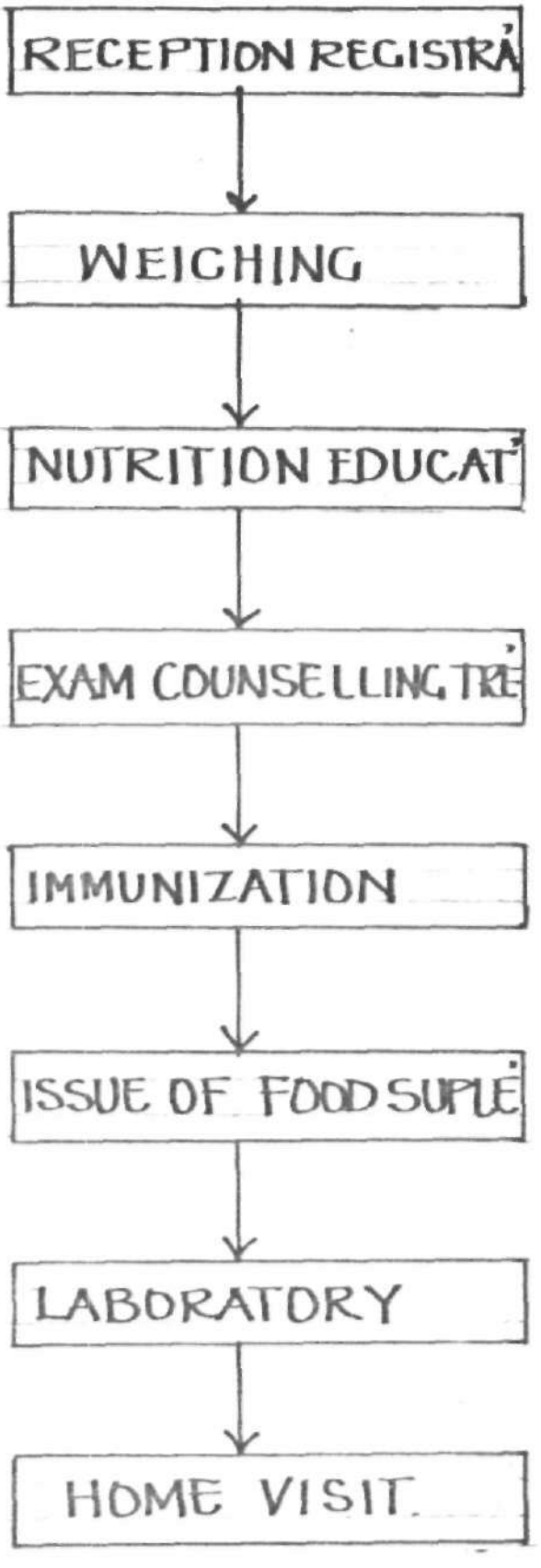


FIG-3

FUNCTIONAL FLOW DIAGRAM
SURGICAL SUITE

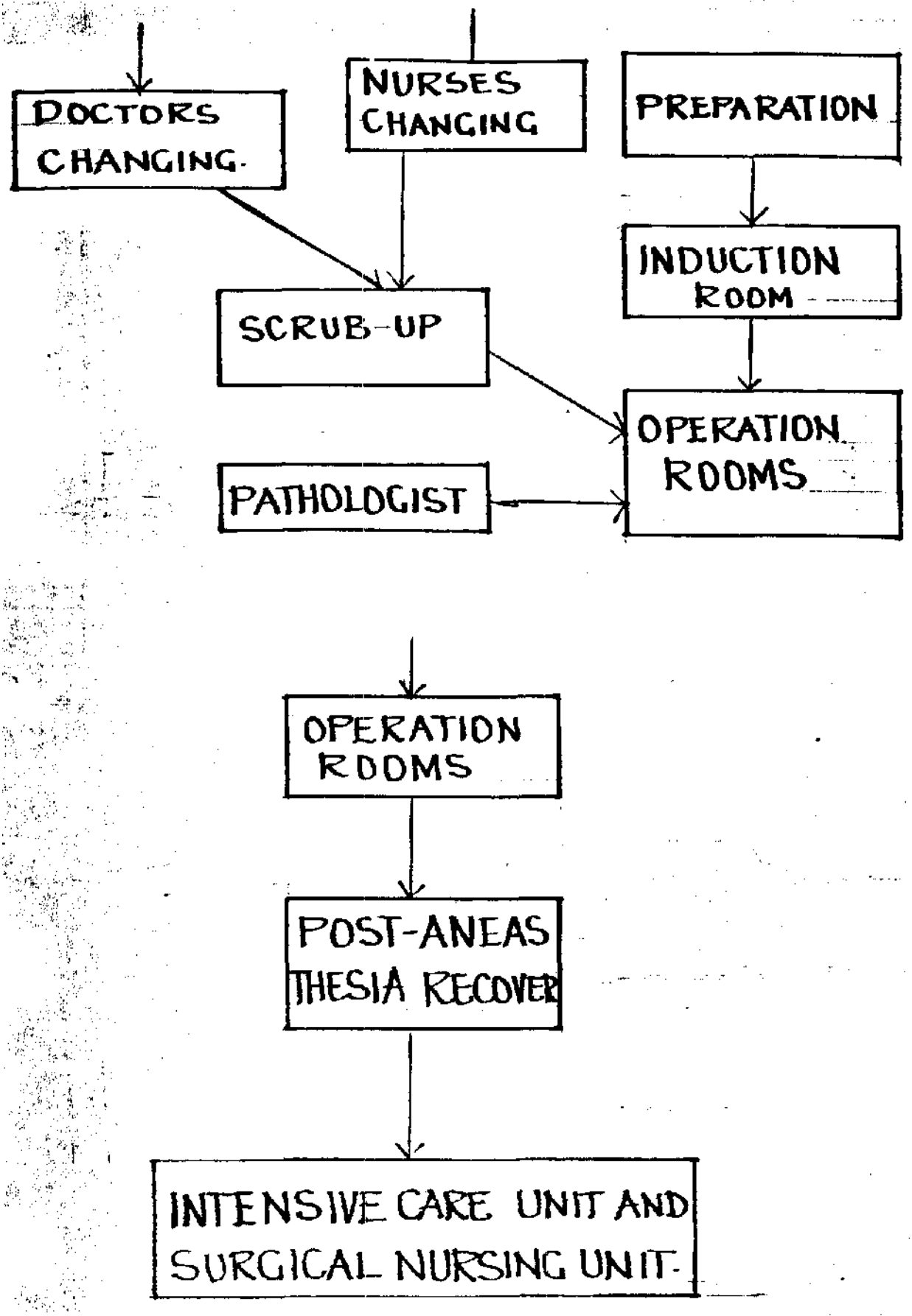


FIG = 4

FUNCTIONAL RELATIONSHIPS NURSING UNITS

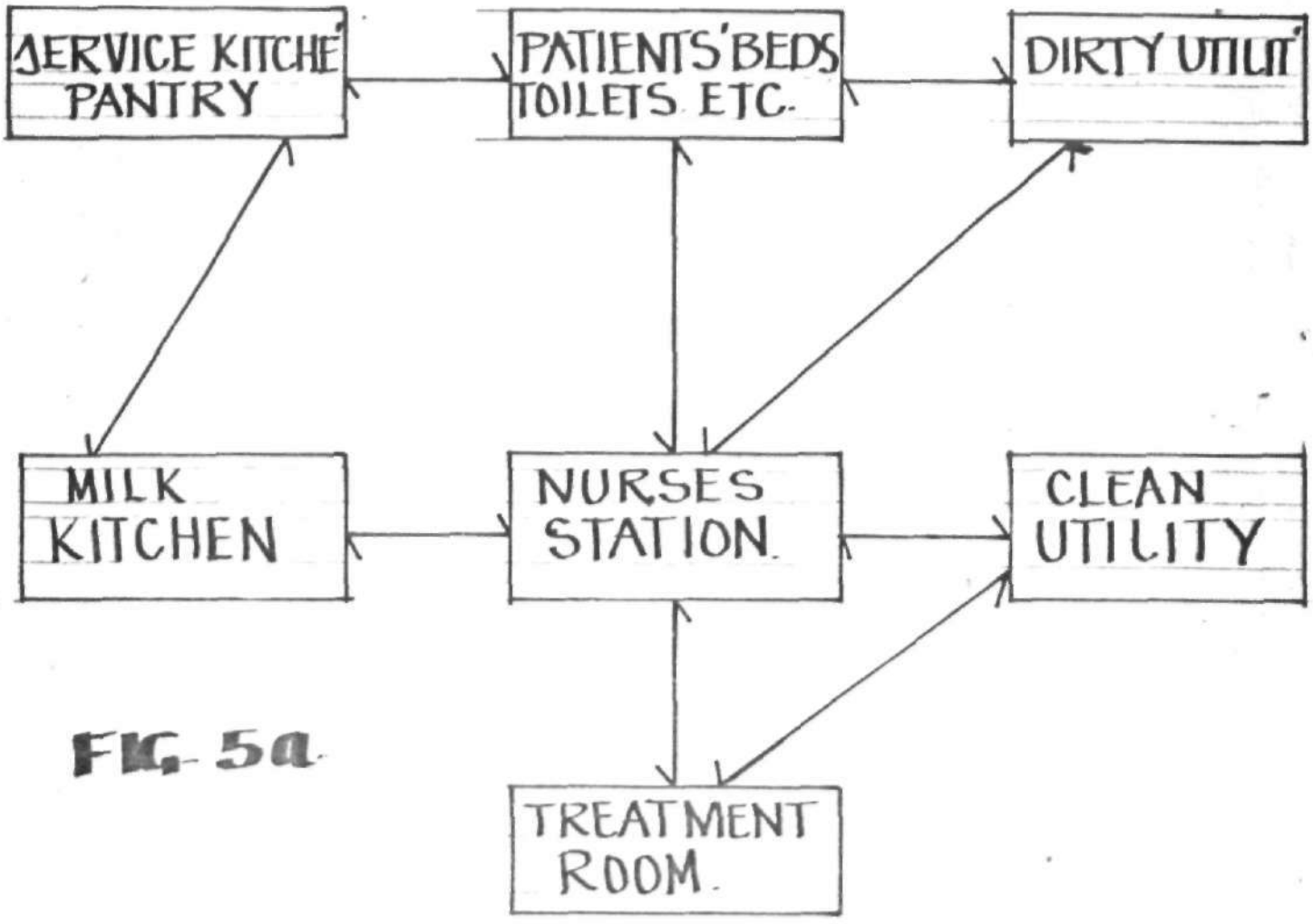


FIG. 5a

CENTRAL STORES

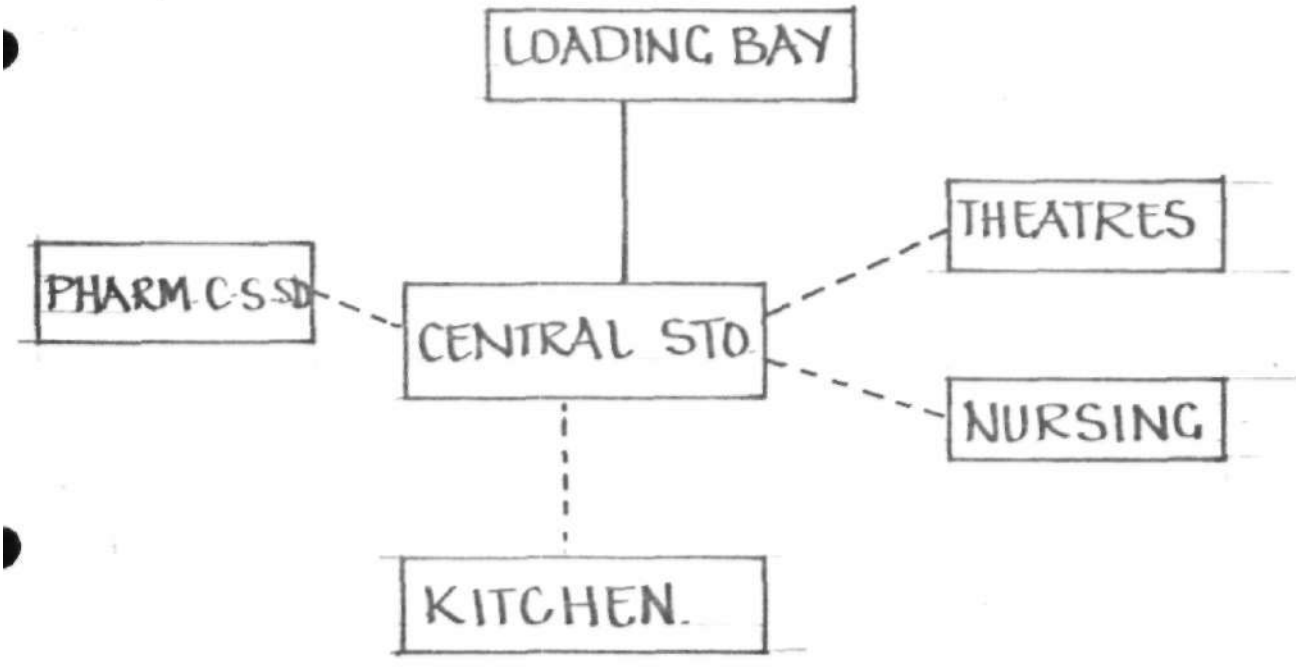


FIG. 5

FUNCTIONAL FLOW CHARTS

LAUNDRY

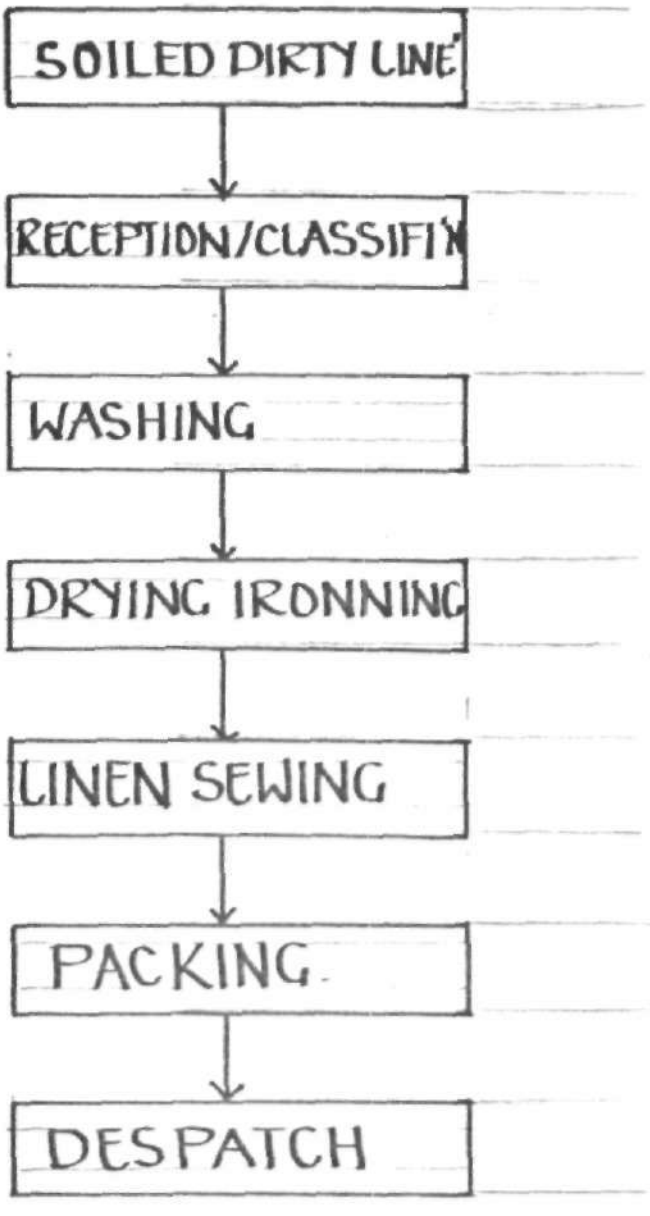


FIG 6

KITCHEN.

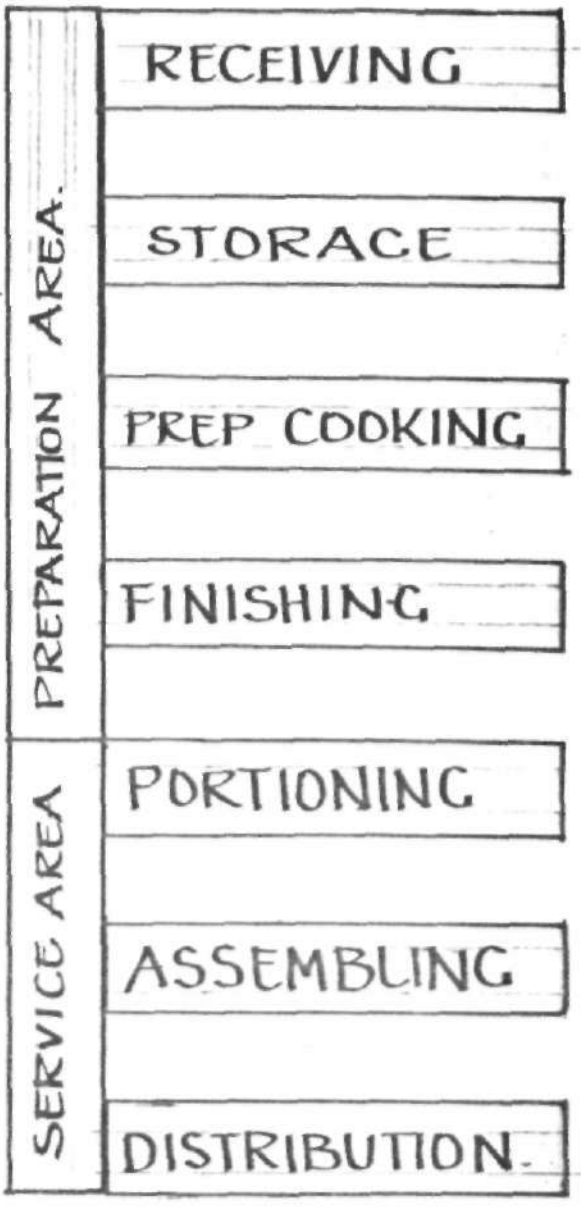


FIG 6a.

FUNCTIONAL RALATIONS

PATHOLOGY

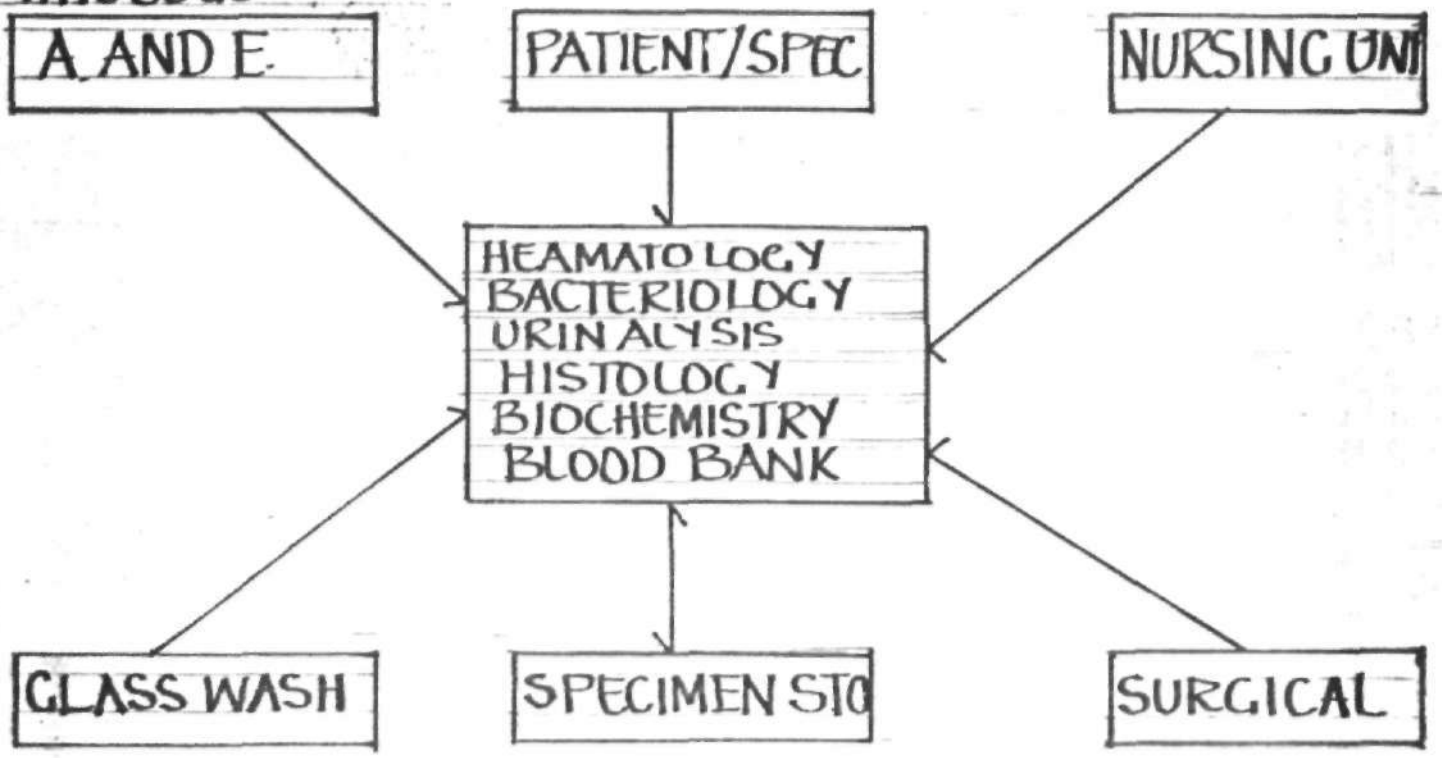


FIG:7

RADIOLOGY

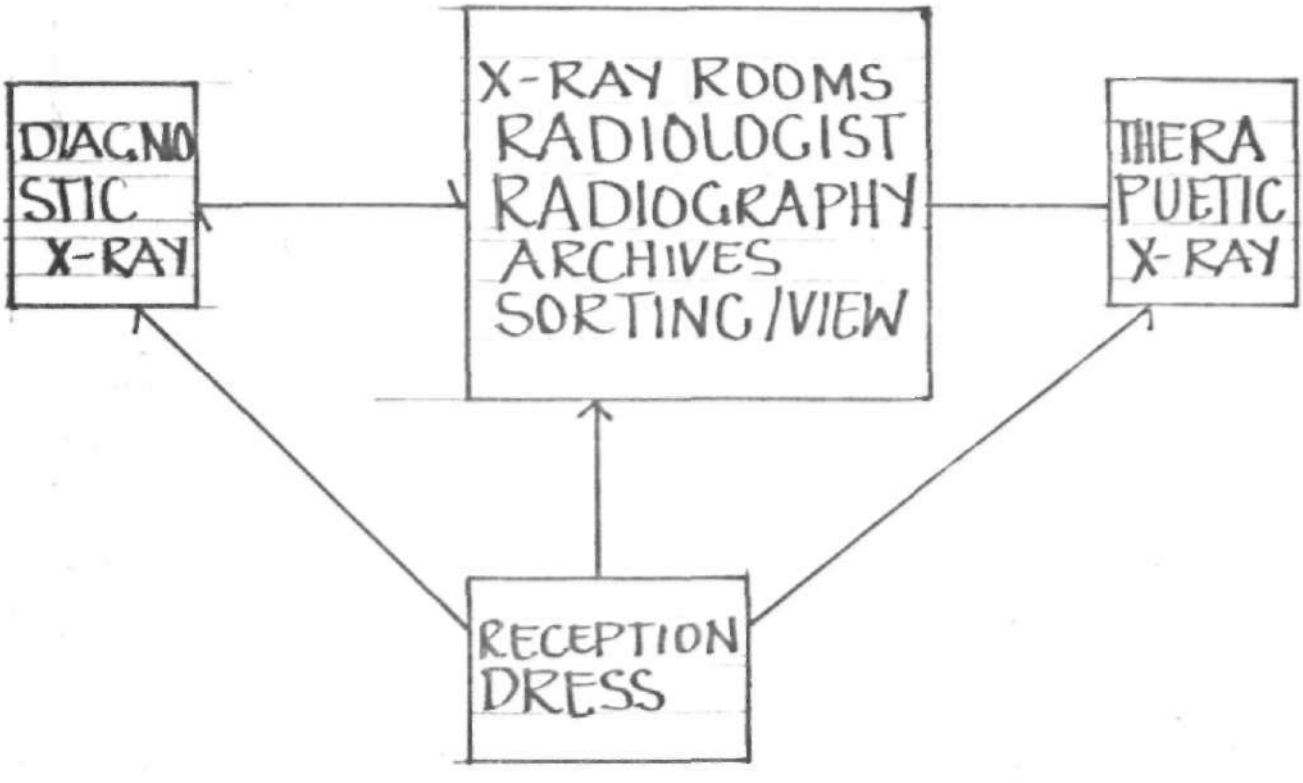


FIG- 7a-

FUNCTIONAL DIAGRAM

PHARMACY.

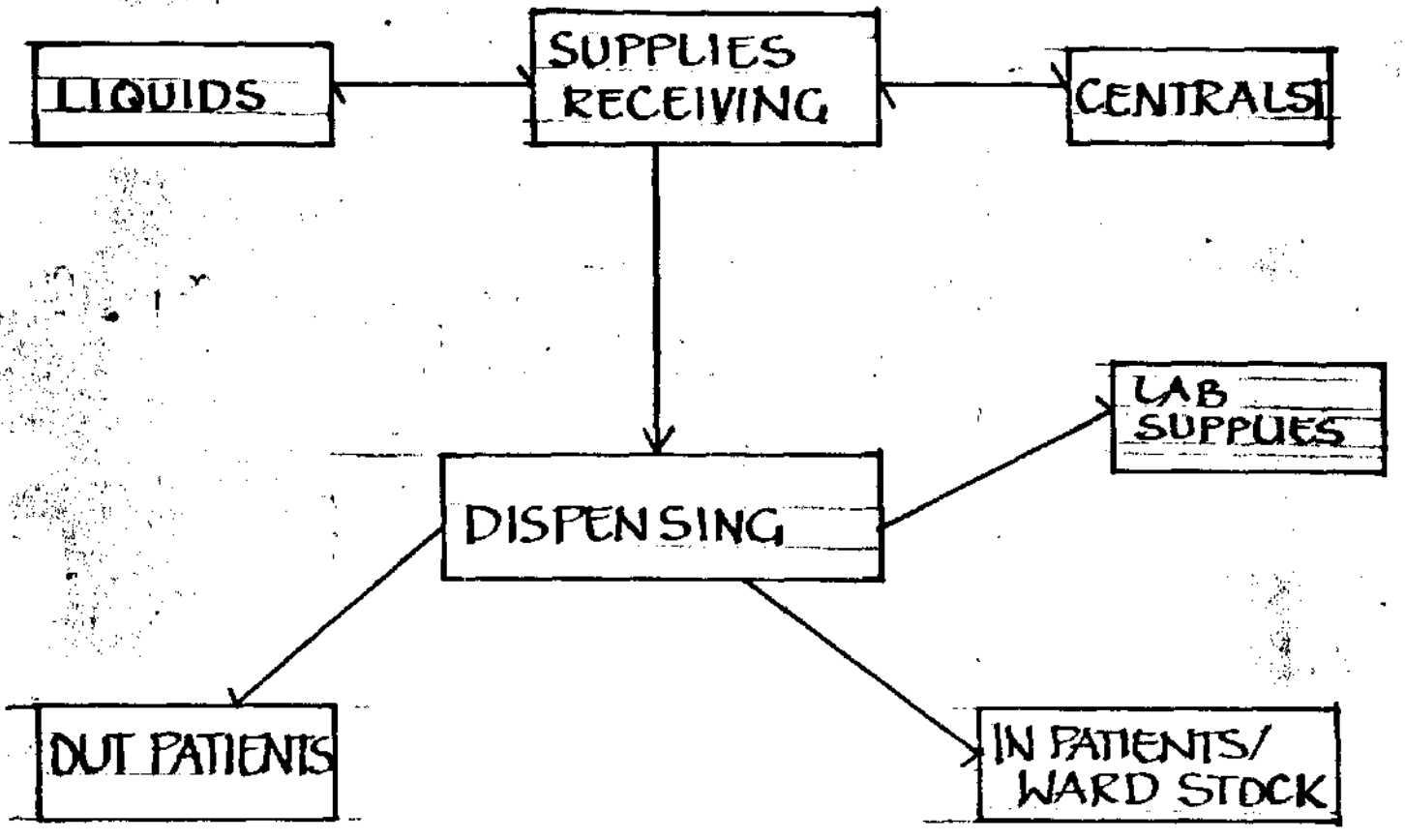


FIG. 8.

ACCIDENT AND EMERGENCY.

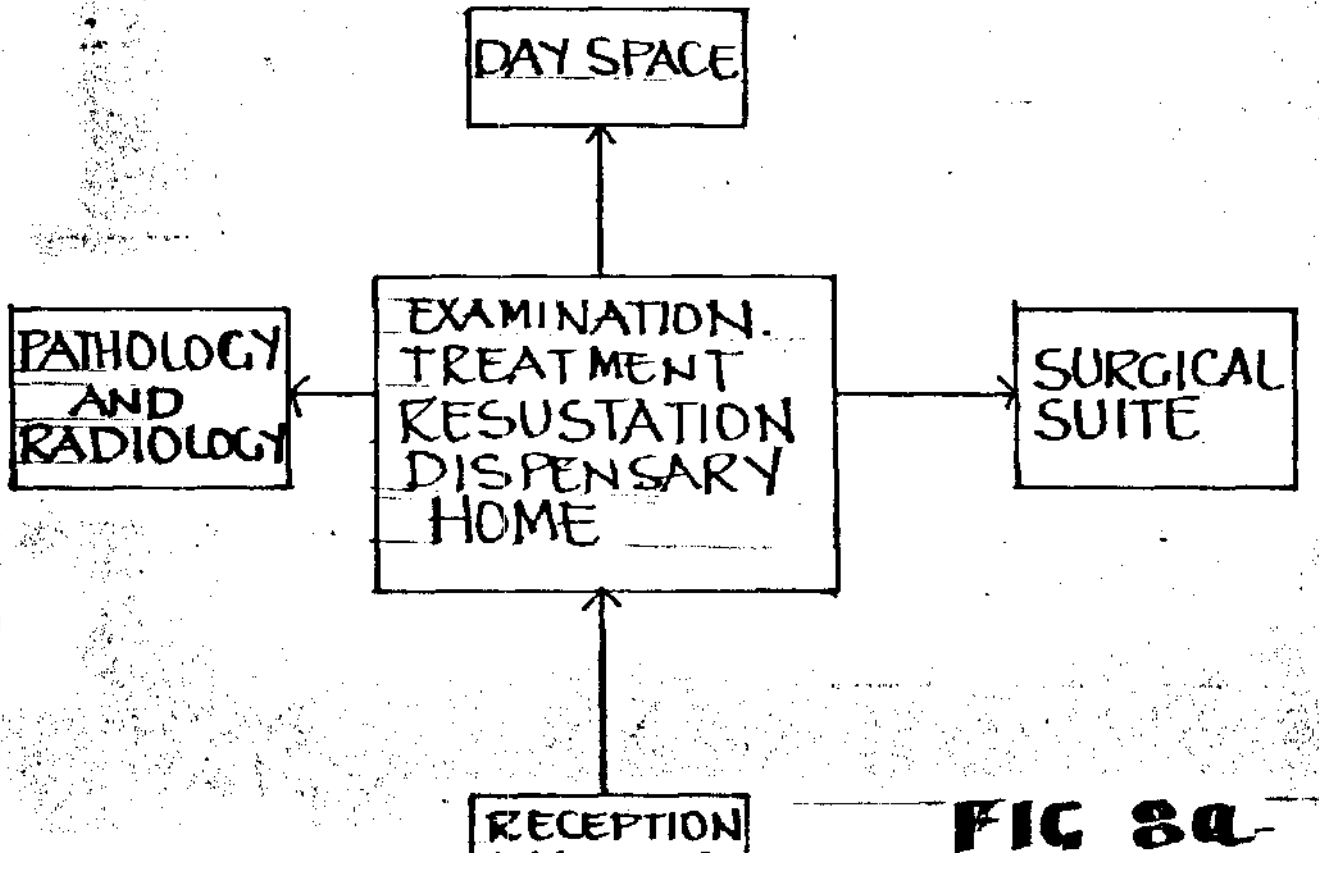
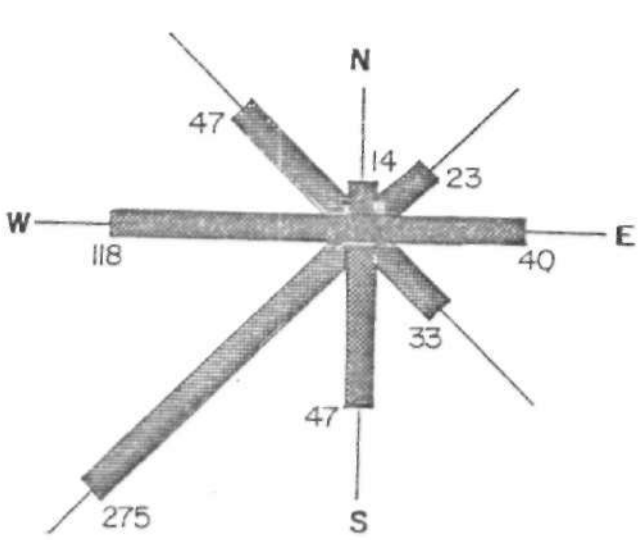
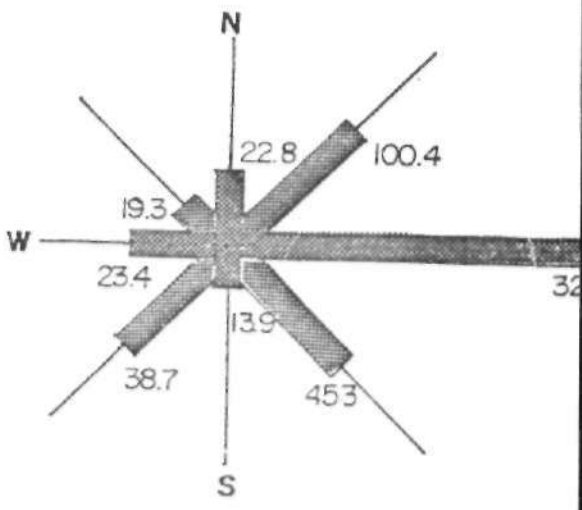


FIG 8a.

WIND DIAGRAM SHOWING 1-33 KNOT WIND PREVALENCE IN DAYS AT SOKOTO 1951/60



SOUTH WEST WINDS
APRIL-SEPT.



NORTH EAST WINDS
OCT- MARCH.

NOTE: The numbers represent days during which the wind of 1-33 knots is blowing from the direction shown in the figure.

FIG. 9.

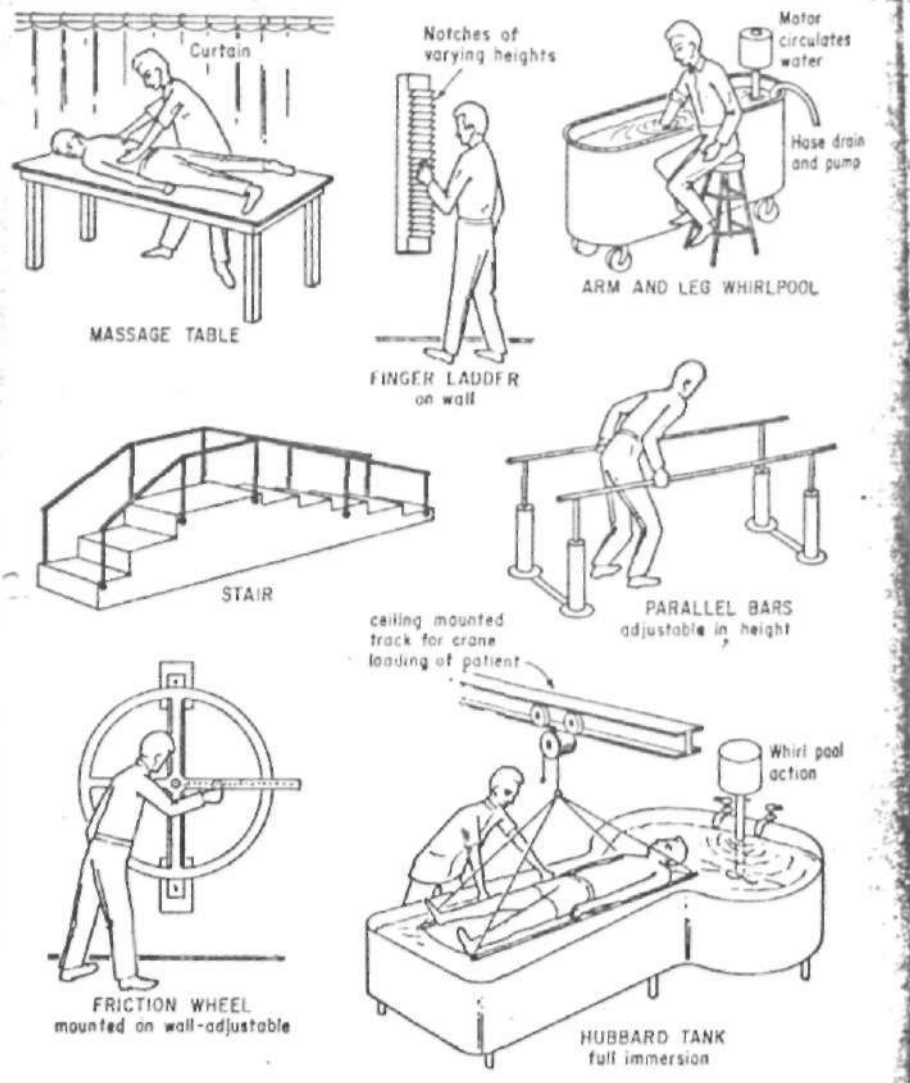
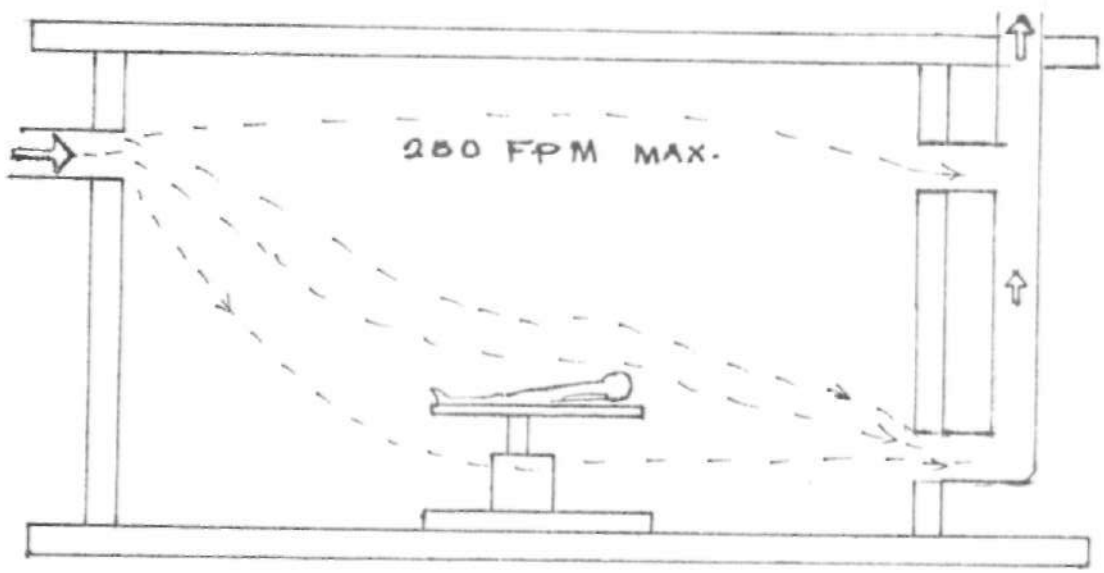


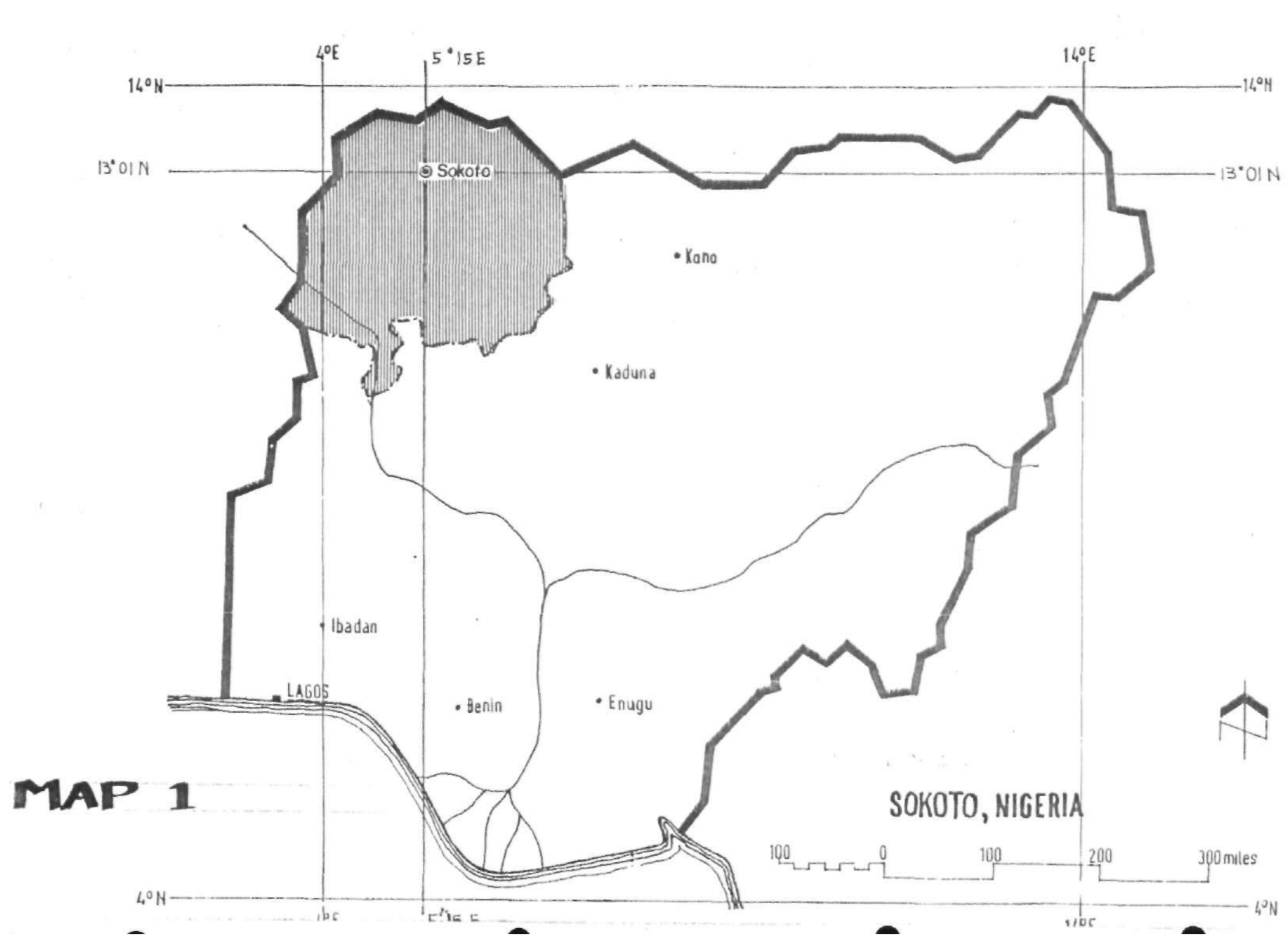
Fig 10 PHYSICAL THERAPY EQUIPMENTS



LAMINAR FLOW OF AIR: EFFECTIVE IN REDUCING THE BACTERIAL COUNT IN THE AIR ON THE ASSUMPTION THAT THE GREATEST DANGER OF CONTAMINATION IS FROM THE PERSONS ABOUT THE OPERATING TABLE. THE MEDICAL RESEARCH COUNCIL OF CANADA HAS RECOMENDED THAT AIR CURRENTS BE FROM THE FOOT OF THE TABLE TOWARDS THE HEAD THEN OUT.

SOURCE: AMERICAN ASSOCIATION OF HOSP. CONSULTANTS.- 'FUNCTIONAL PLANNING OF GENERAL HOSPITALS'.

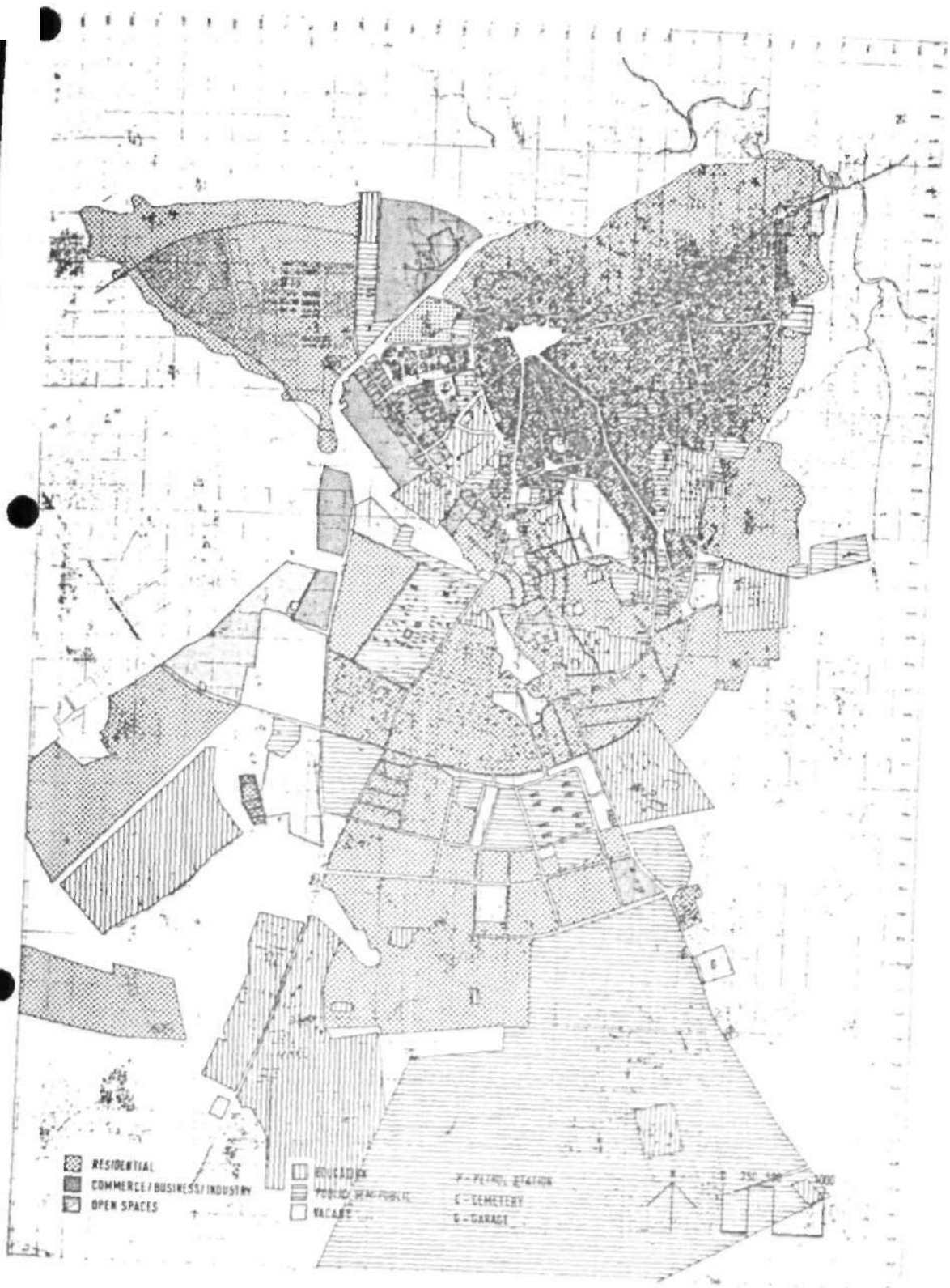
FIG. 11.



MAP 1

SOKOTO, NIGERIA

URBAN SOKOTO
EXISTING
LAND USE.



MAP. 2. SOKOTO LAND USE MAP.



A. *Ethiopia:* A school garden.
Photograph by Dr. H. A. P. C. Oomen.



B. *Kampala, Uganda:* Model low-cost house and kitchen, used for teaching purposes, adjacent to childrens' ward.



C. *Uganda:* An MCH auxiliary gives a food demonstration. UNICEF photograph by Peter Larsen.

SOURCE : C·D· WILLIAMS AND D·A JELLIFE
'MOTHER AND CHILD HEALTH'.

PLATE 1



A. *Guatemala:* Practical training for motherhood—some get their experience young. INCAP photograph.



B. *Eastern Mediterranean:* Delousing with DDT—simple treatment under simple conditions; but the comfort is great. WHO photograph.



C. Nutrition education in a Latin American school. UNICEF photograph.

SOURCE: C.D. WILLIAMS AND D.A JELLIFE.
'MOTHER AND CHILD HEALTH'

PLATE: 2



A. *Mulago, Uganda* In the childrens' ward, a nurse gives demonstrations to groups of mothers.



B. *Tanzania* Gross overfeeding. A child of about 3 years had been admitted in a famine and weighing 14 lb; oedematous, too weak to stand, emaciated. Parents left him in hospital for 1 year and everybody fed him. Present weight 45 lb.



C. *Uganda* A health nurse helps a mother to organize the feeding of twins.



D. *Rwanda* A mobile childrens' clinic.

SOURCE: C.D. WILLIAMS AND D.A JELLIFE.
'MOTHER AND CHILD HEALTH'

PLATE: 3





A. and B. *Western Nigeria:* Chronic severe case of kwashiorkor, before (A) and after (B) 5 months' treatment. Note father's expression. Photographs by Dr. David Morley.



C. *India*. The conditions are most distressing but the baby is beautiful. It is difficult to be dogmatic but breast-feeding is wonderful. UNICEF photograph.

SOURCE C·D WILLIAMS AND D·A JELLIFE
'MOTHER AND CHILD HEALTH'

PLATE: 4



A. *New Guinea Highlands:* A severe and chronic case of kwashiorkor, showing depigmentation of skin, 'flaky-paint' rash, depigmentation and thinning of hair, oedema of feet, and emaciation due probably to anorexia and to malabsorption. Photograph by Dr. H. A. P. C. Oomen.



B. *Ghana*, 1934: Child *in centre*, aged 2½ years, had been brought regularly to a 'weighing centre' for supervision and advice; growth and development excellent. Children *on either side*, each aged about 4 years, brought in from 'bush'. Both suffering from serious failure to thrive, malnutrition and malabsorption. Child *on left* was admitted to hospital and improved after 4 months' treatment. Parents refused admission for child *on right* who died shortly after.



C. *Western Uganda:* The breast-fed baby is beautiful; the deposed child suffers from severe malnutrition and a distended abdomen.

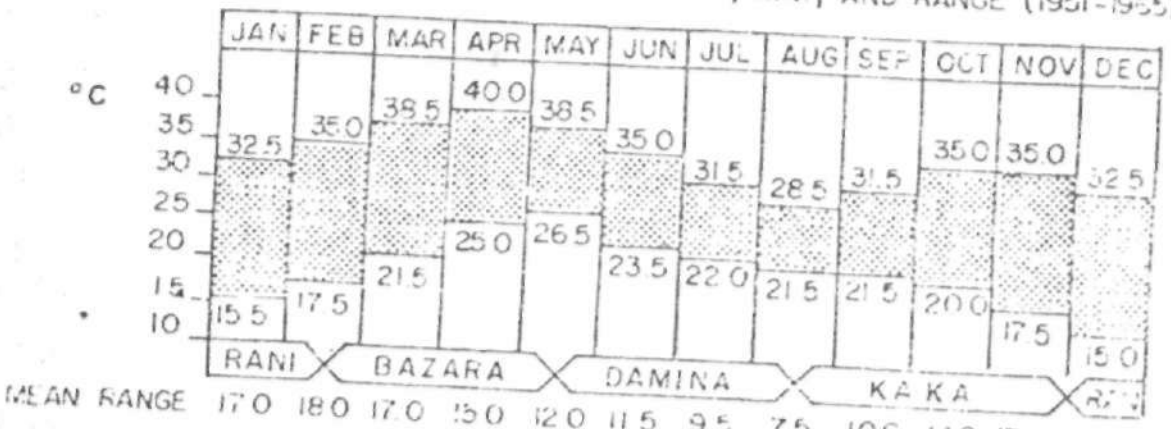


D. *India:* If MCH services are effective, no child should have to reach this condition before being admitted to hospital. This marasmic baby has not the misery of kwashiorkor, and there is comfort in contact. WHO photograph.

SOURCE : C·D· WILLIAMS AND D·A· JELLIFE
MOTHER AND CHILD HEALTH. PLATE : 5

CLIMATE CHARACTERISTICS of SOKOTO

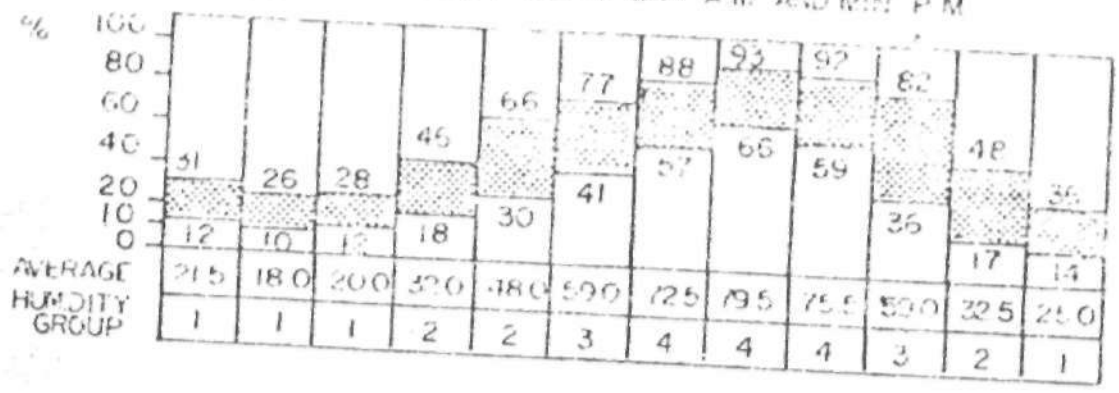
A AIR TEMPERATURE °C : MONTHLY MEAN MAX., MIN., AND RANGE (1951-1955)



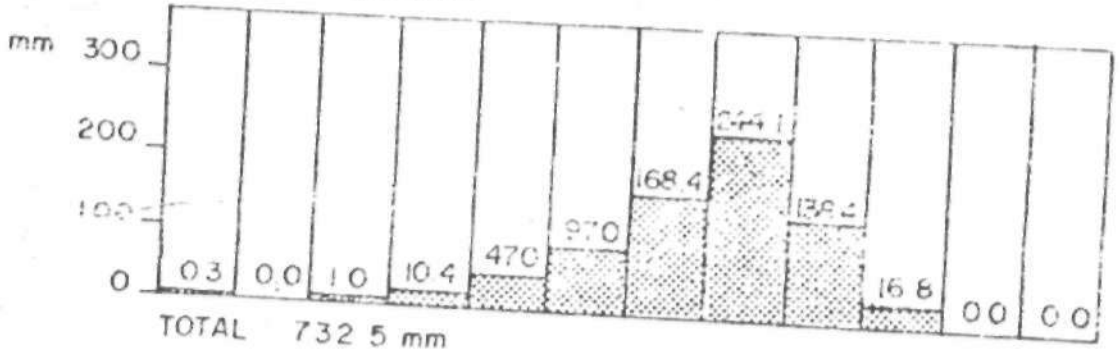
HIGH AMT	
40.0	27.5
15.0	25.0

LOW AMT

B RELATIVE HUMIDITY (R.H.) MONTHLY MEAN MAX. A.M. AND MIN. P.M.



RAINFALL : MONTHLY AVERAGE



HUMIDITY GROUP

1. If average R.H. is below 30 %
2. If average R.H. is below 30-50 %
3. If average R.H. is below 50-70 %
4. If average R.H. is above - 70 %

TABLE 1