M.

HEALTH SERVICES IN UGANDA

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INTRODUCTION:

PURPOSE: The purpose of this thesis is double-fold; it is to serve the purpose of satisfying the requirements of the degree of Master of Architecture, at the same time it is to contribute to Nation Building. Future researhers in the field of Health Facilities in Uganda will find it at least a starting point if not a major stepping stone.

The part on Technical Information will serve as a guide to good design; meanwhile the part on Problem Evaluation in Mulago Hospital point out the major problems which should be avoided in any new hospital to come up in Uganda.

DIRECTION: I thought it right and fitting to do a thesis which is in line with the Government's Development Plan. The Design Project attached to this thesis is hopefully a live project-it is a Hospital Complex for the District of Kampala.

The following three paragraphs are a quatation

from Plan 3 on pages 310-311 for the period 1971/2 - 1975/6.

GOVERNMENT HOSPITALS IN URBAN AREAS

The need to expand and modernise goverment hospital facilities in urban areas has been felt for a number of years. During the Second Five-Year Development Plan, this was accepted as a high-priority programme whose execution, however, was held back due to the relatively higher priority attached to rural hospitals. The non-implementation of most of the planned expansion and modernisation of urban hospitals has had harmful implications for the volume and quality of health services available to the community, as present facilities at these hospitals are now strained to the very limit. It has accounted for the failure to achieve the hospital-bed target of the Second Five-Year Development Plan and it has prevented an adequate spread of specialised treatment facilities to centres other than the main urban areas.

With the exception of the provision of an emergency electricity supply system at Mulago the re-opening of Old Mulago Hospital, and the setting up of a number of specialised units at Mulago, the only capital development in respect of urban hospitals was confined to minor alterations and works which had been under way at the beginning of the Second Five-Year Development Plan.
In Plan 3, the consolidation of urban hospitals is accorded the highest priority, in view of the rapidly deteriorating physical facilities at these hospitals and the key position they occupy in the national health services network.

Mulago Hospital is primarily intended to serve as the national reference hospital and as the teaching hospital for Makerere University. However, in several respects, the hospital is failing to carry out its main functions properly. Statistics reveal that the hospital is, in fact, serving predominantly as a district hospital. Of all admissions to

Mulago, about 90 per cent come from Kampala and the districts of East and West Buganda. This is because of the absence of any other major hospital in these heavily populated areas. Another encumbering factor on Mulago is the overwhelming over-crowding being experienced by all departments at the hospital. In some of the departments actual admissions are currently running at about five times the planned capacity. Inevitably, therefore, Mulago is increasingly functioning as an emergency hospital, confining its attention largely to life-threatening conditions. For these reasons, the standard of medical care has tended to fall below what is expected of a hospital of Mulago's standing. Equally serious, the teaching offered at the hospital is suffering in both balance and depth.

In order to alleviate the critical situation at Mulago, and, at the same time, provide badly-needed additional medical care facilities in Kampala and the surrounding areas of East and West Buganda districts, a new 600-bed hospital is

to be built within the boundaries of the city. The new hospital is designed to take over the heavy emergency and district responsibilities which are shouldered by Mulago at present. In addition, however limited reference facilities and the neccessary specialist consultant staff will be provided to enable the new hospital to be used also for teaching purpose in close liaison with Mulago. In the allocation of facilities at the new hospital emphasis will be laid on paediatrics, obstetrics and gynaecology, traumatic surgery, and orthopaedics. The hospital will also accomodate special VD clinics not only for direct curative work but also for the training of staff to run similar clinics at other hospitals. The total cost of the new Kampala Hospital is estimated at sh. 50 million.

2

# UGANDA HEALTH FACILITIES

## The Ministry of Health

### The Past:

The nucleus of the Ministry of health were the medical stations of the Meical Officer in charge of the health of the employees of the Imperial British East African Company. This colonical Company was chartered at the end of the 19th century to trade in Uganda and Kenya. The service was then limited to Europeans. When in 1894 the British Government took over administration, the service was extended to Asians and African people. These stations were ultimately organised in a Medical Department with a Director of Medical Services in charge. A few years before Independence, the Department changed to Ministry of Health, with a Minister of Health in charge.

In 1903 a hospital building was started at E Entebbe for Europeans, to become the first Government Hospital in Uganda. The number of doctors increased with time, and treatment units

were established at up-country places like Masaka, Jinja, Mbarara and Masindi. The centre at Old Kampala was removed to Mulago in 1913 and this was the foundation of the present large hospital at Mulago, already world famous for treatment, research and training in health.

The Missionaries have played a prominent part in Health Work in this country. Dr. Albert Cook of the Church Missionary Society from U.K. pioneered this work when he started work at Mengo in 1897. He built the first hospital in Uganda at Mengo which functioned as the main medical centre for Uganda and some other parts of East Africa, until this role was later taken over by the Government Hospital at Mulago. Mengo Hospital started training Africans as Medical dressers, dispenser, and miswives in 1917-1918.

The Catholics Missionaries followed Dr. Cook soon. They started health work, built hospitals at Rubaga in 1899 and at Nsambya in 1906, and they also trained staff.

Mission health work has expanded greatly. They have now units all over the country and they continue with the training of personnel. They liase very closely with the Ministry of Health who coordinate health activities all over the country. Besides Missionaries, private and commercial companies together with individuals, carry out health works, and these have units scattered about the country.

THE PRESENT:

Here below we are going to look at the Government policy in close liaison with the existing facilities, and the projected proposals of the current Development Plan - Plan 111.

A- Scope of Services

1.00 DISEASE CONTROL

2.00 HEALTH INFRASTRUCTURE

B- ADMINISTRATION

C- MANPOWER REQUIREMENTS

E- EXPENDITURE.

A. SCOPE OF SERVICES.

1.00 DISEASE CONTROL.

The Government policy has been to emhasise the development of Preventive health services relatively to the curative ones. Plan II, in addition, recognises the inherent inter-relation ships between the two types of health services. There is also the practical fact that most health facilities and personnel are necessarily commonly provided for both types of services. The health policies and projects of the Plan are therefore desgned to add up to an ambitions total effort in all aspects of the health services, both preventive and curative - health education, maternal and child health, enviromental sanitation occupational health. communicable disease control, medical care and rehabilitation.

1.00 Health Education work will be stepped up greatly beyond the past levels, with emphasis continuing in rural ares; By indoctrinating school - going agers, the benefits are likely to be passed onto future generations. At village- level, public health nursing, health visiting, lectures and

demonstrations, will be the main channels employed. At District - level the government will continue financial assistance to the District Health Education Committees which plan the Above all, a Health Education Centre is shortly to be set up to coardinate the whole health education programme, and provide the related training. 1.04

.02 Environmental Sanitation is most Pressing in the fields of housing, food hygiene, water supply, sewerage and refuse disposal. Government is expanding water supply, sewerage and refuse disposal facilities in the city,towns and trading centres. Government too is ensuring meat inspection laws are enforced. The annual home improvement competitions are to continue on a regular basis.

.03 The health of todays children and women of child -bearing age is a principal determinant of the 1.05 overall state of the country's future population Therefore special attention is paid to the health problems specific to this group which consititutes about 60% of Uganda's population. The network of

units to be set will provide maternal and child health sevices and family health care at all levels so as to bring about a significant reduction in infant and maternal death rates and to ensure that children grow up in a healthy manner.

Communicable diseases have claimed a heavy toll of lives and are responsible for the morbidity of a large section of the people. Immunization programs are currently eradicating a large portion of these diseases - to mention a few, whooping cough, tetanus, -diphtheria, tuberculosis, small pox, and poliomyelitis. The Vector Control Division jointly sponsored by W.D.H. and M.D.H. is waging war in a very successful manner against onchocereiasis (river blindness), sleeping sickness, bilharzia, etc. Malaria is virtually under control.

Occupational health services, principally adiministered by Ministry of Labour, covers provision of health services by employers to employees. Apart from the innumerable first aid kits, five fully equiped and staffed hospitals plus several hundred

dispensaries of varying sizes have been provided by employers. In future efforts will be made to Include preventive aspects, which have not been concentrated on yet.

1.06 Although over-emphasis has been on curative health service relative to other services, considerable further development in Medical care services is envisaged in the future, since its present coverage and content still fall below levels. The proposed development entails mainly expansion of the capacity of the network of facilities and improving them qualitatively. Detailes of Government proposols are given in Part 2.00 - Infcastructure.

1.07 Medical rehabilitation and social-and- occupational rehabilitation are jointly provided by the Ministries of Health, and of Culture-and-Community Development, for those Unfortunate cases, who after medical treatment end up disabled and therefore need special training in patterns of life.

## 2.00 HEALTH INFRASTRUCTURE

### 2.01 DEFINITIONS:

1. HOSPITAL

A medical unit where in-patient and out comprehensive medical care is provided and where the services of a qualified doctor are available.

2. HEALTH CENTRE.

A medical where in-patiant and out patiant elementary medical care is provided by a medical assistant, in-patient midwife and where the services of a health visitor are available for home visiting within the defined area around the unit. Preventive care is also available through Health Staff.

3. DISPENSARY/MATERITY UNIT.

A medical unit where in-pantient and out-patient elementary medical care is provided by a medical assistant and where in-patient midwifery services are provided by a qualified midwife.

4. DISPENSARY

A medical unit where in-patient and out-patient elementary medical care is provided by a medical assistant or lower grade auxiliary.

5.

6.

7.

SUB-DISPENSARY

A medical unit where out-patient elementary medical care only is provided by a trained auxiliary.

AID POST

A medical unit where out-patient elementary medical care only is provided by trained staff from a "parent" unit, usually on one day a week basis.

MATERNITY UNIT

A medical unit where in-patientt and out-patient and midwifery services only are provided by a qualified midwife.

5.

6.

7.

SUB-DISPENSARY

A medical unit where out-patient elementary medical care only is provided by a trained auxiliary.

AID POST

A medical unit where out-patient elementary medical care only is provided by trained staff from a "parent" unit, usually on one day a week basis.

MATERNITY UNIT

A medical unit where in-patientt and out-patient and midwifery services only are provided by a qualified midwife.

2.

02 HEALTH INFRASTURTURE.

At the outset of Plan 3, Uganda enjoys a level of health services comparatively superor to many other developing countries, with a total of now over 500 health units (ranging from rural subdispensaries to hospitals) dispersed all over the country; there being someformof medical centre within a reasonable distance of every household. The basic health services are offered free to all.

The existing-facilities breakdown per region is detailed out here,

Additional units have been planned by the ministry in-order to remedy the imbalance existing in the present distribution of the facilities.

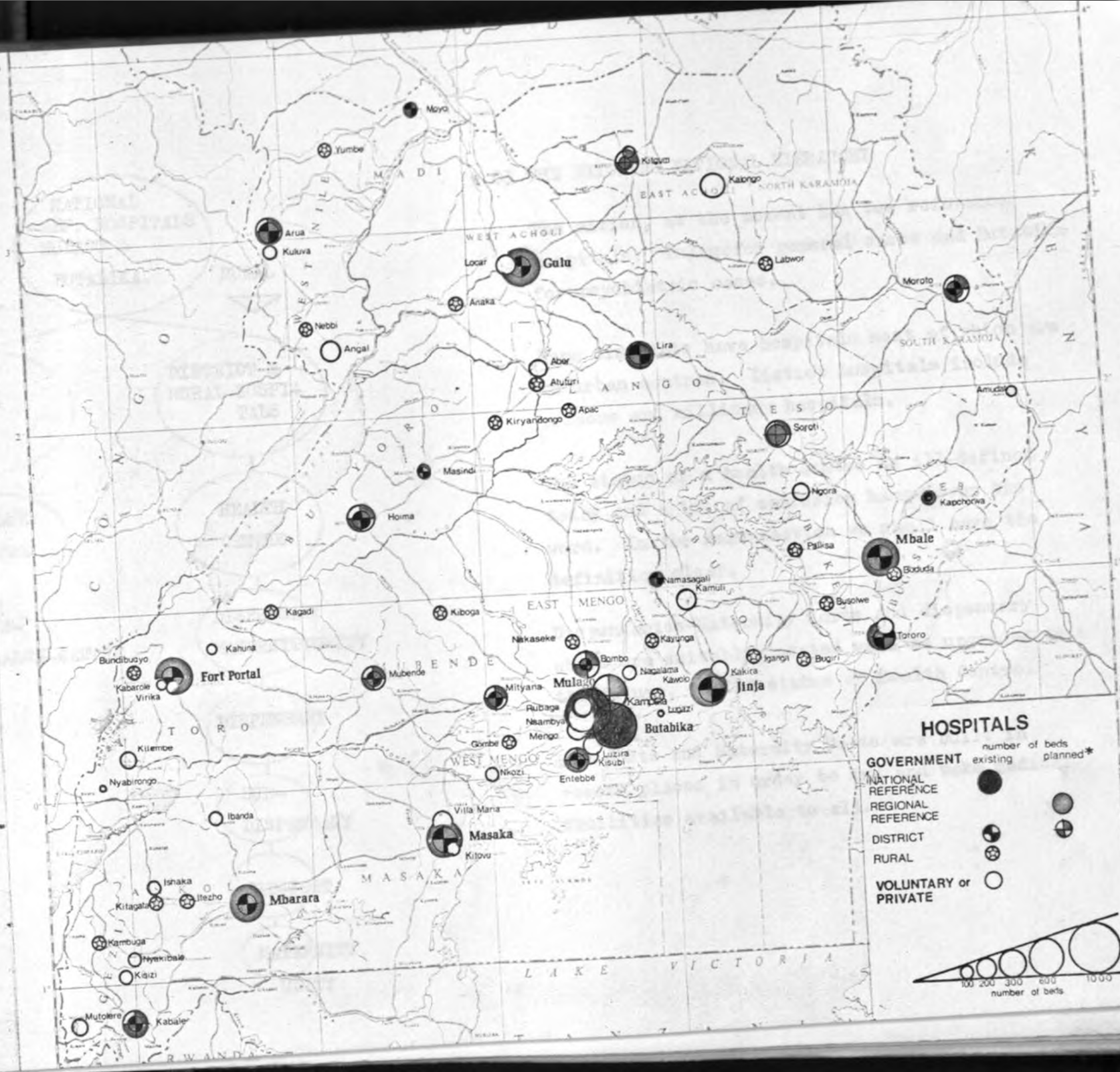
AN INVETORY OF GOVERNMENT MEDICAL UNITS IN UGANDA.

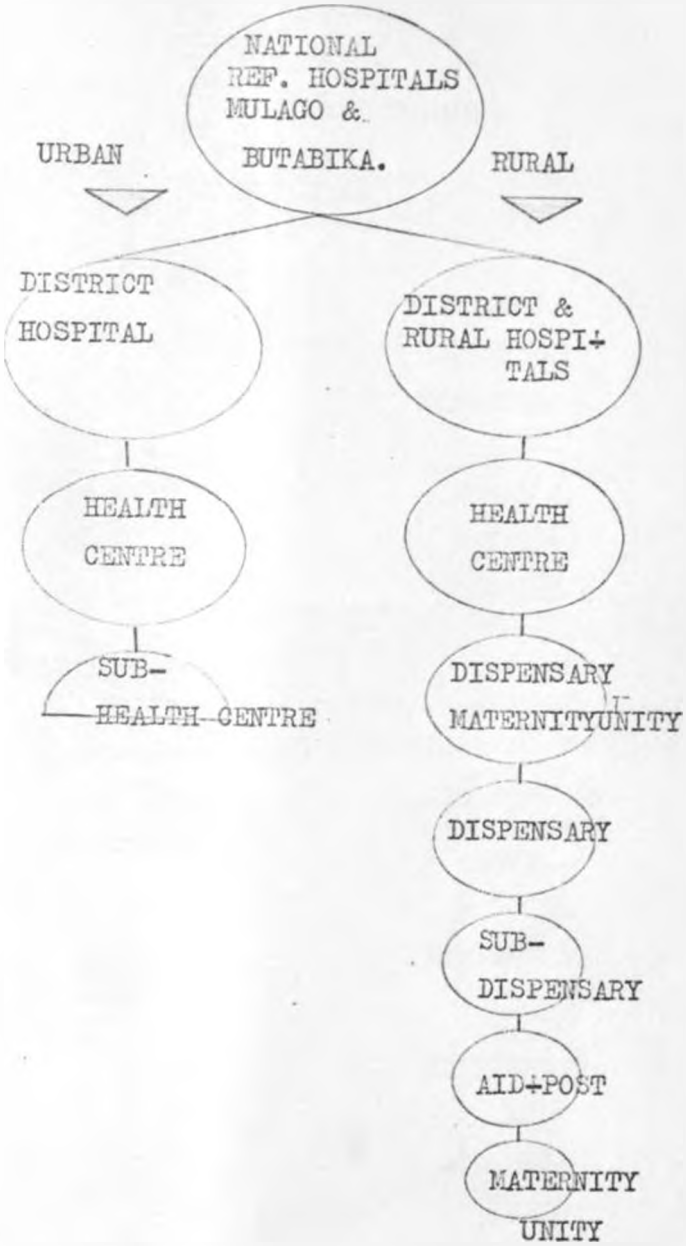
1970, 1st August suppliment of exisiting units.

| REGION | POPULATION ESTIMATE | HOSPITALS | H.C. | D.M.U. | DISP. | S/D. | A.P. | M.U. | TOTAL. |
|---|---|---|---|---|---|---|---|---|---|
| EASTERN | 2 518 103 | 10 | 18 | 12 | 11 | 51 | 37 | 3 | 142 |
| BUGANDA | 2 668 232 | 7 | 9 | 9 | 9 | 21 | 63 | 4 | 122 |
| NORTHERN | 1 919 838 | 8 | 7 | 8 | 35 | 40 | 7 | - | 105 |
| WESTERN | 2 417 303 | 9 | 17 | 18 | 16 | 39 | 56 | - | 155 |
| TOTAL | 9 523 476 | 34 | 51 | 47 | 71 | 151 | 163 | 7 | 524 |

1970, 1st August suppliment of proposed Additional units.

| REGION | POPULATION ESTIMATE | HOSPITALS | H.C. | D.M.U. | DISP. | S/D. | A.P. | M.U. | TOTAL. |
|---|---|---|---|---|---|---|---|---|---|
| EASTERN | 2 518 103 | 2 | 1 | - | - | 5 | - | - | 8 |
| BUGANDA | 2 668 232 | 4 | 4 | 4 | 1 | 18 | - | 3 | 34 |
| NORTHERN | 1 919 838 | 3 | 6 | 6 | - | 28 | 1 | 1 | 45 |
| WESTERN | 2 417 303 | 1 | - | - | 1 | 6 | - | - | 8 |
| TOTAL | 9 523 476 | 10 | 11 | 10 | 2 | 57 | 1 | 4 | 95 |


HOSPITALS
GOVERNMENT
number of beds
existing
planned*
NATIONAL REFERENCE
REGIONAL REFERENCE
DISTRICT
RURAL
VOLUNTARY or PRIVATE
100 200 300 600 1000
number of beds
Moyo
Yumbe
Arua
Kuluva
Nebbi
Angal
Gulu
Locar
Anaka
Kitgum
Kalongo
Labwor
Moroto
Lira
Aber
Atuturi
Apac
Kiryandongo
Masindi
Hoima
Soroti
Amudat
Ngora
Kapchorwa
Mbale
Bududa
Palisa
Namasagali
Kamuli
Busolwe
Tororo
Kagadi
Kiboga
Kahuna
Bundibugyo
Kabarole
Virika
Fort Portal
Mubende
Nakaseke
Kayunga
Bombo
Mulago
Nagalama
Kawolo
Kakira
Jinja
Igangi
Bugiri
Mityana
Rubaga
Kampala
Lugazi
Butabika
Nsambya
Mengo
Gombe
Luzira
Kisubi
Entebbe
Nkozi
Killembe
Nyabirongo
Ibanda
Villa Maria
Masaka
Kitovu
Ishaka
Kitagata
Itezho
Mbarara
Kambuga
Nyakibale
Kisizi
Mutolere
Kabale
LAKE VICTORIA
WEST ACHOLI
EAST ACHOLI
NORTH KARAMOJA
SOUTH KARAMOJA
EAST MENGO
WEST MENGO
MASAKA
TORO
BUNDORO
BUGANDA
LANGO
TESO
MADI
RWANDA


NATIONAL REF. HOSPITALS MULAGO & BUTABIKA.
URBAN
RURAL
DISTRICT HOSPITAL
DISTRICT & RURAL HOSPITALS
HEALTH CENTRE
HEALTH CENTRE
SUB-HEALTH CENTRE
DISPENSARY MATERNITY UNITY
DISPENSARY
SUB-DISPENSARY
AID POST
MATERNITY UNITY

## .03 THE EXISTING NATIONAL HIERARCHY

The nation, at the moment has two reference hospitals: Mulagofor general cases and Butabika for psychiatric cases.

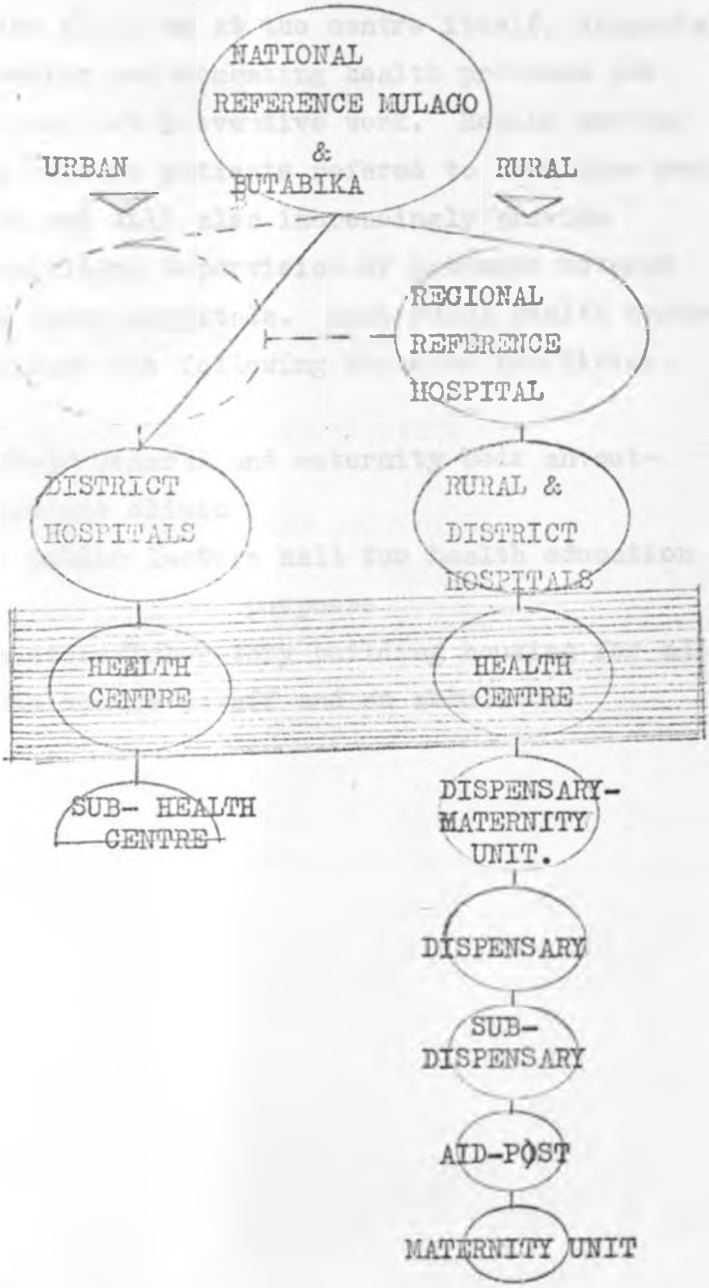
Some districts have hospitals most of which are in urban centres. Distict hospitals include prisons and millitary hospitals.

The status of a health centre is ill-defined today and a lot of confusion hangs over the word. In the next section we shall have the definition clear.

Dispensaries-Maternity units and dispensary which are suitably located will be upgraded in the future, to the status of Health Centre.

Aid-posts and Maternity Units are built in remote places in order to try and make medical facilities available to all.

In urban centres like Kampala, the sub-Health Centre is either temporary or is designed to grow up to the status of a health centre, when need arises.


NATIONAL
REFERENCE MULAGO
&
BUTABIKA
URBAN
RURAL
REGIONAL
REFERENCE
HOSPITAL
DISTRICT
HOSPITALS
RURAL &
DISTRICT
HOSPITALS
HEALTH
CENTRE
HEALTH
CENTRE
SUB- HEALTH
CENTRE
DISPENSARY-
MATERNITY
UNIT.
DISPENSARY
SUB-
DISPENSARY
AID-POST
MATERNITY UNIT

## 2.04 THE PLANNED NATIONAL HIERARCHY

By the end of this decade, a new structure system evolving from the old one, shall have releaved Mulago of the district responsibilities it offers now to Kampala and the surroundings.

The Regional Reference Hospitals planned to be in the urban centres will undertake all reference cases from rural and district hospitals; and will undertake to prepare and deliver all medical supplies required in the respective regions.

The Health centres are planned such that thier location in urban centres will enable them to serve 40000people, while in Rural areas, they will be allocated one to each Gombolola_a total of 614 Gombololas.

Health Centres by definition, will offer in and out-patient medical treatment of an elementary nature, the staff will be expected to work as much

in the field as at the centre itself, diagonizing, detecting and combating health problems and carrying out preventive work. Health centres will recieve patients refered to them from smaller units, and will also increasingly provide domicilliary supervision of patients refered from large hospitals. Each rural health centre will have the following standard facilities.

20--30 General and meternity beds an out-patient clinic
a public lecture hall for health education purposes
a store/laboratory building housing for all the centre'sstaff and an ambulance.

.05 THE NATIONAL BED TARGET.

At the beginning of the second five-year development plan in 1966, there were 12000beds in the country, of which 5200 were in the Government hospitals, the rest in Government and non-government units. This represented population/bed ratio of 714 for each bed. By the end of 1971, if phase 2 of the rural hospitals was completed, the total number of beds ought to have risen to 16400 representing a ratio of 625 people per bed. Facts stand that we have not been able to achive it due to the unexpected rapid growth in population, and to the incompletion of the program

The Government is intending to upgrade rural and urban hospitals and install additional beds; and in only government medical units it is hoped the increasein beds will hit the 3400 mark over the Plan 3 period. This will be an important step towards the perspective target of 500 people per bed by the end of this decade.

2. 05 NATIONAL BED TARGET.

| | |
|---|---|
| BEDS IN GOVERNMENT HOSPITALS ALONE | |
| BEDS IN ALL OTHER MEDICAL UNITS | |
| TOTAL NO OF BED IN THE COUNTRY | |
| NO. OF PEOPLE PER BED. | |

| | 1966 | 1971 | 1980 |
|---|---|---|---|
| | 5 200 | 7 869 | |
| | 6 800 | 8 531 | |
| | 12 000 | 16 400 | |
| | 714 | 625 | 500 |

## 06 RURAL DEVELOPMENT

Phase 2, which started at the beginning of Plan2, and was due for completion in 1971, had 2 hospitals on the construction programme, all of which are now complete, but a good number of them not yet staffed. Those that are staffed are helping a lot in curative and preventive work.

The distribution of hospitals is Geographically unbalanced, however the government is not going to build any more. Government will uphaul some of the existing health centres to the statu of rural hospitals. A rarul hospital has to have 100 beds as its minimum.

Emphasis will be laid on Health Centres and each of the 614 Gombololas is eventually to have one; this means an erection of 72 new ones in those Gombololas which don't have one.

## 2.07 URBAN DEVELOPMENT

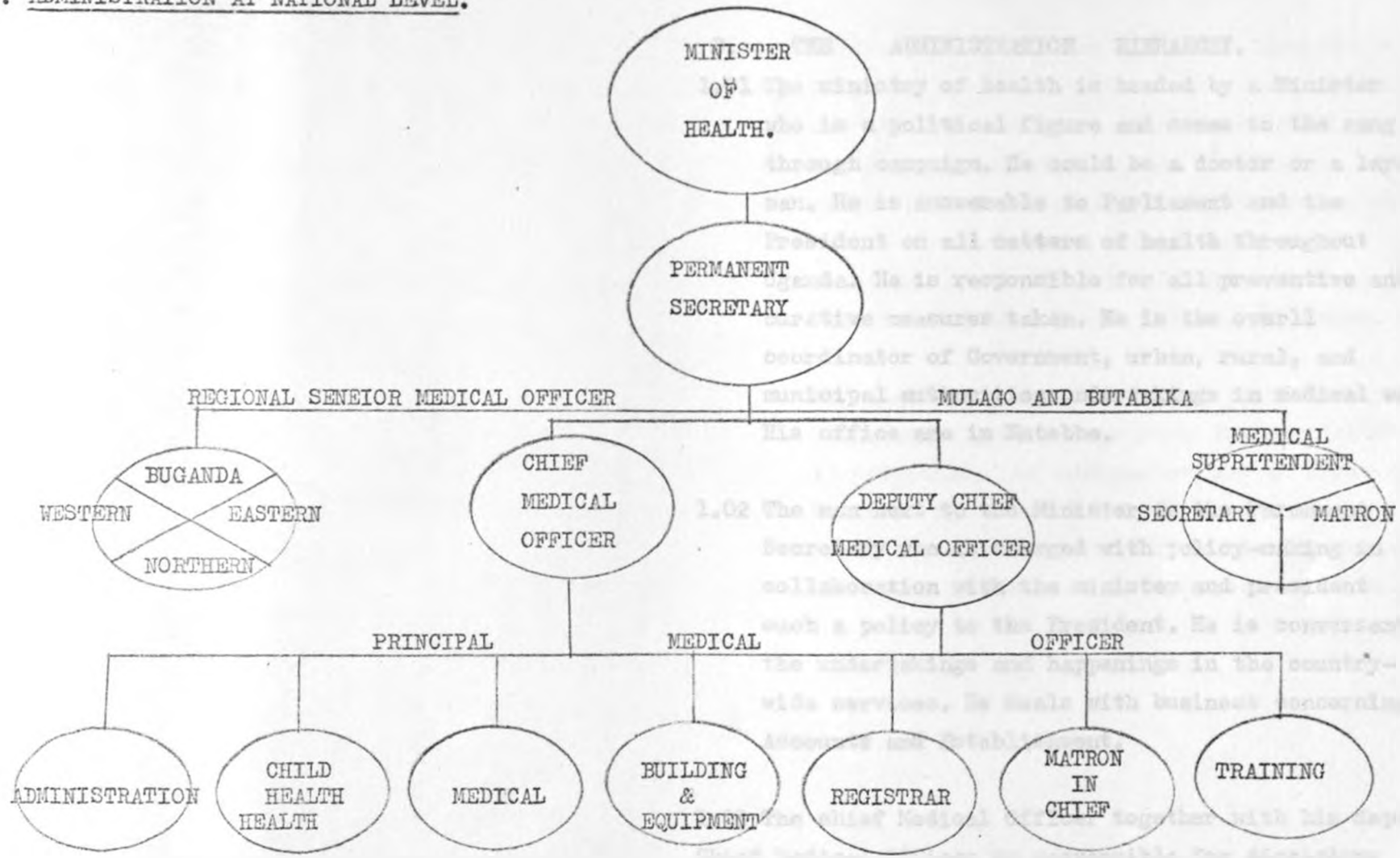
The need to expand and modernise Government hospitals in urban areas has been felt even before Plan 11, and it was a high priority in that Plan. However implementation has always lacked. This has resulted in overcrowding in all Government Hospitals, and a fall in standards expected of the hospitals. The worst hit hospital is Mulago which should be purely a National Reference Hospital, but of all addimissions 90% are from the districts of Kampala, West and East Buganda. The Government is to remedy this during the current plan (see Introductory Brief)

It is further intended to standardise the number of beds, although, a few in thinly populated areas will have 200 or even 100 beds as the situation may warrant.

During Plan three, the Government in Kampala is to build a 600-bed hospital to take over DISTRICT responsibilies from Mulago. Government will initiate a redevelopment programme on Jinja,

Mbale, Gulu, Masaka, Mbarara, and Fort-Portal Hospitals in order to up-grade them to the full-scale Regional Reference hospitals each with 600 beds.

B. ADMINISTRATION AT NATIONAL LEVEL.



B. THE ADMINISTRATION HIERARCHY.

1.01 The ministry of health is headed by a Minister who is a political figure and comes to the rang through campaign. He could be a doctor or a layman. He is answerable to Parliament and the President on all matters of health throughout Uganda. He is responsible for all preventive and curative measures taken. He is the overll coordinator of Government, urban, rural, and municipal authorities undertakings in medical work. His office are in Entebbe.

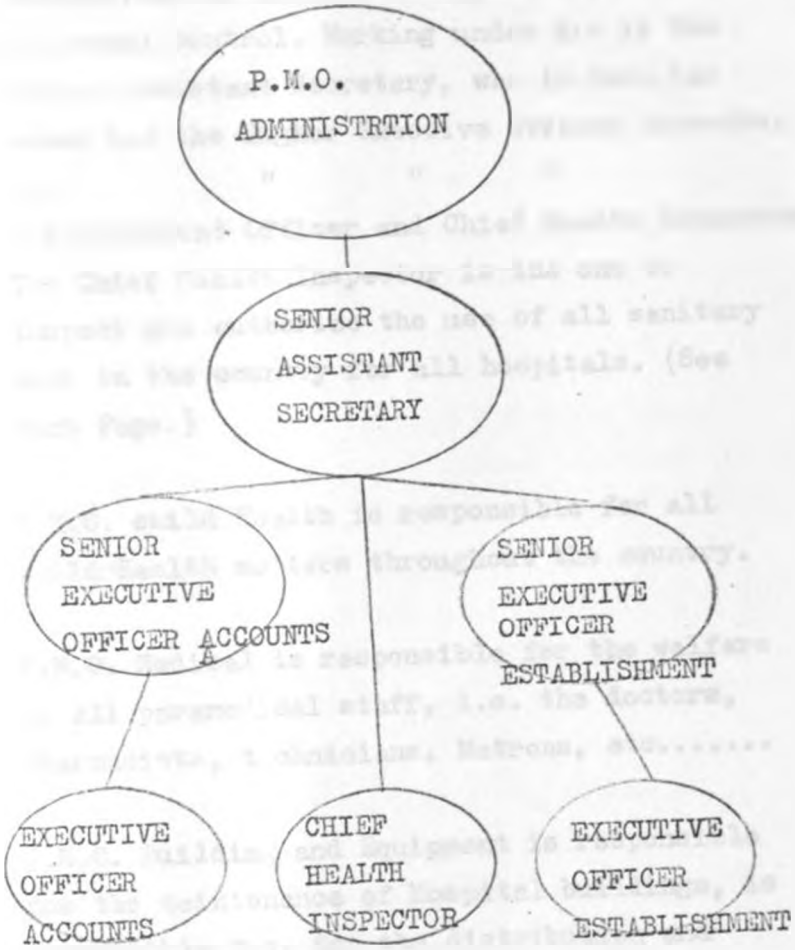
1.02 The man next to the Minister is the Parmanent Secretary who is charged with policy-making in collaboration with the minister and president such a policy to the President. He is conversant with the undertakings and happenings in the country-wide services. He deals with buziness concerning Accounts and Establishment.

1.03 The chief Medical Officer together with his deputy Chief Medical Officer is responsible for discipline deployment, transferance of doctors, and technicians' Complaints, etc... are directed to him.

He handles all circulas and rules from the ministry and ensures their execution, he ensures too that law order are maintained. He has rights to transfer all staff within his Region. He is responsible for training Schools, dispensaries, etc.... in the region except those under municipalities. He may hold other offices like District Officer, Health Officer of a town.

Buganda Region has 13 hospitals, and the headquaters are at Wandegeya; Eastern Region has 13 hospitals, its headquaters are at Mbale while Western region has 2 hospitals with the headquaters at Fort Potal. And lastly Northern has 10 hospitals with the headquaters at Gulu.

PRINCIPAL MEDICAL OFFICER ADMINISTRATION HIERARCHY.




I.04 Below the Chief Medical Officer and his deputy are the following:

Principal Medical Officer Administration,
" " " Child Health,
" " " Medical,
" " " Building and Equipment,
" " " Registration,
" " " Matron in Chief,
" " " Training.

P.M.O. Administration is responsible for all a administration matters of lay staff, accounts and budgetary control. Working under him is the Senior Assistant Secretary, who in turn has under him the Higher Exective Officer Accounts, and " " "
Establishment Officer and Chief Health Inspector The Chief Health Inspector is the one to inspect and authorize the use of all sanitary work in the country for all hospitals. (See Next Page.)

P.M.O. child Health is responsible for all child Health matters throughout the country.

P.M.O. Medical is responsible for the welfare of all paramedical staff, i.e. the doctors, Pharmacists, technicians, Matrons, etc.....

P.M.O. Building and Equipment is responsible for the maintenance of Hospital buildings, is responsible too, for the distribution and delivery of drugs and sandaries - this is done in conjuction with the Chief Pharmacist who

looks after the whole Medical Stores. The P.M.O. Buildings and Equipment deals with all supply of stationary furniture, specialist equipment, etc... These are delivered on IN DENTE.

P.M.O. Registration is responsible for the registration of doctors, technicians, etc .... both of local and expatriate nature.

P.M.O. Metron in Chief has two deputies are in charged with all nursing administration.

P.M.O. Training coordinates all the training both local and overseas.

The above mentioned categories, all have their offices in Entebbe.

1.05 MULAGO AND BUTABIKA HOSPITALS:

These two being National Reference hospitals command a status far above the other hospitals; and the administration of these hospitals by-passes all the afore-detailed system up to the Permanent Secretary, These hospitals, each is headed by a Medical Supritendant with direct access to the Permanent Secretary.
He has the the overall responsibility of running the hospital. He has two team-mates, the Matron and the Secretary.

The Matron handles matters concerning the welfare of Patients, nurses, sisters,
The Secretary on the other hand deals with everything other than medical, like the accounts salaries, general administration, general offices, and transport.

1.06 REGIONAL ADMINISTRATION.

Each of the four Regionals of Uganda, has a Senior Medical Officer the who looks after the Administration of the Region. He also can by-pass the general ministry structure system and have direct access to the Permanent Secretary.

## MANPOWER REQUIREMENTS.

It is estimated that at present there is about one doctor for 16 000 people in Uganda compared with the ratios in "developed" countries of one doctor to every 1 000 people or less, the situation in this country is alarming. Yet in rural areas, there is one doctor to as many as 24 000 people.

The shortages in health staff has generally been due to failure in attaining training targets in the past Plans.

The volume and quality of services provided by the health infrastructure has been greatly impaired by the staff shortage.

Therefore it is now necessary to recruit expartriate staff in order to cover up the everwidening gap between demand and supply of qualified medical staff.

The table on the next page relates Government

and Missionary training requirements; the forecast requirements in 1976 are based on an assessment of the staff needs of different types of health services and units, full account being taken of the planned expansion in Government health services. However the expansion requirements in Missionary health services were not considered as it is not intended to expand on them, and generally missionary high grade manpower is coming from abroad.

A. DOCTORS, SPECIALISTS, AND SURGEONS.

Makerere University Medical School will continue to be the main source of Ugandan doctors, specialists and surgeons. The output has in the past been about 30 annually, but it is hoped this will be gradually augmented to 70 annually. About 20 Ugandans are expected to graduate outside Makerere.
Specialists skills are to be distributed equitably to all hospitals in the country while specialist training will be expanded at Mulago. Training that is not available at Makerere, like that for dental surgeons, is not to be introduced until after 1976.

B. MEDICAL ASSISTANTS.

Two Medical Assistants Training Schools are at Mbale and Fort-Portal. During the current Development Plan, both schools will be expanded to permit enrollments at each of them to increase from 90 to 150.

C. NURSES AND MIDWIVES.

The lower level of trained nurses and midwives in Uganda comprises the enrolled nurses and midwives. These train locally in government establishments at Jinja, Masaka, Gulu, Lira and Mbarara. The expected expansion in these school will bring the total output at 360 annually. At Arua, Soroti and Kabale, in 1974, there will be opened similar schools, and this will bring the total to 216 nurses and 216 midwives. The training of enrolled nurses at Mulago will thence cease.

In the church mission schools, altogether about 60 nurses and 85 midwives ripen every year, and towards the end of plan 3 this situation will increase by about 20.

The upper level is that of Registered nurses. Most of these are foreign trained, a few are trained at Mulago. A second school is hoped to be set up somewhere in the country to compliment the Mulago School.

The Government is to embark on a limited programme of sponsoring registered nurses for higher training at the University level. Such university-trained nurses will help in training posts and senior administrative posts.

D. PUBLIC HEALTH STAFF.

There is no comprehensive programme in the country catering for the training of health visitors, assistant health visitors, health inspectors and assistant health inspectors. There are only two schools (at Entebbe and Mbarara) for assistant health visitors with a total output of 40 graduates annually. New schools be set up at Kampala, Arua, Jinja, and Gulu; and the output will then rise up to 100 as from 1973.

E. ANCILLARY AND SUPPORTING TECHINICAL STAFF.

The training of Engineers of various types, and pharmacists will continue to be done outside the country over the whole period of Plan 3.

Medical social workers, Psychiatric social

workers and entomologists are trained at Makerere and this source is estimated to be adequate for the needs of the health services in all these fields.

Techinical and clinical supporting staff like laboratory technicians, physiotherapists, anaesthetic assistants, occupational therapists, are at the moment in a severe shortage.

Some training is offered at Mulago at present, but to try to overcome a number of short-comings, a new Medical Technical Training Centre is to be set up at Mulago with a total enrollment of 250 trainee dispensers, radiographers, anaesthetic assistants, dental technicians, physiotherapists, occupational therapists, orthopaedic assistants and laboratory technicians Meanwhile entomological field workers training school is to be established at Mbale.

F. TUTOR TRAINING.

In order to alleviate the shortage of tutors for all medical training institutions in the country ,it is planned to set up a Joint Health Tutor Training College during the Plan 3 period,

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TUTOR TRAINING.

In order to alleviate the shortage of tutors for all medical training institutions in the country ,it is planned to set up a Joint Health Tutor Training College during the Plan 3 period,

somewhere in Kampala within easy reach of Mulago, Butabika and Makerere.

It will have an enrollment of 30 trainees preparing to become enrolled nurse/midwifery tutors, registered nurse/midwifery tutors, public health nursing tutors, psychiatric nurse tutors, medical assistant tutors and health inspector/assistant tutors. Other forms of tutor training will be introduced gradually.

# 3

KAMPALA STRUCTURE PLAN.

A. POPULATION FACTORS:

The first attempt to make an estimate of the total future urban population in the Kampala-area was made by the Kampala Mengo Regional Planning Missions in 1966. The results of the mission's work on population are contained in Kampala-Mengo Regional Planning Study No.1- "Population Growth" This estmante attempted to relate the growth of Kampala to its regional, national and world setting, and did not simply project the past trends of the city area itself into the future.

Special attention was paid to the worldwide process of urbanisation, for a great and greater propotion of the total population to be living in urban areas. In 1967, in this country, only 7% of the populace were living in urban area- very low propotion if compared with the 70% or more of some "developed" countries. Therefore the rate of growth of Kampala will greatly be influenced by the migration from rural areas, and not just by

the rate of natural increase of exsting population of the city.

The mission came to a conclusion by making a "low" estimate and a "high" estimate, anticipating that the actual growth would fall somewhere between these extremes since the uncertainities are so great. Its 'low' estimate was for a population of 360000 by 1980 and 1000000by 2000. Its high estimate was for a population of 450000 and 1600000 by 1980 and 2000 respectively.

The third U.N. Mission adopted a different method of estimating the future population of Kampala. First of all it estimated the number of jobs which were likely to be created in Kampala area assuming certain rates of growth for the various parts of the city's economy. Then it defined an acceptable ratio of employed population to total population. This was assumed to decline from 31 workers per 100 population in 1968 to 28 per 100 in the year 2000 . On this basis the 1980 population was estimated to be 485 000 and the year 2000 population to be 1065 000.

The mission estimate pre-supposes a desirable situation if there was to be balanced growth of

population and employment in Kampala otherwise, if the levels are exceeded then there would be growing unemployment and underemployment.

The Town Planning Depertment, while accepting the third U.N mission's assumption of balanced population and employment, varied the base population from 270 000 to 300 000 for the year 1968. It then assumed the Mission's assumed rates of growth and calclated that the 1980 urban population would be 540 000. And for 2000, it would be 1600 000. And it is on these estimates that major land allocations in the structure plan are being based.

B. Effect of the 1969 census:

When the provisional results of the 1969 census were pablished in late 1969, it was discovered that the population of Kampala was considerably larger than had previously been assumed.
In constrast to the U.N. estimate of 270 000 for 1968, it was found that the 1969 population was 330 000 for the original Kampala.
Therefore the population had grown by 7.7% between 1959 and 1969.
If this rate were to continue until the end of

the century, the population would rise to 3,200 000 in year 2000.

This suggests that even if the high growth

rate of 7.7% is not maintained, the highest population figures for 1969 means that the population levels as calculated in the privious estimates are likely to be attained ealier than

previously thought; for example the population figures of 540 000 and 1600 000 on which most of the structure Plan (by Town Planing department) calculations have been based are likely to be achieved not by 1980's and 2000 respectively, but by late 1970's and the late 1980's or early 1990's. The planning depertiment is therefore making it clear that it is becoming now much more uncertain exctly when these levels will be reached earlier than previously thought.

The higher population level and growth rate revealed by the 1969 census also calls into question the validity of planning for a population level which is based on the assumption that population will increase only at a rate in balance with

increases in employment. Already this assumption seems to be in jeopardy, but once again the Structure Plan takes the attitude that it is better to plan its form now rather than prejudice the planned growth with a further period of indecision during which there would be no adequate basis for controlling development.

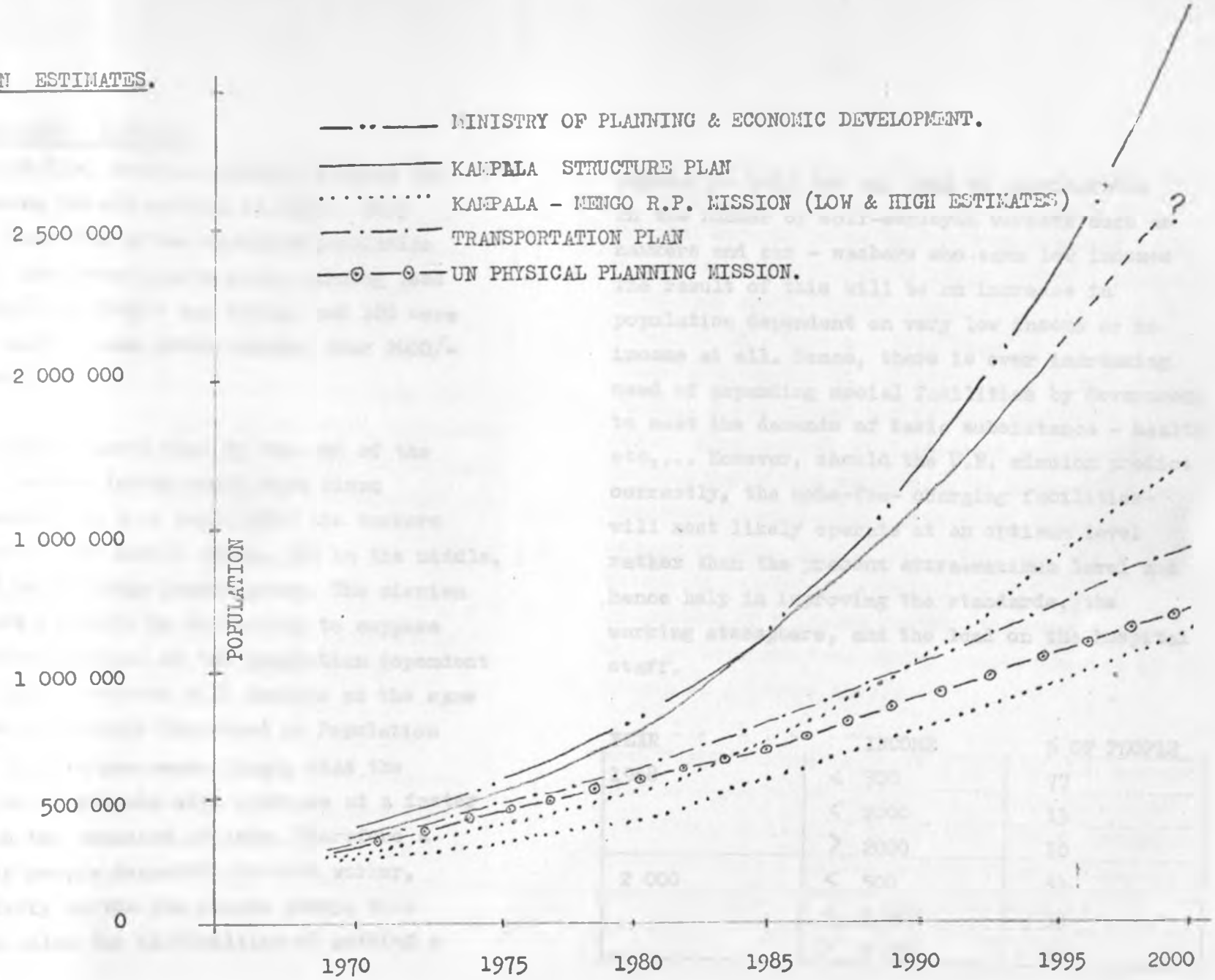
The structure plan endorses the proposals in Uganda's development plan where the Government will endeavour to ensure that in every area of the country there is a mix of economic activities which more or less comforms to the natural and other attributes of the citizens resident in that area to enjoy an increasing standard of life comparable to that enjoyed in any other area of the country; therefore, in time, there should emerge some pattern of regional social services and economic activities to employ and foster regional balance. This will help reduce the rate of immigration into Kampala. People will certainly not stop, but the number may reduce to a sufficiently better balance of population and emplyment in the city.

POPULATION ESTIMATES:

| SOURCE | |
|---|---|
| KAMPALA + MENGO REGIONAL PLANNING MISSION: | LOW<br>HIGH |
| U.N. PHYSICAL PLANNING MISSION | |
| MINISTRY OF PLANNING & ECONOMIC DEVELOPMENT | |
| KAMPALA STRUCTURE PLAN | |

| SHORT RANGE | | LONG RANGE | |
|---|---|---|---|
| DATE | POPULATION | DATE | POPULATION |
| 1980 | 360 000 | 2 000 | 1 000 000 |
| 1980 | 450 000 | 2 000 | 1 600 000 |
| 1980 | 485 000 | 2 000 | 1 065 000 |
| 1980 | 750 000 | 2 000 | 3 200 000 |
| LATE 1970's | 540 000 | LATE 1980's/ EARLY 1990's | 1 600 000 |

POPULATION ESTIMATES.



INCOME-LEVEL FACTORS:

The third U.N. Mission produced figures for the income levels existing in 1968. They showed that 77% of the employed population fell in the lower income group earning less than 500/- to 2000/- per month, and 10% were in the high income group earning over 2000/- per month.

The mission assumed that by the end of the century income levels would have risen considerably so that only 53% of the workers would be in low income group, 33% in the middle, and 14% in the high income group. The mission adds that it would be misleading to suppose that the proportion of the population dependent on low income workers will decline at the same rate. As previously discussed in Population Factors ( A ) it now seems likely that the population of Kampala will increase at a faster rate than the creation of jobs. Therefore a number of people dependent on each worker, particularly in the low income group, will increase. Also the difficulties of getting a

regular y- paid job may lead to considerable in the number of self-employed workers such as hawkers and car - washers who earn low incomes The result of this will be an increase in population dependent on very low income or no income at all. Hence, there is ever increasing need of expanding social facilities by Government to meet the demands of basic subsistance - health etc,... However, should the U.N. mission predict correctly, the none-fee- charging facilities- will most likely operate at an optimum level rather than the present extra-maximum level and hence help in improving the standards, the working atmosphere, and the load on the hospital staff.

| YEAR | INCOME | % OF PEOPLE |
|---|---|---|
| 1968 | < 500 | 77 |
| | < 2000 | 13 |
| | > 2000 | 10 |
| 2 000 | < 500 | 53 |
| | < 2 000 | 33 |
| | > 2 000 | 14 |

## HEALTH INFRASTRUCTURE

### INTRODUCTION:

Attention has so far been concetrated on three of the most important social facilities, namely health facilities, education and open space facilities.

Research work should be under-taken in order to determine the requirements for churches, community halls, etc... otherwise sites for such facilities, in the meantime, are allocated in response to individual demands.

### HEALTH FACILITIES:

The standards for health facilities proposed in the structure plan are mainly based on the findings of a symposium held at Makerere in 1966 under the auspices of W.H.O. and U.N.I.C.E.F. (of Medical Care in Developing Countries, edited by M. King) but with a number of modifications to suit the particular conditions of Kampala. These modifications were made after surveys at Naguru and Kiswa Health Centres.

The structure Plan sympathetically reflects the Developement Plan set up. The basic unit for medical care is to be Health Centre backed up by specialised facilities at large referral hospitals with each centre catering for a populance of about 40 000. This has been found to be a reasonable number of patients for a staff of one doctor, a sister and two medical assistants to treat. Such centres will provided a range of medical facilities consisting of general curative treatment, immunisation ante-natal care, 25 maternity beds, health education, and child care. Everybody in Kampala should live within 2.5 Kilometres of a Health Centre, otherwise people will be deterred from making visits because of the length of journeys involved.

Each Health Centre requires a site of 1.6 hectares used as shown below in table 3. The existing medical facilities in Kampala do not meet these standards There are only 4 Health Centres (Kiswa, Kisenyi, Naguru and Kampala Dispensary) to serve a population of 350 000. None of the centres has the complete range of proposed facilities, and one the Kampala Dispensary, is only a temporary centre.

There are also six main hospitals (Mulago, Butabika, Mengo, Rubaga Nsambya and Luzira) Mulago at present serves as the main referral hospital but it sure is already too small to cope up with the demands of the greatly enlarged population of Kampala. Butabika caters for specialized psychiatric cases, and Luzira serves only the prison population. The missionary hospitals of Nsambya, Rubaga and Mengo provide an important supplement to the government run services, They will doubtlessly continue to expand in the future, but the main responsibility for future provision will be with the government The private doctors and small clinics of Kampala similarly ease the strain on state facilities, but they cannot be expected to provide the basis for a comprehensive system of medical care.

Therefore to cater for the expected population of 540 000 by the mid 1970's in Expanded Kampala stage II, 13.5 Health Centres are needed to obtain a ratio of one centre per 40 000 people. 3 of the Existing Centres can be expanded while the temporary one should be closed. Thus 10.5 comletely new centres will be needed. The map 11 shows the

general areas where these new centres should be located. To cater for a faster rate of population growth, which could give a 1980 population of 800 000, a total of 20 centres would be needed and the general location of the additional centre is also shown on map11. Later, as Kampala expands into the Eastern Zone of stage 111, additional Health Centres must be provided on a similar basis.

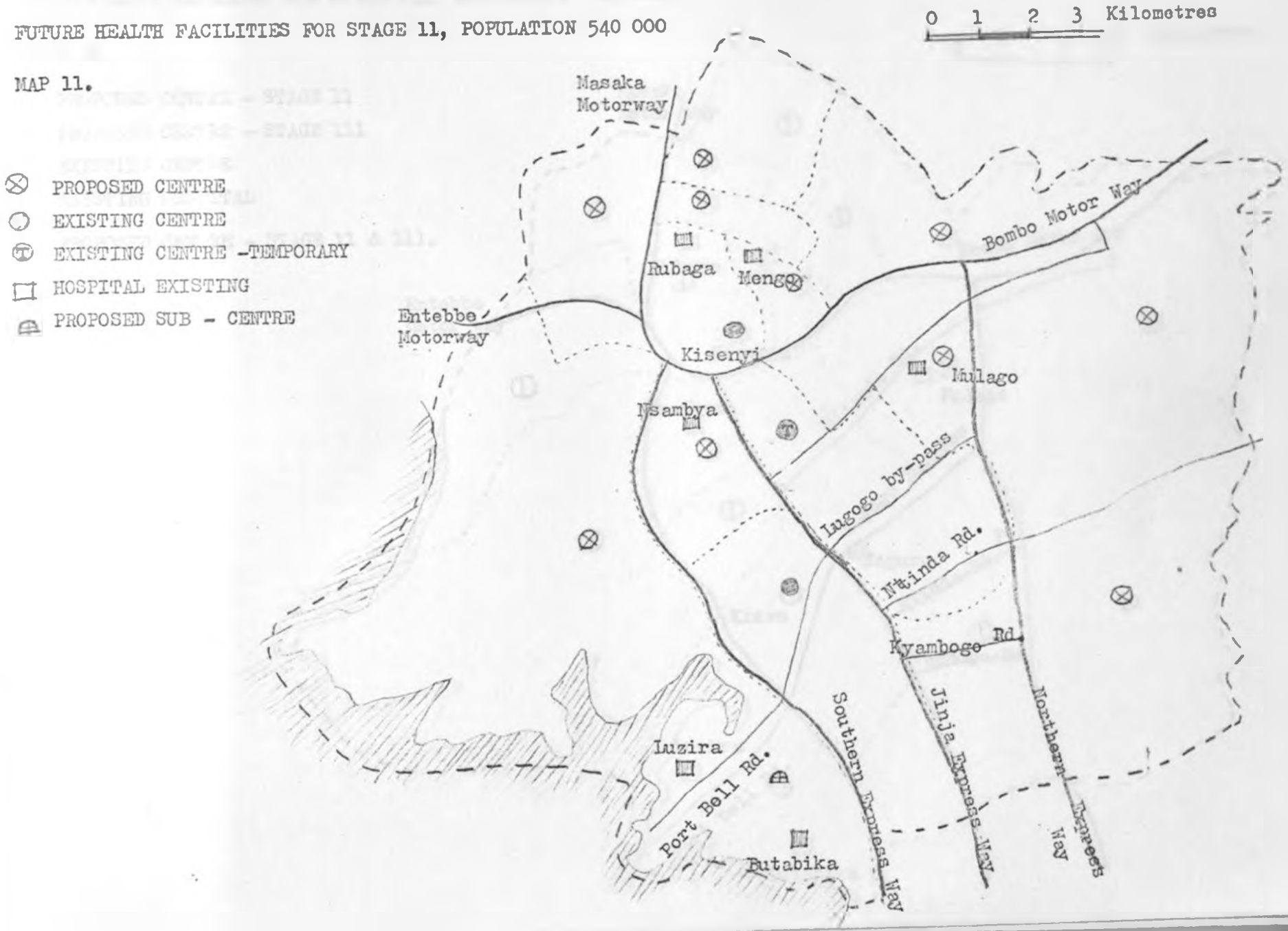
In addition to the Health Centres, a new referral hospital will be required for Kampala within the next 10years. A site of 12 hectares is needed for this purpose, and selection of a precise site is at present under considaration.

TABLE 3. SITE REQUIREMENTS FOR HEALTH CENTRES.

| USE | AREA(Hectares) |
|---|---|
| Health centre building including maternity unit with outside W.C.S, Protein shop, Parking. | 0.8 |
| Housing | 0.4 |
| Reserve for future extensions | 0.4 |
| Total | 1.6 |

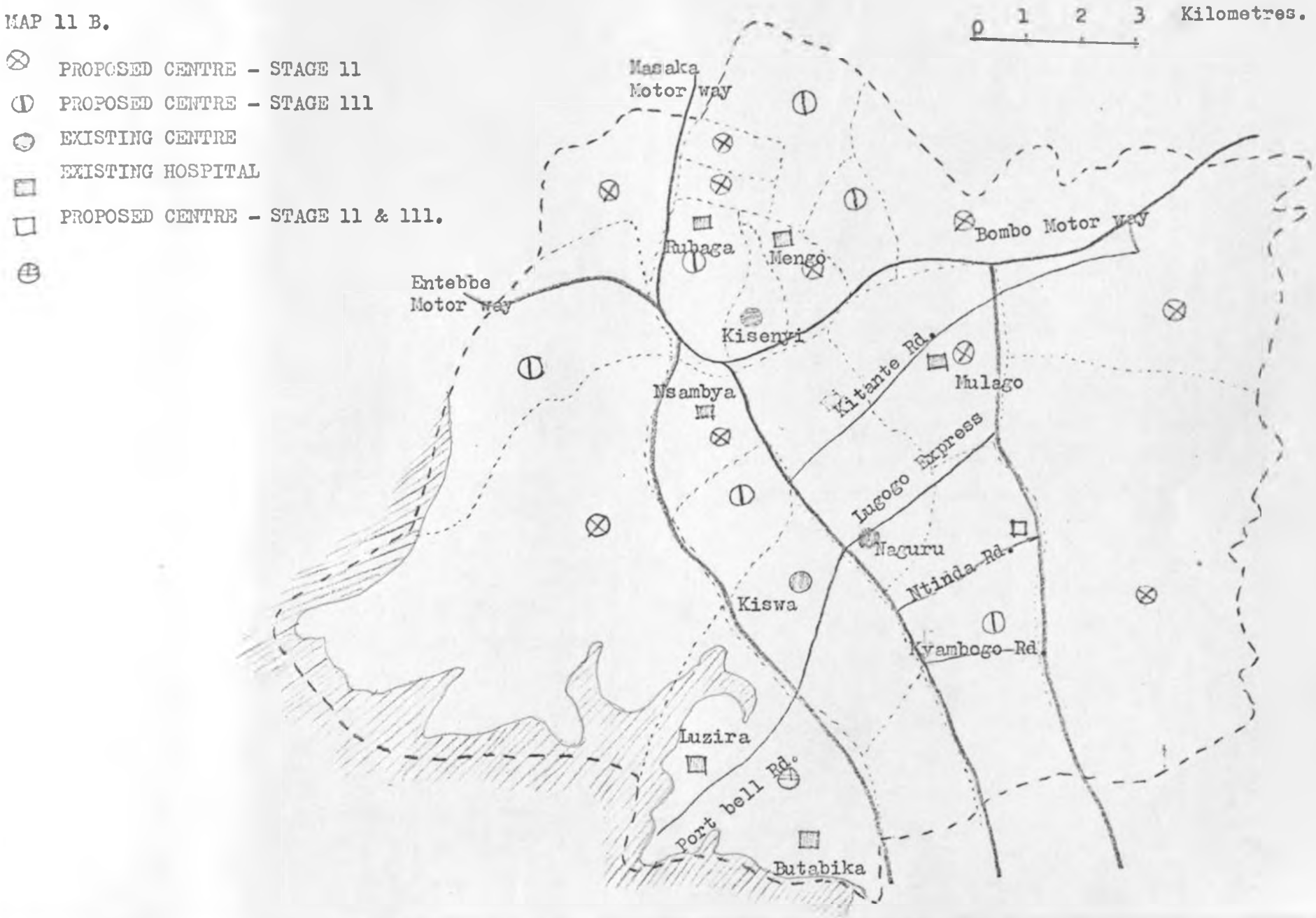
FUTURE HEALTH FACILITIES FOR STAGE 11, POPULATION 540 000

MAP 11.



FUTURE HEALTH FACILITES FOR STAGE 111, POPULATION 800 000

MAP 11 B.



# 4

MENGO HOSPITAL APPRAISAL

EARLY HISTORY.

The first contact between Uganda and the Western World was made in 1862 when Speke visited Kabaka (king) Mutesa on his way to be the first European to reach the source of the Nile. Other Explorers followed.

In 1897 a young British doctor A.R. Cook accompanied by a nursing sister, Miss Katherine, who letter became his wife, travelled from Mombasa to Namirembe almost entirely on foot (a journey of 1 120 km) settled here to undertake Medical work. There were only three Government doctors in the whole of Uganda Protectorate, which included a large part of what is now Kenya.

The first Mengo hospital (so named after the Kabaka's Palance at Mengo) was built just below Namirembe Cathedral, it consisted of two houses with reed walls and thatched roofs and was opened on May 14th, 1897.

In 1900 the hospital was rebuilt on an enlarged

scale still with mud and wattle walls and thatched roof. It had 50 beds and Cook described it as the finest building at the time in the Protectorate. Unfortnately it was struck by lightning 2½ years later in 1902 November, and burnt down. It was rebuilt this time in sun-dried bricks and re-opened in November 1904; it is still in use today as the main hospital block.

In the following years the hospital work developed steadily, interspersed with long safaris by the doctors. Wards were built for Europeans and Asian patients and the first x-ray apparatus in the country was set up in 1910. Mengo was a Base Hospital from 1914 to 1916 during the East African Campaign.

In 1917 a training course for medical assistants began, and continued for several years, foreshadowing the much more complete scheme for medical training begun by the Protectorate Government in 1924.

Training of midwives began in 1919 and of nurses in 1930; both these types of training continue

at Mengo today.

The training program helped, by 1929 to have 22 Maternity and Child Welfare Centres all being run by Mengo trained staff. All these Centres were in rural areas. Over the years some were taken over by the Government or closed for economy reasons, so that today, only three rural centres are still actively in operation, under the Mengo Hospital Administration.

Dr. (later Sir) A.R. Cook retired in 1934 after 37 years of Service to the hospital.

During the next twenty years the standard of training continued to improve and several parts of the hospital were rebuilt.
Physiotherapy work was begun with special emphasis first on Polio patients, and later on to those with cerebral palsy (spastic paralysis)

In 1958 the hospital was handed over by the Church Missionary Society to an independet Board of Governors on which the church, the

Government and the C.M.S. were represented, together with representatives of business and the University College. The Hospital thus became a self-supporting institution, being an integral part of life and witness of the Church of Uganda.

SENIOR ADMINISTRATION

The Mengo Hospital has a constitition under which the administration hierarchy operates. At the top is the Board of Governors which consists of

a) 3 Church-of-Uganda members

b) 1 C.M.S. member

c) 5 M.O.H. members (Appointed consultation with the Archibishop)

d) 1 Nominee by the Archibishop

e) 1 Nominee by the Provincial Medical Board.

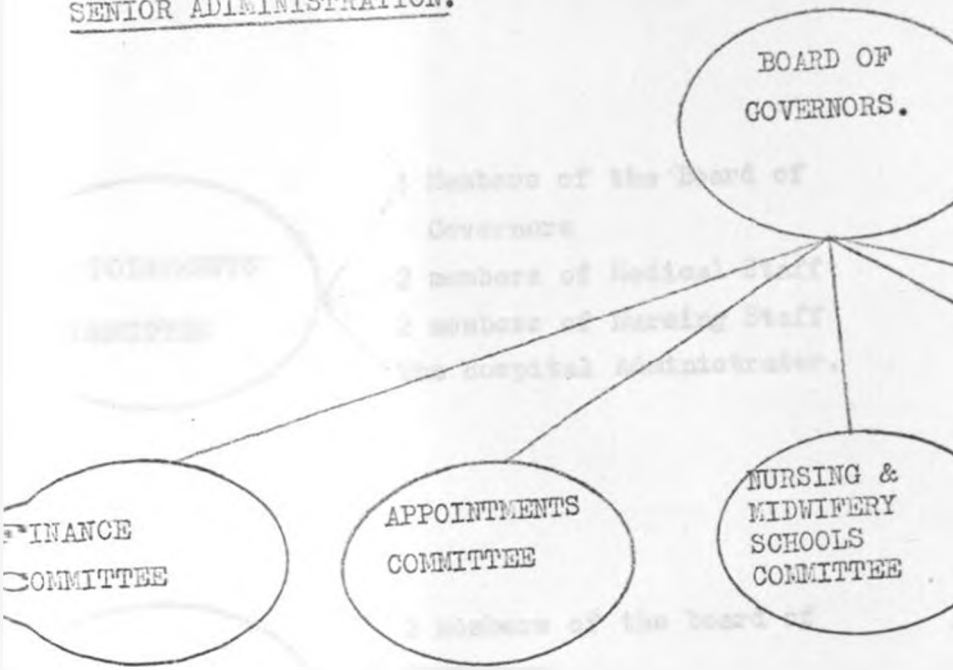
f) The Provincial Secretary -- Ex Officio

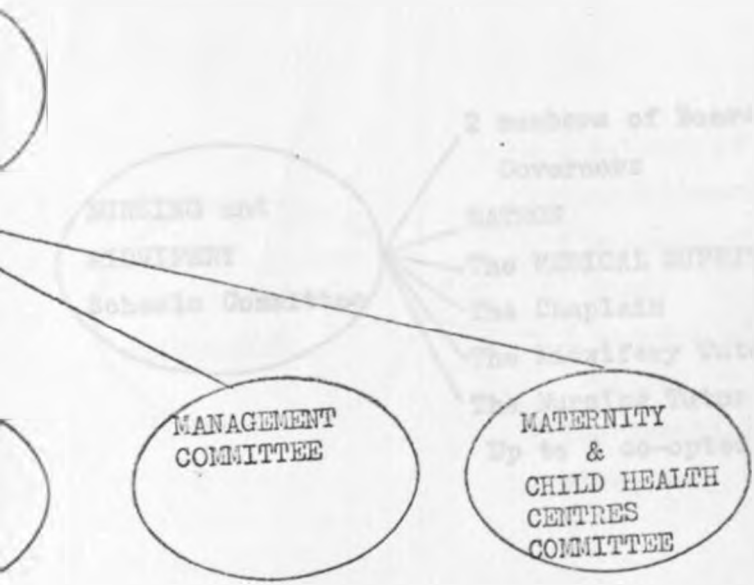
g) 3 members co-opted by Members of the Board.

Under the Board of Governors come the committees which include a number of governors in each of them.

Under the committees comes the Hospital Management which is responsible for the day-to-day running of the hospital.

SENIOR ADIMINISTRATION.




MANAGEMENT
COMMITTEE
MATERNITY
&
CHILD HEALTH
CENTRES
COMMITTEE

APPOINTMENTS COMMITTEE

- 4 Members of the Board of Governors
- 2 members of Medical Staff
- 2 members of Nursing Staff
- The Hospital Administrator.

MANAGEMENT COMMITTEE

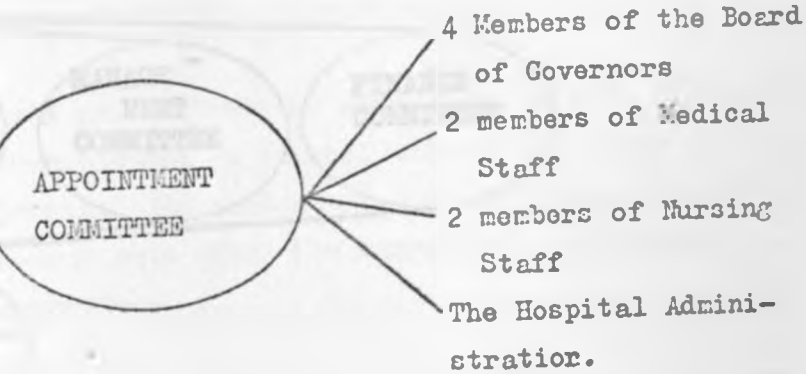
- 2 members of the board of Governors
- The Medical Supritendent
- The Metron
- The Hospital Administrator
- The Chaplain
- 4 members Co-opted from other Senior Hospital Staff.

NURSING and MIDWIFERY Schools Committee

- 2 members of Board of Governors
- MATRON
- The MEDICAL SUPRITENDENT
- The Chaplain
- The Midwifery Tutor
- The Nursing Tutor
- Up to 4 co-opted Members.

MATERNITY and CHIL HEALTH CENTRES COMMITTEE

- 8 members by Board, 2 of whom are Governors
- Metron, Chaptain, Hospital
- Manager of Mengo Hospital.
- Doctor-in-charge of Maternity
- Centres-Appoint by Med. Supri.
- Nursing Sisters for M.C.H. units -Appoint by Metron.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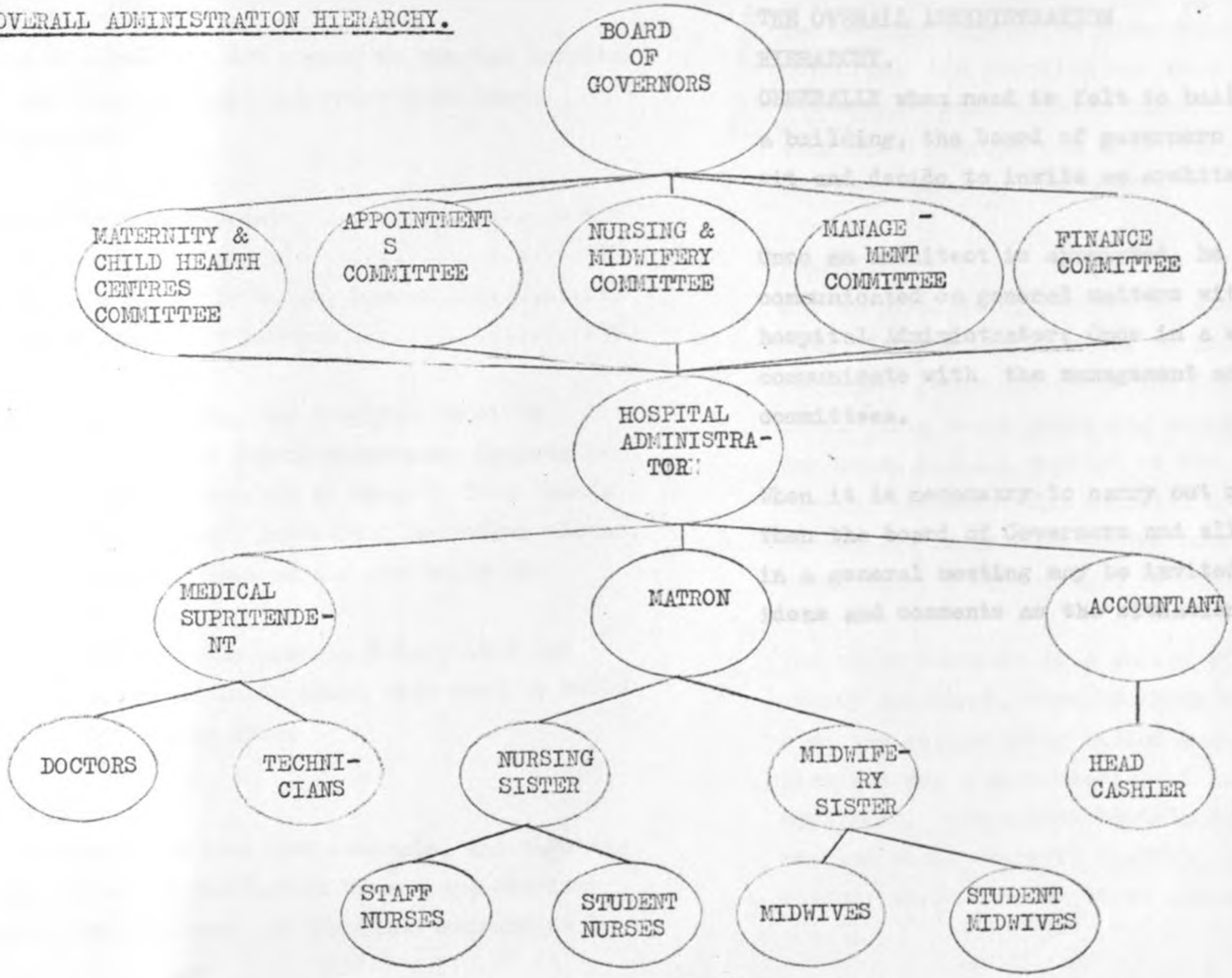
2 members of Medical Staff
2 members of Nursing Staff
The Hospital Administration.

THE OVERALL ADMINISTRATION HIERARCHY.



FINANCE

It costs about £75,000 a year to run the hospital and the money is received roughly in these proportions:

Uganda Government Grants .....41%
Contributions by patients .....41%
Grant and support by C.M.S. London .....11%
Donations and other income .....7%

From outside Uganda, the hospital receives donations also from Church Missionary Society in London and the "Friends of Mengo", from Canada, U.S.A., West Germany, Australia, and other places, particularly for some of the new buildings.

With the Country, the Kampala Rotary club has recently provided funds which were used to build the Cerebral Palsy Unit.

TRAINING

The hospital has over 120 students, who take the examinations of the Uganda Bureau and Midwives council for a diploma of Enrolled training in

THE OVERALL ADMINISTRATION
HIERARCHY.

GENERALLY when need is felt to build or renovate a building, the board of governors and the committee sit and decide to invite an architect.

Once an architect is appointed, he will officially communicated on general matters with the hospital Administrator; Once in a while he will communicate with the management and finance committees.

When it is necessary to carry out major policies, then the board of Governors and all the committees in a general meeting may be invited to contribute ideas and comments as the situation may warrant.

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extended to mothers who come to the hospital for evening classes in Mothercraft and feeding methords. The hospital operates a clinical in the neighbouring slum of Kisenyi where mothers stay for 24 hours, and later they are visited in thier homes by the staff.

PLANNING

The hospital being Missionary was set up more than 70 years ago in order to help people recognise Jesus Christ as the Savior and the Lord. This meant providing nurses and midwives and other medical workers in the prevention and cure of disease. The hospital now caters for almost 200 impatients (under no-flooding conditions, number should be 140).

The whole hospital is a series of old single storey buildings, some of which have seen portion s of themselves being pulled down for reorganiza tion and now - accomodation of improved equipment. The nurses hostels are the only new and multi-storeyed blocks in the hospital campus; these rise to three storeys.

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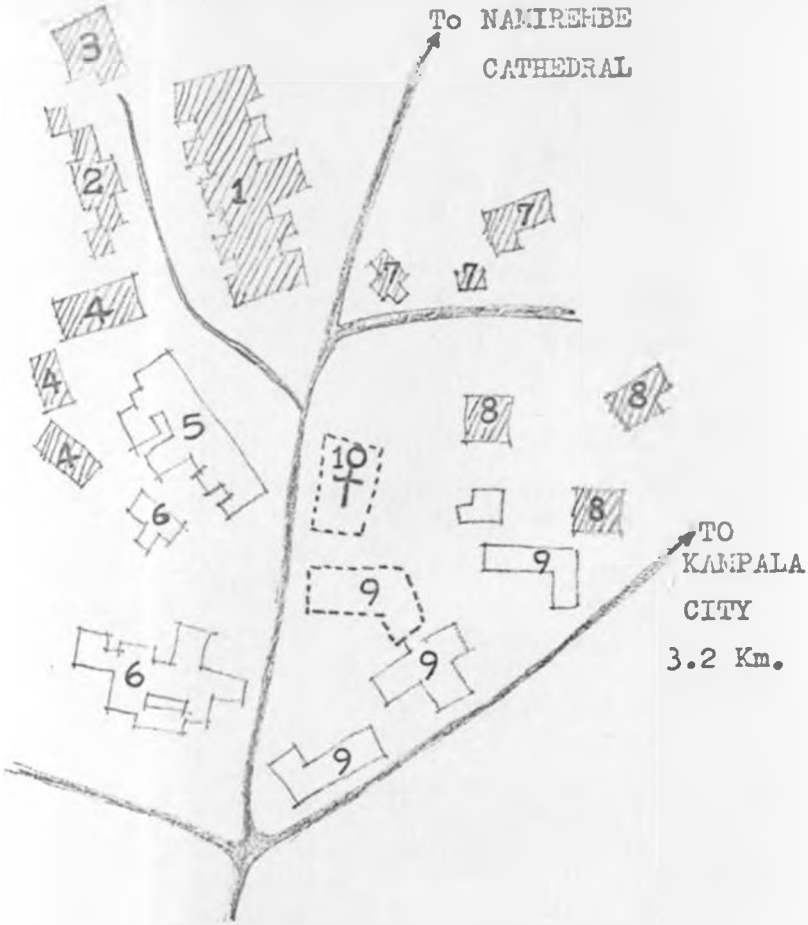
MENGO HOSPITAL



KEY

very old buildings

new buildings

Proposed buildings

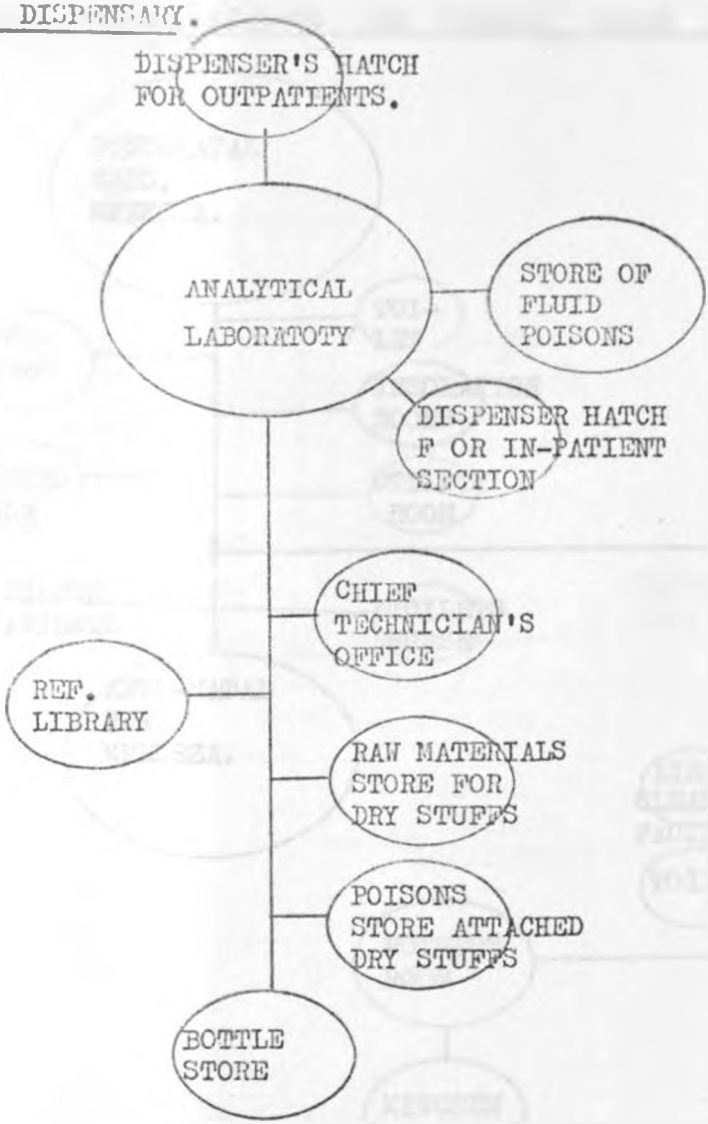
1 MAIN HOSPITAL BLOCK (COOK WARDS)
2 ANNE!WALKER WARDS (MEDICAL NURSING)
3 MAINTENANCE SHOPS.
4 NASOLO & CATHERINE WARDS(NURSING)
5 MPEREZA WARD ( ANTE & POST - NATAL WARDS)
6 O.P.D + DISPENSARY
7 KITCHEN & STORES
8 EDUCATION BLOCKS
9 NURSES'/MATRON'S QUARTERS
10 CHAPEL

A new three - storey mordern hospital block is beibg proposed in the place of blocks 1, 2, 3, & 4.
It will house all maternity units, children's wards, all surgical and nursing units.

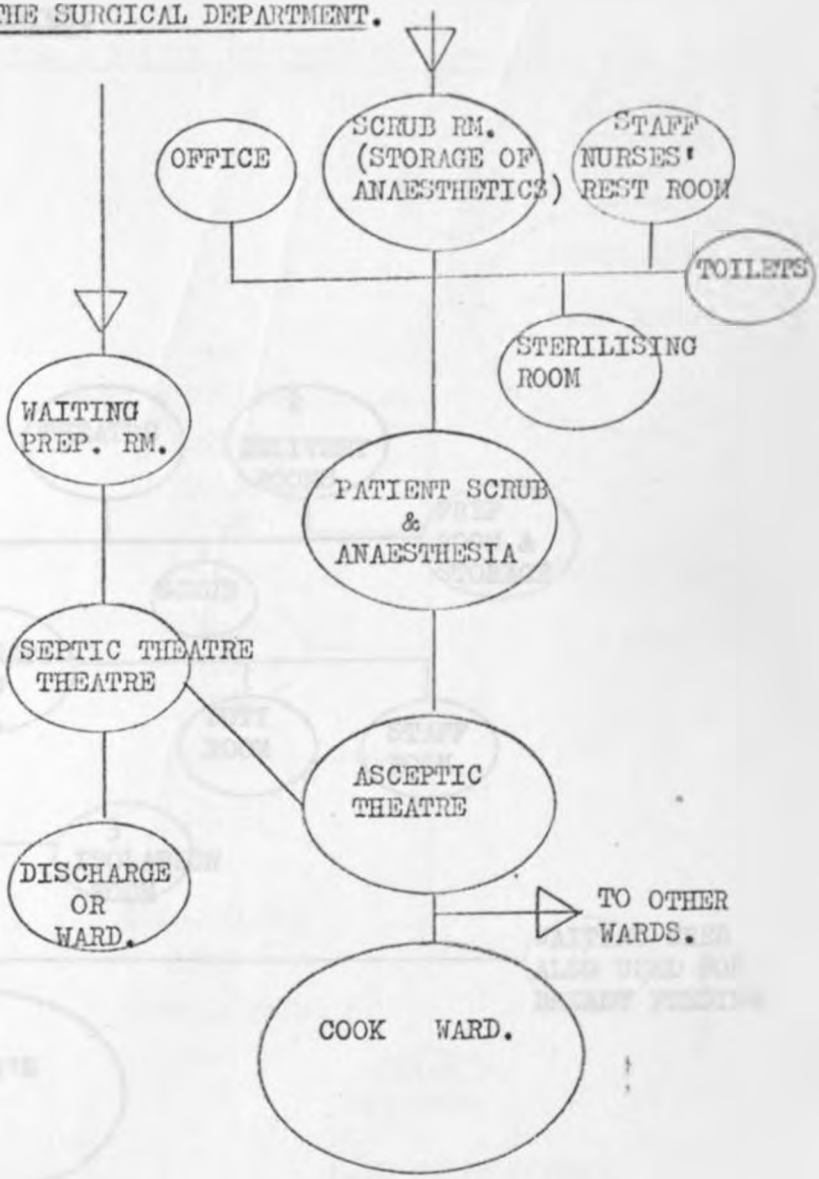
TECHNICAL DETAILS ANALYSIS.

A systemic study of all departments of the hospital has been carried out, and here below it follows. Slide photograph were taken during the survey, and a show is possible on prior arrangment. The method used during the survey of Mengo hospital was generally intended to note down technical points in the general performance of hospital activities. The method however, requires more than one hand in order to exploit it fully, and this is especially true in the case of large hospitals. The method should be revalued and revised in accordance with the complexity of the hospital to be surveyed.

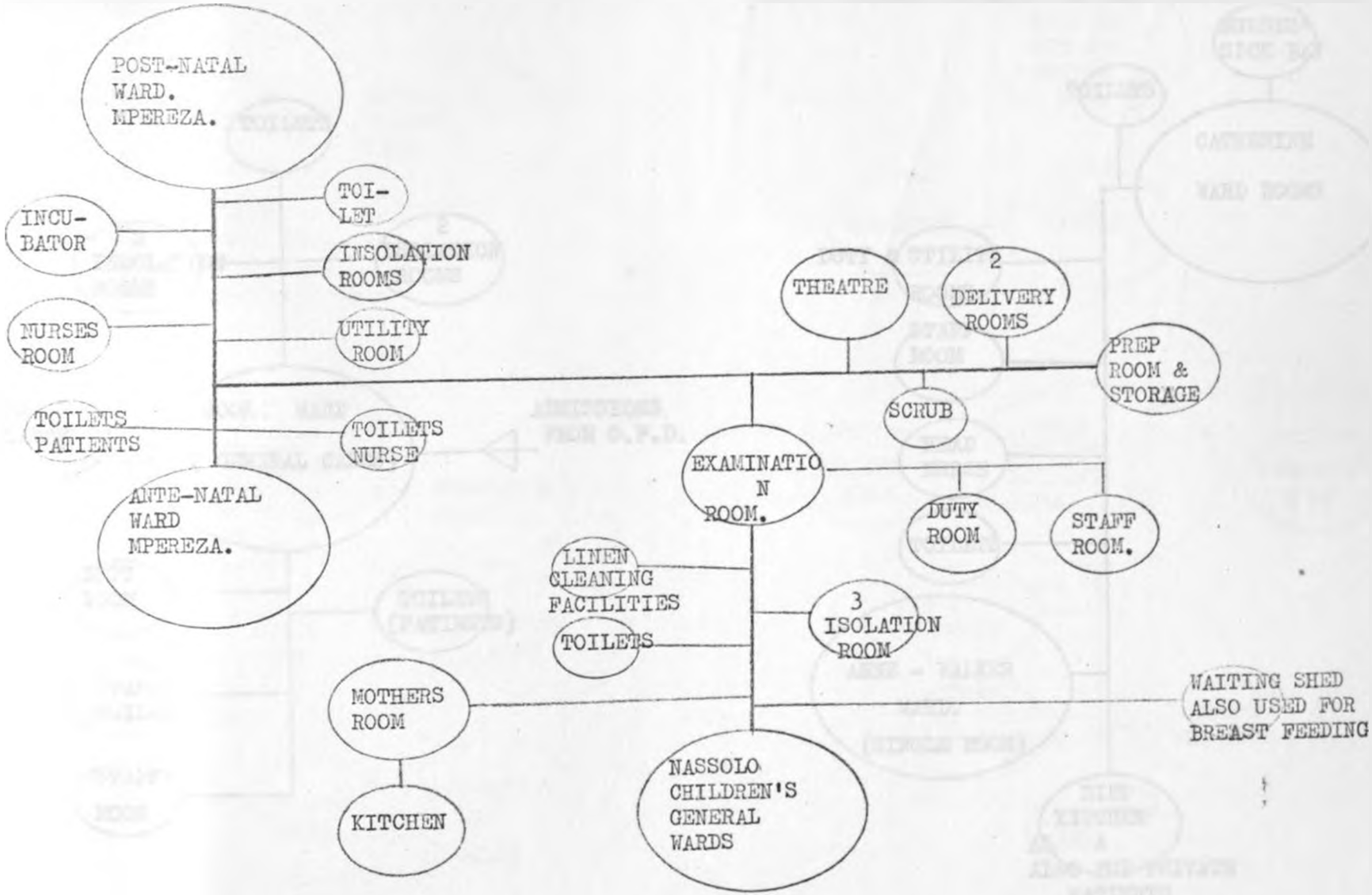
THE DISPENSARY.



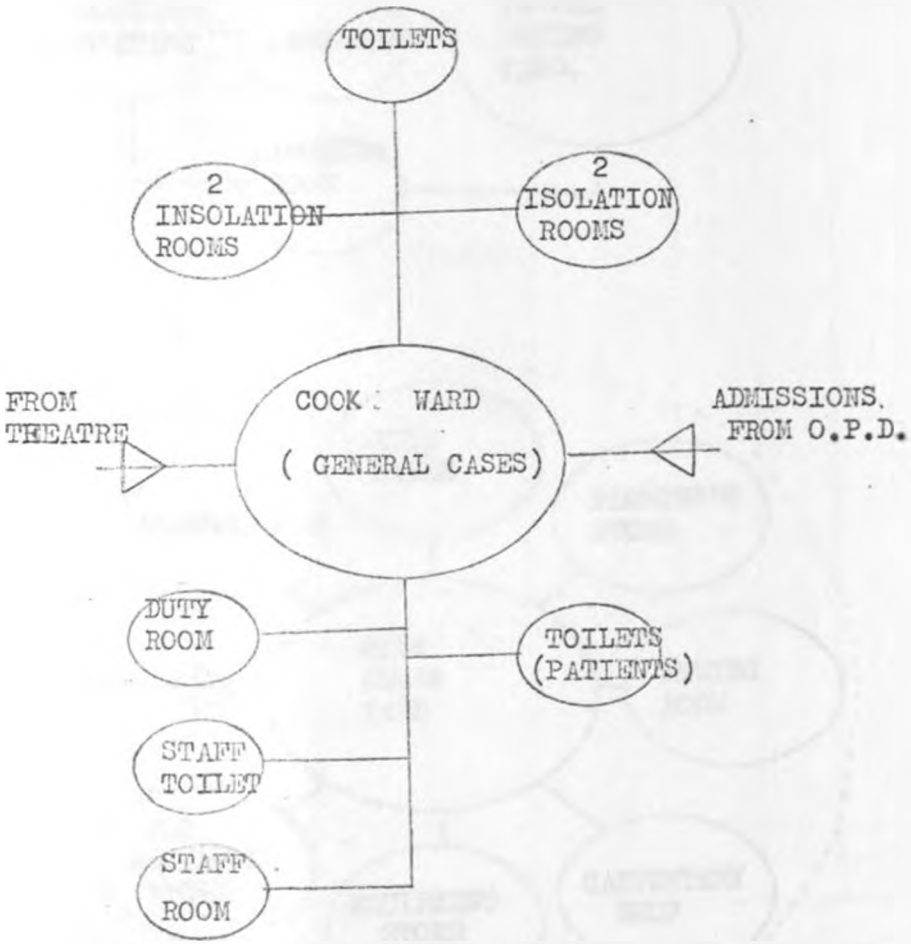
THE SURGICAL DEPARTMENT.



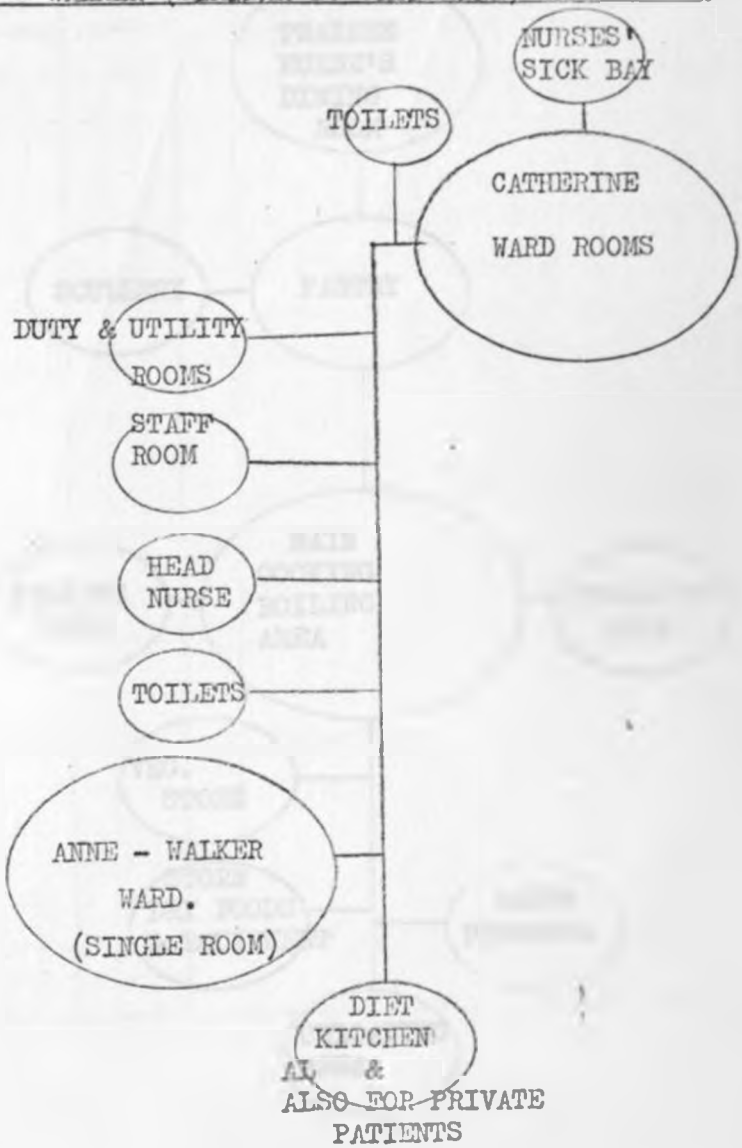
NURSING UNITS: MPEREZA AND NASSOLO WARDS PLUS ANCILLARIES.



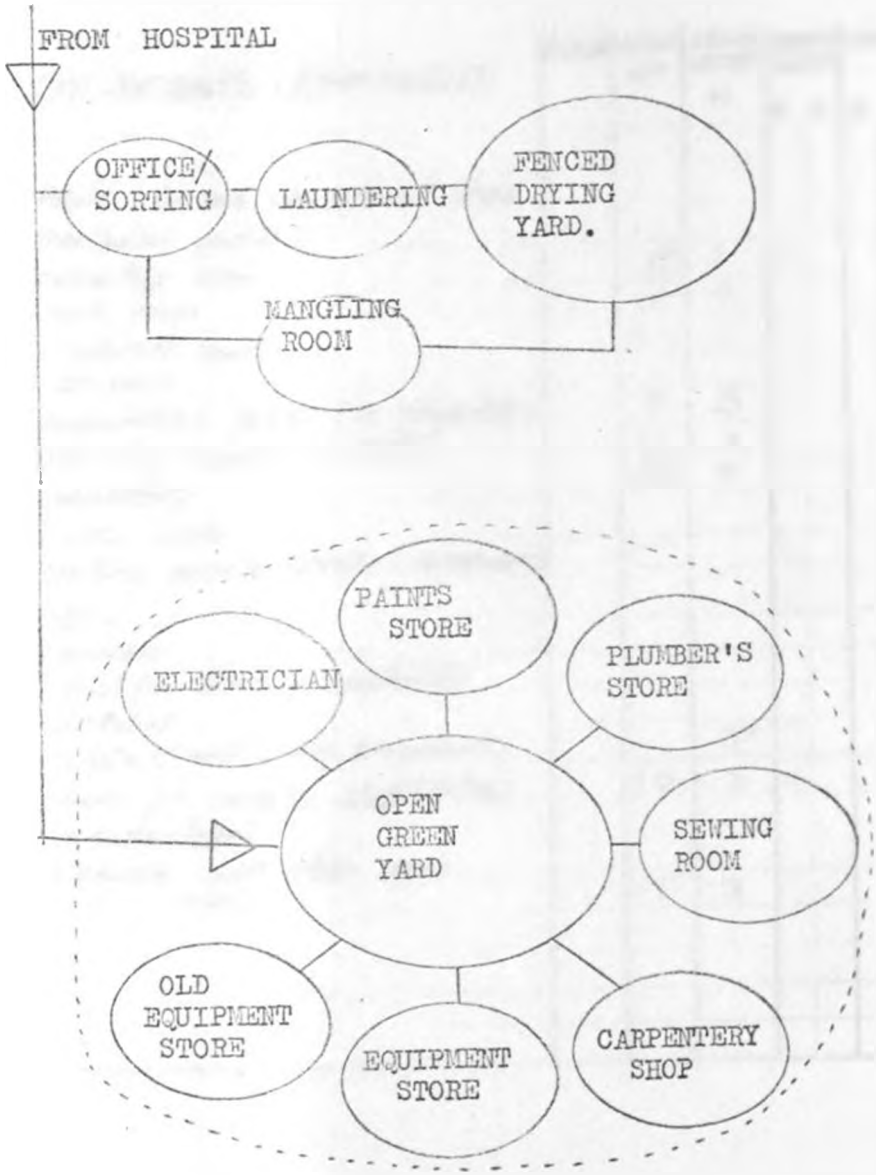
NURSING UNITS:
COOK WARD BLOCK



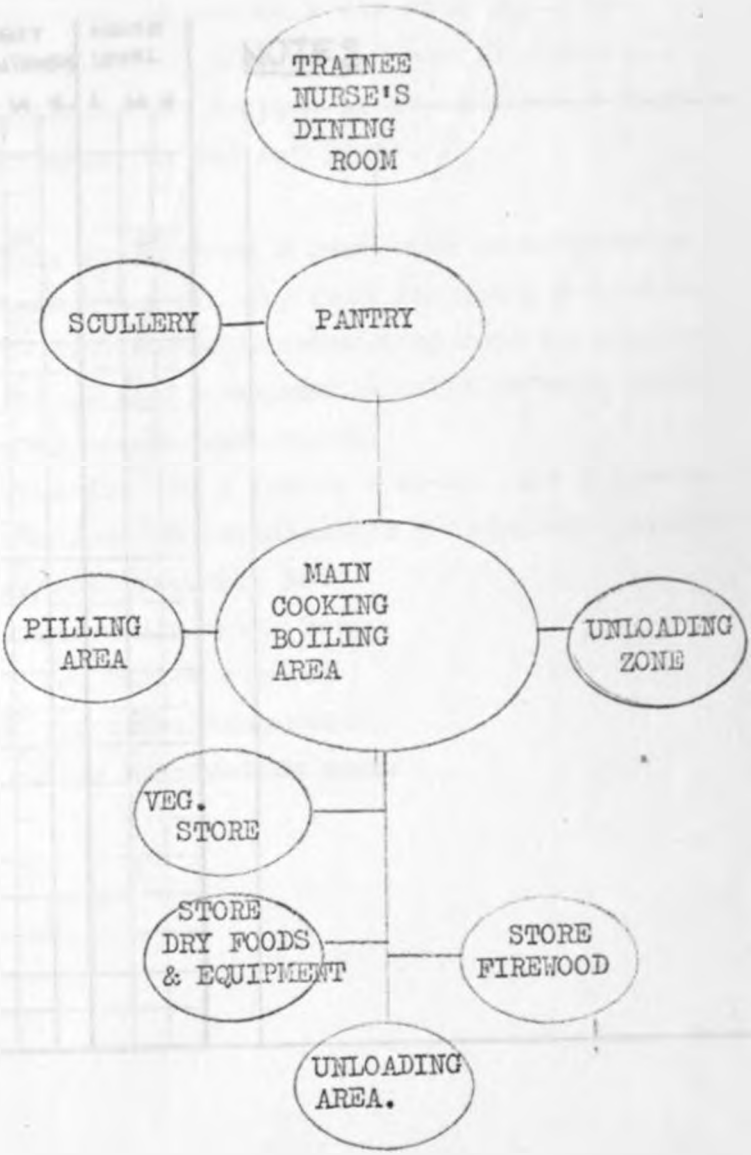
ANNE - WALKER (SIMILAR TO CATHERINE) WARD BLOCK.



MAINTENANCE ZONE



THE KITCHEN.


TRAINEE NURSE'S DINING ROOM
SCULLERY
PANTRY
PILLING AREA
MAIN COOKING BOILING AREA
UNLOADING ZONE
VEG. STORE
STORE DRY FOODS & EQUIPMENT
STORE FIREWOOD
UNLOADING AREA.

| 1. OUT-PATIENTS' DEPARTMENT | FLOOR | AREA M² | CEILING HEIGHT M | VENTILATION N. | VENTILATION A. | COLOR B. | COLOR D. | LIGHT TYPE N. | LIGHT TYPE I. | LIGHT TYPE F. | LIGHT INTENSITY L. | LIGHT INTENSITY M. | LIGHT INTENSITY H. | NOISE LEVEL L | NOISE LEVEL M. | NOISE LEVEL H. | NOTES. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a Policlinics for nose, ear, & throat cases | | | | | | | | | | | | | | | | | |
| b Ophthalmic policlinic | | | | | | | | | | | | | | | | | |
| c consulting room | | 6 | 3 | / | | | | | | | | | | | | | |
| d dark room | | 8 | 3 | | | | | | | | | | | | | | |
| e treatment room | | 15 | 3 | | | | | | | | | | | | | | |
| f rest room | | | | | | | | | | | | | | | | | |
| g Examination room (14 antenantal) | | 5 | 3 | | | | | | | | | | | | | | |
| h operating theatre (Septic) | | 15 | 3 | | | | | | | | | | | | | | |
| i laboratory | | 15 | 3 | | | | | | | | | | | | | | |
| j plaster room | | | | | | | | | | | | | | | | | |
| k Waiting room (+ corridor + Verrandah) | | | | | | | | | | | | | | | | | |
| l office | | | | | | | | | | | | | | | | | |
| m canteen | | | | | | | | | | | | | | | | | |
| n closet for cleaning materials | | | | | | | | | | | | | | | | | |
| o stretcher | | | | | | | | | | | | | | | | | |
| p toilets (1 unit to staff, 2 to patients) | | | 3* | | | | | | | | | | | | | | |
| q 2 rooms for nursing staff (Notes) | | 10 | 3 | | | | | | | | | | | | | | |
| r perambulators | | | | | | | | | | | | | | | | | |
| s stomack evacuation room | | | | | | | | | | | | | | | | | |
| t X-Ray room | | 15 | 3 | | | | | | | | | | | | | | |

1d. Darkroom adjoining x-ray room for only diagnostic & photography work on bones. Entrance to darkroom is constricted & meanders in order to cut out light.

1g. Very small rooms & have been re-subdivided so that there is only room for couch & doctor.

1c. To each doctor's consulting room is attached two general examination cubicles with couch & just enough work space.

Precedent to 2 doctor's rooms, are 2 nurses station for organization & enquiries purpose general sequence is:

+ one addimission room
+ two nurses station
+ two consulting rooms
+ four examination rooms

## 2. SURGICAL DEPARTMENT

| | | | |
|---|---|---|---|
| a | Operating theatre | 24 | 4 |
| b | sterilization room | 18 | 4 |
| c | instrument storage | | |
| d | scrub room | 30 | |
| e | preparation room | 15 | 4 |
| f | nurses' room | 7 | 3 |
| g | doctors' room | 4 | 3 |
| h | storage anaesthetics | 14 | 4 |
| i | storage space for stretcher | | |
| j | janitors closet | | |
| k | toilets | 4 | 3 |
| l | central sterilization | 10 | 3 |
| m | autoclaves | | |
| n | storage space for sterile stocks | | |
| o | storage space | | |
| p | blankets | | |
| q | orthopaedic operating theatre (Plaster) | 12 | 3.5 |
| r | coffee room | | |
| s | dark room | | |
| t | plaster room (see 29) | | |
| u | showers | | |
| v | head nurse's room | 6 | 3.5 |
| w | | | |

2. The scrub room is used for storage of sterile stocks andd some other sterile stocks are kept cupboards.

The orthopaedic theatre undertakes all septic operations.

Thee hospital nurses mockingly call it the "dirty theatre".

3. RADIOLOGY DEPARTMENT

| | | FLOOR | AREA M² | CEILING HEIGHT M | VENTI-LATION N | VENTI-LATION A | COLOR B | COLOR D | LIGHT TYPE N | LIGHT TYPE I | LIGHT TYPE F | LIGHT INTENSITY L | LIGHT INTENSITY M | LIGHT INTENSITY H | NOISE LEVEL L | NOISE LEVEL M | NOISE LEVEL H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | diagnostic room | | | | | | | | | | | | | | | | |
| b | bed sluice | | | | | | | | | | | | | | | | |
| c | control room | | | | | | | | | | | | | | | | |
| d | dark room | | | | | | | | | | | | | | | | |
| e | Wet film viewing room | | | | | | | | | | | | | | | | |
| f | barium meal kitchen | | | | | | | | | | | | | | | | |
| g | therapy room | | | | | | | | | | | | | | | | |
| h | Transformer & control room | | | | | | | | | | | | | | | | |
| i | waiting room | | | | | | | | | | | | | | | | |
| j | filing room | | | | | | | | | | | | | | | | |
| k | dry film viewing room | | | | | | | | | | | | | | | | |
| l | radiologist's consulting room | | | | | | | | | | | | | | | | |
| m | closet for cleaning materials | | | | | | | | | | | | | | | | |
| n | cloakroom & Toilets | | | | | | | | | | | | | | | | |
| o | staff room | | | | | | | | | | | | | | | | |
| p | store | | | | | | | | | | | | | | | | |
| q | Photographic room | | | | | | | | | | | | | | | | |
| r | waiting room for Therapy patients | | | | | | | | | | | | | | | | |
| s | waiting room beds | | | | | | | | | | | | | | | | |
| t | dressing cubicles | | | | | | | | | | | | | | | | |
| u | spare | | | | | | | | | | | | | | | | |
| v | room for x-ray therapist | | | | | | | | | | | | | | | | |
| w | cupboard | | | | | | | | | | | | | | | | |
| x | office | | | | | | | | | | | | | | | | |
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NOTES.

4B

The units is small and caters for patients who stay for about one week.

Admission is on all days except Saturday and Sunday. The unit works in conjuction with a spastic school in Uganda. There is also a mother's hostel to anable mothers to stay for about one week so that they can know how to deal with their children once they have left the hospital.

5.

| | LABORATORY DEPARTMENT | FLOOR | AREA M² | CEILING HEIGHT M | VENTI-LATION N | VENTI-LATION A | COLOR B | COLOR D | LIGHT TYPE N | LIGHT TYPE I | LIGHT TYPE F | LIGHT INTENSITY L | LIGHT INTENSITY M | LIGHT INTENSITY H | NOISE LEVEL L | NOISE LEVEL M | NOISE LEVEL H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | General laboratory | | | | | | | | | | | | | | | | |
| b | clinico chemical laboratory | | | | | | | | | | | | | | | | |
| c | hematological laboratory | | | | | | | | | | | | | | | | |
| d | bacteriological laboratory | | | | | | | | | | | | | | | | |
| e | Pathological-Anatomical laboratory | | | | | | | | | | | | | | | | |
| f | stink sluice | | | | | | | | | | | | | | | | |
| g | | | | | | | | | | | | | | | | | |
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NOTES.

5a. This is a small unit apparently located in a space ori ginally intended for some othere purpose. Only minor cases are dealt with, while serious one are sent to Mulago Hospital.

5.

| | DISPENSARY | FLOOR | AREA $M^2$ | CEILING HEIGHT M | VENTILATION N | VENTILATION A | COLOR B | COLOR D | LIGHT TYPE N | LIGHT TYPE I | LIGHT TYPE F | LIGHT INTENSITY L | LIGHT INTENSITY M | LIGHT INTENSITY H | NOISE LEVEL L | NOISE LEVEL M | NOISE LEVEL H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | dispensing room | | | | | | | | | | | | | | | | |
| b | Office | | | | | | | | | | | | | | | | |
| c | dispenser's room | | | | | | | | | | | | | | | | |
| d | analytical laboratory | | | | | | | | | | | | | | | | |
| e | bottle-washing room | | | | | | | | | | | | | | | | |
| f | galenic laboratory | | | | | | | | | | | | | | | | |
| g | Sterilization department | | | | | | | | | | | | | | | | |
| h | Store | | | | | | | | | | | | | | | | |
| i | Packing room | | | | | | | | | | | | | | | | |
| j | cloakroom and toilets | | | | | | | | | | | | | | | | |
| k | janitor's closet | | | | | | | | | | | | | | | | |
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NOTES.

6 The analytical laboratory combines (6b) & (6d) in form of window hatch and worktop wash basin. (6f) is also simply a zone like (6d). Outpatients collect the prescribed medicines from a window hatch, while ward nurses get medicines from a table inside the laboratory. A "bulky" store is for new materials which are used in the manufacture of medicines. A small section of this store is apportioned to storing solid Poisons and is normally safely locked.

| | SURGICAL & MEDICAL NURSING UNITS | FLOOR | AREA M² | CEILING HEIGHT M | VENTI-LATION N | VENTI-LATION A | COLOR B | COLOR D | LIGHT TYPE N | LIGHT TYPE I | LIGHT TYPE F | LIGHT INTENSITY L | LIGHT INTENSITY M | LIGHT INTENSITY H | NOISE LEVEL L | NOISE LEVEL M | NOISE LEVEL H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | Small size wards | | | | | | | | | | | | | | | | |
| b | large size wards | | | | | | | | | | | | | | | | |
| c | Isolation room | | | | | | | | | | | | | | | | |
| d | Examination room | | | | | | | | | | | | | | | | |
| e | Duty room for nursing staff | | | | | | | | | | | | | | | | |
| f | room for staff-nurses | | | | | | | | | | | | | | | | |
| g | Serving kitchenette | | | | | | | | | | | | | | | | |
| h | cloak room for nurses | | | | | | | | | | | | | | | | |
| i | sluice | | | | | | | | | | | | | | | | |
| j | soiled linen room | | | | | | | | | | | | | | | | |
| k | linen room | | | | | | | | | | | | | | | | |
| l | Washing facilities for patients | | | | | | | | | | | | | | | | |
| m | bathroom | | | | | | | | | | | | | | | | |
| n | Storage Mattresses | | | | | | | | | | | | | | | | |
| o | Space for wheeled stretches | | | | | | | | | | | | | | | | |
| p | closet for cleaning materials | | | | | | | | | | | | | | | | |
| q | toilet | | | | | | | | | | | | | | | | |
| r | showers | | | | | | | | | | | | | | | | |
| s | Storage for hot-water bottles | | | | | | | | | | | | | | | | |
| t | dayrooms | | | | | | | | | | | | | | | | |
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NOTES.

7

There are four ward blocks namely Cook, Catherine, Anne-Walker and Mpereza ward blocks. Anne-walker, originally for Europeans, is of now grade 'A' wards, giving a domestic semblance and has a diet kitchen attached, one labour ward and one scrub room.

Catherine, formerly for Asians, is the group of grade "B" wards; ranging from isolation rooms to large wards of 20 people has male patients on one side and female patients the other.

Mpereza ward units deal will antenatal and postenatal cases as well as all obstetric and gynaecological cases.

The dayrooms attached to "Anne-Walker" and "Catherine" wards are simply balconies with deep over hanging roof.

3

| | OBSTETRICS & GYNAECOLOGICAL UNIT | FLOOR | AREA M² | CEILING HEIGHT M | VENTI-LATION N | VENTI-LATION A | COLOR B | COLOR D | LIGHT TYPE N | LIGHT TYPE I | LIGHT TYPE F | LIGHT INTENSITY L | LIGHT INTENSITY M | LIGHT INTENSITY H | NOISE LEVEL L | NOISE LEVEL M | NOISE LEVEL H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | bedroom cubicles | | | | | | | | | | | | | | | | |
| b | Ward | | | | | | | | | | | | | | | | |
| c | nursery | | | | | | | | | | | | | | | | |
| d | Isolation room | | | | | | | | | | | | | | | | |
| e | Isolation room with sluice | | | | | | | | | | | | | | | | |
| f | Incubator-room | | | | | | | | | | | | | | | | |
| g | Solarium | | | | | | | | | | | | | | | | |
| h | Examination & treatment room | | | | | | | | | | | | | | | | |
| i | Utility room | | | | | | | | | | | | | | | | |
| j | nurses' station | | | | | | | | | | | | | | | | |
| k | Serving Pantry | | | | | | | | | | | | | | | | |
| l | bed-pan closet | | | | | | | | | | | | | | | | |
| m | bathroom | | | | | | | | | | | | | | | | |
| n | clean linen | | | | | | | | | | | | | | | | |
| o | nurses' toilet | | | | | | | | | | | | | | | | |
| p | Patients' toilet | | | | | | | | | | | | | | | | |
| q | janitors' closet | | | | | | | | | | | | | | | | |
| r | delivery room | | | | | | | | | | | | | | | | |
| s | scrub room | | | | | | | | | | | | | | | | |
| t | Sterilization room | | | | | | | | | | | | | | | | |
| u | doctor's room | | | | | | | | | | | | | | | | |
| v | stretcher storage | | | | | | | | | | | | | | | | |
| w | circulation in units | | | | | | | | | | | | | | | | |
| x | balcony day-space | | | | | | | | | | | | | | | | |
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NOTES.

| | FLOOR | AREA | [illegible] | [illegible] | | [illegible] | |
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| | | $m^2$ | m | U | A | U | A |

8 The departments of "OBSTETRICS & GYNAECOLOGY" are not separate; the "SURGICAL & NURSING UNITS" except in postenatal cases and the operating theatres, as labour wards have to be attached to a theatre serving both obstatrics and gynaecology departmonts.

The post-natal ward at the time of survey was overflooded and subsidiary beds hence moved into the ward. This is one of the busiest wards The delivery rooms were in use at the time of the survey, and so they were't visited.

| INFECTIOUS DISEASE NURSING (A) | FLOOR | AREA M² | CEILING HEIGHT M | VENTI-LATION N A | COLOR B D | LIGHT TYPE N I F | LIGHT INTENSITY L M H | NOISE LEVEL L M H |
|---|---|---|---|---|---|---|---|---|
| a Ward | | | | | | | | |
| b Isolation room | | | | | | | | |
| c Examination room | | | | | | | | |
| d bath room | | | | | | | | |
| e disinfection room | | | | | | | | |
| f Storage space for patients' clothes | | | | | | | | |
| g Serving pantry | | | | | | | | |
| h Washing-up kitchenette. | | | | | | | | |
| i Staff nurse's room | | | | | | | | |
| j dressing room for staff nurses | | | | | | | | |
| k Work room for nursing staff | | | | | | | | |
| l linen room | | | | | | | | |
| m Storage space | | | | | | | | |
| n janitor's closet | | | | | | | | |
| o Operating Theatre | | | | | | | | |
| p Sterilization room | | | | | | | | |
| q Scrub-up room | | | | | | | | |
| r stretcher room | | | | | | | | |
| s Ward sluice | | | | | | | | |
| t balcony or terrace day space | | | | | | | | |
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NOTES.

9. The Hospital does not undertake medical care of Infections diseases of a serious nature, e.g T uberculosis However for simple cases like whooping coughs, such cases are treated in isolation rooms.

| PREDIATRICS NURSING UNIT | FLOOR | AREA M² | CEILING HEIGHT M | VENTI-LATION N A | COLOR B D | LIGHT TYPE N I F | LIGHT INTENSITY L M H | NOISE LEVEL L M H |
|---|---|---|---|---|---|---|---|---|
| a cubicle | | | | | | | | |
| b cubicle with air-sluice | | | | | | | | |
| c Ward | | | | | | | | |
| d Examination room | | | | | | | | |
| e play room | | | | | | | | |
| f bath room | | | | | | | | |
| g bedpan closet | | | | | | | | |
| h Serving pantry | | | | | | | | |
| i closet for cleaning equipment | | | | | | | | |
| j toilets | | | | | | | | |
| k room for head nurse | | | | | | | | |
| l Utility room for nursing staff | | | | | | | | |
| m clean linen room | | | | | | | | |
| n Soiled linen and flower room | | | | | | | | |
| o Storage space - stretchers | | | | | | | | |
| p Storage space - beds | | | | | | | | |
| q Storage space - play things | | | | | | | | |
| r Waiting room, also used by | | | | | | | | |
| s mothers for feeding their babies | | | | | | | | |
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NOTES.

10

The unit, which comprises isolation cubicles and a general ward is known as "Nsolo" ward" - named after one of KABAKA'S daughters.
Each cubicle has two cots; and in the main ward are 12 cots designed to serve different age groups. The infectious cases are strictly kept into the isolation rooms.
Next to the ward unit, is a mothers room and an attached kitchen designed at a level to guarantee children's safety, and to cater for charcoal and paraffin stoves, as well as fire-wood cooking.
Inside this room mothers are occasionally given lectures in feeding methods to combat Malnutrition.

An office is attached to the unit for the sisters to prepare thier lessons and demostrate what ever they wish.

| 1- LAUNDRIES | FLOOR | AREA M² | CEILING HEIGHT M | VENTI-LATION N A | COLOR B D | LIGHT TYPE N I F | LIGHT INTENSITY L M H | NOISE LEVEL L M H | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| a Sorting room | | | | | | | | | |
| b laundering room | | | | | | | | | |
| c mangling room | | | | | | | | | |
| d sewing room | | | | | | | | | |
| e linen room | | | | | | | | | |
| f nurses' linen | | | | | | | | | |
| g reception room (vestibule) | | | | | | | | | |
| h Issue counter | | | | | | | | | |
| i Offices | | | | | | | | | |
| j | | | | | | | | | |
| k | | | | | | | | | |
| l | | | | | | | | | |
| m | | | | | | | | | |
| n | | | | | | | | | |
| o | | | | | | | | | |
| p | | | | | | | | | |
| q | | | | | | | | | |
| r | | | | | | | | | |
| s | | | | | | | | | |
| t | | | | | | | | | |
| u | | | | | | | | | |
| v | | | | | | | | | |
| w | | | | | | | | | |
| x | | | | | | | | | |
| y | | | | | | | | | |
| z | | | | | | | | | |
| α | | | | | | | | | |
| β | | | | | | | | | |
| δ | | | | | | | | | |
| B | | | | | | | | | |
| γ | | | | | | | | | |
| π | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |

11. Nurses' linen is cleaned by individual nurses as they have rejected the general laundry services. offered b y the hospital authorities.
There are three hospital laundry sections in all; the general one, the sterilization section, and one attached to the children's ward — the last one being very necessary for the high frequency of washing and ironing.

2.

| | RESIDENTS' ~~NURSES~~ QUARTERS | FLOOR | AREA M² | CEILING HEIGHT M | VENTILATION N | VENTILATION A | COLOR B | COLOR D | LIGHT TYPE N | LIGHT TYPE I | LIGHT TYPE F | LIGHT INTENSITY L | LIGHT INTENSITY M | LIGHT INTENSITY H | NOISE LEVEL L | NOISE LEVEL M | NOISE LEVEL H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | Visitors' reception room | | | | | | | | | | | | | | | | |
| b | bedsitting room | | | | | | | | | | | | | | | | |
| c | Quiet room | | | | | | | | | | | | | | | | |
| d | Sick room | | | | | | | | | | | | | | | | |
| e | Toilets | | | | | | | | | | | | | | | | |
| f | laundering room | | | | | | | | | | | | | | | | |
| g | Ironing & mending room | | | | | | | | | | | | | | | | |
| h | dining room | | | | | | | | | | | | | | | | |
| i | scullery | | | | | | | | | | | | | | | | |
| j | Tea-kitchenette | | | | | | | | | | | | | | | | |
| k | lounge | | | | | | | | | | | | | | | | |
| l | Rehearsal & Music room | | | | | | | | | | | | | | | | |
| m | balconies & walkways | | | | | | | | | | | | | | | | |
| n | classroom for theory | | | | | | | | | | | | | | | | |
| o | classroom for practical work | | | | | | | | | | | | | | | | |
| p | Guest room | | | | | | | | | | | | | | | | |
| q | Storage space-linen | | | | | | | | | | | | | | | | |
| r | soiled linen room | | | | | | | | | | | | | | | | |
| s | janitor's closet | | | | | | | | | | | | | | | | |
| t | telephone cubicles | | | | | | | | | | | | | | | | |
| u | Housekeeper's Quarter | | | | | | | | | | | | | | | | |
| v | library | | | | | | | | | | | | | | | | |
| w | tutors' office | | | | | | | | | | | | | | | | |
| x | lecture room | | | | | | | | | | | | | | | | |
| y | | | | | | | | | | | | | | | | | |
| z | | | | | | | | | | | | | | | | | |
| α | | | | | | | | | | | | | | | | | |
| β | | | | | | | | | | | | | | | | | |
| ε | | | | | | | | | | | | | | | | | |
| δ | | | | | | | | | | | | | | | | | |
| γ | | | | | | | | | | | | | | | | | |
| π | | | | | | | | | | | | | | | | | |

NOTES.

| | BLOCK | AREA | [illegible] | [illegible] | | [illegible] | |
|---|---|---|---|---|---|---|---|
| | | SQ FT | PK | U | A | PK | U |

12. The nurse's quarters are the newest building on the hospital campus. The warden's dwelling comprising a sitting, a bedroom, a toiletroom, and a kitchen, is on the ground floor of the above block Staff Nurses have single rooms and share only the dining-lounge and toilet facilities. Third year student nurses stay in double rooms; every four second-year share a room, while every six first-year students stay in one cubicle.

On every floor is located an ablution room with two bathtubs, a shower room, and four wash-hand basins. Next to the ablution, are two rooms; one a tea-kitchenette, and two a mending and ironing room. The dining room for student nurses is located in the main kitchen block.

All student's boxes and linen are stored in the wardrobes.

Only the sitting room of the Warden's quarters was visited.

| 3 KITCHEN & WORKSHOPS. | FLOOR | AREA M² | CEILING HEIGHT M | VENTI-LATION N A | COLOR B D | LIGHT TYPE N I F | LIGHT INTENSITY L M H | NOISE LEVEL L M H |
|---|---|---|---|---|---|---|---|---|
| a Cooking etc.. central work space | | | | | | | | |
| b Cold freeze | | | | | | | | |
| c diet kitchen | | | | | | | | |
| d Hindu kitchen | | | | | | | | |
| e Preparation room General | | | | | | | | |
| f Vegatable preparation | | | | | | | | |
| g Milk section | | | | | | | | |
| h Pantry | | | | | | | | |
| i Store for dry food stuffs | | | | | | | | |
| j Equipment store | | | | | | | | |
| k scullery for cleaning | | | | | | | | |
| l trolleys' Garage | | | | | | | | |
| m kitchen staff dining room | | | | | | | | |
| n nurses' dining room | | | | | | | | |
| o Service passage | | | | | | | | |
| p | | | | | | | | |
| Q | | | | | | | | |
| r | | | | | | | | |
| s | | | | | | | | |
| t Workshop yard | | | | | | | | |
| u electrician's store | | | | | | | | |
| v Paints' store | | | | | | | | |
| w Carpentary store | | | | | | | | |
| x Sewing room | | | | | | | | |
| y Equipment store | | | | | | | | |
| z | | | | | | | | |
| α | | | | | | | | |
| β | | | | | | | | |
| δ | | | | | | | | |
| ε | | | | | | | | |
| γ | | | | | | | | |
| π | | | | | | | | |

NOTES.

13 The ceiling height indicated is just an average figure as there is no actual ceiling under the roof . The building has a pitched roof.
The diet section is located in the Maternity block and has attached to it a store and a preparation room.
Access to the board room is through the general laboratory.
The accounts office formerly a four-bed ward bay of the grade 'B' ward - Cook Ward, is another example of improvisation.

/4 OTHERS.

| | | FLOOR | AREA M² | CEILING HEIGHT M | VENTI-LATION N | VENTI-LATION A | COLOR B | COLOR D | LIGHT TYPE N | LIGHT TYPE I | LIGHT TYPE F | LIGHT INTENSITY L | LIGHT INTENSITY M | LIGHT INTENSITY H | NOISE LEVEL L | NOISE LEVEL M | NOISE LEVEL H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | Administ. General Office | | 60 | 2.8 | | | | | | | | | | | | | |
| b | " Senior Hosp. Suprt. | | | | | | | | | | | | | | | | |
| c | " Deputy Hosp. Suprt. | | | | | | | | | | | | | | | | |
| d | " Senior Hosp. Secretary | | | | | | | | | | | | | | | | |
| e | " Hospital Secretary | | | | | | | | | | | | | | | | |
| f | " " Assist. Secret. | | | | | | | | | | | | | | | | |
| g | " Matron | | | | | | | | | | | | | | | | |
| h | " deputy Matron | | | | | | | | | | | | | | | | |
| i | " Assistant Matrons | | | | | | | | | | | | | | | | |
| j | " chief clerk | | | | | | | | | | | | | | | | |
| k | " files stores | | | | | | | | | | | | | | | | |
| l | " Stationary stores | | | | | | | | | | | | | | | | |
| m | " Night duty Sister office | | | | | | | | | | | | | | | | |
| n | Radio Room | | | | | | | | | | | | | | | | |
| o | Post Office | | | | | | | | | | | | | | | | |
| p | Waiting rooms | | | | | | | | | | | | | | | | |
| q | Accounts office | | 20 | 3.8 | | | | | | | | | | | | | |
| r | Technical departments | | | | | | | | | | | | | | | | |
| s | other offices | | | | | | | | | | | | | | | | |
| t | Boardroom | | 40 | 2.8 | | | | | | | | | | | | | |
| u | Workshop open yard | | 150 | | | | | | | | | | | | | | |
| v | " electrician's store | | 10 | 2.5 | | | | | | | | | | | | | |
| w | " paints store | | 10 | 2.5 | | | | | | | | | | | | | |
| x | " carpentry shop | | 10 | 2.5 | | | | | | | | | | | | | |
| y | " sewing room | | 10 | 2.5 | | | | | | | | | | | | | |
| z | " equipment store | | 40 | 2.5 | | | | | | | | | | | | | |
| α | Relatives' Hostel | | 80 | 4.0 | | | | | | | | | | | | | |
| β | | | | | | | | | | | | | | | | | |
| δ | | | | | | | | | | | | | | | | | |
| ε | | | | | | | | | | | | | | | | | |
| γ | | | | | | | | | | | | | | | | | |
| π | | | | | | | | | | | | | | | | | |

NOTES.

14. The technical services, like the kitchen, laundry, maintenance shops, stores, employees' facilities, etc. all are housed in dilapidated houses and sheds which are unsuitable for human habitation; this has resulted into these departments being unsuitably located.

# 5

L APPRAISAL.

NEW MULAGO

lago hill commenced in 1913
ted on free labour, with mud
nd with grass roof a total

ment decided to rebuild
A site adjacent to the old
ted in preference to
old hospital.

due to false starts so that
956 that a group of
ommissioned to plan a 750-
ital with an additional 100-
ete patients.

ospital complex was completed
1962, and July the same year
d in August 1962 and was
on 16th October 1962 by

Her Royal Highness, The Duchess of Kent as part of the celebrations to mark Uganda's Uhuru. Mulago serves patients from Uganda, Kenya, Tanzania and Zaire.

2.0 DESIGN BRIEF.

The hospital was to be planed to fulfil the following functions:-

1.a) Replacement of the existing hospital at Mulago and the former European and Asian hospitals at Nakasero (see map 1.)

b) Treatment of patients referred from district hospitals, dispensaries and private practitioners of Kampala and upcounty (see map 2.)

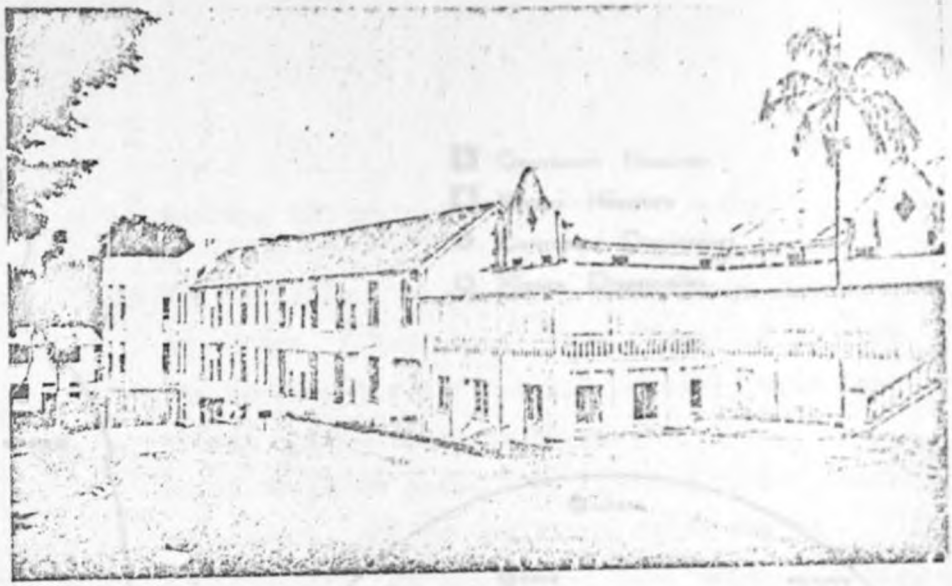
c) The provision of teaching facilities for medical students from Makerere for clinical and laboratory work.

d) The continuation and expansion of nursing training.

2. Capital costs were to be kept as low as possible.

3. Recurrent costs were to be kept to a minimum by economic planning and use of permanent finishes.

4. Construction was to begin as soon as possible, and the annual expenditure was to be evenly spread over the contract period.

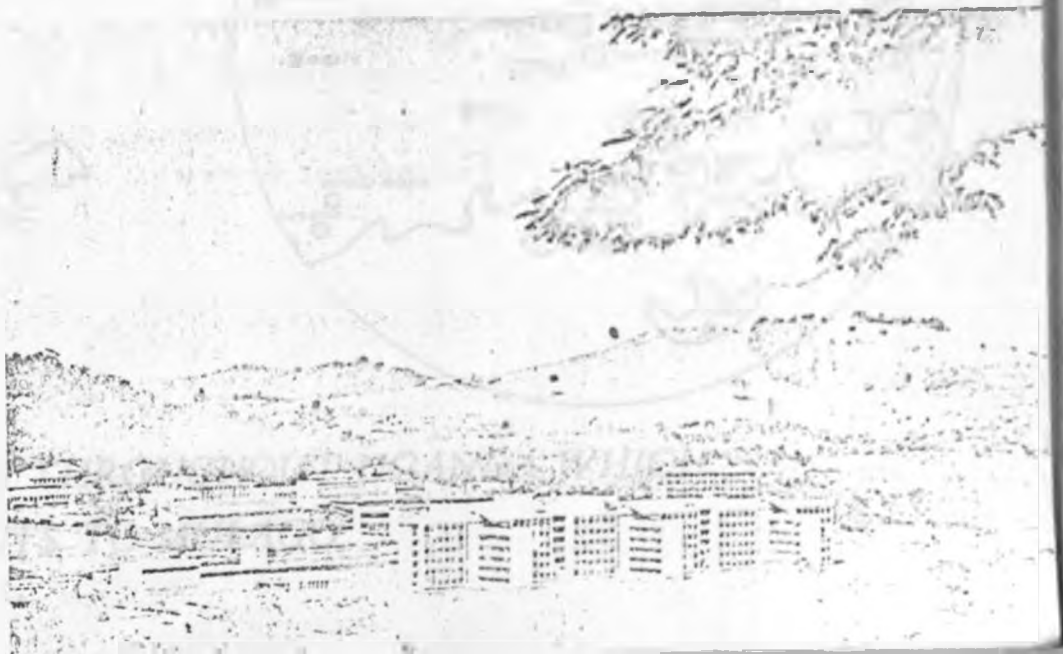
▲ Nakasero

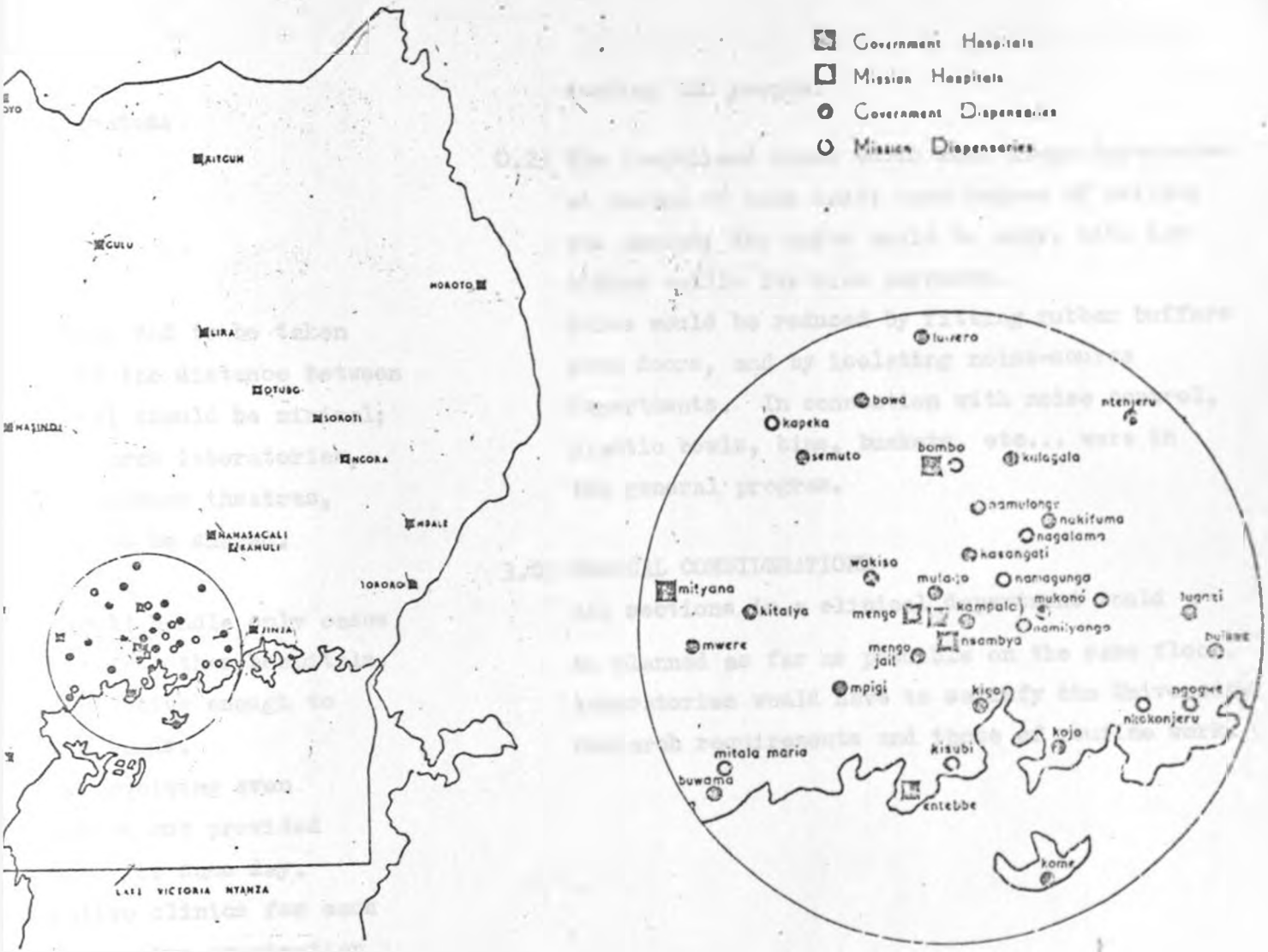
*GO REPLACES TWO*
*NG HOSPITALS*

MAP 1.

Old Mulago ▼

▼ New Mulago






*TALS AND DISPENSARIES THROUGHOUT UGANDA WHICH REFER PATIENTS TO MULAGO*

MAP 2.

ıs dominated:

ıl school had to be taken
so that the distance between
ıe school should be minimal;
ts, research laboratories,
ıseum, lecture theatres,
... had to be shared.

ties would handle only cases
nsaries and other hospitals,
d be extensive enough to
to the wards.
cases involving even
be carried out provided
urn home the same day.
nsultative clinics for each
own extensive examination
ities were provided, and e ch
seating area capable of

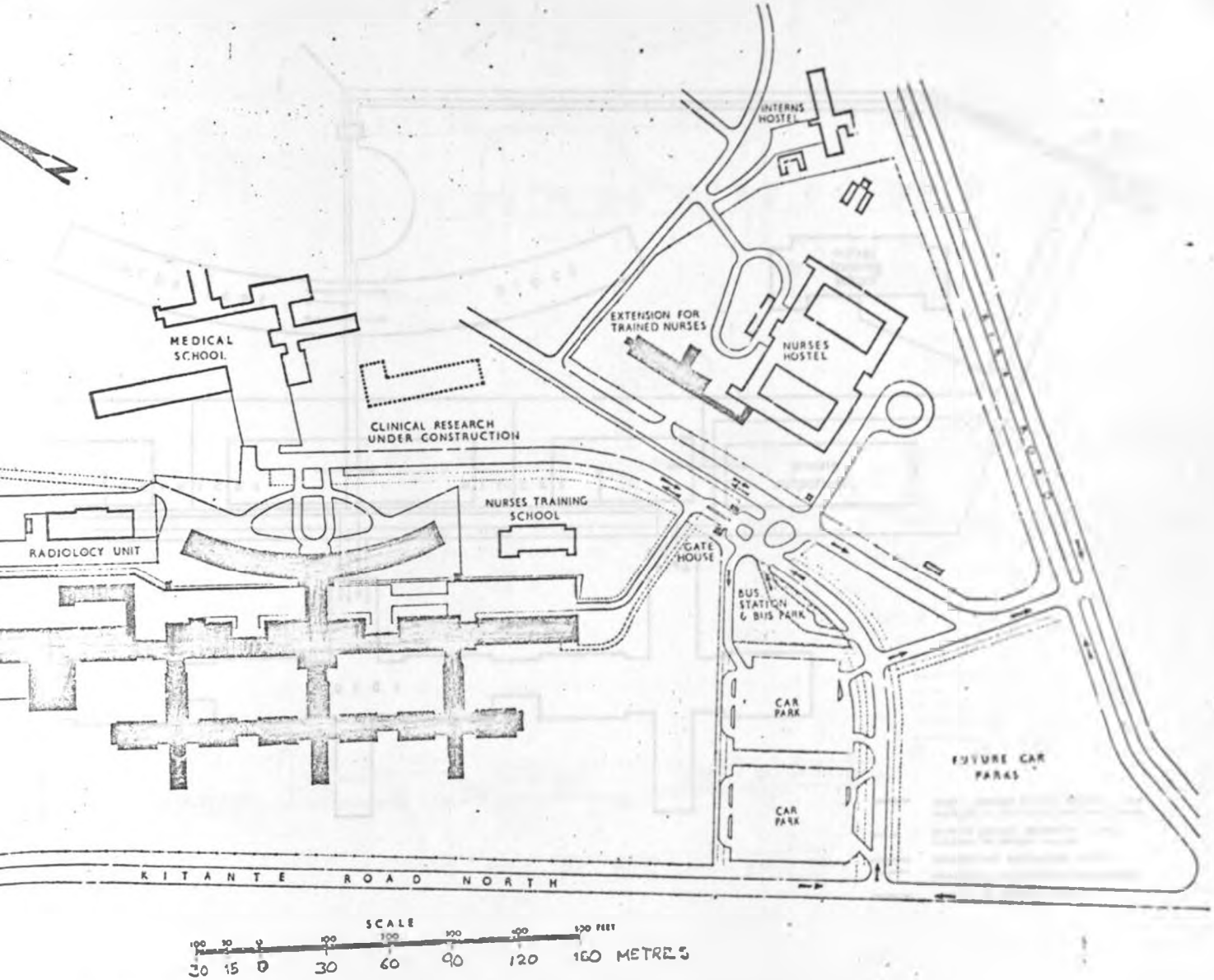
seating 100 people.

0.23 The in-patient wards would have large day-spaces at centre of each unit; some degree of privacy was needed; the wards would be airy, with low window -cills for view purposes.
Noise would be reduced by fitting rubber buffers onto doors, and by isolating noise-source departments. In connection with noise control, plastic bowls, bins, buckets, etc... were in the general program.

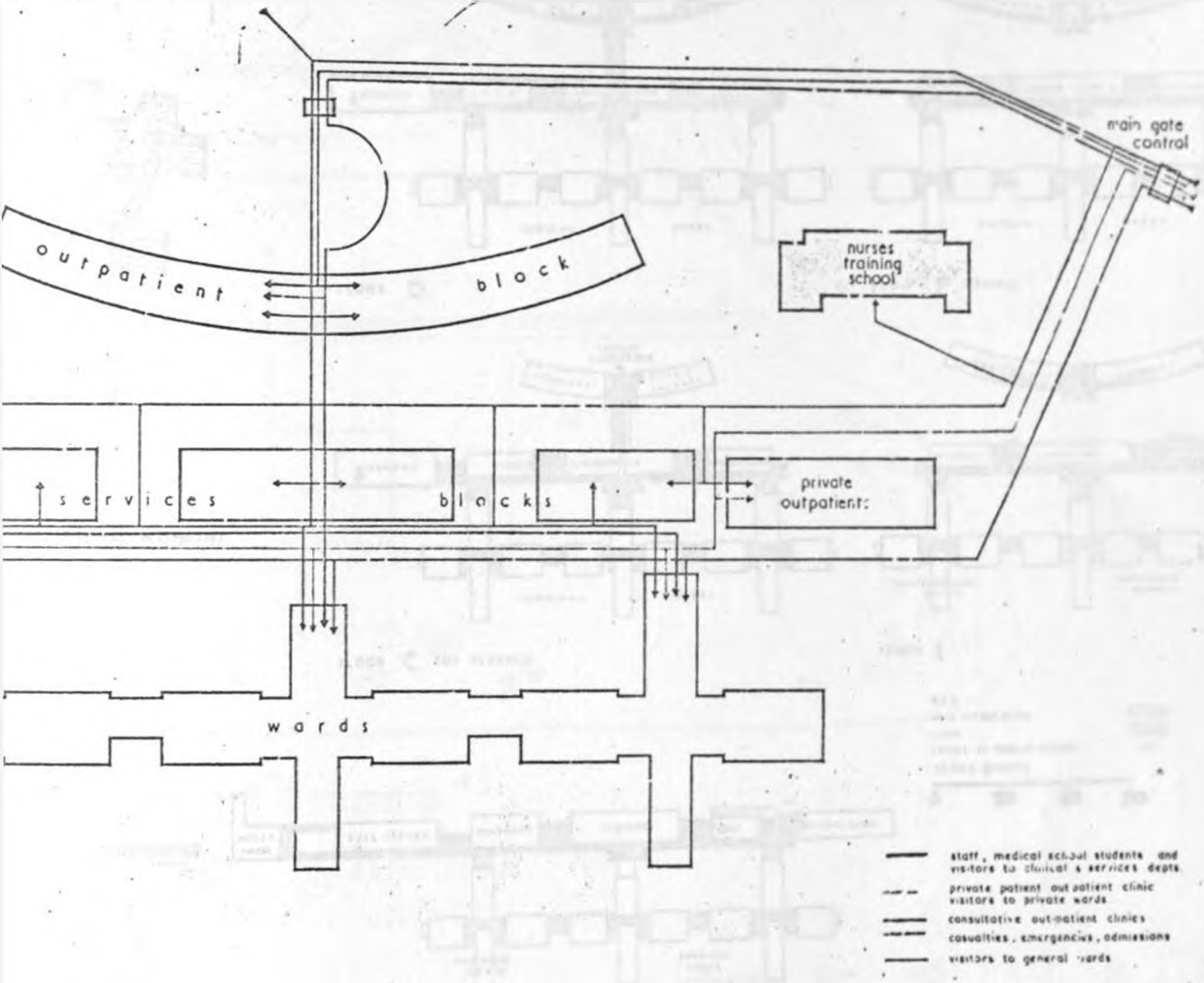
3.03 MEDICAL CONSIDERATIONS

All sections in a clinical department would be planned as far as possible on the same floor. Laboratories would have to satisfy the University research requirements and those of routine work.

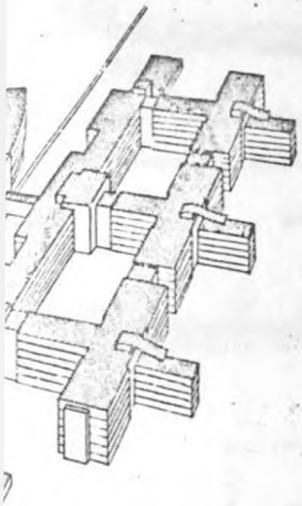
DEPARTMENTS and SATURATION PATTERNS ANALYSIS.



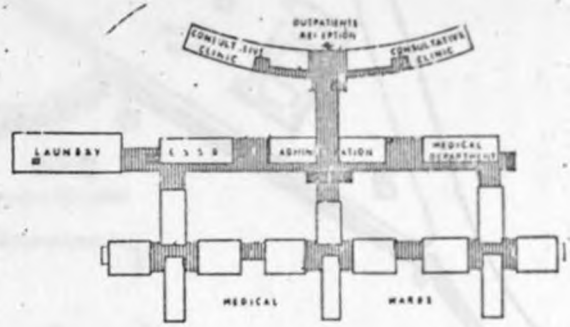

*DETAILED PLAN OF SITE AND ENVIRONS*



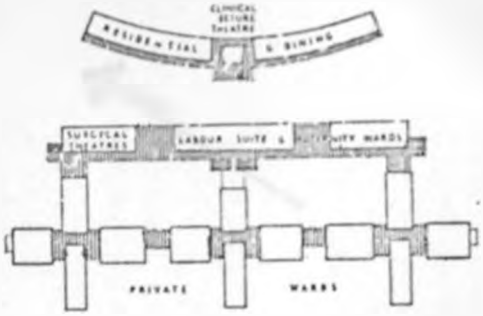

*TRAFFIC FLOW INTO THE HOSPITAL*



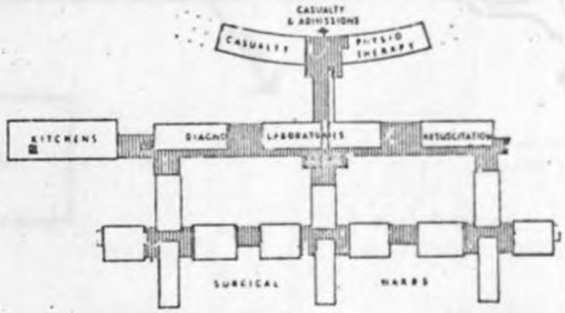
AERIAL PERSPECTIVE



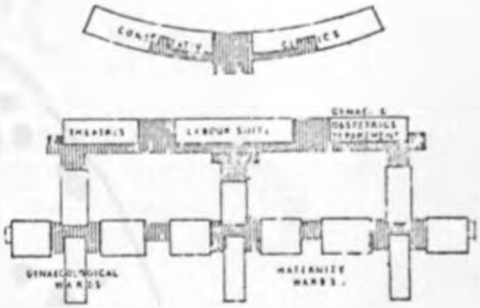

FLOOR D



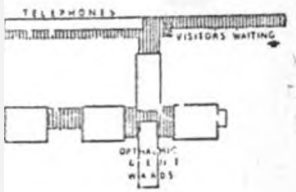

FLOOR F PRIVATE

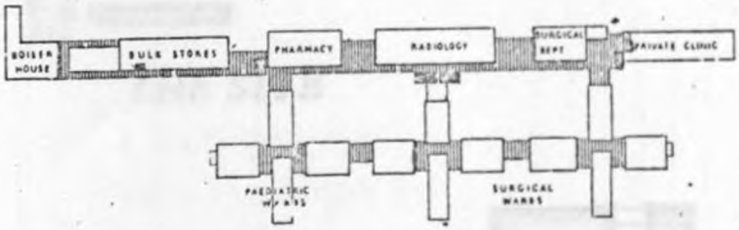



FLOOR C TOP TERRACE




FLOOR E




FLOOR B MIDDLE TERRACE

KEY

MAIN CIRCULATION

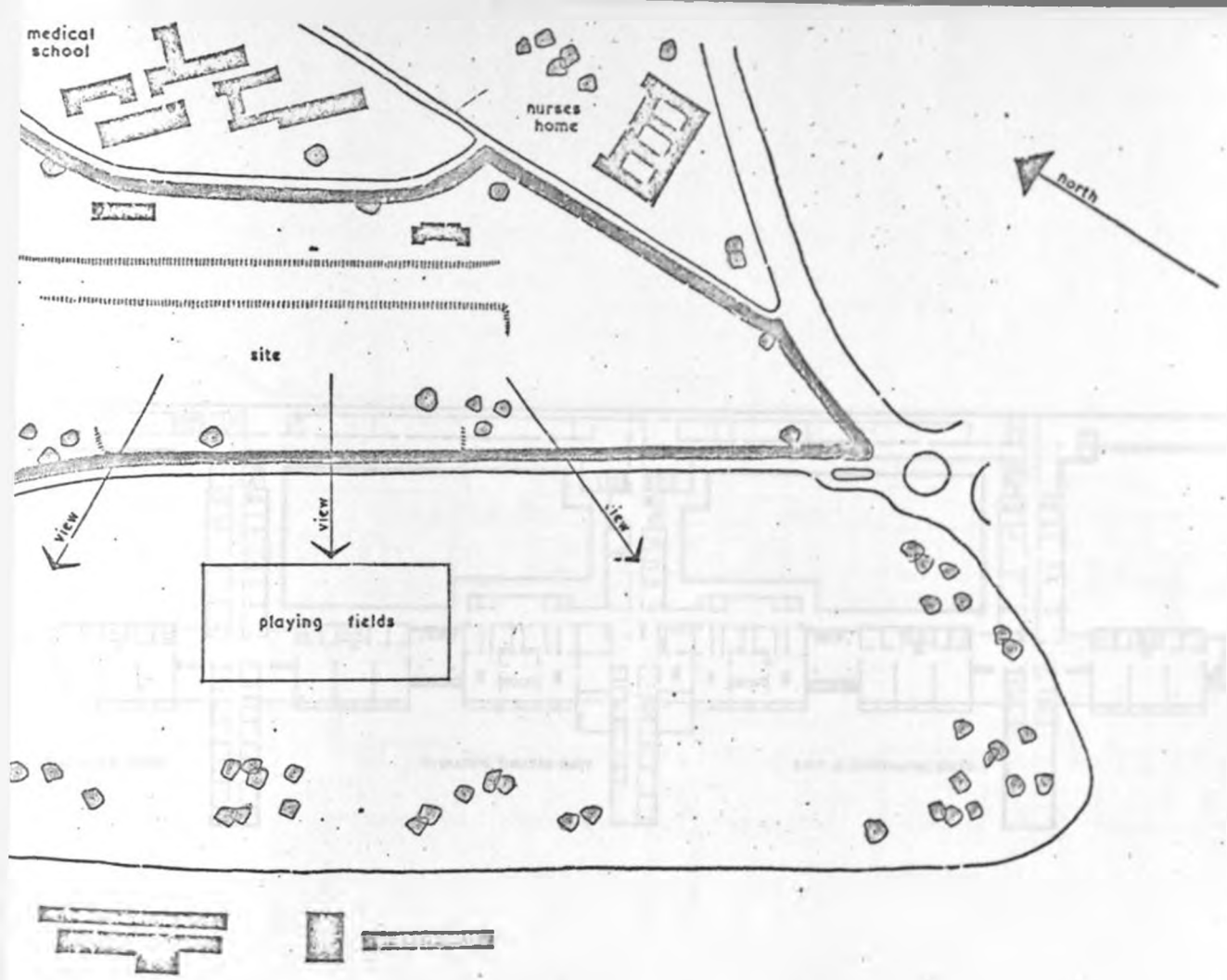
LIFTS

POINTS OF PUBLIC ACCESS

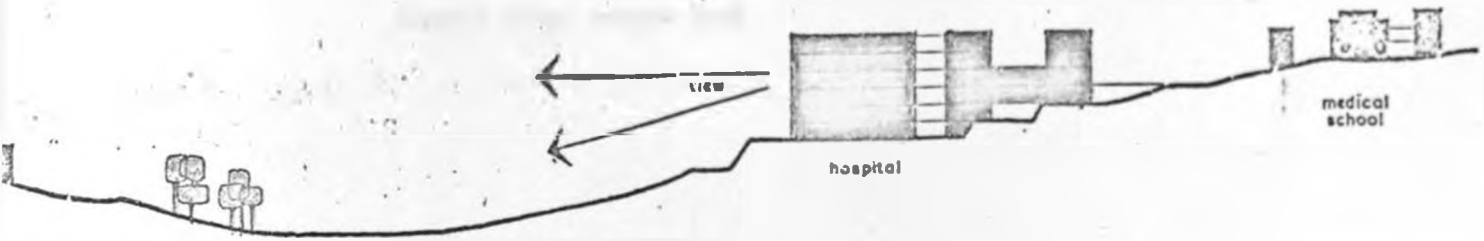
SCALE (APPROX)

0 30 60 90

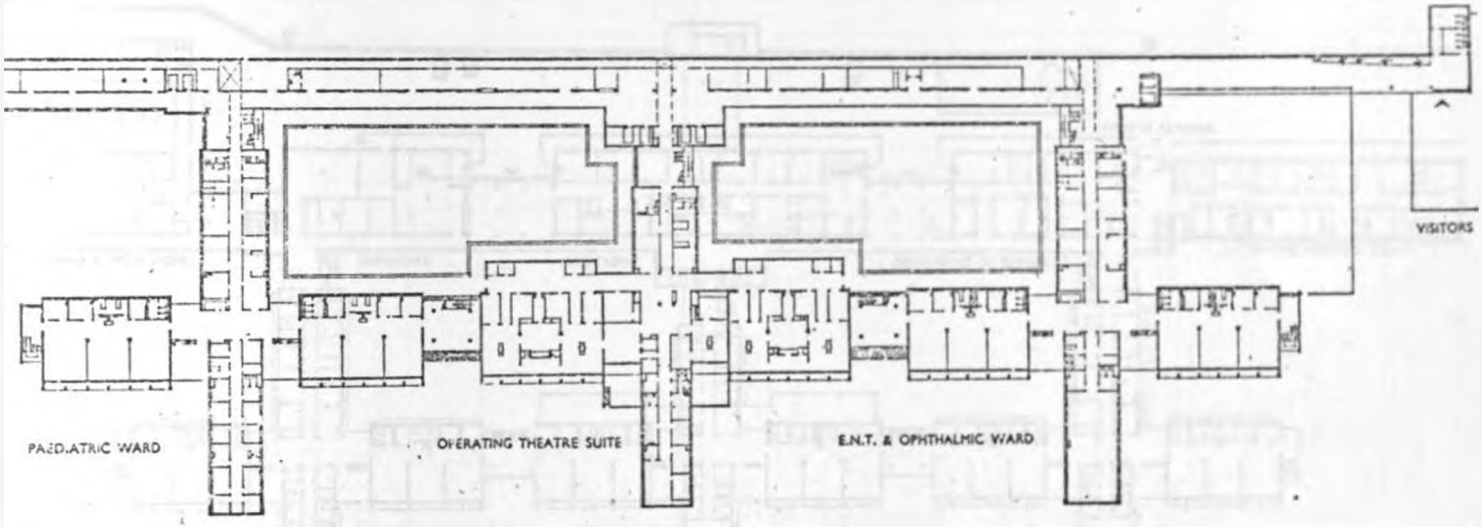
# RELATIVE GROUPING OF DEPARTMENTS




*THE SITE*

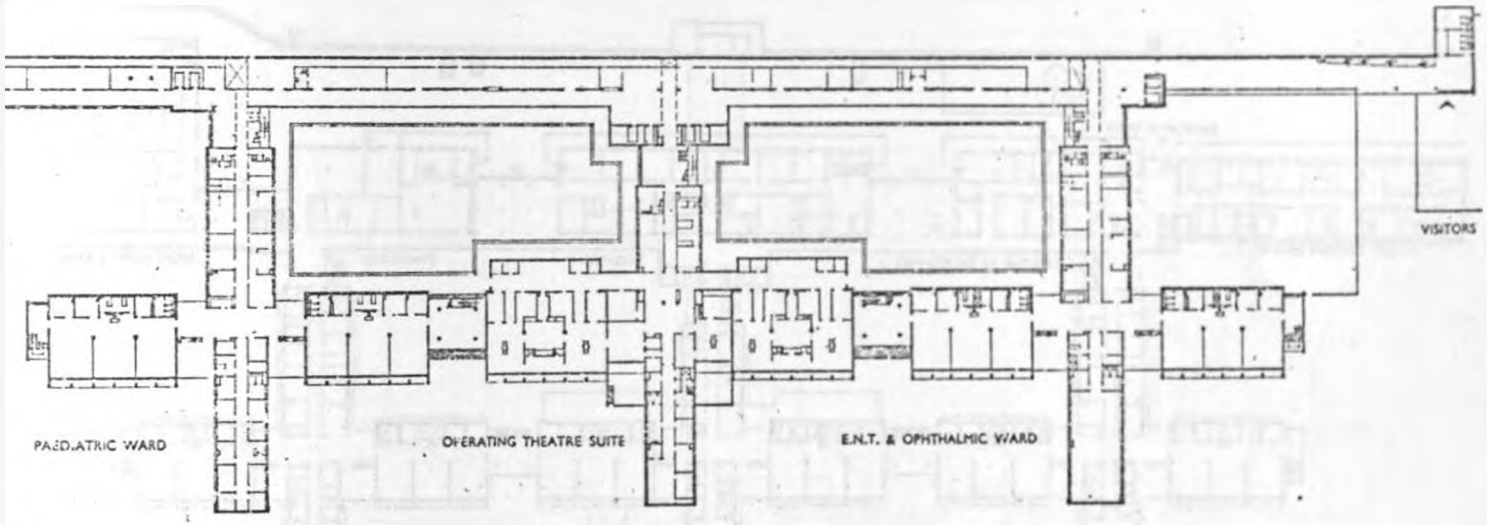



*SECTION THROUGH THE SITE*



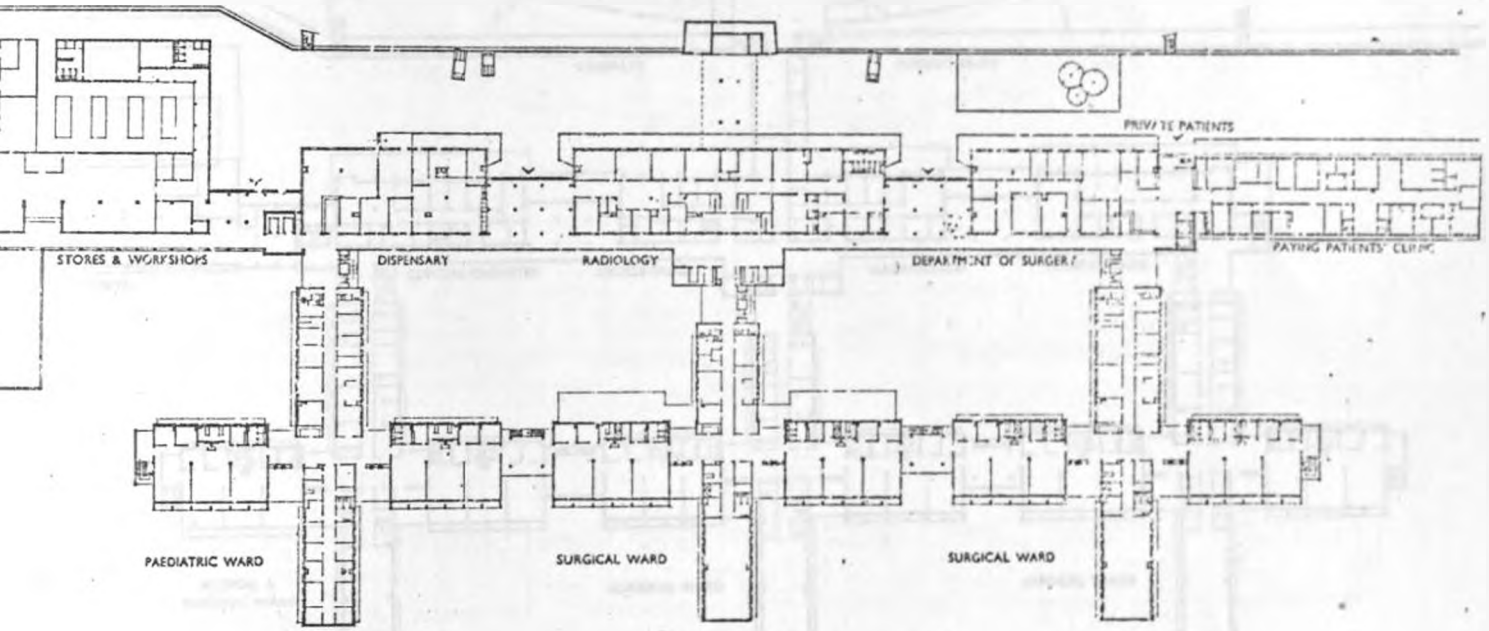

*FLOOR 'A'*

**(General visitors entrance level)**



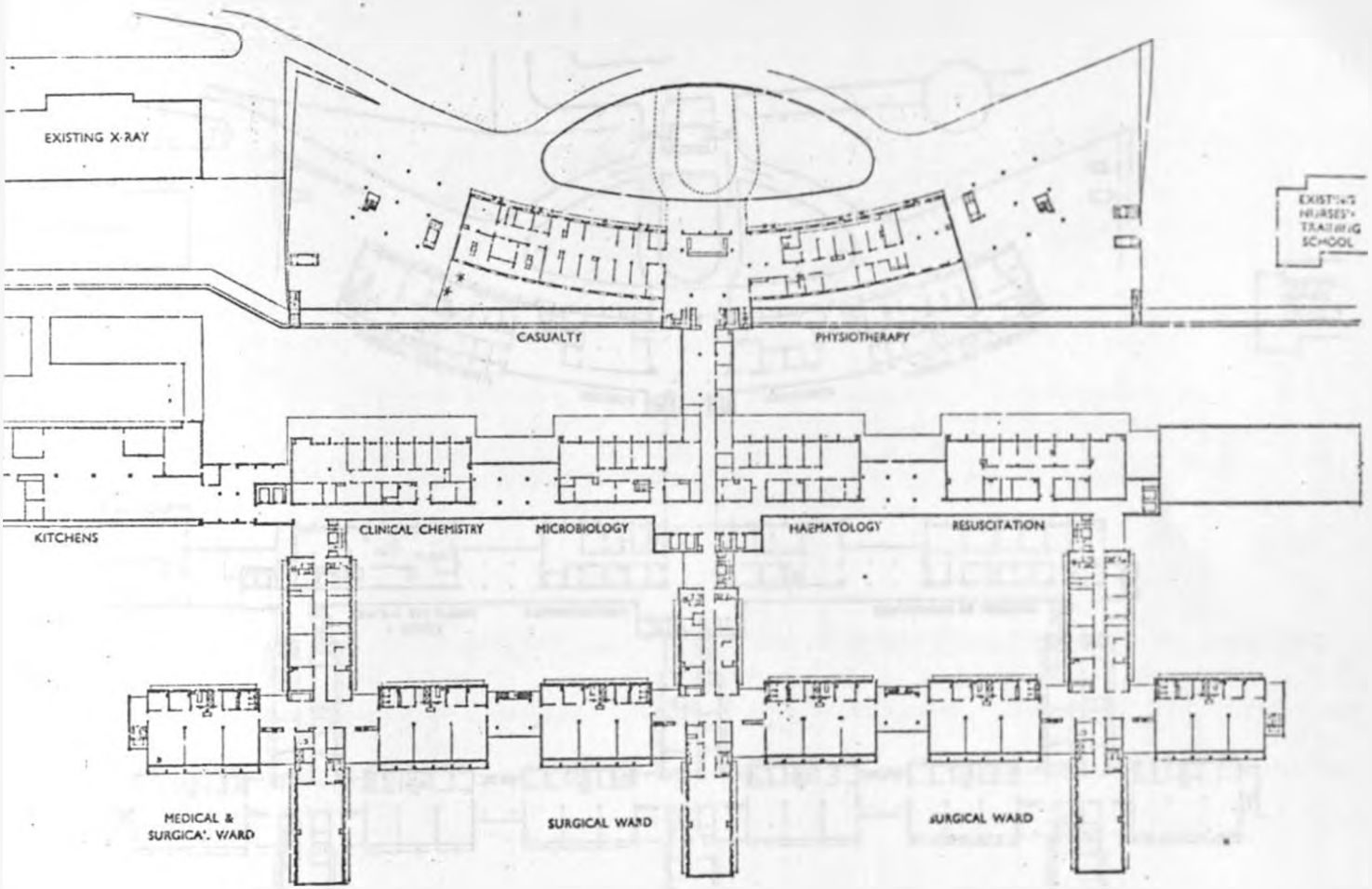

*FLOOR 'A'*

**(General visitors entrance level)**



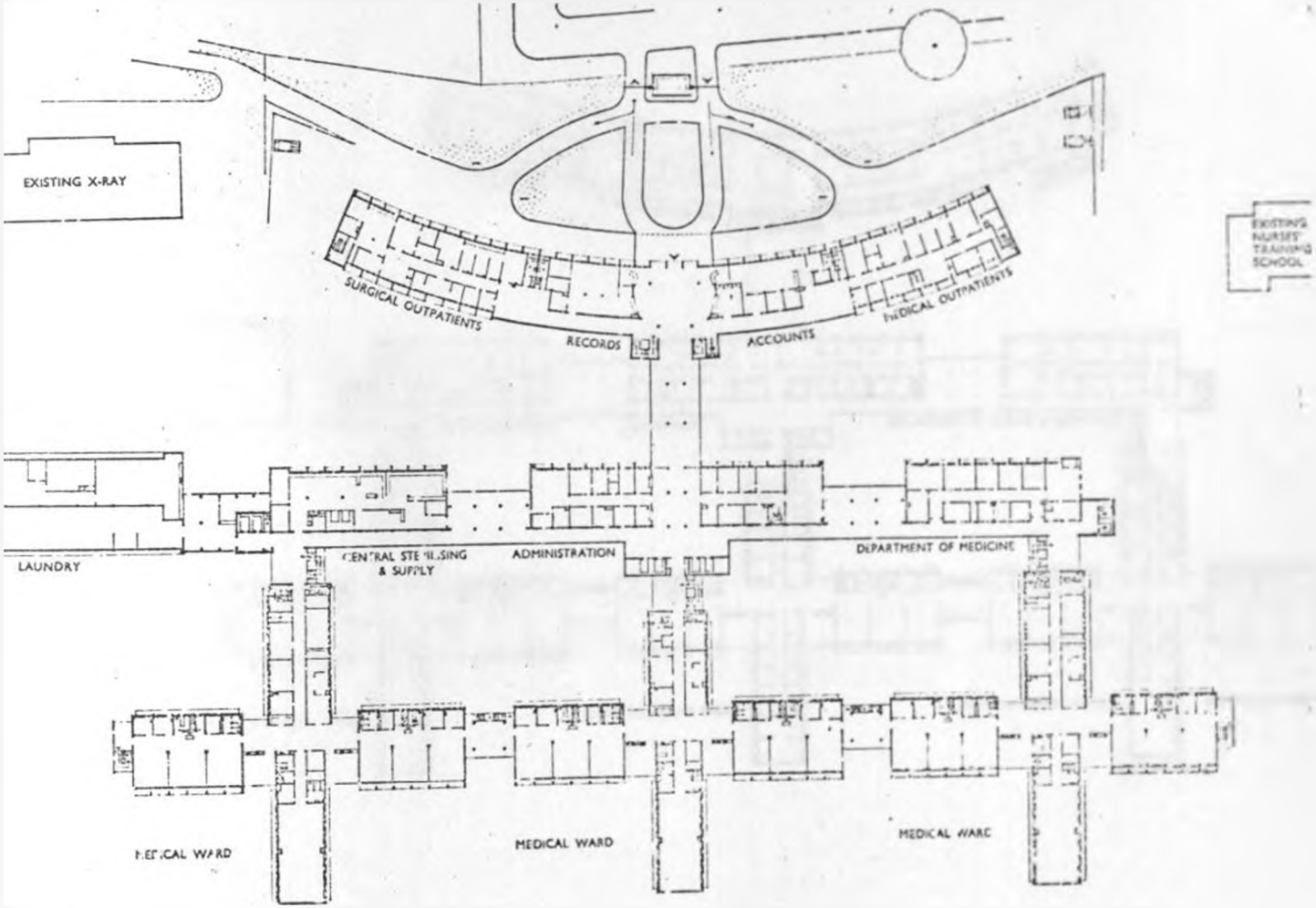

*FLOOR 'B'*

**(Private patient and staff entrance level)**



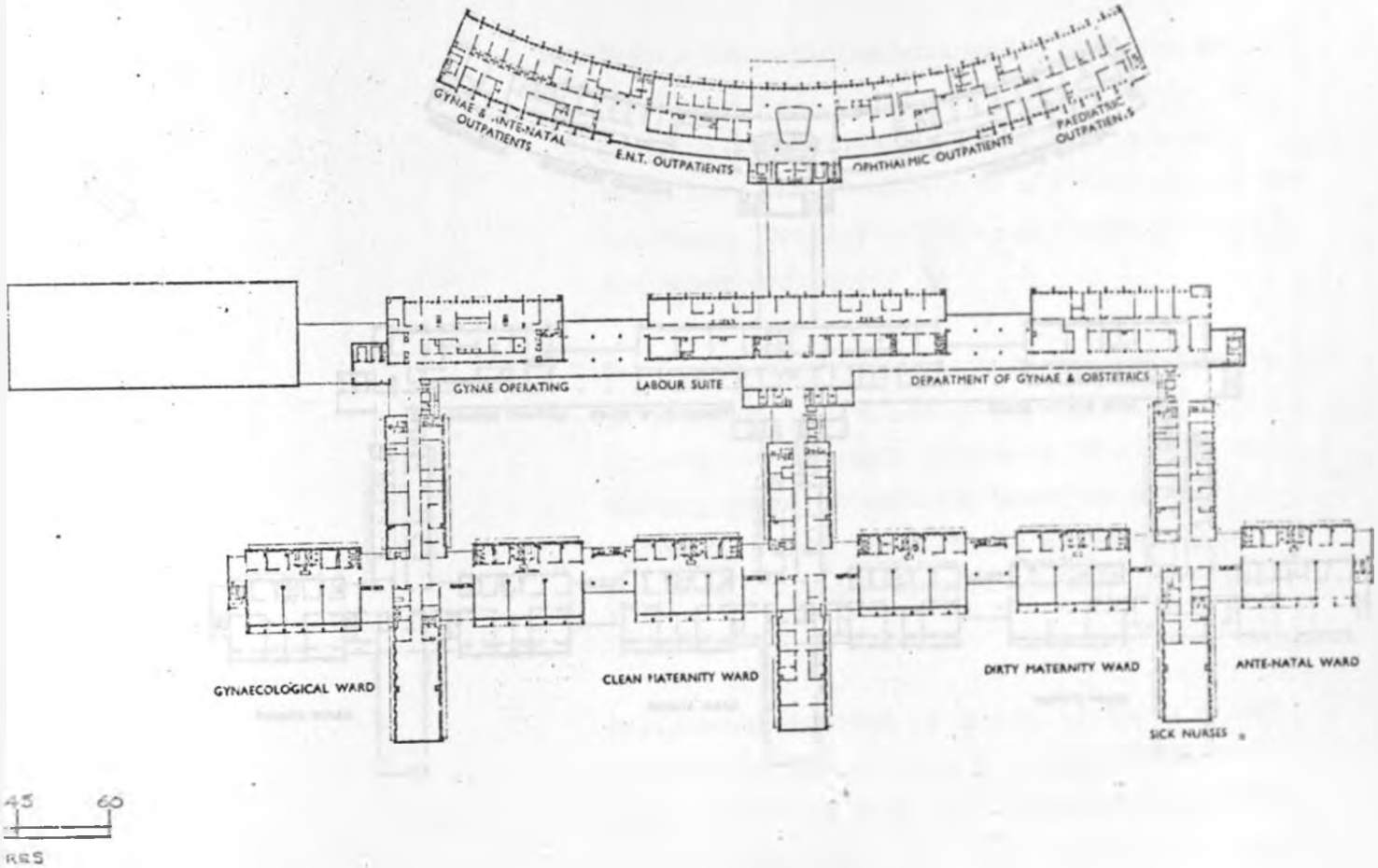

*FLOOR 'C'*

**(Casualty and admissions entrance level)**

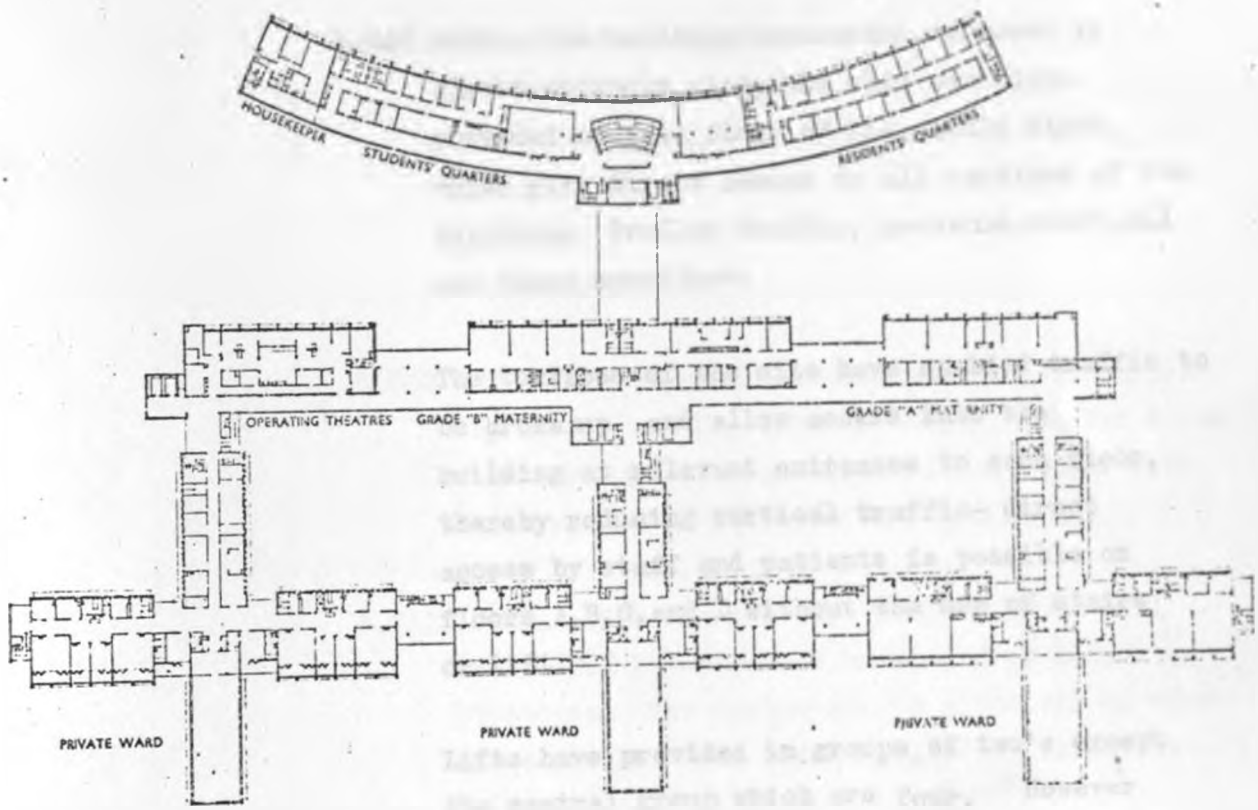



*FLOOR 'D'*

**(Main entrance level)**


GYNAE & ANTE-NATAL OUTPATIENTS
E.N.T. OUTPATIENTS
OPHTHALMIC OUTPATIENTS
PAEDIATRIC OUTPATIENTS
GYNAE OPERATING
LABOUR SUITE
DEPARTMENT OF GYNAE & OBSTETRICS
GYNAECOLOGICAL WARD
CLEAN MATERNITY WARD
DIRTY MATERNITY WARD
ANTE-NATAL WARD
SICK NURSES
45
60
RES

*FLOOR 'E'*


HOUSEKEEPER
STUDENTS' QUARTERS
RESIDENTS' QUARTERS
OPERATING THEATRES
GRADE "B" MATERNITY
GRADE "A" MAT UNITY
PRIVATE WARD
PRIVATE WARD
PRIVATE WARD

60

*FLOOR 'F'*

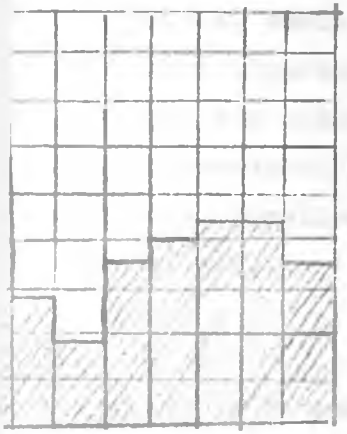
3.042 Within the building horizontal movement is almost entirely along the wide corridors provided on each floor of the middle block, which give direct access to all sections of the building. Trolley traffic, patients, staff, all use these corridors.

The terraces of the site have enabled traffic to be broke up and allow access into the building at relevant entrances to each floor, thereby reducing vertical traffic- direct access by staff and patients is possible on floors A, B, C, and D without the use of stairs or lift.

Lifts have provided in groups of two's except the sentral group which are four. However only 5 of the 9 lift provision was installed at the beginning.

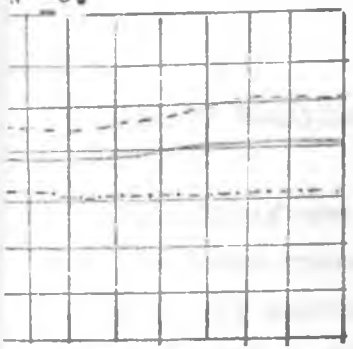
Within each unit, internal corridors are provided for pure staff and patient traffic (see details for each floor.)

Mm.



M J J A S O N D

N °C:



M J J A S O N D

3.01 DESIGN DETERMINANTS

Three climatic features which greatly influence the environment were considered and these are:

Rainfall

Breezes

Temperature

3.011 Rain Fall which is concentrated in two periods, April-May and September-November, usually takes the form of short-duration sudden storms with wind speeds at not more than 160 km/hr.

3.012 Mulago like the rest of Kampala is on hill slope and catches cool breezes from lake Victoria. The design was to allow air to flow freely around the buildings. (see illustration)

3.013 The Temperature of Kampala rarely rises above 29.5°C although there is sunshine daily and all year round.

›ise traffic, smell and
ıl location objectionable
l location was selected.
supply depertment (c.s.s.d.)
ıll sterile supplies of
truments, etc...

steam supply to sterilizers
and cold water,
ıking water,
,
gen,
tion.
Mechanical Ventilation.

om with calorifiers & pumps
form the basic system for
supply. All sections with
ies are supplied with steam

The boiler plant uses electricity at 440 V each boiler has a capacity of 1 000 kilowatts.

Hot water is restricted to baths and showers only, for reasons of economy.

The cold water tank has a capacity of (80 800 gallons) which is about one days supply.

A single-stack is used for sanitary services; stacks are cast-iron, and anto-syphonage pipes are in copper.

Cold rooms are provided in the Heamatology department for the blood bank; in the clinical chemistry department; and in the Mortuary for the body refrigeration room. All these require temperatures around 2°C. Multi-cylinder compressors with air-cooler condensers mounted on the slabs over the cold room roofs, and propellor-type air coolers with water defrosting systems are fitted within the cold rooms. Cork insulation is used on walls, ceilings and floors, and onto this is fixed woven wire to take plaster;

floors are in granolithic.

The operating theatre suite is fully airconditioned this is the only one unit air-conditioned. The A.C. plant is below it in the basement and provides 100% standby equipment, chilled water and pumps. Air-extraction is through the sterilizing area so as to prevent escape of steam or warm air into the theatre.
A special air-conditioning unit has been installed in the premature baby unit where the high conditions of up to (80°F) 35°C and 65% Relative Humidity are required.

3.053 Communications

A 250 extension P.A.B.X telephone system was installed with two operators to handle outside calls. In addition a radio frequency staff location system for doctors and other essential personnel was installed. 50 receivers were installed at the beginning.
A patient-staff call system of a bell-push beside each bed was restricted to paying patients. It operates a buzzer and light at the nurses station.

3.060 GEOLOGICAL FACTORS

3.061 Earthquake: Kampala is within the Earthquake zone, so the hospital structure was designed to withstand the strongest Seismic tremors ever recorded at Entebbe, some 35 kilometres from Kampala.

3.062 Subsoil conditions:
Two type of soil are on the site; pebbles and a red coffee soil. Both soils drain well.

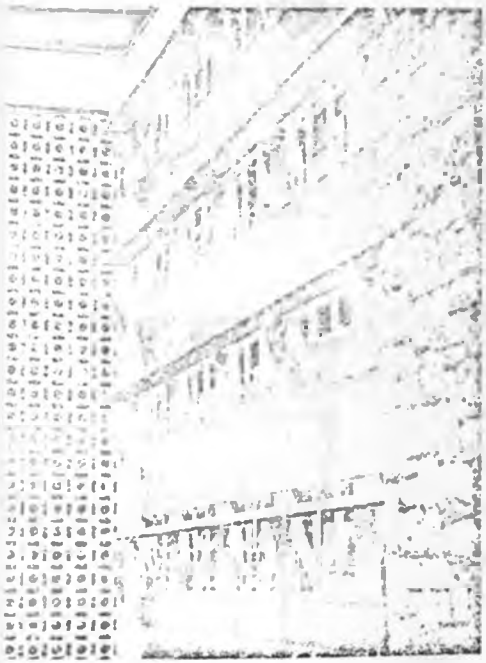
3.070 FLEXIBILITY
Future extensions were not considered necessary; internally the arrangement is supposed to allow some minor rearrangements.

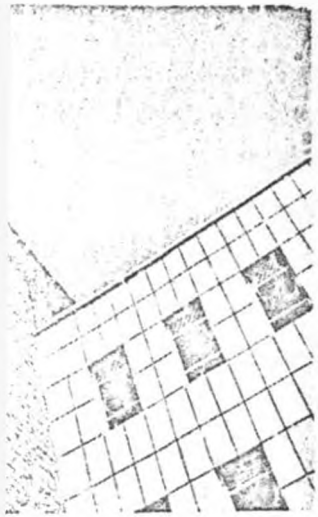
3.080 FINISHES.

Permanent finishes, requiring no maintenance, were chosen wherever capital cost permitted.

.081 EXTERNAL FINISHES.

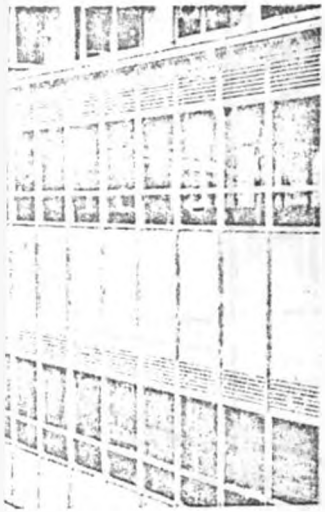
Precast terrazo panels using white and black marble chips and white cement, with the agregate exposed by wire brushing, cover much of the external wall surfaces, cills, mullions, and canopy edgings are finished in the same material. In places where costs has prevented the use of P.C. panels, concrete block walls were finished with a single coat of rendering with a wood float finish, painted with external P.V.A. (polyvinyl acetate) emulsion paint. Panels beneath windows are faced in a blue ceramic mosaic so that in combaination with the white terrazo sorrounds, gives a cool appearance.
(Fig. 11.)





To provide some contrast in texture, squared blue and brown granite rubble walling, quarried locally, has been used on plinth facing, on some ground-floor walls, lift towers and retaining walls. (Fig. 12. )

The two bridges connecting the Outpatient Block and the Supply Block to the service Block have been emphasised by the use of Aluminium curtain walling with in-fill yellow asbestos sheet panels. (Fig. 13)



The reinforced concrete flat roofs are covered with a thick vermiculite screed laid to fall towards deep gutters around their edges. "Rubervent" bitumenous felt with a white mineral topping, incorporating a system of vents to prevent building, covers the screed.

.082 INTERNAL FINISHES.

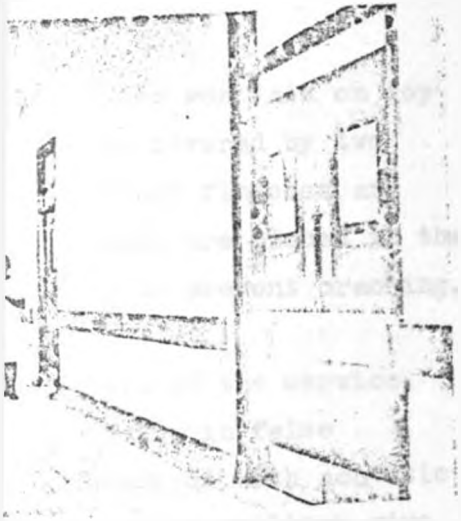
Internal partitions are constructed of 100 mm hollow clay blocks manufactured in Kampala-Kajansi. They are rendered with cement-sand and finished with a coal of lime-putty.

Floors of wards, corridors, treatment units and most other areas, with the exception of offices, are terrazo in several colours, and over 30 000 sq. metres of this finish was laid— total floor area is 53 005 sq. metres.

The terrazo is devided into one-metre squares by ebonite strips. Floor gullies are strategically placed in wards and corridors.

Internal corridors in the clinical departments, diagnostic and administrative departments are in cork. The radiological rooms, dining rooms gymnasium and physiotherapy department have wood block floors of a local hardwood.

Walls have a variety of finishes. Those of the main hospital corridor are lined with terrazzo to a height of 1 metre on both sides, while columns and walls in wet or dirty areas are lined with the same material. Splayed terrazo skirtings are used in corridors to keep trolleys well clear of the walls. Timber rails in these areas serve a similar



4.

iding handrails for patients.
aluminium trolley plates and
determined by the height of
s, which are standardised
(Fig. 14. )
ntrance hall are faced with
e slabs, and pannelled in a
ing of a local timber-Nkoba.
was used in selected area;
om, walls were lined with

S.
it system was laid on top
oor and covered by two
here floor finishes are
wire mesh are placed in the
nduit, to prevent cracking.

st units of the service.
rizontally in false
he underside with acoustic
nels in the ceilings give
ce, and the tiles give a

clean finish to the building and greatly assist
sound insulation.

4.01 FLOOR AREAS.

The total floor area of the hospital, including external wall thickness is approximatelly 53 005 sq metres.

The accompanying chart is a summary of the sizes of the major sections and the percentage each one forms of the whole.

5.01 ALLOCATION OF BEDS.

The hospital was designed for a full capacity of 887 beds, although at the time of opening due to lack of finance, the hospital was short of beds by 84 of them. Wards were planned to accomodate male and female patients in one unit in proportions of 34 to 20, or 40 to 14. Allocation to various departments is here given.

Nursing units were to be generally of 54 beds, as it was in the old Mulago, due to shortage of staff. The advantage was that a clinical firm could have all its patients under the control of one sister. The beds could therefore be divided into three self contained sections. Two sections of 20 beds each, in three six-bed bays and two single rooms; the third with 14 beds in an open ward, providing an adaptable unit for special purposes. (see "The Standard Ward Unit" diag.)

Private patient accomodation would take the form of small wards of six, four, twoand single beds, some of which would have thier own

bathroom and toilet (see "Private Patients Unit")

5.02 ANCILLARY ROOMS.

A Tutorial Laboratory is provided in each ward unit into which beds could be wheeled for teaching, and for students to carry out pathological tests.

A centrally placed treatment unit with its own axcillary rooms would avoid the need to carry out treatments at bedside, and provide facilities for a considerable number of minor procedures to be performed with the consequent lessening of load on the main operating theatre.

## 6.01 COST ANALYSIS

The estimated cost of the project was prepared in September, 1957 and was £2 300 000. There have been additional requirements since that time, principally in the form of extra approach roads and car parks. Because of this the final cost came to approximatelly £2 315 000.

A considerable amount of equipment was recovered from the old hospital, and this was allowed for in the original estimate.

I NEW MULAGO.

ılago Hospital was
ıt at a time when a
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› have been in action.
I was a member of the
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ıence try to dissuade
ption. Even then, a
giving minimal answers,
go to the hospital
laimed, knows all
nefficiencies lie.

a sizeable number were
fully cooperative.
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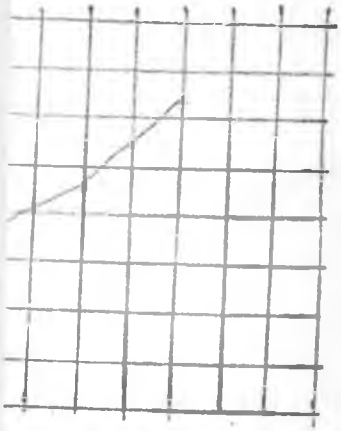
idears; but, at least they indicate where need occurs, and some were able to suggest simply reorganization and / or erticize the inflexibility of the spaces.

The spaces which have outstanding problems are discussed here below, followed by suggested ways of dealing with them or how to minimize them. It should however be remembered that the hospital is over loaded so that every department is experiencing some kind of squeezing.

Because of the medical system of "offs" and the great numbers of patients who come to Mulago Hospital all medical work is carried out by three separate firms -- the blue firm, the red firm, and the green firm, Doctors and nurses who work in the blue firm will always work in that likewise, a patient who is on the first day treated by the blue firm will have to come back only when that firm is on duty. The idea is to make sure a person is dealt with by people who will follow the developments until recovery time. This is very useful in the case of outpatients.

ONS



8 9 70 71 YEAR.

## 7.o2 ADMISSIONS.

The interview held with the statistics officer brought to light a number of interesting points. The figures he gave me show an ever increasing number of admissions to Mulago Hospital.
This can be explained by the facts that
(i) the population in Kampala and neighbourhood is increasing drastically,
(ii) more and more people are realizing the value of medical care rather than the traditional "witchcrafts"
(iii) more and more hospitals and other medical units, both government and private, are making use of the referral facilities in Mulago.
(iv) the economic forces which have resulted into family - ties disintrgration, have led to a number of morbid patients being abandoned in hospitals so that the Ministries of Culture and Health have had to establish occupational therapy department.

| | CASES. |
|---|---|
| | 503 871 |
| | 179 863 |
| | 10 817 |
| EDICS) | 10 856 |
| | 4 839 |
| | 2 088 |
| | 7 661 |
| | 7 537 |
| | 1 990 |

7.022 MEDICAL CASES 1971.

From the records of 1971 we realise that the outpatient department alone catered for cases greater than the total admissions of 1963, yet in that year the hospital was at its optimal capacity.

The overcrowding occurs in the departments in this order

1st Gynaecology and Obstetrics
2nd Paediastrics
3rd Surgery-accidents
4th Surgery ordinary
5th Medicine
6th E.N.T.& OPHTHALMOLOGY
7th INFECTIOUS DISEASES.

Within the department of Medicine disease-types distribution is even.

A lot of accidents were said to occur on

a) Public holidays
b) Month ends
c) Weekends.

ON 1st AUGUST 1972.

| BEDS | COTS | TOTAL |
|---|---|---|
| 227 | | 227 |
| 181 | 15 | 196 |
| 168 | 2 | 170 |
| 252 | 6 | 258 |
| 44 | 2 | 46 |
| 24 | | 24 |
| 6 | | 6 |
| 1075 | 26 | 1100 |
| 85 | | 85 |
| 38 | | 38 |
| 1151 | | 1176 |

AL WAS TO BE 887

7.03 BED STATE AT PRESENT.

Through a system of squeezing up, the hospital has been able to expand its bed capacity from the original 887 to 1176. In actual fact, many treatment rooms, especially in the peadiatrics section, and even in the Out-patient department, have been turned into improvised-wards. These cases together with patients who cannot find a bed, and have to sleep on the floor have not been included into the 1176; otherwise the figure could easily climb to twice the original capacity.

OMS. IN O.P.D.

s of partitioned-off
up by a medical corridor;
ed from the corridor by
curtain. The walls that
p to a height of 2 metres
ht is approximately 2.8m.

his system were:
s privacy because all that
or is overheard in the
her cubicles.
ripping dressing for
nostic examination of
ly cloth - covered.
ystem is too solid and
The partions are built
s manufactured at Kajansi
with the present shortage
ccept smaller cubicles
d more cosultations.
e for office so that
an own office where he

could relax for some moments. They wanted more for treatment purposes.

e) One doctor expressed concern about the rainwater which gets blown through the ventilators into the medical corridors. If the corridors had been sloped very gently towards gulley for a cleaner whenever stormy rains pour.

However, some points were appreciated in this section and these are:-

a) The idea of having sinks next to the consultancy rooms is very good.

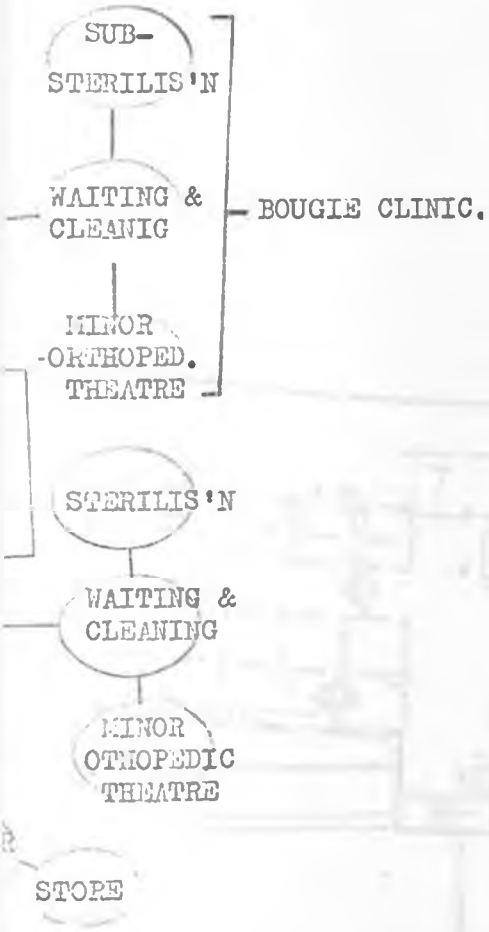
b) The P.V.C. The accoustictiles on the roof make conditions quite comfortable.

c) The middle - pivoted windows were liked and it was suggested that they should replace the louvre windows in wards.

d) A common public consultation room for all the doctors and nurses to facilitate communication; The size of which should be 10m per doctor.

e) adequate treatment areas with arecovery room for those patients who cannot walk off immediately after treatment.

## 7.05 O.P.D. SURGICAL.




The O.P.D. Surgical is a section that undertakes minor operations which do not need hospitalization, e.g. plaster cases.

This section was originally designed to undertake about twenty cases in each subsection (e.g. the Bougie clinic-- for opening urinal canals) but now each subsection handles over 50 cases a day.

This has resulted into shortage of waiting space, undressing space, clerical space, staff changing space, and treatment.

It is now clear that each department should have:

a) a local waiting space for about 30people.
b) undressing facilities for two people at a time
c) clerical space with adquate storage space for the three firms.
d) local staff changing facilities and staff rooms.

## 7.06 CASUALITY DEPARTMENT.

The casualty department is too small for the volume of patients handled here. This is especially true on public holidays, weekends and month-ends.

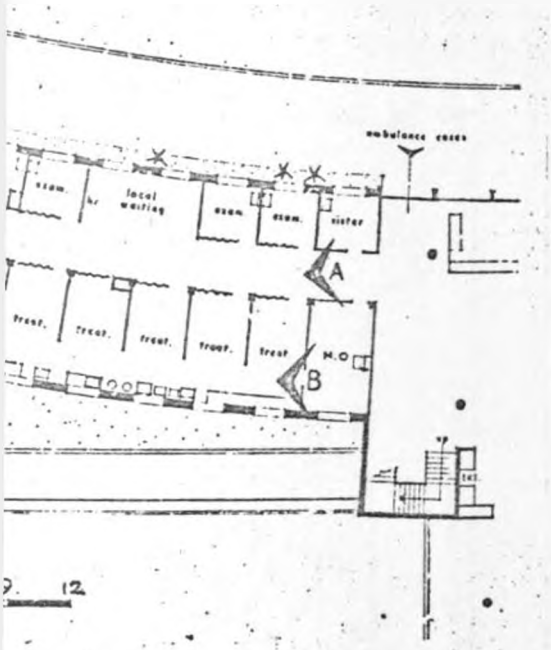
Some of the defects in the original design are here:

a) There was no store provided for sterile supplies required in the theatres and treatment rooms. There is no store for non-sterile return equipment.

b) There is a policeman on duty to record all accidents, but no particular office was set aside for this purpose—now the hospital is simply improvosing.

c) The night dispensary which is located in the waiting room in form of shelves, should be in a room of about 10 m floor area.

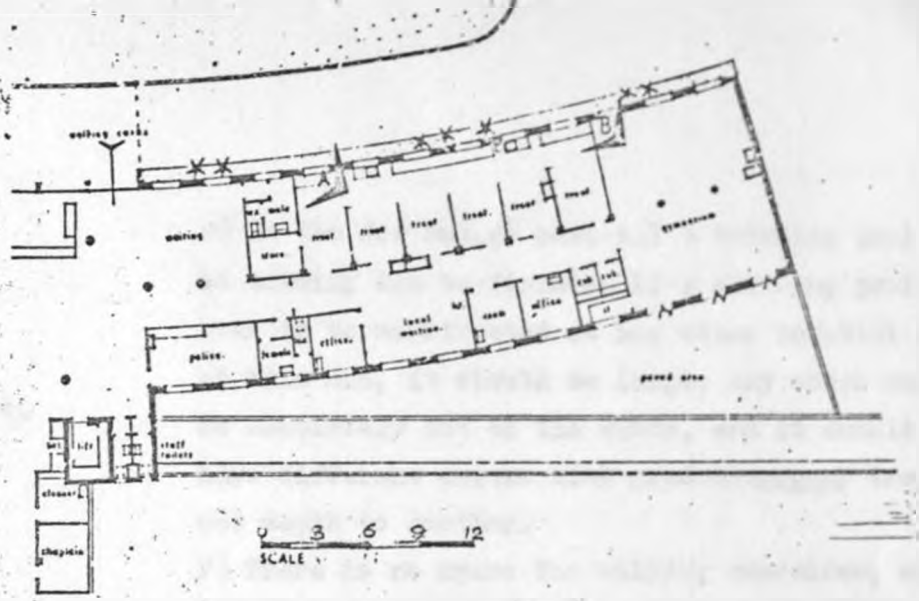
d) It was very inconvenient for casualty patients to go upstairs to the main dispensary for medicines. So a day dispensary had to be opened to facilitate distribution.



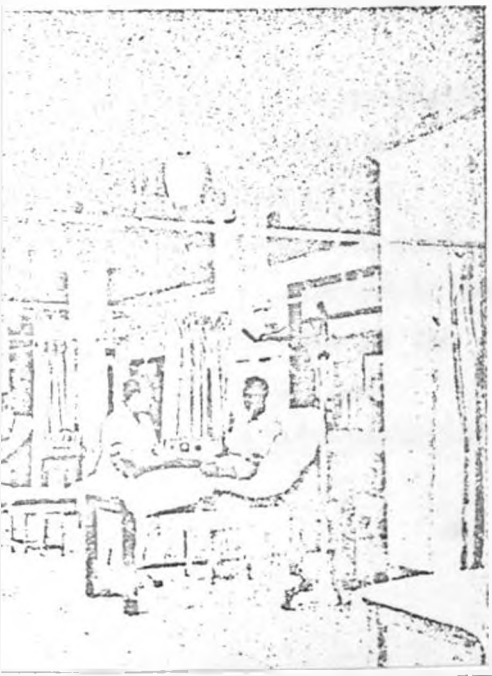
The room for the purpose was obtained by reducing the transport section to a half its original size.

erapy Department, which is
nt Block and is used for the
s. The original clinic in the
nabilitation of the paralysed,
by a voluntary organisation,
is a hydrotherapy pool and
liances of this clinic and the

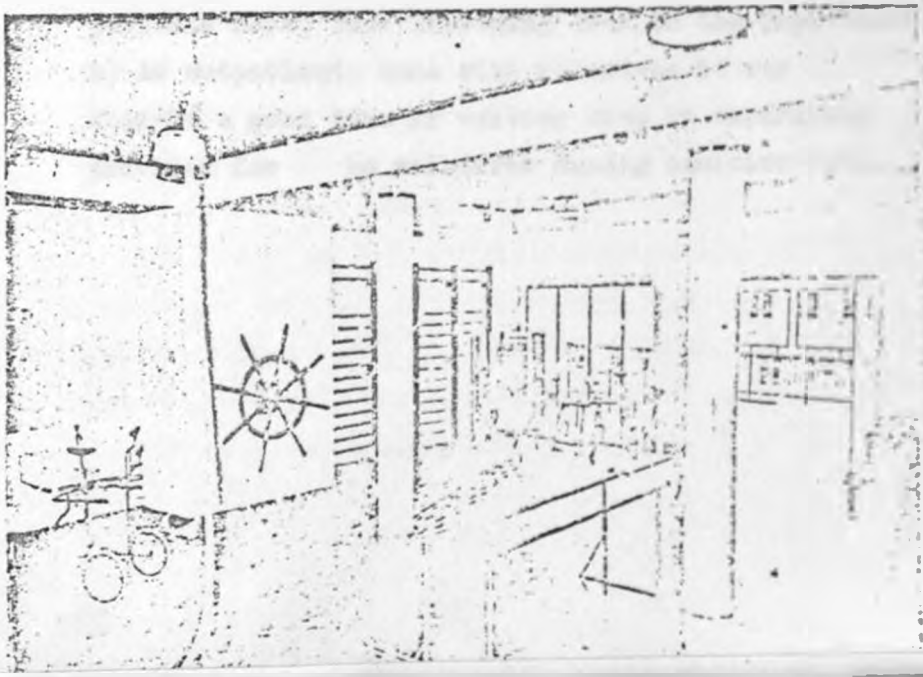
new Department can be sub-
ng, and this enables treatment
multaneously. The general
one side and a medical staff
ed here. There is a separate
gymnasium equipped with
apparatus. This has a wood
pen on to an external paved




The treatment area viewed from A



The gymnasium viewed from B



TMENT.

ves both outpatients and
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staff.

in the Gymnasium, when inter-
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s about 110 $m^2$
lapseble door-system to enable
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ily moved from place to place.
long have been confined to bed
have these exercises in the
ised that any Gymnasium
ound with a possible extension
ee Shade.

e) At the New Mulago hospital a swimming pool is missing due to finance. If a swimming pool is e ever to be constructed at any other hospital or at this one, it should be large, any steps should be completely out of the water, and it should have different depths with gradual change from one depth to another.

f) There is no space for walking exercises, which should be a completely open space with no equipment in it.

g) If day-spaces attached to wards are spaceous en enough, the orderlies could carry out exercises with patients here, thus lessening load on the Department

h) As outpatients came with relatives it was thought a good idea if waiting area is separately provided for he relatives during exercise time.

## 7.08 CENTRAL RECORDS STORE.

This department in the whole hospital is perhaps th most squeede yet very few can pay attention to the problems found here.

The chief statistician recommended the following ideas in any future design of this department.

a) Centralization of records is not the best solution. Several record stores near the departments where records are required will answer the task more satisfactorily. This has the advantages of saving time and speeding up sorting.

b) There should be a separate store room for new stationary capable of holding a years supply The stationary may be cards, files, books, etc... He did not indicate what size it could be; but an area of 10 sq. metres may be sufficient.

c) As far as the central records store is concerned, he said, it should have a clearly defined filing space for between five to ten men. There should also be a room for the catalogue, of floor area approximately 10 sq, metres.

There should also be a library for dise-se-index books of about the same size as the catalogue room.

d) An office for the chief statistician equiped with a telephone. A second telephone extension should be at the sorting area.

e) When the idea of micro-film shotage method was mentioned to him an an alternative to card and file system, he said that such facilities have not been introduced yet. He agreed that the microfilm is likely to reduce space requirements The Records have to be kept for a total of 10 years. This means that foresight into future requirements is extremely essential.

A simple formula can be developed using the information available from New Mulago Hospital, for finding total floor space require for shelves.

1. Each shelf on plan is 2.44mx0.6m. saturation space required around it in a simplified way is 0.9 and 0.75 wide on each side as indicated. So total floor space required per shelf is : 1.5 x 3.19 = 5.25 sq. metres.

2. Each shelf has 10 compartments horizontally and 10 vertically - a total of 100. m. each shelf, the compartments are faced back to back, giving a grand total of 200 storage compartments per shelf.

3. Each of these 200 compartments stores a maximum of 50 files. So each shelf ultimately stores 10 000 files.

4. In each 5.25 sq. metres on plan we can store 10 000 files, i.e. we cater for 10 000 patients. If it is possible to forecast the number of patients who will visit the hospital, excluding reattendances we can work out floor space required:

Suppose "P" patients will visit the hospital in 10 years.
Then shelves required in 10 years will be P/10 000.

Therefore area required will be $\left(\frac{P}{10\ 000} \times 5.25\right)$sq. m.

N.B. "P" is the total sum of outpatients and in-patients.
"P" can be estimated from existing statistcs.

ted department, and all
for volume of patients and

om have turned into a teaching
eh is quite necessary for
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lting rooms have been
ursing Wards for brief
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y for this department was
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7.10 O.P.D. OPHTALMOLOGY

This too, is a conjested place. The reception and its seating area is too small; so the medical corridor is used for waiting.

The only doctor's office in the section is used for several stores, as well as for coffee.

7.11 E.N.T., ORAL & NEURO SURGERY.

The doctors interviewed, agreed that these three items, if grouped together match very well and make mutual consultations between doctors very easy.

Oral surgery is at present accomodated into two "very small" rooms used for the following:-

a) clinic
b) waiting
c) stores
d) records
e) office
f) dressing

The dotors however feel that each of these items should be accomodated into an own room.

DEPT.

uced department and as such,
ognition as well as for space.
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rmerly used as a Post Office
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very necessary due to the
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the department is purely
le and developing skills
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he department requires
light crafts work, and

b)Storage space for items made in the workshop.

c) Storage spce for patient's various equipment like wheel chairs, etc... is lacking.

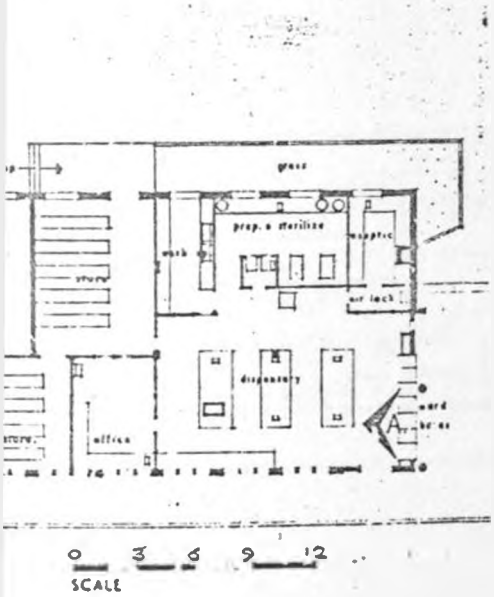
Therefore the sister concluded we need a department comparable in size with the physiotherapy department.

## 7.15 PHARMACY.

The department is headed by a senior pharmacist, the only qualified fellow in the whole section. For the last seven years, there have been 6 to 8 workers while the manpower estimates put the figure at 15 and over. The understaffing has greatly affected the total output of the department.

The space provided for the whole department is insufficient. The storage space is so small that the bulk stores are still at Old Mulago. Originally it was intended that about five students would have laboratory lessons in this department, but now up to thirty students have to be accomodated.

Talking to him about security, he said that loss is potentially high, but hitherto, no buggleries have taken place.The greatest problem, however ensures from the hospital staff themselves and in this case there is no exception. Treatment staff and the pharmatical staff, on going out of the pharmacy stores take with them various items of medicine. He concluded that only prayers to God remedy this situation, serious as it is.



To summarize; the department should have adequate teaching facilities for a class of about 40 students, adequate storage for all medicines, and should have a bulk store attached to it.

## 7.16 RADIOLOGY DEPARTMENT.

T he department of radiology too, is suffering from the common disease:lack of space. The patient attendence has multiplied by 8times the optimum figure. Most of the waiting patients have to stand up for long periods; the waiting room and corridor are packed up full with beds wheeling in non-ambulant patients.

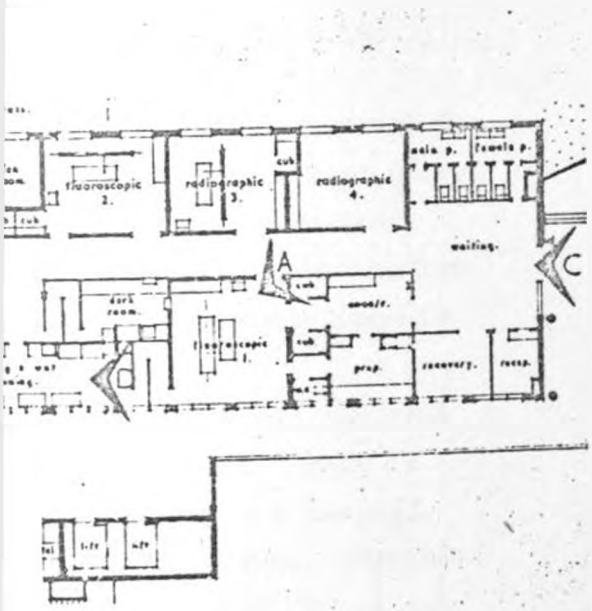
The radiographer who took me round made the following remarks:

a) The waiting room should have been designed for up to 200 people a day.

b) The offices are being shared between the radiologists and the 15 radiographers inthe department. And all offices are used as stores in some form. He recommended that each radiologist should have an own office.

c) The secretary, who at the moment works in the general office, should have her own office.

d) The general office should be broken down into three different offices namely general administration office, filing office, and



dispacth office. At present, the three of them are in one office.

d) The clerks office was later changed into a staff restroom but it lacks coffee making facilities.

The users, complained of lack of storage in this staff-room;-storage for gowns and personal belongings like handbags. They suggested lockers as a good solution to this problem.

e) The film store is too tiny for the storage it is supposed to accomodate. The films have to be kept for a minimum of six. Since the attendance has gone up by 8 times, storage should also rise by the same factor, hence bringing floor area required to not less than 100 sq metres.

f) The general store, which is about 5 sq metres floor area, keeps only small-size articles. The big articles like x-ray equipment is kept in corridors. It was suggested that any store should be large and adaptable.

g) The appointment area is too small; however if it had been planned with the window facing outside so that all the queing is done outside, it could very easily suffice.

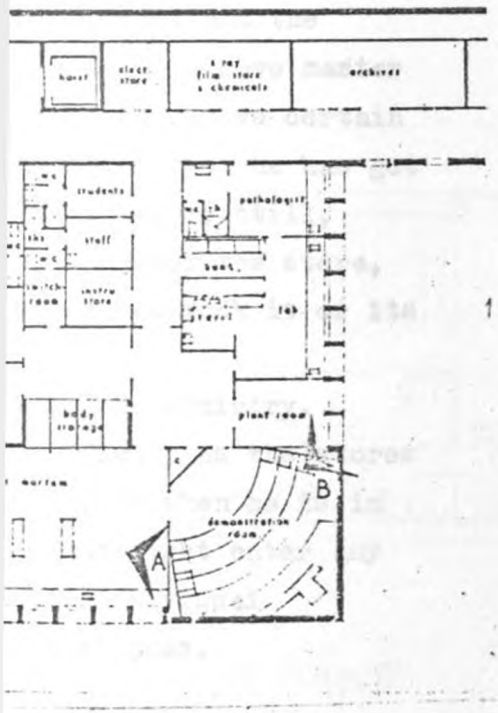
a local visitors' room
lants who normally accompany
ttendant-patient ratio is

of x-ray and fluorroscopic
. In some rooms, two or
ipment are installed, whereas
ld be in its own room.
the case of Mulago, there
ut 10 such rooms.
c room should have two
e present situation is
n.
p room is adequate enough for
ut since it is used as nurses
is different when nurses
and only God knows whether
terile. The nurses room is

f and patients are combined
on of the staff. This is
act that they are located
tients waiting area. Further
em of "MEN", "LADIES" is not

adequate as a large portion of the populace is still illiterate. It is suggested that diagramatic indicators should be fixed on doors to save a number of people humiliation when someone enters the wrong toilet facilities.

## 7.17 MORTUARY.




The Mortuary which is at the far end of the building complex is quite alright in most of its spatial requirements. The head-man, however, made the following comments:

a) The refrigerator is too small for the purpose it serves. It supposed to carry 16 bodies at normal full capacity and the bodies are supposed to be stored for 48 hours. Due to poor communication and transportation relatives of the dead do arrive beyond the 48 hour limit; in some instances they may show up after a week. So bodies are kept for a week.

So at the moment two adult bodies plus a number of young ones may be kept on any one rack, so that it is possible to go beyond fourty bodies in all.

b) The provission of changing rooms and showers is for senior staff. The junior staff should also have changing facilities as they are rejected by other junior staff in the central staff changing rooms.

.on mentioned two basic
pace, and poor administration
equirements, every store is
the office has been
re.
lministration he said that
Supritendent and the
itendent both have master
stores and remove certain
knowledge, yet he has got
items. Worse still,
re taken from the store,
o trace who took it or its

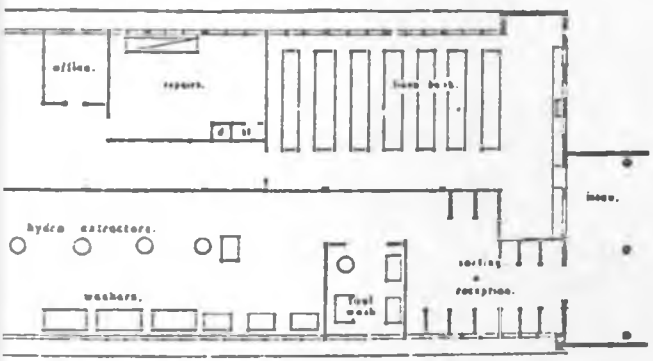
ied by the ministry.
ry difficult as the stores
rridor; so when he is in
see who might enter any
nsisted on visual
the entrances.

d) The stores at the hospital are scattered into several buildings. It would be quite an ideal solution if all stores are located in one building.
There is a total of 2 maintenance shops each of 20 sq metres.

## 7.19 LAUNDRY DEPARTMENT.

The linen has had an expansion towards the issue counter. Hence the issue-counter space has been reduced by one shelf space.

The repairs room is very small relative to the number of people who work here. The headman reported that the number of workers have trebbled in number since six years ago.
Therefore the space should have been expanded to achieve a better atmosphere. The present room is about 20 sq metres floor space.




Y AND LINEN BANK

The department was criticized for not having:-
a) Toilet facilities adjacent to the work place. Staff have to walk long distances to toilet facilities.
b) A room where staff could try on newly supplied uniforms. A screen system has been devised for the purpose.

The ironing-pressing-mangling roomand the repairs room are very humid and warm due to steam and

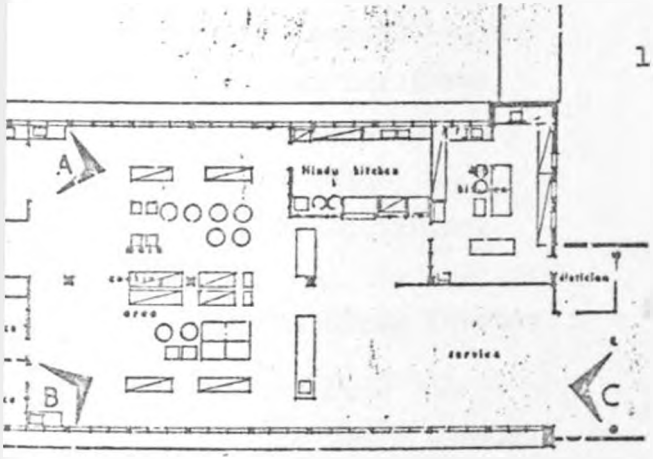
heat decipated by the equipment.
Ventilation is very inadequate; mechanical ventilation would have worked better.

The changing facilities are combined for both men and women. This causes lots and lots of inconvenience. They should be separate and lockers should be provided in each section.

## 7.20 THE MAIN KITCHEN.

The kitchen headman had a good number of points to discuss at length; so it has been possible to pin-point weaknesses in design and make certain sensible recommendations in general terms. These will be left open for the artical to interpret and make use of.

The problem ranged from administration difficulties to technical failures in design and material performance.




1. Duplication: The whole system is subdivided into five smaller kitchens: the hindu kitchen
the islamic kitchen
the european kitchen
the African kitchen and
the diet kitchen.

Each of these kitchens is self contained, and so a lot of equipment instalment has been duplicated. Additionally men who work in one kitchen cannot work in another kitchen so that more people than required have to be employed.

This is wastage of manpower. Another wastage is that for each kitchen there has to be three shifts; so the total manforce employed is 3 what he thought would be needed if the kitchen had been sensibly designed.

He suggested a kitchen design with a common main cooking island for all boiling and cooking of the different foods. Then, isolated from one another would be the separate special hindu, African, islamic, european, and dietician items.

He further suggested that the main cooking area should be in a long strip so that any one cook can attend to two activities before and after him. The present kitchen set-up is a series of rooms solidly partitioned off; this he fully rejected.

2. PLANNING: He criticized the store-kitchen relationship. There are a few small stores within the main kitchen, but these are totally inadequate. The greater bulk of food is kept in the General stores, which are on the floor below

as to be prepared on the floor
ransported to the main kitchen.
ied upon for this purpose; and
t provided for this purpose
has to be transported along
ine the inconvenience.

; The stores provided in the
suggested, should be changed
old rooms should at least
he total floor area to at least
would possibly provide enough
's supply ; the present
enough perishables for three
e further suggested that diary
ept separate from meat; fish
alone; so should vegetables.

particularly the Hindu Kitchen

kitchen-store to hold all
kept here for the day's supply.
artment are too few and too
ion is poor because a mosquito

gauze was incorporated in all ventilators, and now, flying particles have blocked the meshes rendering the ventilators useless. It was suggested that a mosquito gauze can be left out and bagglar bars only to be constructed in their place.

Floor construction is bad in the sense that it has not been able to withstand abrassion, and worse still it is very damp. It is a cement floor.
Storage compartment are very few so that most foods have to be pured onto the ground rather than being properly banked in shelves, etc...

The provisions also indicates that at the time of design, people did not understand how the store would function- especially in ralation to local foods like Matooke, Potatoes, etc...

The room for peeling is not suitable for local working methods. It was suggested that two long strips of rooms one for washing and the other for peeling would have been an ideal solution. In the present system, women have to stand round a central peeling place till they finish working.

t encourage high prductivity.

pacious and it is possible to
by reducing the yard.

a lot of rats in the stores.
his department should make it
in to enter.

: This sections looks at needs
senior staff.

om was provided for the kitchen
ber of set-backs the most
g:- it was designed for only
nly 20 lockers are provided.
it caters for about 50 people.
back is that it was not divided
e changing room. So the women
ing facilities. On top of
rribly narrow. It looks like
artitect found hanging loose
ed this purpose, which it does

There are two toilet units, which again, are too tiny and hence inadequate for the number of people working in the kitchen. The head of the kitchen wished that four units had been provided, two for Junior staff, and the other two for senior staff.

A visitors room is a very serious omission, and all attempts to improvise one have proved futile. If it had been provided it would have stopped unnecessary numbers of people who stream in every now and then.

The senior staff need offices for the following people:- the cater; the assistant cateser; the dietician; then a general office for requisitions and registration of orders from wards for special requirements. The office could be used for records storage too.

5. CHANGES: Anumber of changes have taken place in the kitchen. The Hindu kitchen is now unused. The washing space which formerly was about 100 sq. metres is now to a third of the original size, the other portion is used for dry-stores and for food preparation especially meat.

ated that if he is given
nces he could still go
es for the better.

ATION.

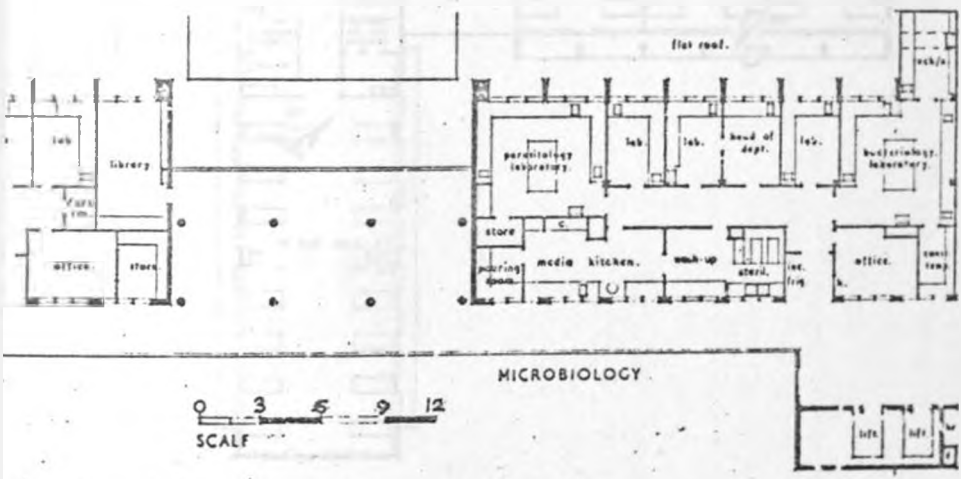
stores, the floor finish
l-sand has been badly eaten
salt. A floor finish resistant
composition of these items

a the quarry tiles are
oor and it is due apparently
ed .
tacked and decomposed by the
which drops or spills from
An investigation into this
ried out and materials
should be used.

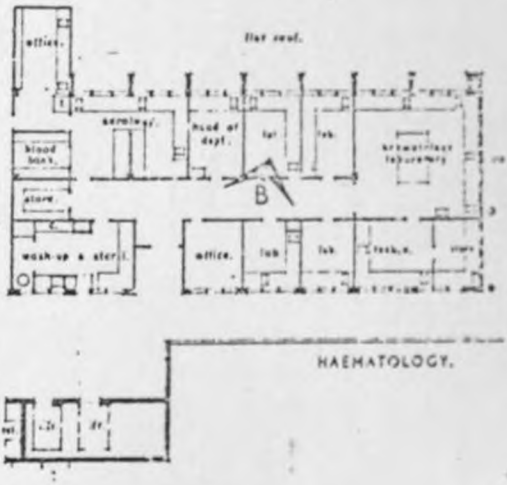
' store, which are used to
potatoes are poorly
ad of the timber louvres and
linary iron bars just to

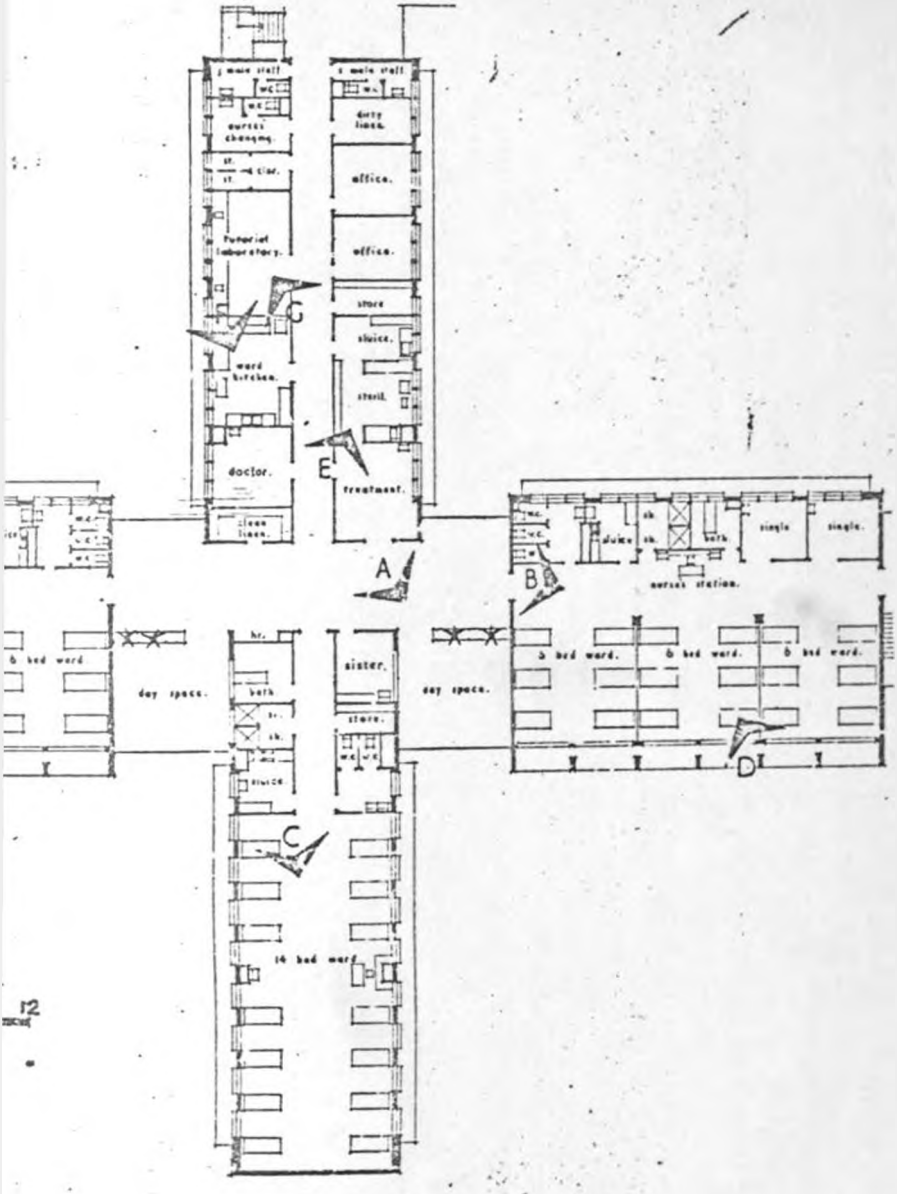
prevent birds and thieves break into the stores would be a preferable alternative.

Doors to stores should all be gate type to increase ventilation.
The automatic locking spring system fixed onto doors should all be on top end rather than the bottom end because water enters the locking spring system and destroys it.




*DIAGNOSTIC LABORATORIES*


offices.
flat roof.
serology.
head of dept.
lab.
lab.
blood bank.
store.
B
wash-up & steril.
office.
lab.
lab.
HAEMATOLOGY.




TANDARD WARD UNIT

# 6

ontemporary hospitals by the
r activities, equipment and
ts, there is little question
xity has increased more in
ears than in the previous
us increase in complexity has
se to great increases in
ration and maintenance cost,
ced in relative, not absolute
tability to respond to
s in health service, medical
earch.
eption, hospital design and
niques have given ground
problems which increasing
erates. As new mechanical,
nication and transport systems
d into the already congested
of the typical hospital to
ervice needs, the depth of
been increased by that
to "get it in, " without
e fact that there is a point
his approach to hospital

development. Beyond that point, operation, maintenance and adaptability are critical impeded, at the very time when these functions are most critical to effective hospital life.
While each of these problems is no doubt individually soluble through more prudent design and construction, the fact that the problems are extensive and pervasive indicates that no casual approach to solution will be of any significant value. The cost effects of such design, construction, operational and maintenance problems cannot be wholly quantified, but they are sufficiently visible and forceful to lead one to look at new approaches to hospital development from a completely fresh point of view.

While serious efforts have been made to attack such problems, these efforts have been in the man limited to single-hospital solution, having no broader application.
That such efforts are not more general is, at least in part due to the consideration that there are few owners or agencies responsible for large scale multiple hospital development

among these who have

s to generic research in
t.

ministration (VA) of the
nment owns and operates the
stem in the nation. There are
tals under its jurisdiction,
for care in VA hospitals number
A hospitals differ enomously in
l programs, physical settings

onment that the Veterans
undertaken the most
rch effort to date to reduce
ospitals to manageable
plicable to large hospitals
rojects.
o develop a nationally
building system that will
of hospital programs to be
le better order, discipline
ospital design and
ures. It is the intent
ospital performance and

adaptability, to reduce hospital development time, and to gain cost benefit from these improvements.

The research task itself, under direction of the Research Staff, Officer of Construction of the Veterans Administration, has been conducted by a joint venture of San Francisco architectural firms, Stone, Marracomi and Patterson, and Building Systems Development, inclusive.

een done in three phases. The
feasibility of integrating
cal systems for VA hospitals,
tional systems development
, is dependent on a guaranteed
ment for manufacture's develop-
ble subsystems, whose inte-
ve certain cost and performance
ond alternative for development
tionalization of existing
rrently available products on
, without the necessity of
industrial innovation. The
onsidered the more appropriate
ame the basis for succeeding dev

took the development of a
ng system for that portion of
ousing nursing care and
This was published by VA in
been completed, and its
cted in mid-1972. It extends th
and is the basis for the
llows.

VA SYSTEMS APPROACH:

from the general to the particular . The VA building system tends to general solutions of what are, in essence general problems. The systems approach, therefore is one of strategies for planning and construction which establish a basic compatibility, while at the same time allowing wide latitude for different project requirements materials most suitable to the specific problem. In the long run the generic nature of the VA building system provides a useful basis for continued effectiveness and development. The system can obsorb new building products and imroved design and construction methods as they become available so as to keep pace with the advances of industry, as well as with new needs in service teaching and research functions of the VA.

In basic overview, the systems approach is concerned with modular planning systems, with selected physical subsystems (structure, ceilings, partitions, HVC, plumbing and electrical), and with their integration in hospital design.-

In terms of planning , the hospital is considered as an assembly of large scale service modules (1000sq.m.)

ontent and organization. These
ain common characteristics which
mbly into hospitals of widely
rogram, siting and esthetic
mmon characteristics of these
include their essential
lectrical indendence, the
terstitial space which separates
rvice activities, and common
eristics and disciplines.

ng system is essentially
a base of user needs and
rements, and a design manual of
and selected building subsystems

presses the functional,
ychological and esthetic needs
e needs are subsequently
nctional and performance
h determine space allocation,
nviornmental characteristics.

THE DESIGN MANUAL is derived from and responds to user needs and functional performance requirement.

THE PLANNING MODULES (Fig.1-) are ranges of space with an assured capacity to acommodate a wide variety of hospital activities. They represent, in essence, large scale assemblies of the building subsystems which, simultaneously, take into account functional space, service space and life safety requirements. The integration of these interrelated aspects within a basic geometrical and dimensional discipline provides a useful and versatile desgn tool that can help to expedtite preliminary planning. Alternative plan configurations can be quickly generated and evaluted relative to the particular program, budget and site requirements. This all the relevant factors of th building organization can be btought together and reconciled at a very early stage in the design process.

S OF SUBSYSTEMS

building system currently
amilies of subsystems shell
ch together consitute about two
st of contemporary hospitals.
(Fig.2. )includes the structure
tion subsystems. The service
cludes the heating ventilating
and electrical subsystems.

ng system deals with the
ems on a generic basis that is
ge of options for apporopriate
ticular project development.
ic design options has different
e or integrates these different
elected subsytems within a basic
ch permits compatibility
stems of a given project
selected option.

busystems have categories of
daptable components. Permanent
ose whose introduction,
emoval would require major
building reconstruction. Accordingly, such components are designed for sufficient capacity to meet projected increase in demand. Permanent components include the basic structure the ceiling assembly, two-hour fire-separations primary piping main HVC duct, and wire way mains. Adaptable compnents can be relocated altered added or deleted without major building reconstruction. They include air handling equipment, local service distribution and terminal components, partitions future service systems for which initial space and load provision is made. In general, adaptable components are sized only for current needs. This concept of permanent and adaptable provides the framework for improved hospital adaptability which is essential to the long-term needs of the Veterans Administration program.

FLEXIBLE CHARACTERISTICS
OF PLANNING MODUES

There are four types of planning modules:structural bays, sevice modules space modules and fire sections

THE STRUCTURAL BAY

is the basic unit of which all other modules are

of structural bay size is
bay width of 7.0m and a
anging from 12.0m to 18.0m in
, where required, an 5.5

are derived from the organi-
s of the nursing unit, which a
be the most repetitive and m
al unit in the hospital. These
tested and confirmed as
functioanl space requirement
ions of the hospital. If in
its lose validity, or change
ensions can be established as

anning module of the hospital
, which combines and integrates
service space. The service modu
service bay, a functional
one (Fig.. ). The decentralizatin
into mechanically in-
space provides the op-
alize a building as an
blocks, and provides a

means of mainpulating the assembly to achieve a suitable plan configuration with the assurance that the subsystem capability remains (Fig. ). Operationally, the mechanical independence of the service module permits one unit to undergo alternations without affecting other areas of the hospital while they are in use.

Dimensional characteristics of service modules are determined by the number of structural bays and the service content and organization necessary to support the activities housed. Service modules range from 1 540sq m to 4 620 sq m. These represent a scale of spare and performance sufficiently generalized to be compatible with a wide range of departmental size and enviroments.

In the patient care areas, the service module is more precisely scale to the functional requirements of the nursing unit by means of THE SPACE MODULE. The space module is a sub-unit of service modules designed to take into account the special requirements of these areas, such as exterior exposure at the building perimeter. Currently, a vocabulary of 11 space modules (Fig. ) provides the area, perimeter, content, and

form to the user needs and
nents of the Veterans

rvice modules is a subunitings
uirements. Fire sections must
our fire separations, and any
fire-protected.The coincidence
nd fire section boundaries
he number and comlexity of
s.

ISIONS
ULE
the service control point for
es all the basic equipment for
ubsytems and all vertical service
from the module. The concen-
ical services within the service
functional zone free for
change without the traditional
ce stacks and shafts, and
nization of the service zone
ace for equipment would be more
roblems of industrial safey.

THE SERVICE BAY
is a special variation of the structural bay and provides some of the shear walls for the over-all lateral resistance of the structual frre.

THE FUNCTIONAL ZONE is that portion of the service module which can be hospital activities and which canbe internally organized in various ways to accomodate the different functions. Generally, the only permanent vertical components and which occur within the functional zone are the structural col columns. Shafts, shear components and two-hour fire partitions are rocated at the perimeter so as not to interfere with planning freedom or with horizontal service distribution in the service zone above.

THE SERVICE ZONE
carries the horizontal service distribution of the service module. All services are downfed to the gravity zone with the exception of the gravity drains from the service module above.

Cost studies have indicated that increased building height to provide more service space is

additional height simplifies
ruction process and improve

objective, accessibility of se
tion maintenance, repair and ch
l. Hence the service zone has
platform, which within this
g subsystem. It also has a
ization of service distribution
ent accessibility to components
tendance.
und that changes in direction of
erstitial space create cross-
srupt service organization
and reduce accessibility
vice zone, all service runs are
s of reserviced subzones to
nstallation, minimize cross-over
eve rights-of -way for future

(Fig..6 ) are horizontal layers
that define the direction of trav
s. The main service distribution
ervice bay immediately below
allel to the main girder to

end of the service zone. Branches run at right angles to the mains and are located on the layers immediatly above and below. Plumbing and drains occupy the upper layer between the beams. HVC and electrical occupy the lower layer. Laterals run at right angles to the brances and parallel to the ceiling system strongbacks immediately above the ceiling.

The direction and depth of beams girders and ceiling strongbacks visually locate the respective layers and provide physical refences in the service zone both for the initial location of services and for later revisions to the layout.

Secondary subzones are vertical divisions of the main distribution primary zone for particular s services and are defined by the ceiling hanger spacing

With this organization it is obvious that no shortcut or point-to-point routing of service can be permitted without jeopardizing the predictability of initial or future installations.

A full size mock-up of the service zone over a portion of a radiology suite was constructed and is shown in Fig.. . It shows not only the nature and organization of subsystems but also accessibility as an inherent system characteristic.

iling is intended for over-all
nstruction purposes, accessibility
by subsystem installation. It
ne that components requiring
be organized along established
mple occurs in Fig..13, where
wn at the left center of the
one of a series of reheat coils
ess lane perpendicular to the

even along dedicated lanes,
strained by branch and later
in Zones S5 and S5 shown in
use of insterstitial space
ad, industrial safety
h constraints will for the
of individual project
ccessibility can be increased
ing branch and lateral
em components, at the risk
nce. Accessibility can also
tion of size or frequency of
s crossing primary access
hanging duct size or other

local modifictions. Trade-off judgments are involved in such design and contruction decisions.

ORGANIZATION OF
THE SHELL SUBSYSTEMS

The basic structural system is a post girder and beam assembly, with shear walls or braced frames assuming all lateral loads. The generic structural options are steel, pre-cast or poured in place con concret. Regardless of which material is employed the organization of structural components remains the same. Perimeter girders are always flush with top of the beam system. Interior girders are always below the beams to allow the passage of certain services above the grders and beteen the beams. Beam spacing is always modular, but varies with the generic option employed for the specific project.

The ceiling system services as the working platform of the service zone, as the terminus and support for partitions, and as a contributor to fire safety. It also provides capacity for cutting and patching and support for certain hospital equipment.

the platform for flush
installation or for esthetic
.e, though provision is made for
to accommodate those conditions
sembly can be constructed of a
products. There are at this mo
ings on such assemblies.
ial of the VA Systems program,
first application for a private
a, specifically has induced
submit such an assembly for
test requirements were
ted ceiling was accepted for
dleback Community Hospital in
r-all building system is not
rating for the ceiling
s it is incombustible.
ating will benefit the system
ced some fire protection costs.
re a wide range of partition ty
ding system brings them to
iformity. The partition
te many of the significant
r problems. It establishes

a uniform partition height for a service module and a very limited number of partition heights for the hospital as a whole. It establishes uniform methods of attachment and lateral support as well as for acoustical seals. It provides for installation of partitions prior to in combination of local services. It removes from partition requirements many load-bearing demands and transfers them to the ceiling as for patient television sets and some service consoles. The system greatly standardizes door height and mountings. At the same time it permits wide variation in finish for functional or esthetic reasons, as well as for cost considerations. It provides for partitions of a great range of performance characteristics within contemporary industrial practice.

## ORGANIZATION OF THE SERVICE SUBSYSTEMS

The basic design of the HVC subsystem is all-air within which the generic options have been limited to the low-or medium pressure terminal reheat system and the dual-duct mixing-box system. The subsystem is capable of handling from 25 to 100 per cent outside air with return and general exhaust extracted through the service zone by either duct or

nbing and electric subsystems are con-
in their materials and their assembly,
ational in organization. The organization
mains and local laterals will demand more
whose cost will be offset by more rational
n zoning and by substantial reduction or
of interference with other work. With
on of gravity drains all services
rough the ceiling, Services to rooms can
mounted or installed within partitions.

ANCE OF THE
S APPROACH.

s indicated conformance of the building
stablished cost limits, which are in
range of contemporary VA hospital costs.
nary design was carried through for a
the radiology department of the hospital
ce with the VA hospital program.
ic-design for a systems design building go
conventional design development for
of planning in its simultaneous
on of functional requirements,

structural mechanical electrical and fire safety organization. Preliminary design, as illustrated also goes beyond conventional design procedures in the information presented. Working drawings a and specifications are not likely to be reduced for systems hospitals, but many major conventional problems can be eliminated or substantially reduced through the systems approach.

The hospital designer has, in a sense, been given a new palette and guidelines for planning. He must still command the whole spectrum of conventional design services, to the smallest final detail. But if he has been given new design instruments, he has been also assured of the ability to coordinate and integrate design to a higher level and earlier than is the case with conventional design.

Systems hospitals developed according to this program will be somewhat larger in area than conventional hospitals due to the significantly increased area allocated to mechanical and electrical subsystems. Cubage will be higher because of the reduction in subsystem conflicts, in the continuity of the work

which are discontinuous in
ruction, and because of a
of overall building

tomatic assurance of this
ctation. It will require that
to effective cost control
the documentation establish
nomic value of the pre-coord-
erent in the system.
cal building system is intended
king tools within the
nt practice. Experience and
rmine where and how system
and can be achieved.

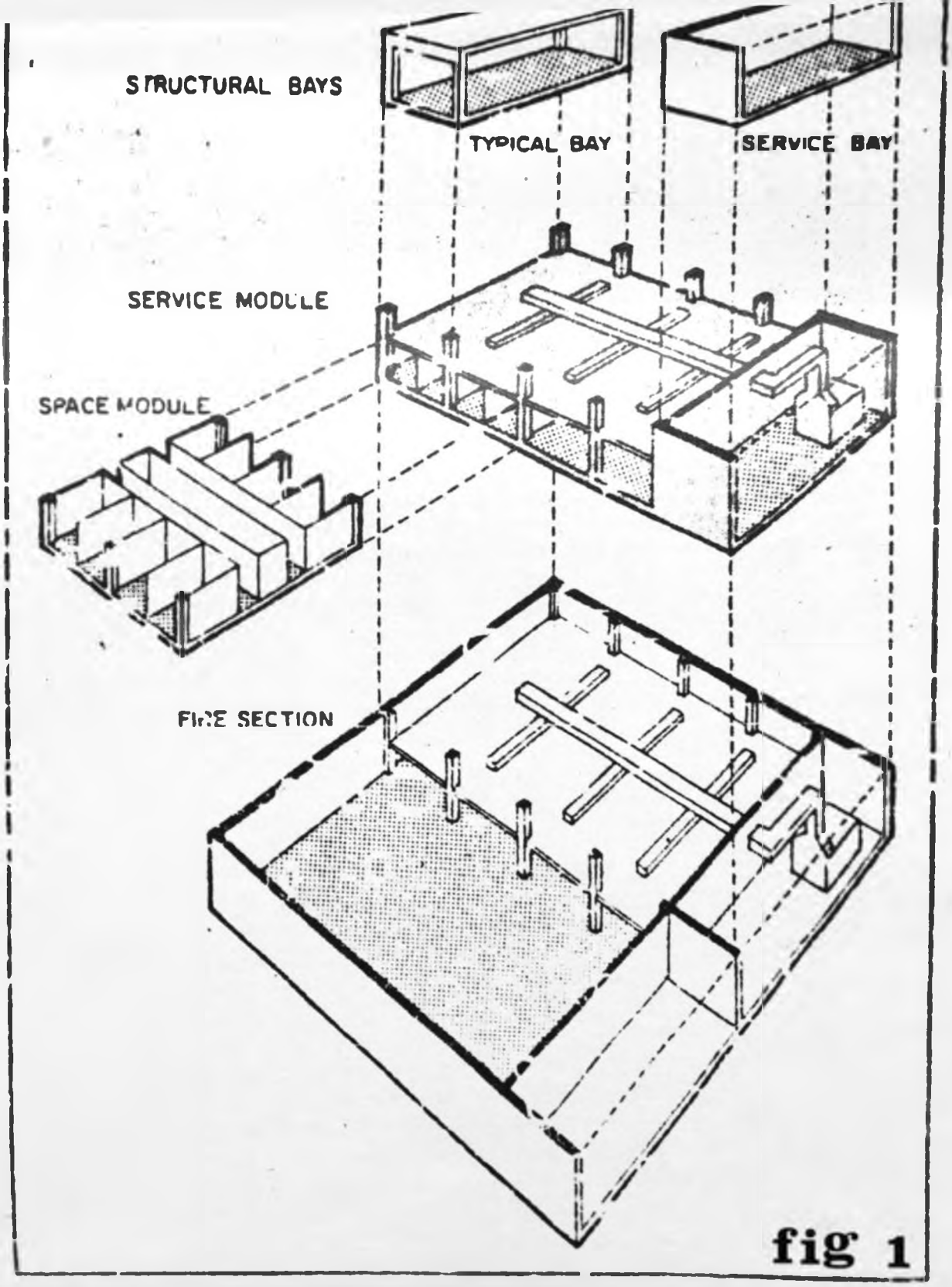

STRUCTURAL BAYS
TYPICAL BAY
SERVICE BAY
SERVICE MODULE
SPACE MODULE
FIRE SECTION

fig 1

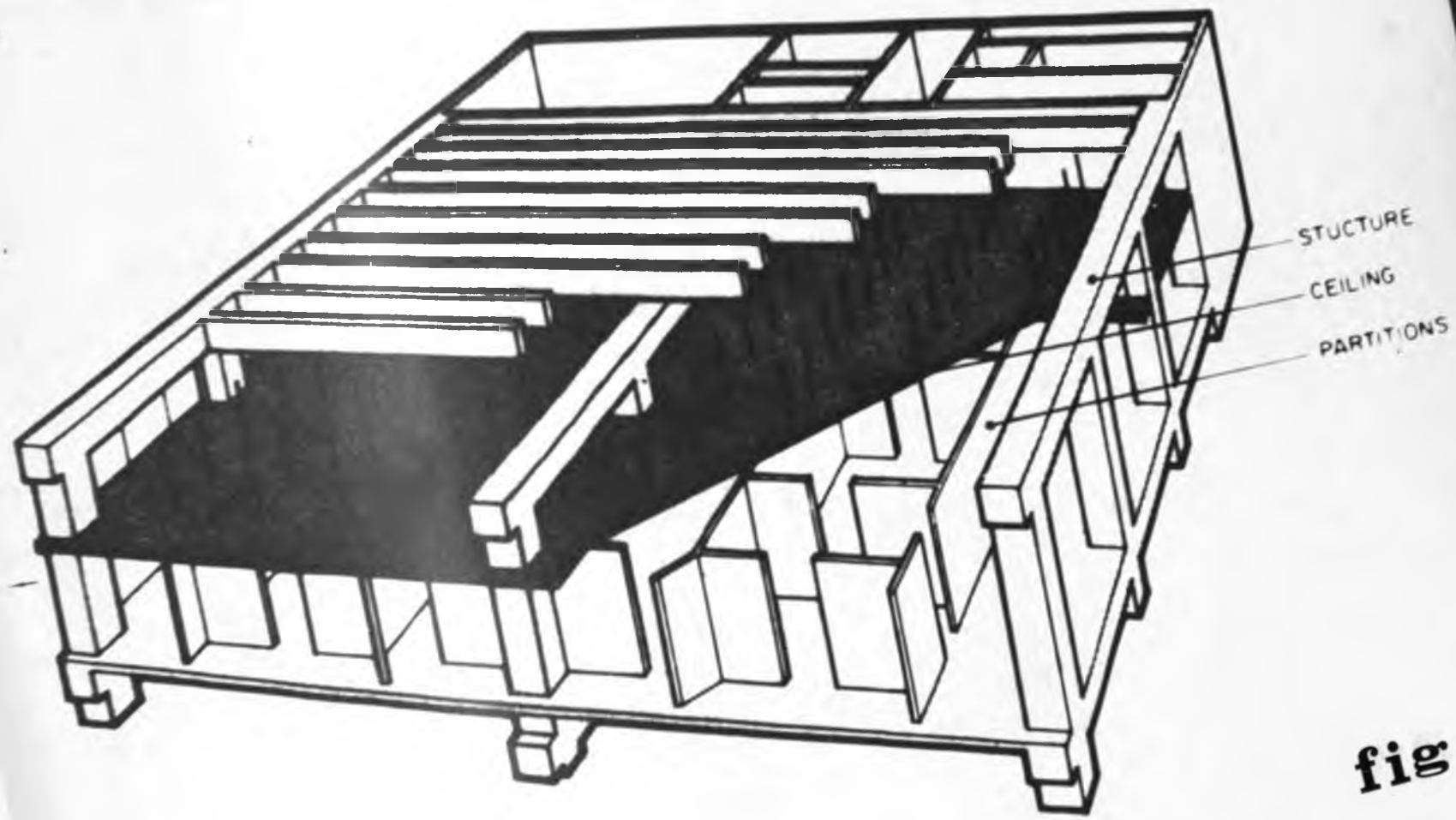
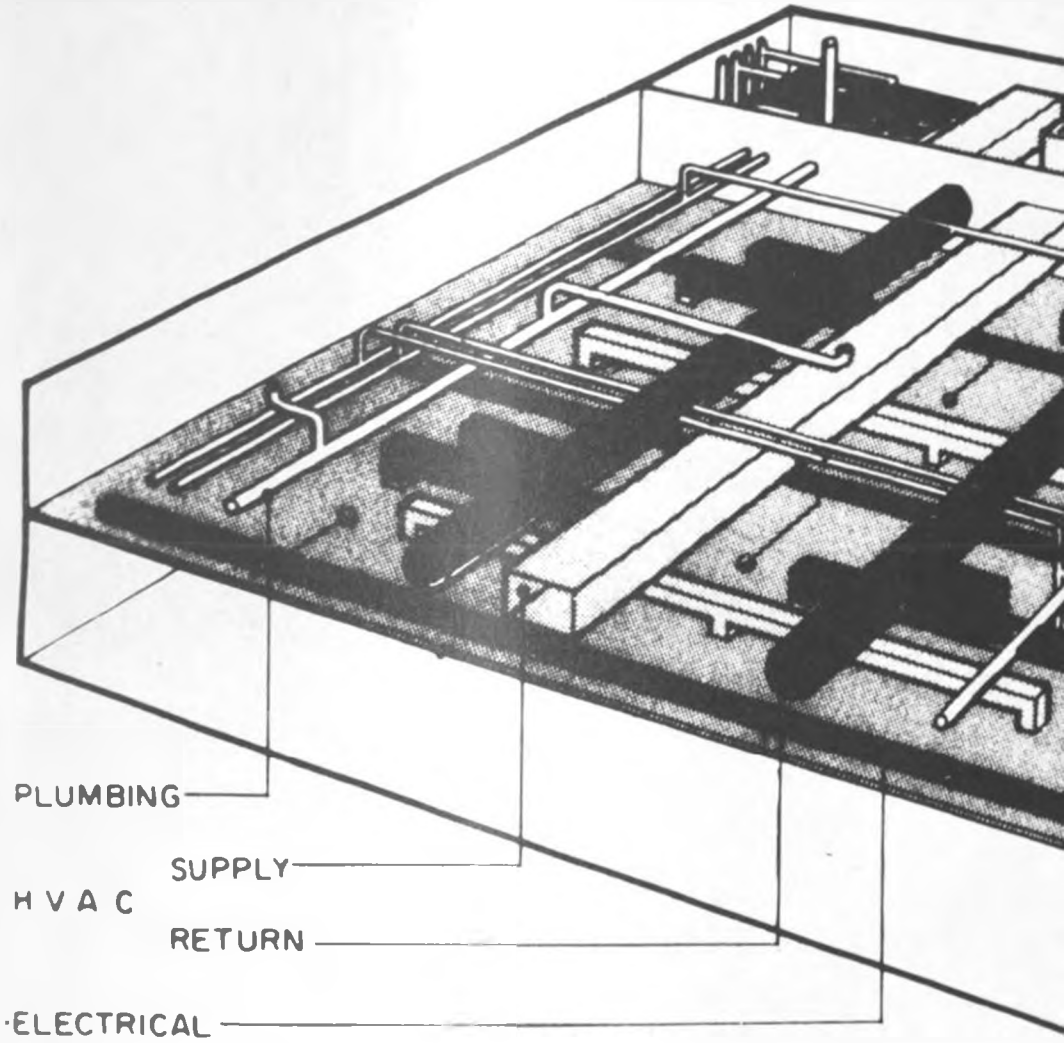



fig 2




The service subsystems.

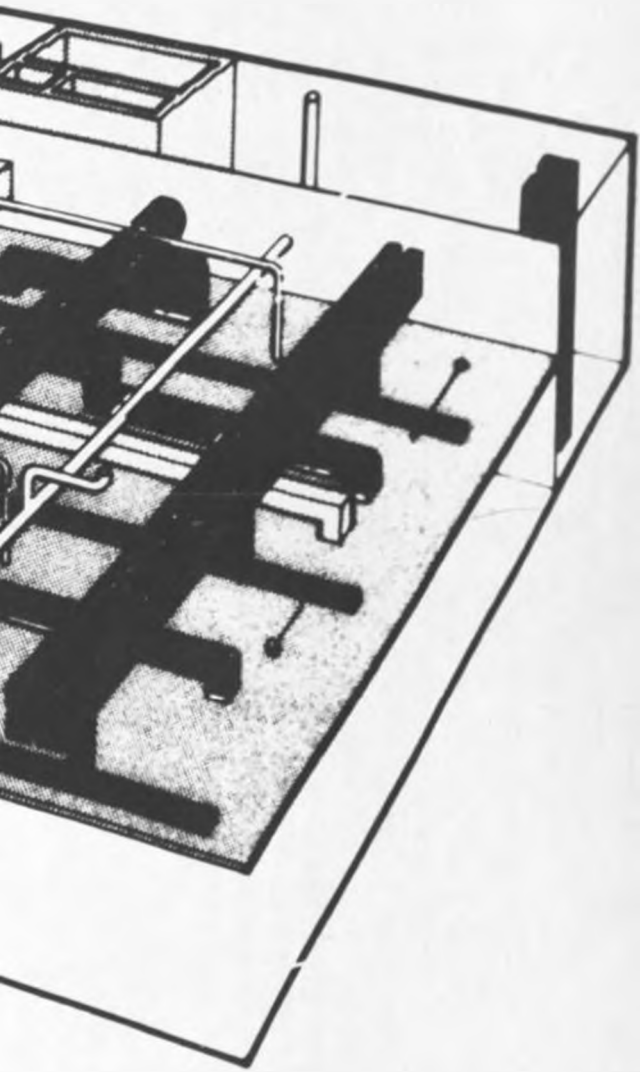
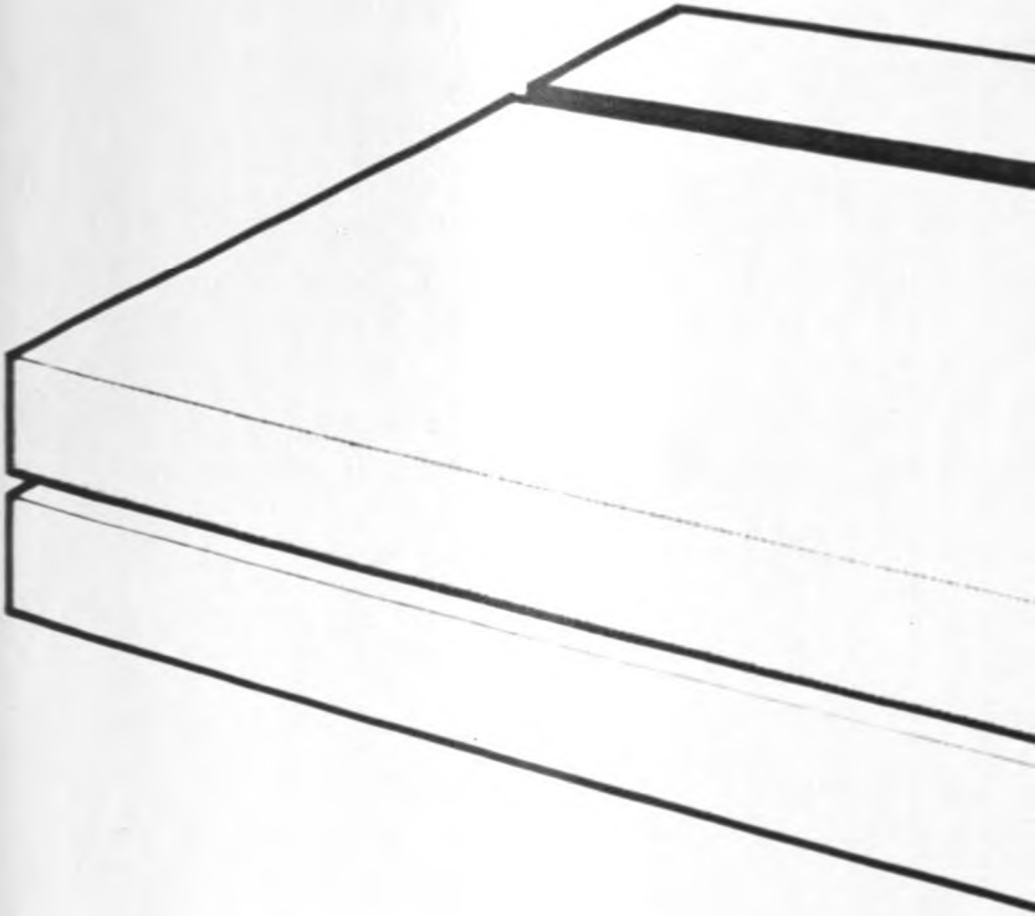


fig 3



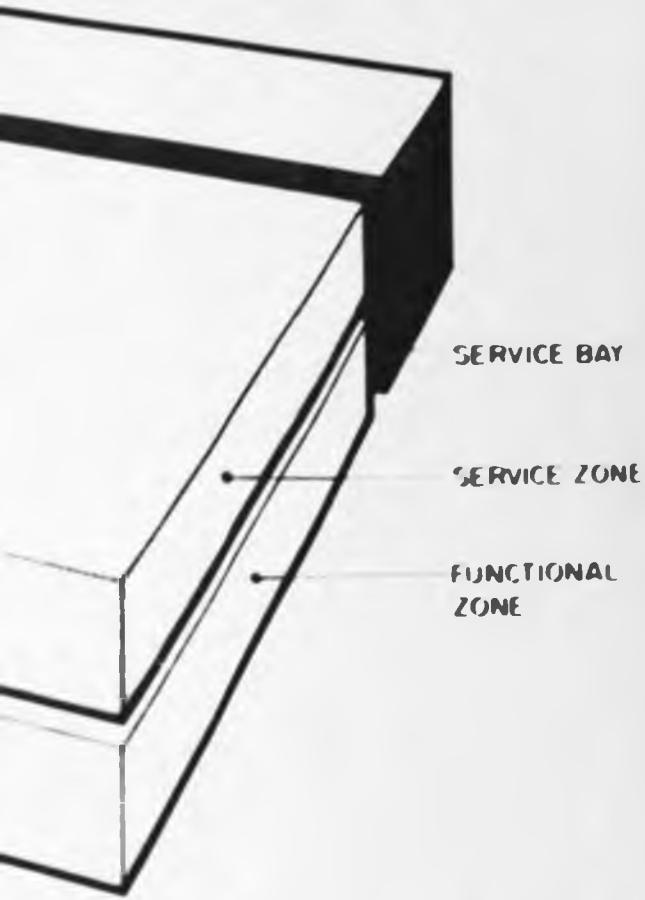



fig 4

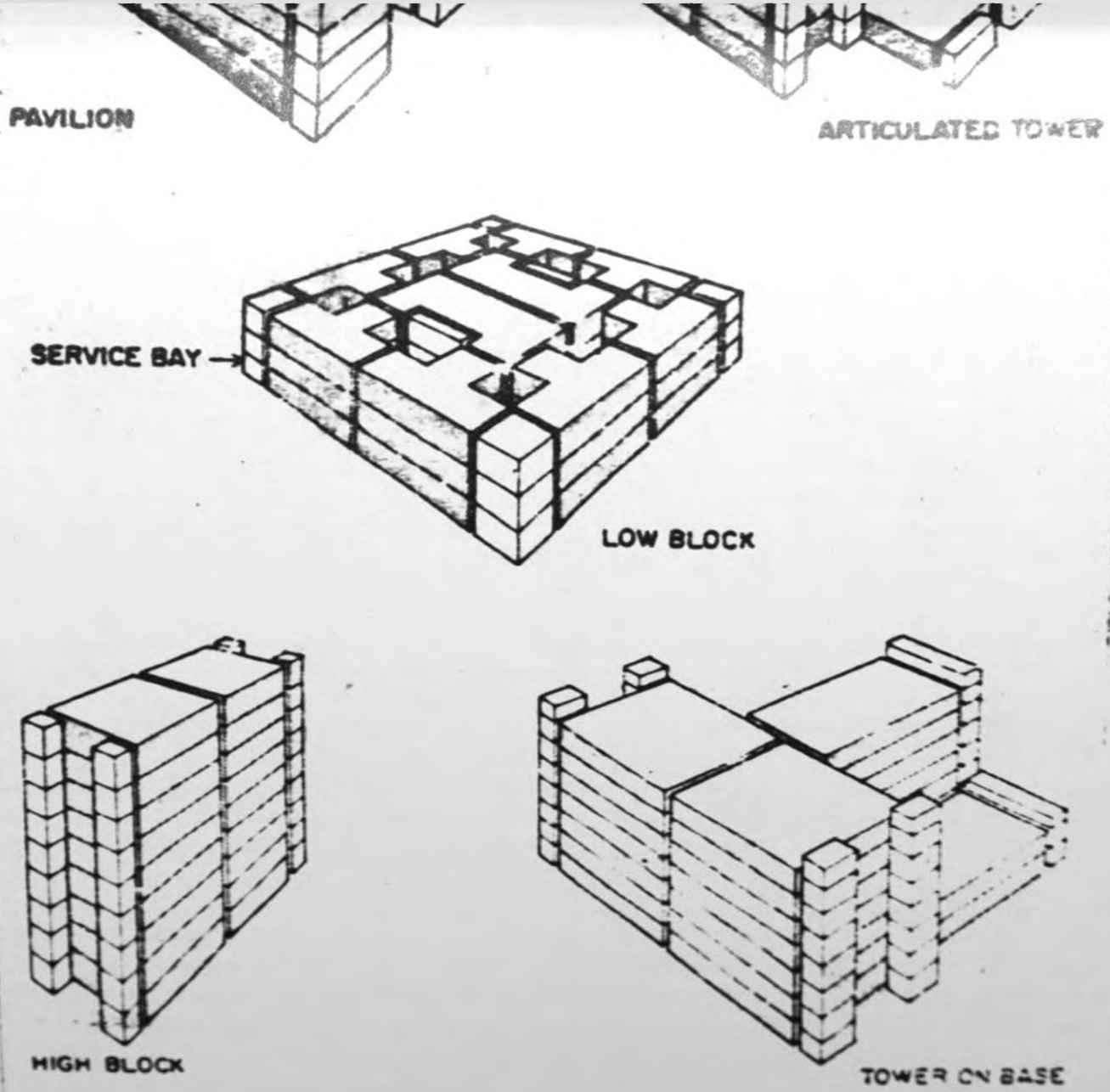
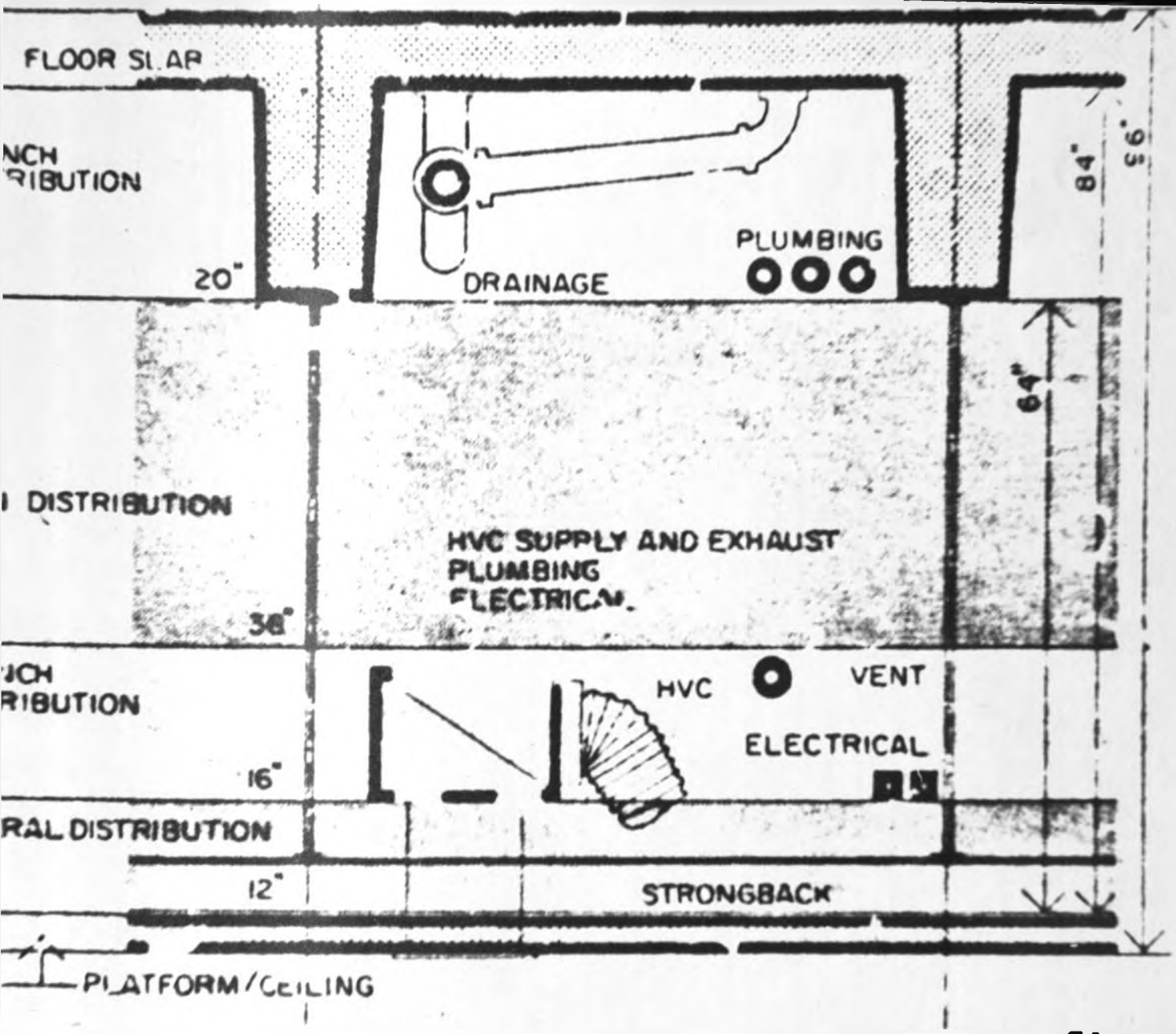
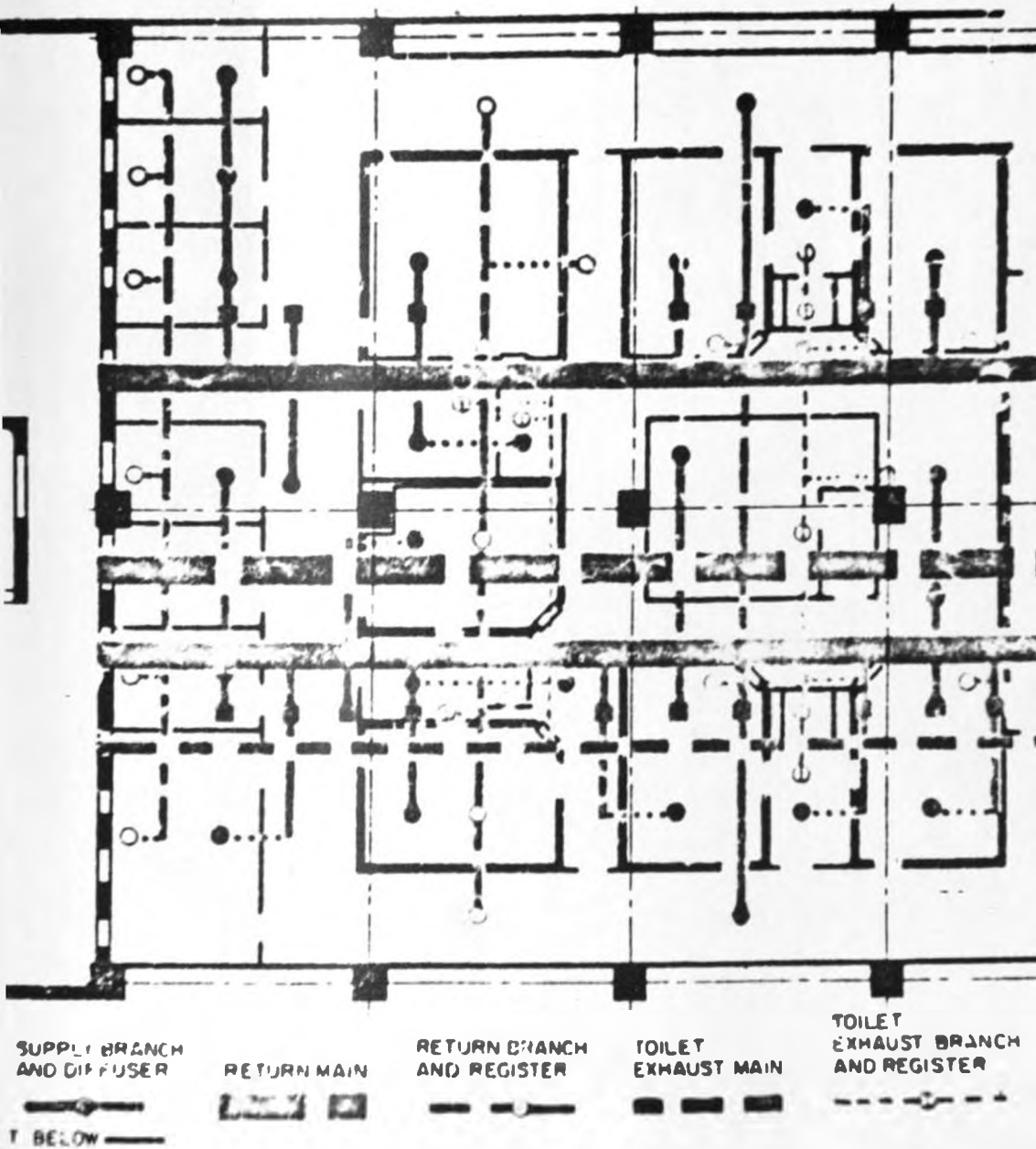

PAVILION
ARTICULATED TOWER
SERVICE BAY
LOW BLOCK
HIGH BLOCK
TOWER ON BASE

fig 5



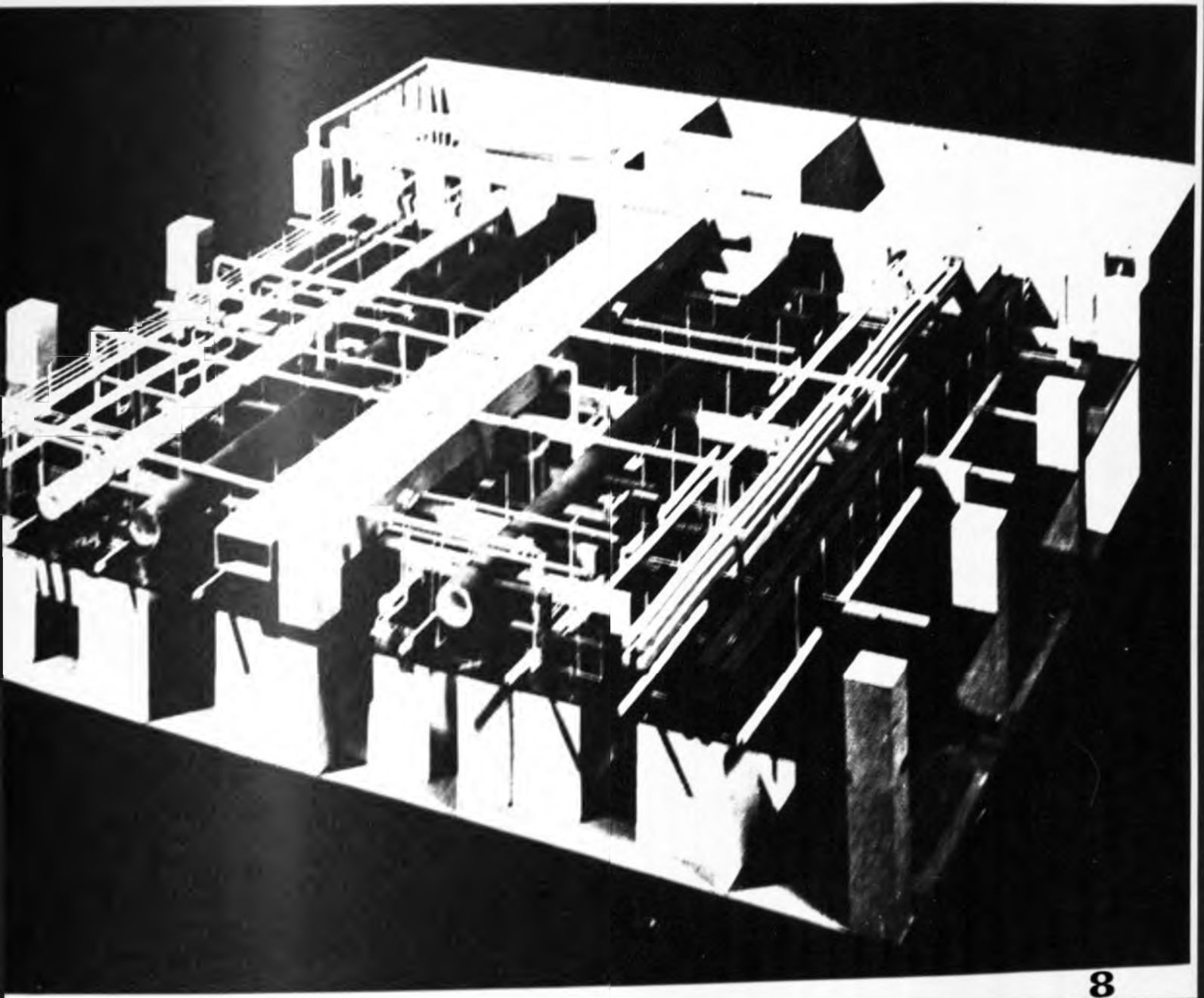

Primary subzones of the service zone. fig 6

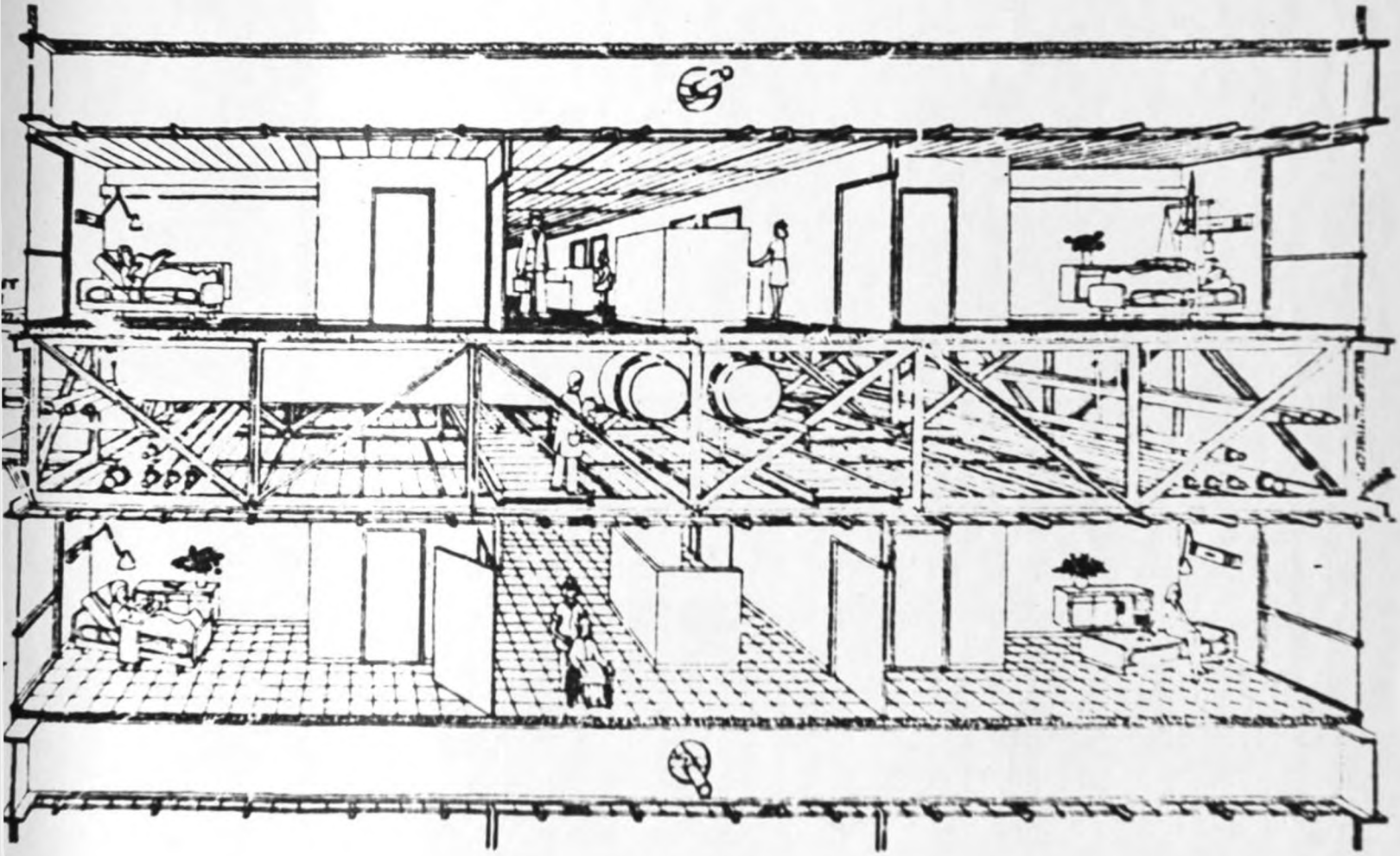
C Systems, structure and service bay, partition layout below.



FLEXIBLE DUCT ..... REHEAT COIL

fig 7





fi9 9

# 7

GH BRIEF.

RENCE HOSPITAL.

have carried out has
wards Understanding:
strative hierarchy and
ated between the
is particular project of
ce Hospital is being
of Health, the Ministry
istry of Works.

ften been neglected. I
him" by devoting much,
o Hospital case study
eels inadequacies, and
m remedied.

er must understand the
ct. The live case
go, Kenyatta Hospital
intended to serve the
g the intergration of

services into structure to accomodate a social function of hospitalization.

(d) The social patterns relating Medical Staff, Patients, the public and clerical staff are a great factor in the whole complex, which I have tried to illuminate on a number of accasions in the EVALUATION parts of the thesis.

(e) The new hospital is going to be located in Kampala city and is intended to serve as a Referral Hospital. Therfore the medical structure, both present and proposed had to be understood.

(f) Recommendations on standards of design are incorporated in this brief. These form perhaps the most important part of study to future researchers andhospital designers.

2.00 The hospital development will have to be phased as the Economic situation prevailing makes it not possible to develop the whole complex at one go.

A suggested schedule of accomodation of Facilities is given below. This was a Ministry of Works Schedule which has been revised, upgraded in standards and up-dated in accordance with the recommendation in the THESIS REPORT. Departments (17) to (24) were not included in the original schedule of the Ministry of works, and so have been added later on.

KAMPALA REFERENCE HOSPITAL.
SUGGESTED SCHEDULE OF ACCOMMODATION.

1. WARDS GENERALLY

It is proposed that the basic nursing unit in the hospital will be thirty-two beds and that where possible four units should make up a ward floor and share central facilities.

unit

| | | |
|---|---|---|
| 's | 240 | |
| ms | 30 | |
| | 20 | |
| ablution areas, showers | | |
| | 65 | |
| oom | 20 | |
| ty room | 10 | |
| ty room and Sluics | 20 | |
| | 10 | |
| ion | 10 | |
| icers office | 10 | |
| icers office | 10 | |
| a | 10 | |
| | 510 | |
| 35% circulation | 180 | |
| | | 690 |

rving four nursing units)

| | | |
|---|---|---|
| ooms and toilets | 60 | |

| | |
|---|---|
| lets | 10 |
| chen | 15 |
| oom | 40 |
| is | 40 |
| bays | 10 |
| room | 10 |
| | 185 |
| % circulation | 70 |

:ology Ward Floor

; this floor consists of
es follows with central
al admission unit, labour
e baby unit.

it 32 beds - standard

t 32 beds - standard

26 beds - special design

150

it 26 beds - special

116

| | |
|---|---|
| . unit | 690 |
| unit | 690 |
| | |
| : in ward units of 26 beds each | |
| : bed bays | 400 |
| bed rooms | 60 |
| areas, showers, ablutions and | 165 |
| | 80 |
| rooms | 20 |
| n utility rooms | 40 |
| y utility rooms and sluice | 10 |
| ries | 20 |
| es stations | 20 |
| ers Offices | 20 |
| .cal Officers Offices | 20 |
| 'age areas | 100 |
| 'sesries | |

| | |
|---|---|
| ation | 955 |
| | 330 |

| | |
|---|---|
| ving ward floor | |
| st room | 30 |
| ooms and toilets | 30 |
| rooms and toilets | 40 |
| en | 15 |
| om | 40 |
| es | 40 |
| ays | 10 |
| oom | 10 |
| | 215 |
| 35% circulation | 75 |

| | |
|---|---|
| | 10 |
| pace | 20 |
| on rooms | 20 |
| w.c. etc | 5 |
| oom | |

1 285

290

| | | |
|---|---|---|
| | 55 | |
| 5% circulation | 20 | |
| | | 75 |

| | | |
|---|---|---|
| t stage rooms (two beds each) | 70 | |
| 's., for the above | 10 | |
| utility room | 15 | |
| utility room and sluice | 20 | |
| ery rooms | 100 | |
| delivery rooms | 30 | |
| up | 10 | |
| hetic room | 10 | |
| e room | 15 | |
| s Office | 10 | |
| rs Office | 10 | |
| changing areas and toilets | 35 | |
| ley bays | 10 | |
| y | 5 | |
| ers room | 5 | |
| | 365 | |
| 48% circulation | 145 | 51 |

| | | |
|---|---|---|
| 3 | 80 | |
| es | 20 | |
| | 5 | |
| | 20 | |
| room | 10 | |
| | 10 | |
| 1 | 10 | |
| ers | 24 | |
| | 5 | |
| g room and toilets | 10 | |
| | 5 | |
| kitchen | 20 | |
| room | 30 | |
| | 250 | |
| rculation | 110 | |
| | | 360 |
| and Gynaecology | | |
| natal clinic) | | 3 890 |

is floor consists of three
--two beds each of

dard central
on for resident

rd units of

| | | |
|---|---|---|
| ation | | 2.070 |
| 20 mothers | 100 | |
| blutions | 20 | |
| ration room | 30 | |
| | 150 | |
| rculation | 50 | |
| | | 200 |
| ties serving floor | | 290 |
| ward floor. | | 2 560 |

Floors

surgical and E.N.T. beds
n six nursing units of
one and a half floors,
provided on each floor.

E.N.T. Nursing units

| | |
|---|---|
| ies serving floors | 4 140 |
| E.N.T. Ward floors | 580 |
| | 4 720 |

edical ward floor
andard pattern
its with central
oor.

units of thirty-two

| | |
|---|---|
| | 2 760 |
| ities serving floor | 290 |
| rd floor | 3 050 |

ras
se beds should be
vided standard pattern
. Central facilities
other ward floor.

ental Ward unit of

Dental wards

B. Ward

beds are accommodated

enty beds each. Each

wing accommodation:

| | |
|---|---|
| | 280 |
| ablutions | 100 |
| room and sluice | 20 |
| room | 10 |
| | 10 |
| | 10 |
| | 10 |
| | 10 |
| | 25 |
| rooms and toilets | 20 |
| | 5 |
| | 10 |
| | 520 |
| | 180 |

ulation

690

690

eases ward units

erating theatres
-patients and accident
entralised into one
.

| | |
|---|---|
| res | 240 |
| ms | 110 |
| | 70 |
| | 54 |
| rooms | 45 |
| s | 30 |
| ing facilities and | 25 |
| changing facilities | 40 |
| d technicians' | 30 |
| est room | |
| ng facilities and | 12 |

700.
1400.

artment. It is
stigations would be

| | |
|---|---|
| | 240 |
| ubicles | 30 |
| | 5 |
| | 10 |
| | 5 |
| | 20 |
| | 20 |
| and sorting area | 40 |
| lms | 20 |
| | 10 |
| | 30 |
| | 60 |
| | 20 |
| areas and toilets | 75 |
| radiologist, Assistant | 40 |
| | 30 |
| om | 30 |
| ooms | 15 |

| | | |
|---|---|---|
| | 700 | |
| ulation | 315 | |
| | 1 015 | 1 015 |
| Radiology | | |

HTMENT AND FRACTURE

| | |
|---|---|
| | 20 |
| atcher cases | 10 |
| | 5 |
| patients, | 100 |
| lets etc. | 10 |
| | 15 |
| | 10 |
| | 20 |
| ice | 10 |
| | 25 |
| area | |
| and treatment | 60 |
| | 10 |
| | 15 |
| room | 30 |
| sluice | |
| | 15 |
| minations and | |

| | | |
|---|---|---|
| ɔction rooms | 30 | |
| (minor) | 35 | |
| | 20 | |
| | 10 | |
| | 10 | |
| | 15 | |
| ɔom | 25 | |
| | 30 | |
| | 10 | |
| or staff with | 20 | |
| | 20 | |
| | 10 | |
| it of twelve beds | 160 | |
| | 20 | |
| linic | 50 | |
| ɔoms | 55 | |
| ıbicles | 30 | |
| | 10 | |
| | 50 | |
| | 950 | |
| | 430 | |
| | | 1 380 |

nd Emergency Department

the I.C.U. should contain ten
be closely associated with
e recovery ward.

| | |
|---|---|
| bays | 100 |
| oms | 30 |
| ation | 10 |
| lity room | 10 |
| lity room and sluice | 15 |
| | 50 |
| room | 20 |
| | 5 |
| ffice | 10 |
| | 30 |
| | 280 |
| 35% circulation | 100 |

sive Care Ward

L MEDICINE

there will be no hydro-therapy
of occupational therapy in

| | |
|---|---|
| vaiting area, changing | 80 |
| | 80 |
| reatment cubicles | 10 |
| on bay | 180 |
| | 50 |
| | 30 |
| | 25 |
| | 35 |
| and rest room | 25 |
| nging and toilets | 8 |
| room | 640 |

| | |
|---|---|
| | 70 |
| nt | 40 |
| | 20 |
| | 130 |
| circulation | 225 |

nt of Physical Medicine

general outpatient
a limited

ent

| | |
|---|---|
| ea, reception | 400 |
| ilets | |
| | 135 |
| minations room | 10 |
| om | 10 |
| om and test | |

130
225

---

995

| | |
|---|---|
| g area and | |
| | |
| nation rooms | 135 |
| | 10 |
| and test | 10 |
| | 10 |
| g area and | |
| | 50 |
| | |
| | 135 |
| ation rooms | 10 |
| and test | 10 |
| test | 10 |
| g area and | 50 |
| | |
| | 30 |
| | 30 |
| | 20 |

| | | |
|---|---|---|
| ice | 10 | |
| ice | 10 | |
| | 10 | |
| oth general and | | |
| ) | 200 | |
| | | 1 355 |

ent department

d on six two to three hour
ay, using three multi-user
ics, it is assumed that the
ll be held in one of these

| | | |
|---|---|---|
| er Clinics with consulting/ | | |
| icillaries waiting areas etc. | 500 | |
| oms and diagnostic rooms | | |
| . | 100 | |
| it with recovery ward | | |
| | 150 | |
| wo surgeries and | | |
| | 90 | |

| | | |
|---|---|---|
| | | 840 |
| | 2 520 | |
| circulation | 990 | |
| rtment. | | 3 510 |
| | 25 | |
| store | 200 | |
| iagnostic index | 10 | |
| fficers Office | 10 | |
| | 10 | |
| | 120 | |
| l | 20 | |
| s | 20 | |
| | 10 | |
| | 10 | |
| | 10 | |
| security | 425 | |
| circulation | 40 | |
| | | 465 |
| s department | | |

| | |
|---|---|
| e | 15 |
| | 10 |
| nt's Office | 10 |
| ts Officer | 25 |
| | 30 |
| g etc. | 90 |
| | 15 |
| Office | 10 |
| | 10 |
| | 25 |
| ices | 10 |
| | 10 |
| 's Office | 10 |
| ent's Office | 10 |
| uperintendent | 30 |
| | 20 |
| | 40 |
| | 50 |
| room & library | 15 |
| | 20 |
| | 10 |
| office | 20 |

One number typing pool

Janitorial store

35% circulation

TOTAL AREA of Administration

MISCELLANEOUS AREAS

Main Entrance Hall
One number Telephone Exchange, Staff location and apparatus room
One number Rest room
Two number Porters offices
One number postal sorting room
Two number toilets
One number Junior staff dining
Paying Office (Private Patients)
Paying office (salaries)
Waiting tobby
Strong room
Office of accountant
Bank room

50
50
520
140
660

100

40
10
20
20
20
120

10
10
30
5
10
10

MISCELLANEOUS CONT:

Bank Office

Strongroom

Security Office (Hospital)

Police post. (casualty)

Incinerator space

10% circulation

TOTAL AREA of Miscellaneous accommodation

11. CENTRAL STAFF CHANGING ROOMS

Non-resident nursing and other female staff changing rooms and toilets

Non-resident male Junior staff and porters

Non-resident technical male staff

Non-resident technical female staff

10% circulation

TOTAL AREA of central staff changing rooms

10
5
10
10
20

450
45

495

100
75
20
20

215
20

235

12. ADMISSION UNIT

One number Admission rooms

Two number bathrooms and w.c.'s

One number Patients Waiting area

10% circulation

TOTAL AREA of Admission Unit

13. CENTRAL STERILE SUPPLY DEPARTMENT

One number clean up and washing room

One number packing and autoclave room

One number syringe and instrument room

One number Glove room

Bulk Storage

Sterile Storage

Two number Office

Two number Trolley bays

Two number staff changing and toilets

15% circulation

TOTAL AREA of Central Sterile Supply Department

| | | |
|---|---|---|
| | 30 | |
| | 10 | |
| | 100 | |
| | 140 | |
| | 15 | |
| | | 155 |
| | 25 | |
| | 70 | |
| | 15 | |
| | 10 | |
| | 70 | |
| | 50 | |
| | 25 | |
| | 20 | |
| | 5 | |
| | 290 | |
| | 40 | |
| | | 330 |

## 11. PATHOLOGY

### (i) Admission

One number Patients Waiting room
Two number Patients toilets
Two number Patients examination rooms
One number Reception for specimens and
Clerks Office
One number staff rest room (with S-facilities)
Two number staff toilets
Four number Offices
One number Secretaries' Office
One number general and-records store & stationry
One number tea-room

### (ii) Morbid Anatomy Section

One number general laboratory
One number Specimen cutting room
Two number Special laboratories
One number store
One number Records store & stationary

30
6
20

30
15
6
60
10
30
10
220

66
22
44
10
20
160

| | | |
|---|---|---|
| ry | 66 | |
| ory | 22 | |
| ory | 22 | |
| n unit | 50 | |
| ment | 10 | |
| | 10 | |
| | 10 | |
| | 20 | |
| stationary. | | 210 |

| | | |
|---|---|---|
| | 20 | |
| | 20 | |
| | 10 | |
| | 44 | |
| ory | 22 | |
| | 20 | |
| ment & bottles. | 22 | |
| oratory | 6 | |
| | 10 | |
| | 20 | 200 |
| om | | |
| onary store | | |

| | | |
|---|---|---|
| | 66 | |
| | 22 | |
| | 10 | |
| | 20 | |
| | 10 | |
| | 20 | |
| onary store | 5 | |
| | | 130 |
| | 10 | |
| | 20 | |
| | 20 | |
| | 20 | |
| | 10 | |
| | 10 | |
| om | 20 | |
| tionary store | | 120 |
| tion | | 1 400 |

## 15. ANIMAL HOUSE

It is assumed that a small animal house may be required for routine tests only.

One number animal house with necessary ancillaries

TOTAL AREA of Animal Huse

## 16. MORTUARY AND POST-MORTEM

One number body store (24 places)
One number Trolley bay
One number Pathologists office and changing room
One number Attendants changing and rest room
One number Post Mortam room (two tables)
One number sluice room
Two number viewing rooms
Two number Visitors' waiting room and toiles
One number general office
One number store
One number Cleaner's room & facilities

| | |
|---|---|
| 200 | |
| | 200 |
| 45 | |
| 5 | |
| 10 | |
| 10 | |
| 40 | |
| 5 | |
| 25 | |
| 25 | |
| 10 | |
| 20 | |
| 10 | |

45% circulation

TOTAL AREA OF Mortuary and Post Mortem room

17. ENGINEERING DEPARTMENT.

Central boiler House
Electricity room-switch gears & Emergency generator
Engineers office (maintanance)

18. Pharmacy:

Main laboratory for manufactures
Dispenser's room (Packaging)
Analytical laboratory
Dispensing room (deliveries)
Office & records interview-facilities
Staff rest room & facilities
Bottle washing & drying room
Bottle store (empties)
Store for materials required for daily use

| | | |
|---|---|---|
| | 205 | |
| | 90 | |
| | | 295 |
| | 180 | |
| | 300 | |
| | 20 | |
| | 500 | |
| | 100 | |
| | 40 | |
| | 10 | |
| | 30 | |
| | 40 | |
| | 20 | |
| | 20 | |
| | 20 | |
| | 20 | |

Store for solid poisons

Store for liquid poisons

Large store

Disposal room for bad/wrong chemicals

Library

Cloak room

2 Toilets

Dispenser's laboratory

Galenic laboratory

Sterilization room and distilation room

add 30% for walls & saturation

19. <u>Maintenance Shops:</u>

Plumber's stores

Tools store

Light spares

Heavy spares

Office

Electrician's store

Tools store

Light spares

Heavy spares

Office

| | |
|---|---|
| 120 | |
| 20 | |
| 100 | |
| 10 | |
| 10 | |
| 15 | |
| 15 | |
| 10 | |
| 20 | |
| 50 | |
| 570 | |
| 190 | |
| 760 | 760 |

10
100
100
10
10
100
100
10

| | |
|---|---|
| Toilets & local changing facilities | 10 |
| Male | 10 |
| Female | 10 |
| Office of Technicians | 10 |
| Orders reception & dispatch room | 20 |
| Staff rest room & Tea facilities | 500 |
| add 35% for saturation, walls etc. | 160 |
| | 660 |

| | | |
|---|---|---|
| GENERAL STORES:-FOOD | | 50 |
| Dry Food Stuffs | -Beans | 50 |
| | Nuts | 20 |
| | etc.. for source | 50 |
| | Salt | 50 |
| | Unga | 50 |
| | Sugar | 20 |
| | Onions, carrots | 20 |
| | Curry & tea-leaves, coffee, etc. | 50 |
| Green Food stuffs | -Cabbages & tomatoes (cold store) | 50 |
| (Fresh) | Irish potatoes | 100 |
| | Sweet potatoes | 100 |
| | Matooke | 50 |
| | Greens | |

660

| | | |
|---|---|---|
| Dairy Products | Milk store | 20 |
| | Butter & chees, etc.. | 20 |
| | Eggs | 20 |
| | Pork cold store | 10 |
| | 2 general meat cold stores | 20 |
| | 1 Fish cold store | 10 |
| | Accounts office for accountant & chief cook & secretary | 20 |
| Workshops | Store metals | 100 |
| | Store timbers | 100 |
| | Store pipes | 50 |
| | Store iron mongery | 50 |
| Maintenance | buildings external including roofs | 50 |
| | roads | 50 |
| | office of storeman & his deputy | 10 |
| | add 30% saturation, etc... | 350 |

| | |
|---|---|
| Total | 1550 |

21. LAUNDRY DEPARTMENT.

Weighing
Sorting room
Laundering room
Mangling room
Sewing room
Linen bank
Issue & trying on facilities
Offices
New linen registration room
Disnfecting and bleaching

Saturation - 35%

Total.

22. WORKSHOPS:

electrician
carpentary
electricians store
carpentary store
Up holstery
Toilets & changing
Junior tea-room
Plumbers work shop
Elect Power room
Visitors room

Saturation - 35%

| | |
|---|---|
| 20 | |
| 20 | |
| 240 | |
| 180 | |
| 40 | |
| 120 | |
| 5 | |
| 20 | |
| 10 | |
| 40 | |
| 705 | |
| 235 | |
| 940 | 940 |
| 50 | |
| 100 | |
| 30 | |
| 50 | |
| 50 | |
| 20 | |
| 10 | |
| 50 | |
| 10 | |
| 10 | |
| 380 | |
| 125 | 505 |

23. Residenses & Messes & Teaching Facilities

One number house keeper's flat

Ten number duty students rooms including toilets (10 rooms)

One number duty students dining

One number duty students kitchen

One number Nurses dining room

One number Doctors' mess

One number Lecture theatre, etc..

One number Patients rest room attached to lecture theatre Bachelors quaters for doctors, sisters, etc...

Add saturation space

24. MAIN KITCHEN:

It is suggested that food will be made in the main kitchen and then transport in covered containers by trolleys to departmental pantries where it is warned up and distributed by trays to individual patients.

| | |
|---|---|
| 100 | |
| 200 | |
| 40 | |
| 40 | |
| 40 | |
| 100 | |
| 300 | |
| 25 | |
| 450 | |
| 450 | |
| | 1545 |

Dry store for 1days supplies

Diary store for 1days supplies

Chiefs office & deputy

Dict kitchen

Main kitchen

Parking bay for trolleys

Servery or pantry

Kitchen equipment store

Food prep area Matooke

Meat

Fish

Pork

Vegetables

Bread

Scullery

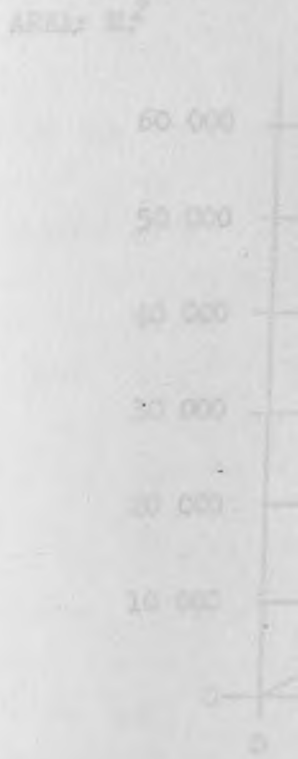
Staff facilities

Kitchen staff visitors parlour

Saturation 20%

GRAND TOTAL.....

| | |
|---|---|
| 70 | |
| 20 | |
| 20 | |
| 40 | |
| 200 | |
| 100 | |
| 200 | |
| 60 | |
| 60 | |
| 30 | |
| 30 | |
| 15 | |
| 20 | |
| 10 | |
| 20 | |
| 100 | |
| 15 | |
| 1010 | |
| 200 | 1 210 |
| ..... | 34 685 |

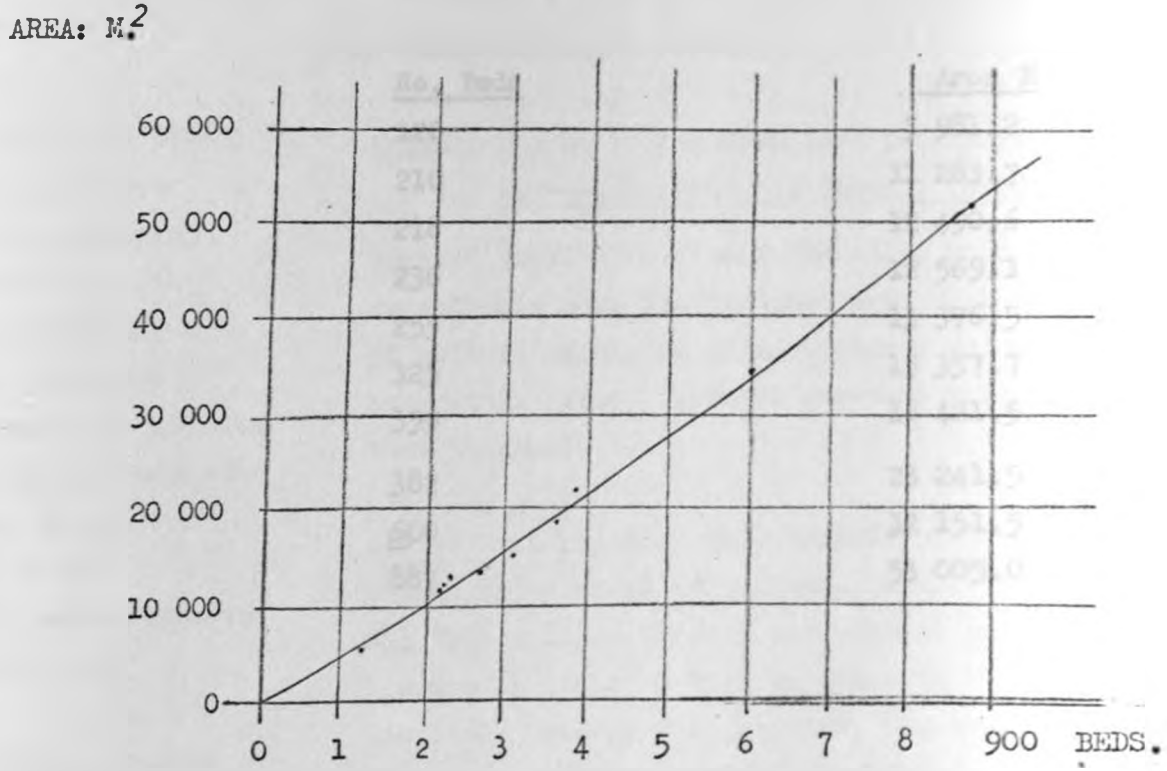

60 000
50 000
40 000
30 000
20 000
10 000
0
0

## 3.00 COMPARATIVE STUDY SUMMARY

The purpose of the comparative has been to see how spatial requirements vary with the number of beds in a hospital. The great draw-back here is that the spectrum is not complete and the spectrum is not complete and the statistics used is not of random selection.However the method used looks valid enough for conclusions to be drawn from the graphs that accompany the statistical tables.

FOR DETAILS, see the Report.

The graph below shows a number of hospital platted on it. The recommandation about this graph is that the area requirements for any hospital in Uganda will be above the line because, for example a 600-bed hospital is likely to operate at a bed capacity higher than 600, in fact may creep to 750 or 800 beds Indesigning all the departments this must be.born in mind.


AREA: M.2
60 000
50 000
40 000
30 000
20 000
10 000
0
0
1
2
3
4
5
6
7
8
900
BEDS.

The Hospitals Plotted on the graph are;-

Tittle

Protestant Hospital, Harlingen

Diaconessenhuis, Breda

St. JOZEPH HOSPITAL, DEVENTER

DISTRCT HOSPITAL, GORINHEM

R.C. HOSPITAL, OSS

"LICHTENBERG" HOSPITAL, AMERSFOOT

PRINSES IRENE HOSPITAL, ALMELO

ST. LAMBERTUS HOSPITAL, HELMOND

KAMPALA REFERENCE HOSPITAL

NEW MULAGO-KAMPALA

| No. Beds | Area M |
|---|---|
| 120 | 5 981.2 |
| 210 | 11 283.7 |
| 218 | 12 490.6 |
| 236 | 12 569.1 |
| 255 | 13 376.5 |
| 325 | 15 357.7 |
| 359 | 18 421.5 |
| 382 | 23 241.5 |
| 600 | 32 151.5 |
| 887 | 53 005.0 |

lation falls into three
very distrinct from
ential staff housing
rses Hostels
neral Staff Housing
otes staff like the
o consultants, metrons and
staff. It is recommended
with houses at points
rably next to the
at whenever need arises to
e easily obtaineb.

omies achieved in housing
nlocality and due to the
fford own trasnport, it is
re housed somewhere near

can be accomodated in the
f Ntinda, Naguru and others.

## 5.00 TRAFFIC FLOW AND CONTROL

Traffic may be broken down into two basic groups-
Service Traffic and General Traffic.

Service traffic involving vehicales will be allowed an entrance near the service yard. With the building it will be mainly by wide corridors on most horizontal basis. Vertical movement will be limited to a minimum.

General traffic flow will include both pedestrian and vehicular movement of patients, staff and visitors. All this will go through one general entrance with a guard in order to tighten security within the hospital. Once past this point, the traffic may be broken into purely staff routes, casualty routes patients routes; and parking will also be in two lots - senior parking and general parking.

## .00 COSTS

Government has allocated up to 50. million shillings for the hospital. This figure looks suscipious, and re remains to be checked at the end of the exercise. However on top of the 50 million shillings, the government together with the city council has to undergo initial costs of road betterment and reconstruction, basic- services introduction, like water, sewerage, etc... All these estimated by the various departments concerned at just over 10 million shillings.
(For Details see COST Study-REPORT)

Land-ownership is by city council, so no costs are involved for the purchasing of land. However, the site I have suggested has a few families there. These can be bought out.

## 7.00 SITE STUDIES.

AREA: The site is approximately 18 hectares

LOCATION: The site is on Ntinda hill, bound off on the southern side by which is to be turned into the North Express Way, Kira Road.

Ownership: City Council land

ACCESSIBILITY: The site will accessible by a feeder road off Kira Road.All roads should cross a minimum of contours.

NEIGHBOURHOOD: On the western side, there is a mosque and a school, on the Southern side is Ntinda Housing Estate. On the Northern side, it simply is bush.

BUILDING BY-LAWS: The city council is in the process of revising the standing by-laws. The council has not yet come out with recommendations on Plot Ratios, Population Density, Day-light Angles, Zoning, Building Systems (high rise or low rise), parking-standards, etc...

The choice is left open.


KAMPALA
Kawempe
Kanyanya
Kulambiro
Kisaasi
Kiwatule
Nalya
Kibwa
Lugoba
Kikaya
Buye
Kigowa
Nsimbiziwoome
Banda
Kyebando
Kazo
Nabweru
Ntinda
Bukoto
Bwaise
Nansana
Kyambogo
Kamwokya
Mulago
Makerere
KALUME FR
Namungoona
Kawaala
Kinawataka
Nakawa
Lubya
Bukesa
Masanafu
Mbuya
Nakulabye
Lusaze
Lugala
Kisenyi
Wabigalo
Bugolobi
Namirembe
Namuwongo
MPANGA PLANTATION
Mengo
Kisugu
Kiwuliriza
Lunguja
Nsambya
Bukasa
Natete
Lubaga
Kawe
Muyenga
Kayunga
Kibuye
Ndeeba
Kitante Park
Museum
Hostel
Lugogo Sports Field
Sewage Disposal Plant
Wireless Station
Golf Course
Police Lines
Cathedral
Survey Camp
High Level Reservoir
Cemetery
Cinema
Police College
University College
Ginneries
Kampala Technical Institute
Nagwnu
Mutesa Tomb
Kasubi
Mpanga
Kitintale
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C28
71 Y 19
71 Y 7
71 Y 9
71 Y 11
71 Y 2
71 Y 13
71 Y 12
71 Y 28
71 Y 35
71 Y 30
71 Y 18
71 Y 5
71 Y 10
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40
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TORS.

otres North of the
f 1200 metres on the
Victoria; the climate
but pleasant.

are stead and blow from
during day time. These
atural ventilation as
ole hospital. Ventilation
possible.

concentrated into two main
September-November,
storms of short
ter-noons. Therefore roof-
against sudden contracti-

are very few days in a
ot seen at all. Afternoons
h ot; sunshine should
ng up to about four o'clo-

The sun swings approximately 22½ S&N, about the equator - it should be remembered that, for practical purposes, the site os considered as being on the equator.

DAYLIGHT: The sky is practically always overcast save for early mornings. The sky factor is high enough to provide all daylight required inside the buildings. For this reason, deep planning is not recommended; furthermore deep planning calls for artificial ventilation, which would be an unnecessary drain on the country's scarce resources.

NOISE: For purpose of ventilation, the windows in the hospital will have to remain open. This makes it difficult to control noise entering from outside. Therefore, wards will be sited as far away from the main highway and feeder roads as possibly practicable. Buildings will be broken up both vertically and horizantally by noise-buffer zones. Noisy supply departments will be isolated and located near the periphery.

[illegible] SERVICES.

[illegible] be developed whatever, the[illegible] Services program will be comprehensi[illegible] site services to special[illegible] services, it is recommended that serv[illegible] installation, especially electricity, [illegible] power, should not be phased, as it [illegible] more expensive to replace, say small [illegible] transformers with large transformers [illegible] etc.

[illegible] services program will cover the following[illegible]

[illegible]ified services,
Electricity services,
Communication services, &
Equipment.

[illegible] phased services program will cover:-
[illegible] plant system
[illegible] of water supply
Cold water supply
Drinking water supply
Gas
Oxygen
Suction
Sanitary Services disposal

It is also recommended that plastic bowls, bins, buckets, etc... should be used in wards in line with noise reduction. Rubber buffers shall be fitted onto doors to enhance the campaign.

ORIENTATION: As far as possible all buildings will be orientated with windows facing North - South in order to minimise chances of direct sunshine streaming in.

SEISIMIC ACTIVITIES: Kampala is not in an epicentre of earth-quakes, however tremors up to bar 2 have been exprienced. Framed construction is one of the answers for such a problem; in this case this solution will be adopted especially as the construction is going to be multi-storeyed .

ENGINEERING SERVICES:

The site has no development whatsoever, therefore the services program will be comprehensive, ranging from site services to special-purpose services. It is recommended that services installation, especially electricity, water and sewer, should not be phased, as it becomes more expensive to replace, say small capacity transformers with large transformers later on.

The services program will cover the following:

Piped Services,
Electricity Services,
Communication services, &
Equipmet.

The piped services program will cover:-

Boiler plant system
H ot water supply
Cold water supply
Drinking water supply
Gas
Oxygen
Suction
Sanitary Services pipework

Refrigeration systems to cold rooms
Airconditioning and Medical Ventilation
Storm water drainage
Fire-fighting systems

The Electricity services to be included, roughly are:-

Main supply
Transformer room and switch gear requirements
Distributinn system throught the hospital.

The communications program, will exclude all items considered in Traffic flow section, so will include all bout

P.A.B.X. telephone system
Radio call system and loud speaker system.
Bell-push call system beside beds
Fire-alarm system.

The Equipment in an hospital forms an integral part of services though at first sight it doesn't appear so. The type of Equipment installed infuences the kind of service system attached, therefore to be considered are:

Sterilizing equipment,

Sanitary ware,

Kitchen equipment,

Laundary equipment,

Oxygen and Vaccum services,

Gas containers and its distribution,

Incinerator equipment,

Refuse handling equipment.

COSTS STUDY SUMMARY.

The site south of Kira road has already been considered by the relevant authorities and cost estimates of services infrastructure have been established, and they are:

Kira road reconstruction: This is an expensive idea but a necessary one. High speed communication traffic will be a must between the Kampala Referral Hospital and New Mulago Hospital. To reconstruct it with a four-lane system, a kerb, side drain, street lighting, etc.. the overall cost is estimated at around 2 860 000/=

To construct the new feeder road to Jinja road the basic cost was quoted as 3 750 000/=

10% contingency sum

30% contract sum

bringing the overall cost to 5 362 500/=

This feeder road will be as Kira road by starndads.

Water connection: Thereis already in the vicinity of the site a water main of 250 mm ø. Connection to this main will cost 2 000/=

Fowl sewer pipe: To run a 225mm Ø pipe from the site proposed by the Ministry of works to the neighbouring community sewer, it will cost 16 200/=

Electricity: To re-route the existing electricity 33 Kv power line it will cost 498 000/= including the removal of the pylon.
To supply 2 of 11 Kv lines it will cost 1 600 000/=

Postal services: As the site has no present provision there will be no costs involved when introducing the services.

Remark: Mr. Clarke of the city council sugested that during the programme of phasing due consideration should be seriously given to items like sewer, electricity, water, etc.. as these if phased may be very expensive so that a big expense in the beginning may be cheaper in the long run.

PITAL REQUIREMENTS:

hospital may be defined as a building in which tients are cared for, nursed and treated. This finition is itself sufficient to give an ea of one the difficulties with which the e person who has to build a hospital is faced. or a building is something permanent, something hat is difficult to change once it has been onstructed. The methods of looking after the atients, nursing and treatment, however, hange continually and rapidly, due to the levelopment of medical science. New medicines provide possibilities for new methods of treatment: improved narcotics and new apparatus bring changes in the field of surgery, a field which has an ever increasing number of specializations; the arsenal of diagnosing aids is being continually expanded; diseases which until recently were incurable can now be fought successfully; new departments such as isotope departments and departments for physical therapeutics make their appearance. All these changes are of consequence when considering the standards to be set for the hospital.

Therefore a hospital builder actually has to create a building which satisfies medical and spatial requirements that during the period in which the design is made are only partially, at any rate not fully, known and which, after the completion of the building are still subject to continual change.

A second difficulty for the hospital builder is the fact that the progress of medical science is accompanied by an increase in the investment and operating costs of the hospitals, which of course makes its influence felt in the hospital fees. In order to keep these at a socially desirable low level, the hospital builder is expected to construct an extremely efficient building.

A third point, which related to the two preceding ones, is the fact that it is difficult to secure sufficient nursing staff, on the one hand because the task of a female nurse is an exacting one and gradually more and more other occupations becoming open to women, on the other hand because the new

methods of treatment demand relatively heavy staffing; the average number of staff members per hospital bed is greater than it used to be. For the hospital builder this means that he must always strive for such a building method and such a layout that it will be possible for the building to be used and maintained with a minimum of staff.

B. A number of layouts accompany the particular. The diagrams are to serve as a guide in understanding the design aspects of particularly complicated spaces like the operating theatre.
Not all spaces in the hospital are described, but general conclusions satisfying a number of room requirements have been included in this part of library research.

OUT-PATIENT DEPATMENT

Location: It is recommended that the department should be accomodated on the groundfloor as many patients will have difficulty in climbing staircases.
Easy communication between outpatient and radiology departments should be ensure.
It should not be possible to look into the examination treatment rooms from outside.

COMBINATION OF VARIOUS CLINICS: A number of specialists will use very often the same rooms. This does not present difficulties in actual practice if an efficient roster is drawn up. The important point is to find the correct combinations; for example orthopaedics and surgery go very well together.

OTHER DEPARTMENTS: An important connection to the laboratory exists especially as regards routine tests. The O.P.D. could have its own laboratories but these could be centralised

into the pathology department.

TECHNICAL REQUIREMENTS:

Floorfinish: The floor finish should have the following qualities: adequate resistance to wear and tear; non-slippery; not too hard; sound deadening; resistant to staining; resistance to chemicals; easy to clean; light colour; sufficiently warm to feet and easy to clean. The following table gives a list of materials and their performance as regards the afore-mentioned properties. (see table.)

WALLS: should be tiled behind work tables, drain boards, sinks, slop sinks, etc... They should be resistant to water during cleaning, and should not be saponifiable, should be resistant to alkalis and should not shine. Chrolinated rubber or polyvinyl acetate paint is recommended. The base for these paints should be hard.

Ceilings: The ceiling height should not less than 3 metres in small rooms, and in large ones not less than 3.25m.

| | Resistance to | | | | | | | | | | | | Other properties | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | wear | impact loads | point loads | moisture | water ( excess) | acids | alkalis | salts | mineral oils | organic oils | organic solvents | weather effects | elevated temp. | non-slip (dry) | non-slip (wet) | warmth to feet | sound deadening | resilience | ease of maintenance | repair possibilities |
| SEAMLESS FLOORS | | | | | | | | | | | | | | | | | | | | |
| cement mortar | 3 | 2 | 5 | 5 | 5 | 1 | 4 | 3 | 2 | 1 | 2 | 4 | 5 | 4 | 2 | 1 | 1 | 1 | 4 | 2 |
| granite | 4 | 3 | 5 | 5 | 5 | 1 | 4 | 3 | 3 | 1 | 3 | 5 | 5 | 4 | 2 | 1 | 1 | 1 | 4 | 1 |
| latex cement | 3 | 4 | 2 | 3 | 3 | 3 | 3 | 4 | 2 | 2 | 2 | 1 | 2 | 4 | 1 | 2 | 2 | 1 | 4 | 3 |
| polyvinyl acetate (plastic) | 3 | 2 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 1 | 1 | 2 | 4 | 1 | 2 | 2 | 1 | 4 | 3 |
| SLABS or TILES IN MORTAR | | | | | | | | | | | | | | | | | | | | |
| quartzite | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 3 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | 1 | 1 | 1 | 4 | 4 |
| split tiles | 3 | 3 | 5 | 5 | 5 | 4 | 4 | 2 | 4 | 4 | 4 | 3 | 5 | 4 | 1 | 2 | 1 | 1 | 4 | 4 |
| double hard-baked tiles | 4 | 3 | 5 | 5 | 5 | 5 | 4 | 2 | 5 | 5 | 5 | 5 | 5 | 4 | 1 | 2 | 1 | 1 | 5 | 4 |
| NAILED or GLUED | | | | | | | | | | | | | | | | | | | | |
| pine | V | 4 | 3 | 2 | 1 | 2 | 2 | 2 | 4 | 3 | 4 | 2 | 3 | 4 | 2 | 4 | 3 | 4 | 2 | 4 |
| hard wood | V | 4 | 4 | 3 | 2 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 2 | 4 | 2 | 3 | 2 | 4 |
| linoleum | 3 | 2 | 3 | 3 | 1 | 2 | 1 | 3 | 3 | 3 | 3 | 1 | 3 | 4 | 1 | 3 | 3 | 3 | 3 | 3 |
| cork lenoleum | 3 | 2 | 2 | 2 | 1 | 2 | 1 | 3 | 2 | 2 | 2 | 1 | 3 | 4 | 2 | 5 | 5 | 4 | 2 | 3 |
| rubber | 3 | 4 | 5 | 5 | 2 | 3 | 3 | 4 | 2 | 1 | 2 | 1 | 3 | 5 | 1 | 3 | 5 | 5 | 4 | 3 |
| polyvinyl chloride (plastic) | 3 | 3 | 3 | 5 | 2 | 5 | 4 | 4 | 4 | 3 | 1 | 1 | 1 | 4 | 1 | 2 | 2 | 2 | 4 | 3 |

Qualification: 1 bad, 2 moderate, 3 reasonable, 4 good, 5 very good, V varying acc. to type.

FIRE HAZARDS: Fire extinguishers should not be too large and so easy to handle.

TEMPERATURE: Room temperature should be about 18°C

DOORS: Most doors should be fitted with automatic door-closing mechanism. Along routes for movement of strecher patients doors should have a free passage not less than 1.10 metrs.

RADIOLOGY DEPARTMENT.

Location: A should be located in between the out-patient department and the wards. Easy contact with the surgical department should be ensured

RELATIONSHIPS BETWEEN ROOMS:

The waiting room office should be in their immediate vicinity of the entrance.It is recommended that the office, the filing room, the film-viewing room and the radiologist's room should be located next to each other and provided with communicating doors so that it is possible to walk from one room to another.

The contact between dark room and diagnostic rooms should be easy as possible,which implies that the latter should be adjacent to or between the dark rooms(s). It is also recommended that there should be direct communication between the wet film viewing room and the dark room and between the wet film viewing room and the diagnostic room. The wet section of the dark rooms should preferably be adjecent to the wet film viewing room and the dry section adjecent to the diagnostic room.

It is recommended that direct communication with the surgical department by means of a lift for cassettes should be available which implies that the dark room should be located below the surgical department.
It is sometimes suggested and is desirable that the diagnostic and therapy rooms should communicate with each other by means of a low corridor built outside and along the longitudinal exerior wall. This for example, enables the radiologist to move from one room to another having to pass through the corridor which is also open to the public.
If a diagnostic room does not adjoin the dark room, the transport of cassettes from the former to the latter can also be effected through this corridor. With this solution adequate daylighting is difficult to realize.

RADIOLOGY DEPARTMENT.

ELECTRICAL PROTECTIVE MEASURES:

According to the Intenational Recommendations of the Congress of Chicago (1937) the following points should be observed:

The floor of the X-ray room should preferably consist of insulating material, such as wood, rubber or linoleum.

Conduit fixed to the ceiling should be located at least 10 ft (3 m) above floor level.

It should consist of strong metal tubing or some other non-radiating conductive material. The connection cables must be kept taut by means of rollers and should likewise be non-radiating.

If possible eathed protection screens must be fitted to rduce the chance of accidental contact with nearby parts of the high-tension system.

Unprotected supply lines should be kept as far as possible from the staff and the patient. It is recommended that use should be made of X-ray equipment protected against high tension and in w which the high-tension circuit is fully enclosed in the earthed conductor. Metal parts of the equipment metal objects in the room should be earthed.

Main and auxiliary switches should be easily accessible and clearly recognisable. They should not be located in the vicinity of objects which are under high tension. It is recommended that double-pole instantaneous switches should be used. If two or more apparatuses are supplied from a common high-tension source, they should be controlled by suitable mult-pole high-tension switches. In many high-tension D.C. apparatuses the condensers retain a residual charge after switching off. Hence, some means of totally discharging those condensers should be provided. Transparent warning plate which light up when the apparatus is in very useful. Foot switches should only be used in series with ordinary switches and they should be so designed that they can neither be left switched on nor be accidentally switched on. A suitable kilvoltmeter shou be provided for measuring the high voltage on the X-ray tube.

## DIAGNOSTIC ROOMS:

Dimensions for a fully equipped diagnostic room (with universal unit and Potter Bucky unit) a clear work space of approx. 5.50x6m. should be available.

FLOORS: If below the floor concerned there are some rooms regularly used by people this floor should have a lead equivalent of 2mm.
Floor material should be resistant to acids, non- and easy to clean. Terrazo and cement finishes are un suitable.cork and P.V.C. tiles, linoleum etc.. are alright.

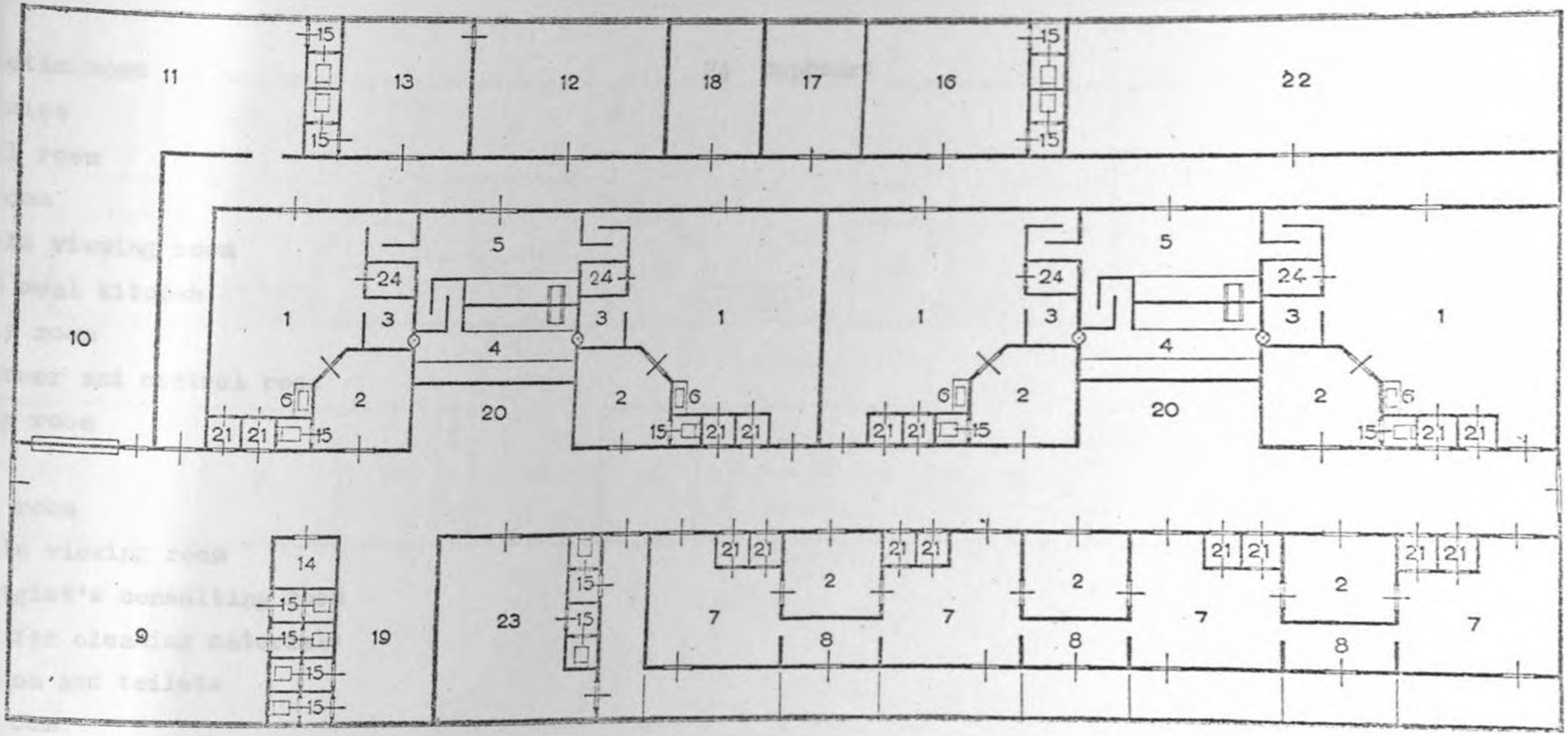
WALLS: should be of 2 mm lead equivalent. The windows, if fixed at 2 metres above floor level then no need of lead-equivalent insulation.
Any neighbouring building should not be nearer than 6 metres.
4 x 2 mm. lead glass is equivalent to 2 mm lead insulation capacity.
The above is valid for voltages not exceeding 125 kv

DOORS : The casing should be painted black.

WINDOWS: " " " " " " .

CEILINGS : If there are any rooms above the radiology rooms, the ceiling should have a lead equivalent of 2 mm.

VENTILATION AND TEMPERATURES: Six air changes will be adequate, if the equipment is free fromm spurious r radiation, otherwise ten air-changes will be required. Room temperature should be $18^{\circ}$- $22^{\circ}$C.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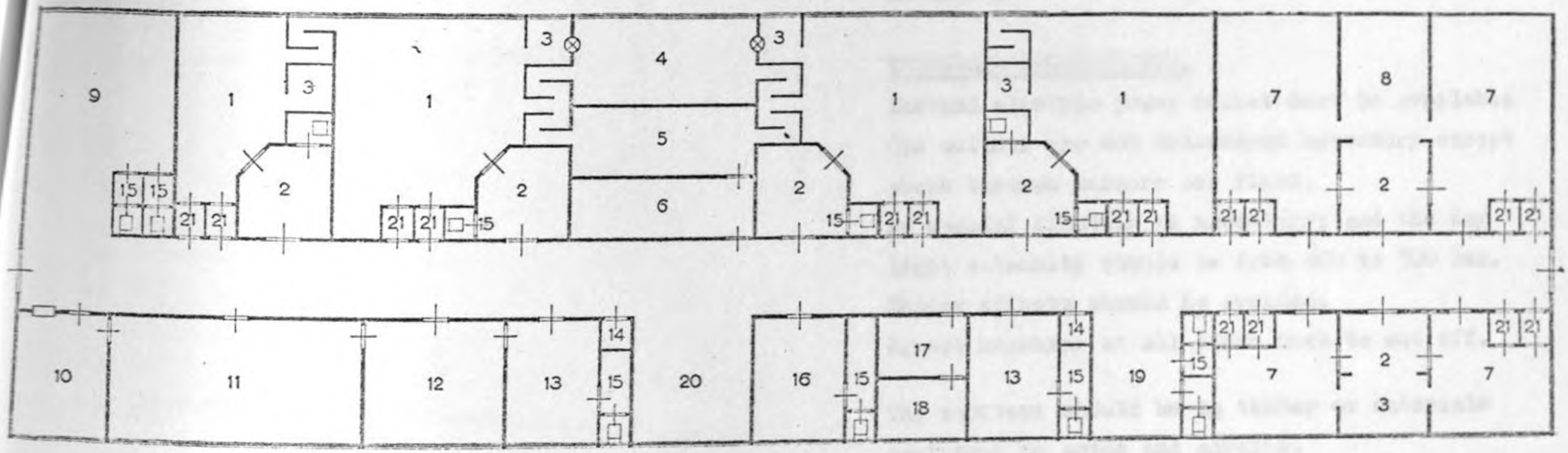
1 diagnostic room
2 bed sluice
3 control room
4 dark room
5 wet film viewing room
6 barium meal kitchen
7 therapy room
8 trnsformer and control room
9 waiting room
10 office
11 filing room
12 dry film viewing room
13 radiologist's consulting room
14 closet for cleaning materials
15 cloakroom and toilets
16 staff room
17 store
18 photography room
19 waiting room for therapy patients
20 waiting room beds
21 dressing cubicle
22 spare stores of equipment.
23 room for X-ray therapist
24 cupboard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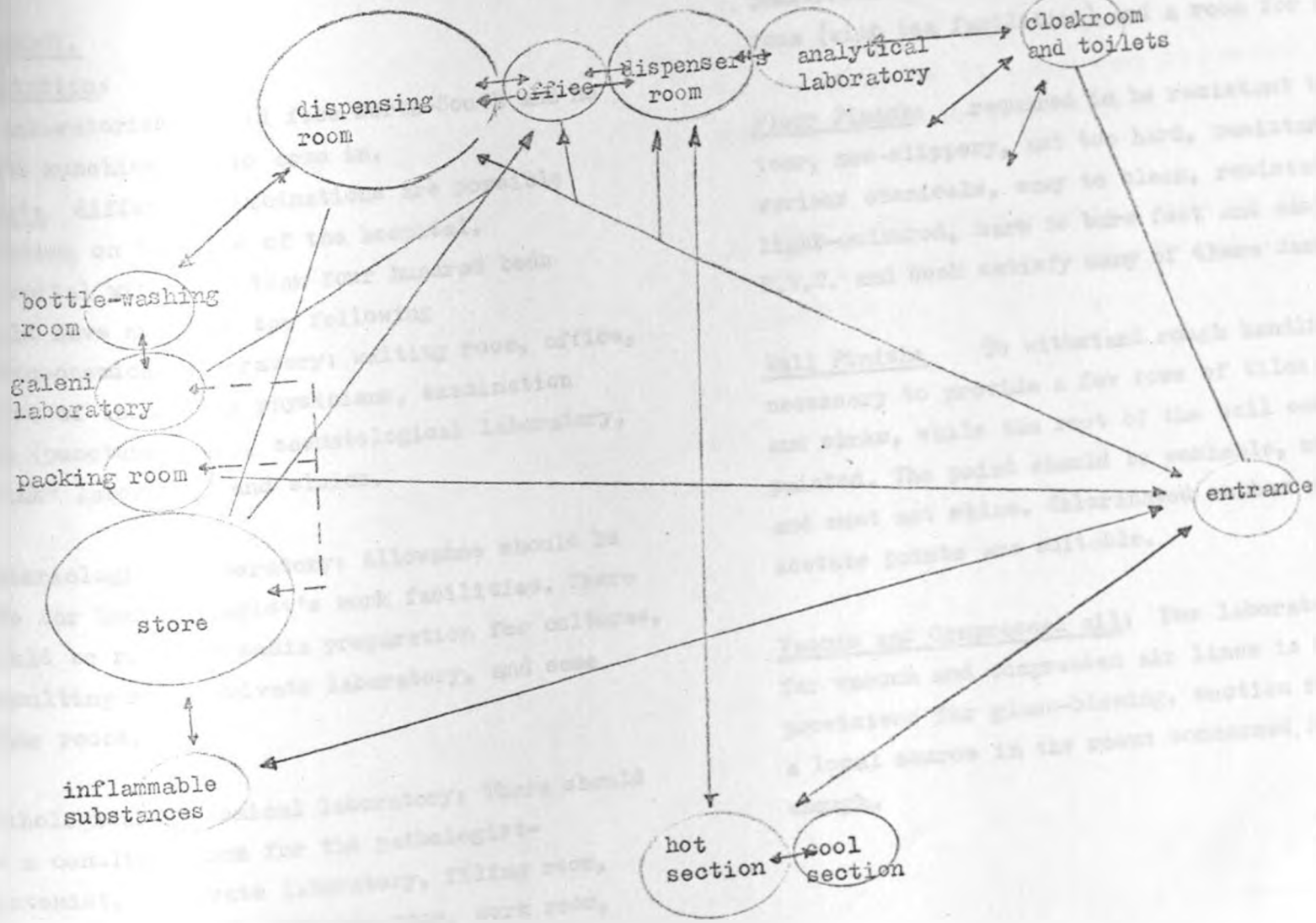
PHARMACY

TECHNICAL REQUIREMENTS.

Earthed electric power socket must be available
Gas outlets are not considered necessary except where burnsen burners are fixed.
No special lighting is necessary; and the day light intensity should be from 400 to 500 lux.
Shadow effects should be avoided.
Direct sunshine at all times must be cut off.

The worktops should be in timber or materials resistant to acids and alkalis.


dispensing room
office
dispensers room
analytical laboratory
cloakroom and toilets
bottle-washing room
galeni laboratory
packing room
store
entrance
inflammable substances
hot section
cool section

PATHOLOGY.

Orientation:

All laboratories should face North-South and no direct sunshine should come in.

Layout: different combinations are possible depending on the size of the hospital.

A hospital with more than four hundred beds should have at least the following

clinicochemical laboratory: waiting room, office, office of laboratory physicians, examination room (puncture room), haematological laboratory, "stink" laboratory and sluice.

Bectoriological laboratory: Allowance should be made for bacteriologist's work facilities. There should be room for media preparation for cultures, consulting room, Private laboratory, and some other rooms.

Pathological Anatomical laboratory: There should be a consulting room for the pathologist-anatomist, a private laboratory, filing room, room for histology, formalin room, work room, store room, dark room, photography room,

janitorial closet, cloak room and W.C. staff rest-room (with tea facilities) and a room for a secretary.

Floor Finish: required to be resistant to wear and tear, non-slippery, not too hard, resistant to various chemicals, easy to clean, resistant to stains, light-coloured, warm to bare feet and easy to repair. P.V.C. and cook satisfy many of these demands.

Wall Finish: To withstand rough handling. It is necessary to provide a few rows of tiles along tables and sinks, while the rest of the wall can simply be painted. The paint should be washable, not saponifiable and must not shine. Chlorinated rubber and polyvinyl acetate paints are suitable.

Vaccum and Compressed ail: For laboratories, the need for vaccum and compressed air lines is confined to provisions for glass-blowing, suction for pipettes, etc a local source in the rooms concerned is adequate enough.

1. [illegible] laboratory
2. [illegible] cupboard (h = 2.50m)
3. refrigerator
4. [illegible] distilled water [illegible]
5. [illegible] bath [illegible]
6. incubator
7. evaporator
8. trolley
9. centrifuge
10. [illegible] cupboard [illegible] with supply of water and bl[illegible] beneath it
11. [illegible]
12. [illegible]
13. [illegible]
14. analytical [illegible] balance
15. stone weighing and vibration table
16. stand for burettes
17. shelf and wall cupboards
18. table (h = [illegible] (80 cm)
19. table (h = [illegible] (90 cm)
20. water bath, [illegible] (37° C)
21. [illegible] wall [illegible]

F IRE HAZARDS: Provide fire blankets , sand should be available in the laboratory , and fire sprinklers should be fitted. Carbondioxide extinguishers should be available, and of a size easy to handle. They should be prominently displayed.

ELECTRIC POWER OUTLETS: Outlets need not be waterproof , but should be earthed. They should be amply distributed .

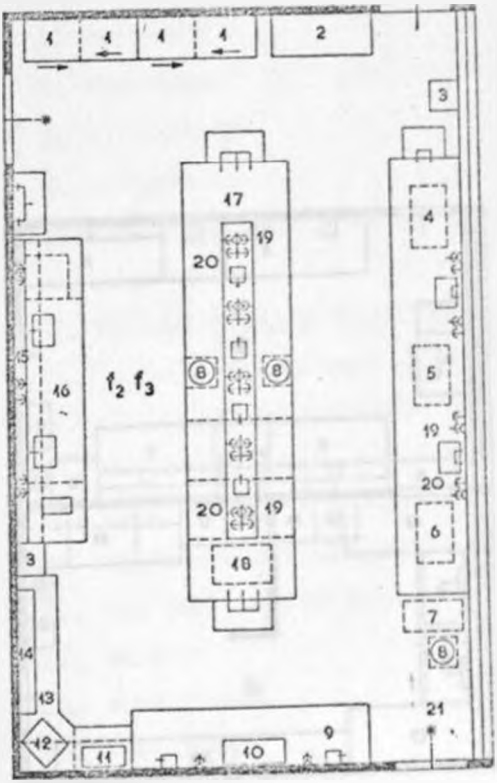
$F_2, F_3$ clinicochemical laboratory

1. storage cupboards (h = 2.50m)
2. refrigerator
3. distilled water stand
4. water bath (100°C)
5. incubator
6. evaporator
7. trolley
8. centrifuge
9. fume cupboard, with supply of sand and blankets beneath it
10. Kjeldahl's apparatus
11. chemical balance
12. analytical arresting balance
13. stone weighing and titration table
14. stand for burettes
15. shelf and wall cupboards
16. table (h = (80 cm)
17. table (h = (90 cm)
18. water bath, (37° C)
19. twin wall socket

PATHOLOGY

20. gas outlet

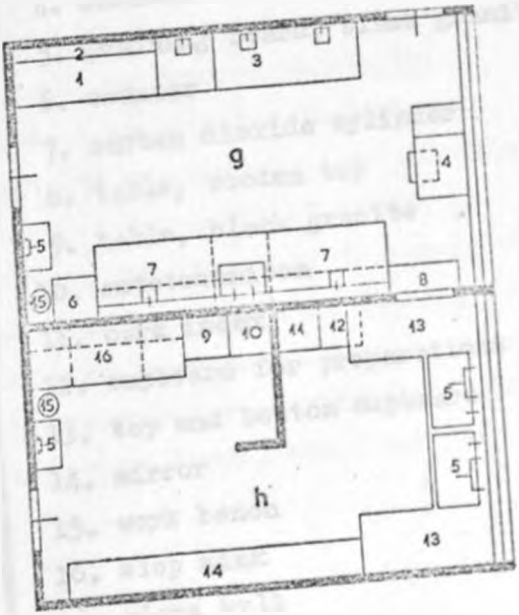
21. shower bath



g "stink" laboratory

h sluice

1. microscopy table (h = 31½in. (80 cm)
2. shelves (h = 20in. (50 cm)
3. fume cupboard, with suply of sand blankets beneath it
4. desk
5. washbasin
6. refrigerator
7. table for qualitative determinations (h = 36 in. (90 cm)
8. counter
9. steam apparatus according to Koch
10. distilled water stand
11. disinfecting apparatus
12. slop sink
13. stone rinsing table
14. drying cupboards (h = 8 ft (2.50 m)
15. sublimate stand
16. table with drawers, cupboards and shelf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a consulting room

b private laboratory

c dissecting room

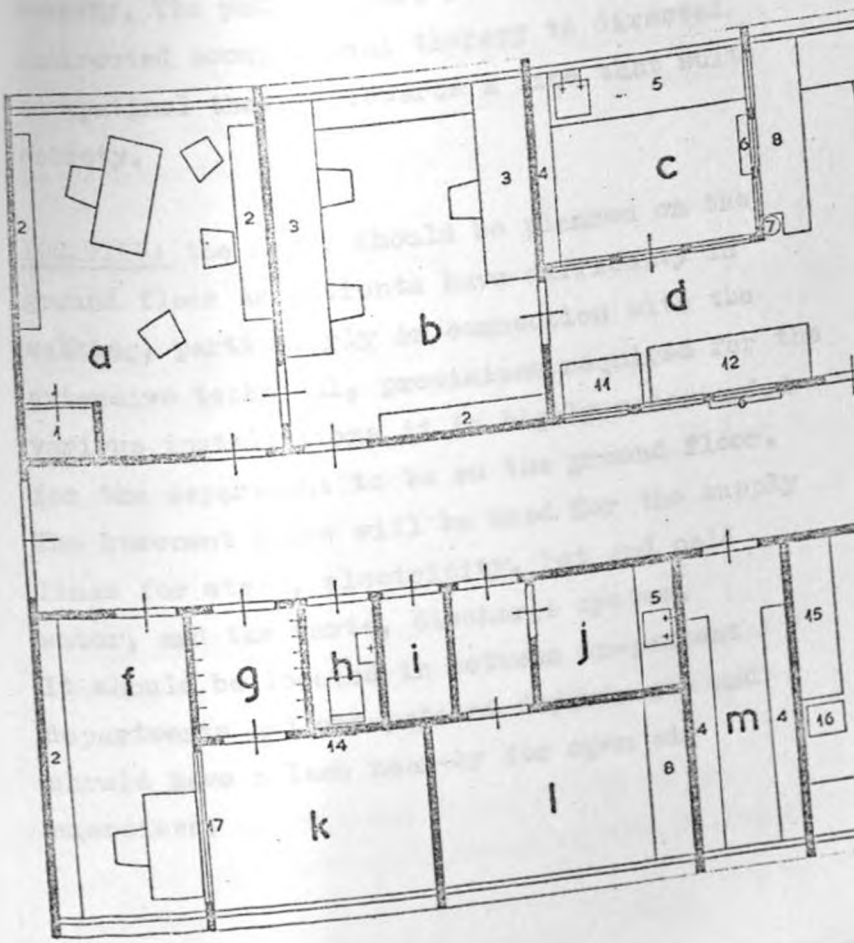
d filling room

e histology

f secretary

g cloakroom

h w.c.



i closet

j darkroom

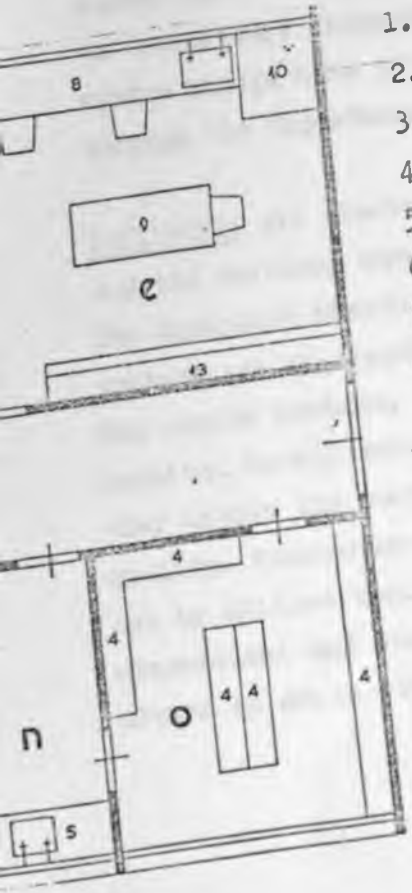
k room for meals

l photographical room

m stocks

n workshop

o formalin room




1. cupboard
2. bookcase
3. microscopy
4. shelves
5. draining board, black granite
6. counter
7. carbon dioxide cylinder
8. table, wooden top
9. table, black granite
10. autotechnicon
11. card index
12. cupboard for preparations
13. top and bottom cupboard
14. mirror
15. work bench
16. slop sink
17. glass wall

PHYSIOTHERAPY DEPARTMENT.

Physictherapy and occupational therapy can be regarded as the pillars of rehabillitation, making the patient once more a useful members of society. The patient must be coached by undirected occupational therapy to directed occupatinol therapy towards a line that suits society.

LOCATION: the dept. should be planned on the ground floor as patients have difficulty in walking, particularly in connection with the extensive technical, provisions required for the various installations it is highly recommended for the department to be on the ground floor. The basement below will be used for the supply lines for steam, electricity, hot and cold water, and the waste, discharge system. It should be located in between in-patient departments and out-patient departments and should have a lawn near-by for open air exercises.

FLOOR FINISH: The colour should not make it possible for stains to show up too much. Floors should be laid of non-slip material and warm to the bare feet.

TEMPERATURE: Many of the exercises are done half-naked. In this condition a body is very sensitive to temperature changes. Therefore the window system should make it possible to control wind speed through the department.

EQUIPMENT: All electrical equipment must be earthed, and the earthing should be checked regularly. The equipment should be so arranged that various systems are as short and as economical as possible. The supply systems, if independent of other hospital installations, are then easy to encure that they supply the services in sufficient quantities and quality. Maintenance and supervision must be carried out by skilled men. And vulnerable components like utraviolent and short-wave lamps, etc.. must be always in ample stock.

DIMENSIONS: The department should be designed primarily to satisfy lighting and environmental temparature requirements, and should not be less than 3.25 metrs high. Corridors should be very wide and fitted with a handrail.

FIRE HAZARDS: Fire extinguishers should be the dry type, not too large to handle, and should be prominently displayed.

PAEDIATRICS NURSING UNIT.

TECHNICAL REQUIREMENTS

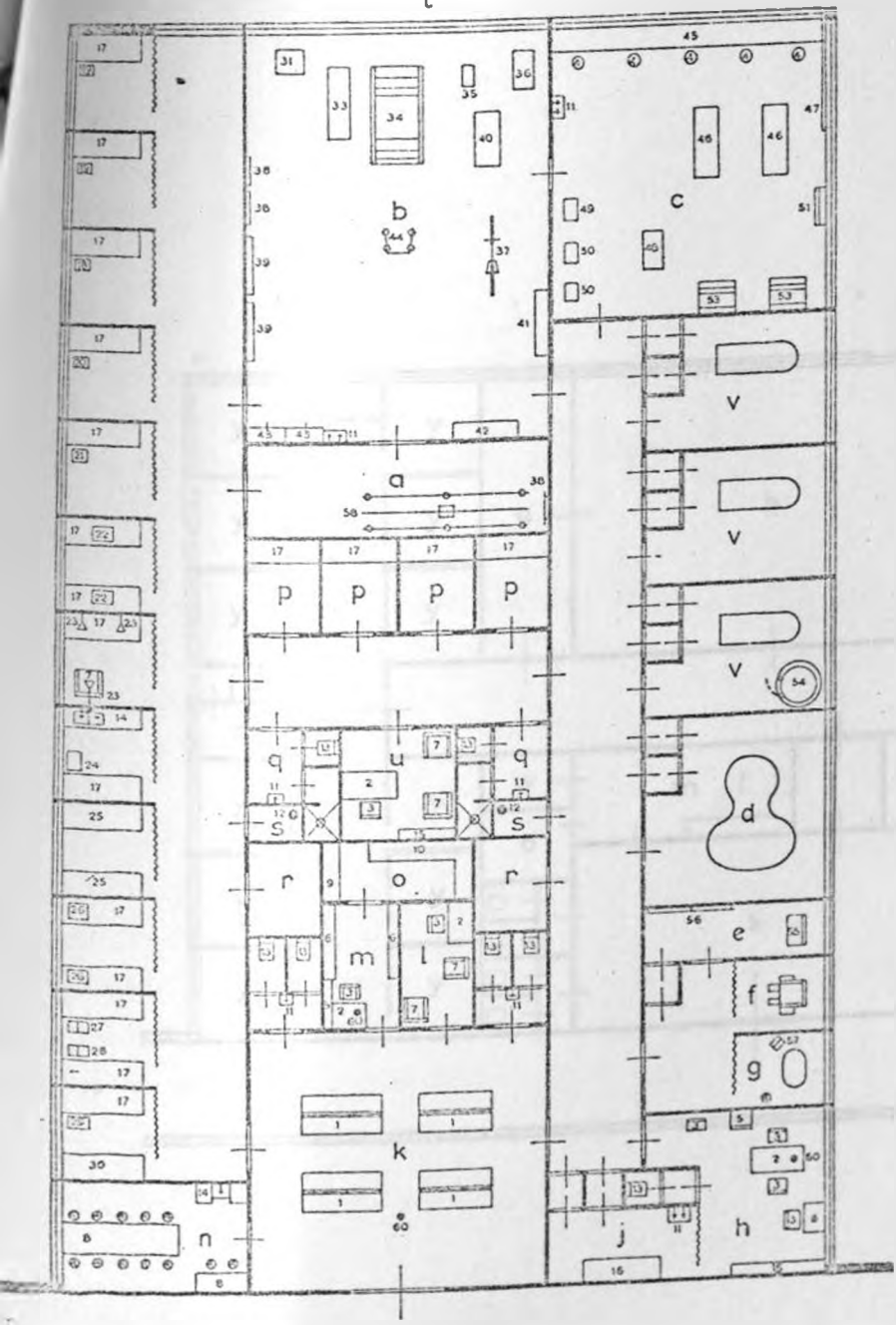
In a paediatric department, cubicles are required in large number. The requirements are a as those in the INFECTIOUS DISEASE NURSING UNIT.

BASIC ELEMENTS

Partitions separating cubicles are recommended to be glazed to ease the psychlogical feeling of children.

In a 600 bed hospital there should be about 100 bed for paediatric cases in the following categories.

t

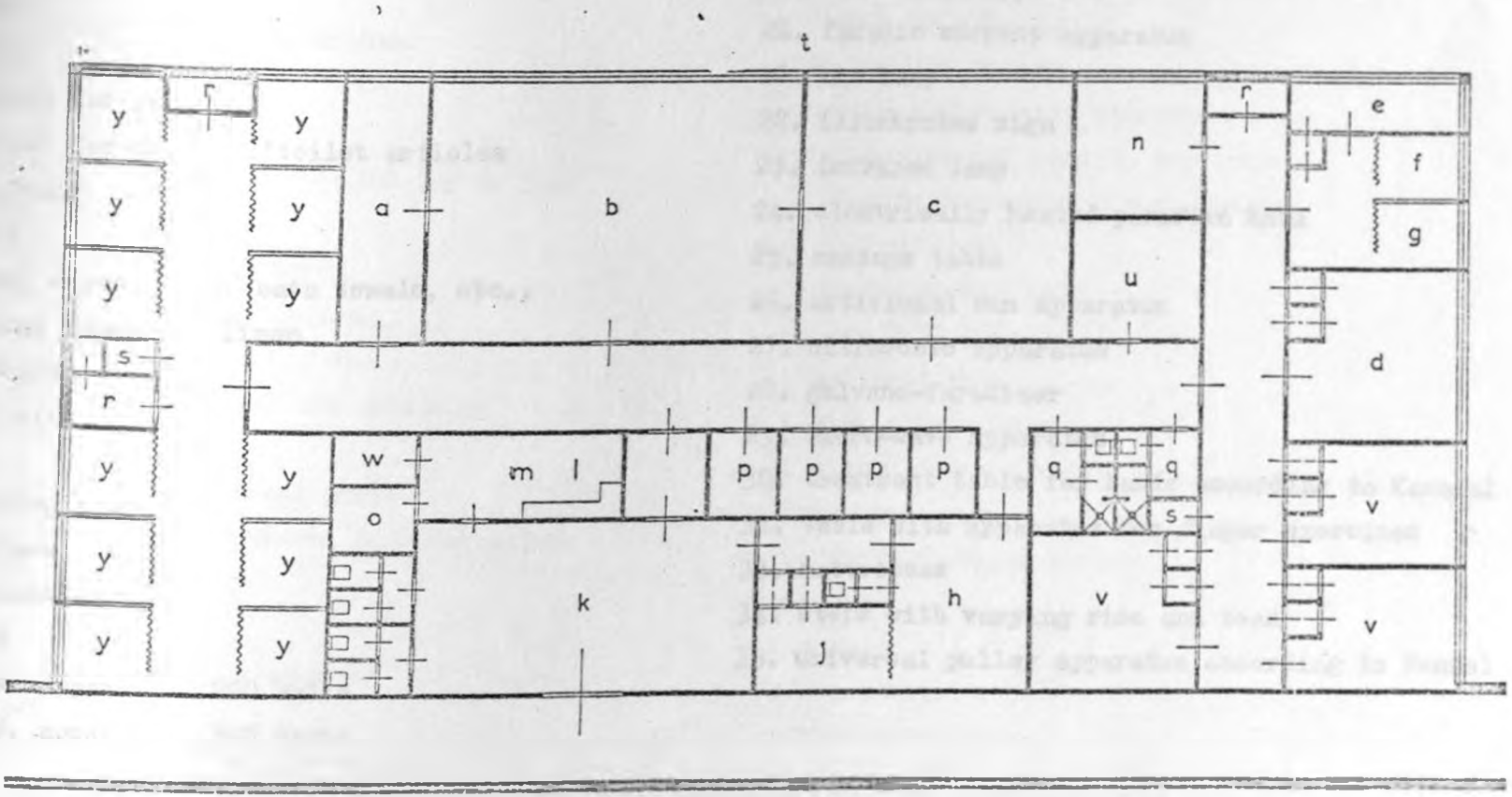


PHYSIOTHERAPY DEPARTMENT.

ALT.1

PHYSIOTHERAPY DEPARTMENT

ALT. 2.



Physiotherapy department lengend.

1. benches for waiting patients
2. desk
3. chair
4. stool
5. cabinet for records
6. cabinet for patients'toilet articles
7. arm chair
8. table
9. drying cupboard for bath towels, etc..
10. storage racks for linen
11. washbasin
12. slop sink
13. w.c.
14. draining board
15. bookcase
16. examination table
17. couch
18. U.S.W. apparatus, 200 Watts
19. U.S.W. apparatus, 300 Watts

20. galvanic current apparatus
20. diathermic apparatus
21. faradic current apparatus
22. arc lamp
22. illuminated sign
23. infrared lamp
24. electrically heated paraffin bath
25. massage table
26. artificial sun apparatus
27. ultrasonic apparatus
28. galvano-faradizer
29. micro-wave apparatus
30. treatment table for hands according to Kanafal
31. table with apparatus for finger exercises
33. mattresses
34. steps with varying rise and tead
35. universal pulley apparatus according to Hennel

36. universal pendant apparatus
37. exercise bicycle with adjustable cranks
38. mirror
39. Swedish wall rack
40. home trainer (rowing apparatus)
41. Swedish bench
42. exercise bench
43. cupboard for balls (3½ to 7lbs (2½ to 3kg)
44. invalid walker
45. work table for wicker work, carpet making, making leather goods, modelling in clay, etc..
46. work table for woodwork and metalwork
47. tool rack
48. woodwork lathe with tread drive
49. sewing machine for hand-and foot-operation
50. fret-saw bench
51. loom
52. loom for "quadrupeds" exercises
53. table loom
54. steam shower with steam generator
55. shower cathedra
56. railing
57. step

58. walking school with crab, pully, corset and railings (one adjustable)

59. walking bath with crab pulley, corset and railing

60. calling system

a space for walking exercises

b gymnasium for general exercises

c section for occupational therapy

d Hubbard tank

e Scotch shower bath

f four tank bath

g wirlpool bath

h physician's room

i examination room

k waiting room

l room for social worker

m office

n canteen

o linen room

p rest room

q shower bath

r storage

s closet for cleaning materials

t lawn

u room for head masseur

v bathroom

w drying cupboard

x walking bath

y treatment cubicles

STERILISING ROOMS:

These should have a "Hot" and"Cool" section.

"Hot" section to provide room for:

a) preparing and distilling water,

b) sterilization apparatus (autoclaves)

c) cleaning facilities for transfusion bottles, etc...

d) drying over sterilizer

e) demineralization apparatus

f) storage cabinets.

"Cool" section to prove room for:

a) racks to store stocks of chemicals for sterilization

b) worktables with storage cabinets below

c) a sink, above which there is also supply of distilled water

d) a gran and milligram balance

e) rack or shelves for storing clean bottles.

## SURGICAL AND MEDICAL NURSING UNITS.

SIZE: As a conclusion from general experience, a nursing unit should not exceed 32 patients, although staff members prefer 28 (or less.) certain facilities can be combined to effect cost saving; those could be day room, consulting room, linen, etc...

ORIENTATION: A south east to south orientation is alright. Everything possible should be done to stop afternoon sun streaming in.

CORRIDOR SYSTEM:

DOUBLE: effect considarable saving in time for traffic movement between rooms. Bad lighting and bad ventilation in the centre are the main disadvantages of this system.

MEDICAL CONSIDERATIONS: It is recommended to accomodate patients in small groups; this reduces the risk of infection.

NURSING CONSIDERATION:

The work of the nursing staff is influenced by three main factors which are:-

1. The care and the nursing of the patient in bed, thus, washing, giving injections, assisting with meals, feeling the pulse, making the bed, etc...
2. Preparatory work for the above duties in the service spaces, such as dividing food in the serving kitchen, cleaning urinals, etc...
3. Traffic between the various spaces.

PATIENTS REQUIREMENTS

The patients generally prefer to be nursed in a 4- to 6-bed bay.

TECHNICAL REQUIREMENTS IN

a) KITCHEN: The method that will be used is:- food is taken from the central kitchen to the serving kitchen in a trolley and there taken to a serving pantry where it is placed on individual plates.

Therefore in the serving kitchennettes we need

1. Cooking appliances
2. Warming cupboard and storage facilities for

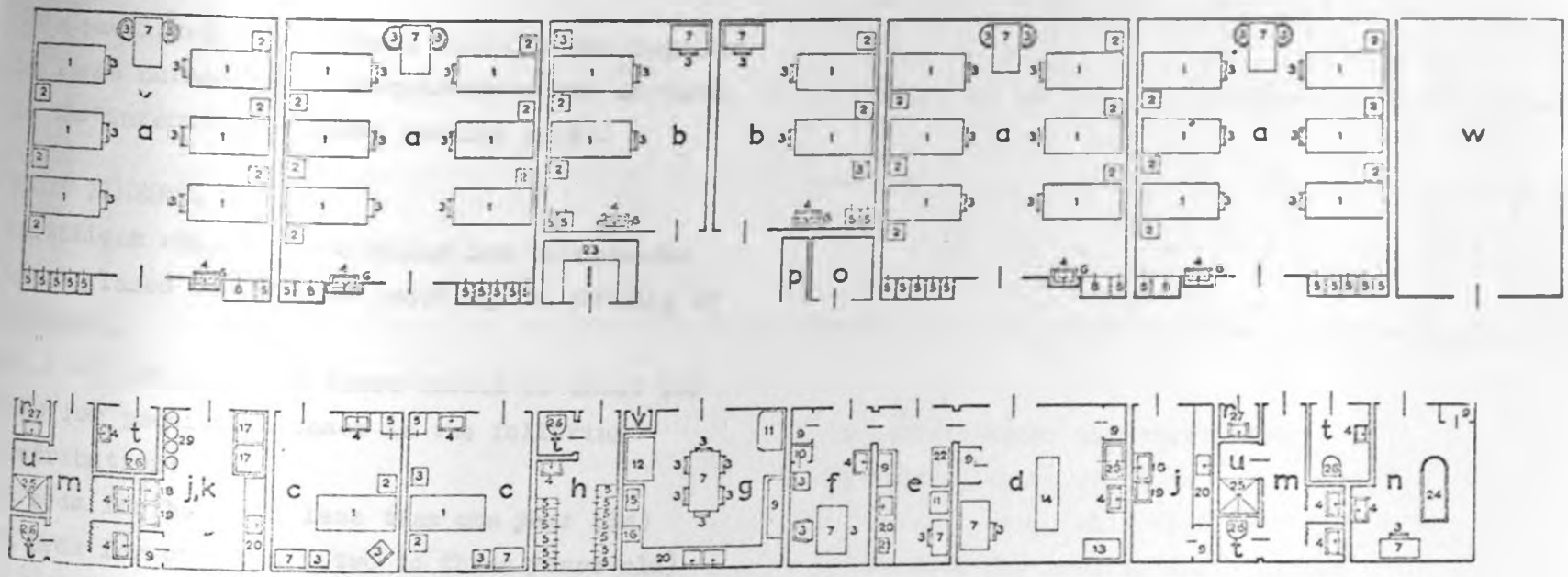
plates, trays, etc.....

3. rack for drying aprons, etc.....
4. draining board with sinks
5. refrigerator
6. Table
7. a few chairs
8. dumb waiter goods lift.

b) SLUICE: Afully equipped sluice should certain

1. Ventilated cabinet
2. drainboard and sink
3. rack for urinals, and for bedpans
4. slopsinks for urinals, and bedpans
5. rack for bedpans
6. drying rack
7. facilities for washing bedpans
8. facilities for disinfecting bedpans.

SURGICAL AND MEDICAL NURSING UNIT.




a room for 6 patients
b room for 2 patients
c isolation room
d examination room
e workroom for nursing staff
f room for staff nurse
g serving kitchen
h cloakroom for nurses
j sluice
k soiled-linen room
l linen room
m washing facilities for patients
n bathroom
o storage mattresses
p space for wheeled stretchers
r closet for cleaning materials
t toilet
u showers
v storage hot-water bottles
w day room
1 bed
2 bedside table
3 chair
4 washbasin
5 clothes locker
6 medicine cabinet above wash-basin
7 table or writing table
8 cabinet for bowls
9 cupboard
10 cabinet for narcotics
11 refrigerator
12 warming cupboard
13 instrument table
14 examination bed
15 2-ring cooker
16 tipping boiler
17 container for disinfection of linen
18 slop sink for urinals
19 slop sink for bedpans
20 draining board
21 steriliser
22 trolley for dressings
23 shelves
24 bath
25 shower
26 w.c.
27 slop sink
28 slop sink for stomach evacuation
29 bags for soiled linen

## PAEDIATRICS NURSING UNIT.

TECHNICAL REQUIREMENTS.

In a paediatrics department cubicles are required in large numbers. T he requirements are as those in the"infectious disease nursing unit".

BASIC ELEMENTS.

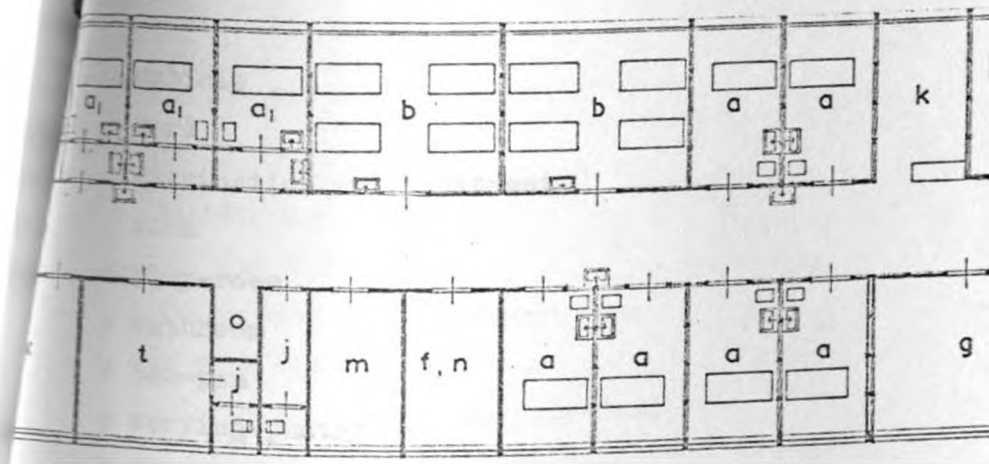
Partitions separating cubicles are recommended to be glazed to eaze the psychlogical feeling of children.

In a 600 bed hospital there should be about 100 beds for paediatric cases in the following distribution:

35 beds for babies ( less than one year old)
24 beds for children ( two to three years old)
41 beds for pre-adolescents ( ten to fifteen)

T hree standard bed sises are recommended for the three categories:

bed sizes: type 1 ; 800 x 400 mm.
type 2 : 1 200 x 550 mm.
type 3 : 1 500 x 650 mm.




a cubicle

a cubicle with sluice

b ward

c examination and treatment room

d play-room

e bathroom

f bed-pan closet

g serving-pantry

h closet for cleaning equipment

j toilets

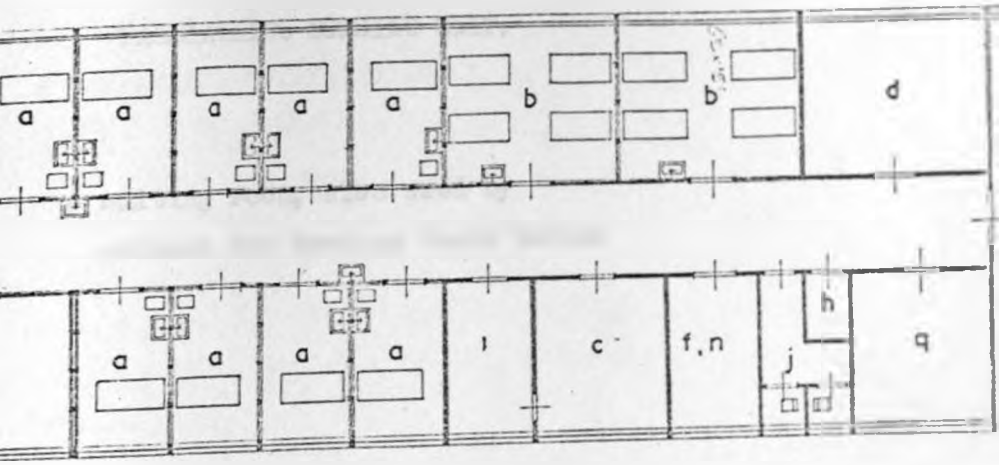
k room for head nurse

l utility room for nursing staff

m clean-linen room

n soiled-linen and flower room

PAEDIATRIC NURSING-MEDICAL DEPARTMENT.




o storage space for stretchers

q storage space for beds

t waiting room, also used by mothers for feeding their babies

PAEDIATRICS NURSING UNIT.

nd treatment

P waiting room, also used by
mothers for feeding their babies

aning equipment

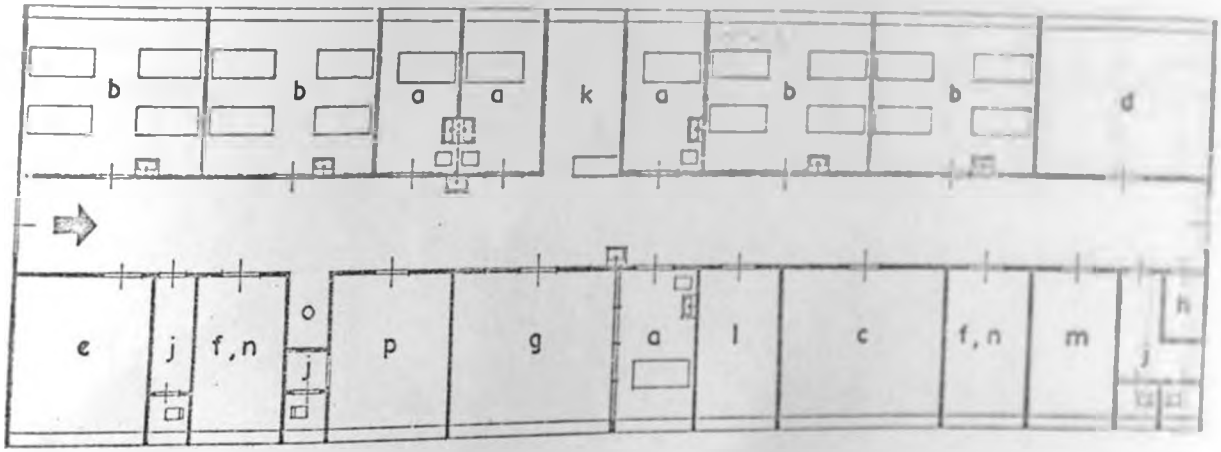
nurse

or nursing staff

om

nd flower room

for



matures

ies

ios

reatment room

ring baby-food

ng bottles

ng equipment

so

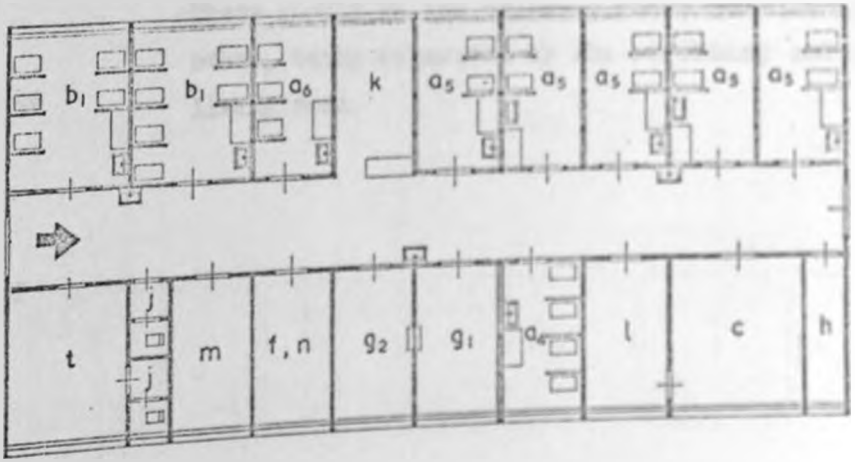
nursing staff

flower room

o used by

ng their babies

PAEDIATRICS NURSING UNIT.



OGICAL UNITS.

o days to combine the
rics and Gynaecology in
cially small hospitals.
e methods of accomodation
e:-
same room as mothers, beside
bed.
or more special nurseries
.
r to six mothers in a
g-in wards.
mended.
mother and child should
equirements:
babies and visitors must be

be transfered through

be disturbed by crying of

ntact between mother and

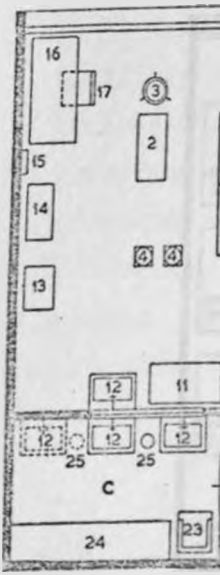
5. Concentration of rooms in which mothers and children are accomodated.
6. Isolation facilities for suspected babies must be available
7. Isolation facilities for mothers in whose condition complications have occured and who need complete rest.

Method (c) is satisfactory in most of these cases.

In a hospital of more than 400 beds the departments of obstetrics and gynaecology should be separate.

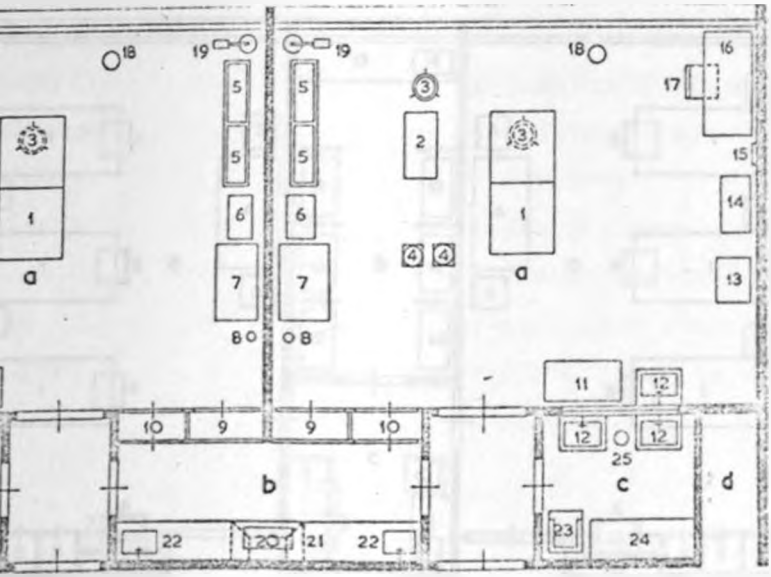
There should be two delivery rooms next to each other, being separated by the scrubbing and sterilising room.

a delivery room
b sterilizing
c scrub-up
d stretcher storage
1 delivery table
2 instrument table
3 kick bucket
4 single basin stand
5 hot and cold bath
6 scales
7 heated dressing table
8 oxygen apparatus
9 cabinet
10 instrument locker
11 table
12 washbasin
13 anaesthesia unit
14 heated cradle
15 clock with sweep second hand
16 desk
17 chair



DELIVERY SUITE

18 adjustable stool
19 movable lamp
20 sterilizer
21 fume hood
22 counter with sink
23 slop-sink
24 marble counter
25 alcohol container



a beroom

b nursery

c work-space

1 bed

2 bedside cabinet

3 chair

4 table

5 wardrobe

6 washbasin

7 medicine cabinet over lavatory

8 locker for baby clothes

9 cart for soiled napkins

10 slop - sink

11 sink in counter

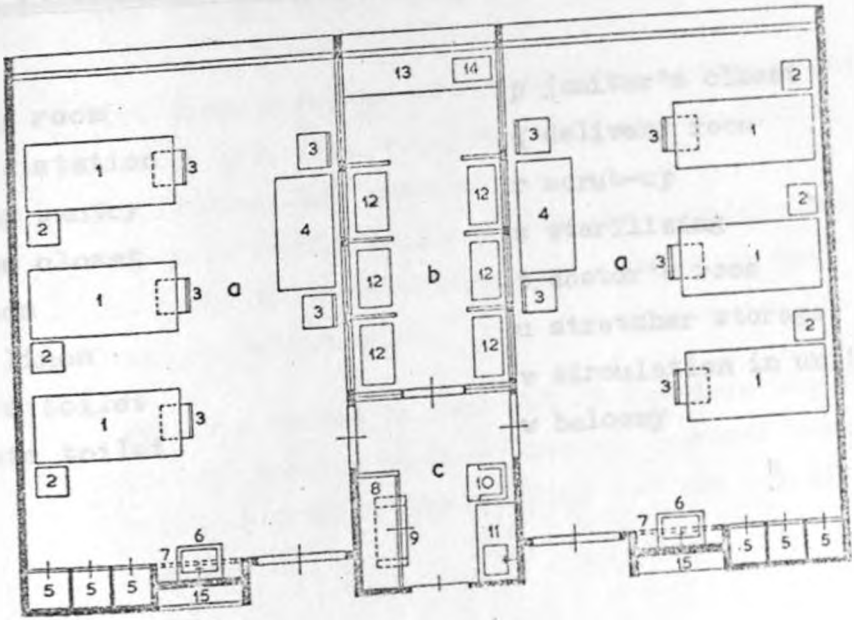
12 cradle

13 heated dressing table

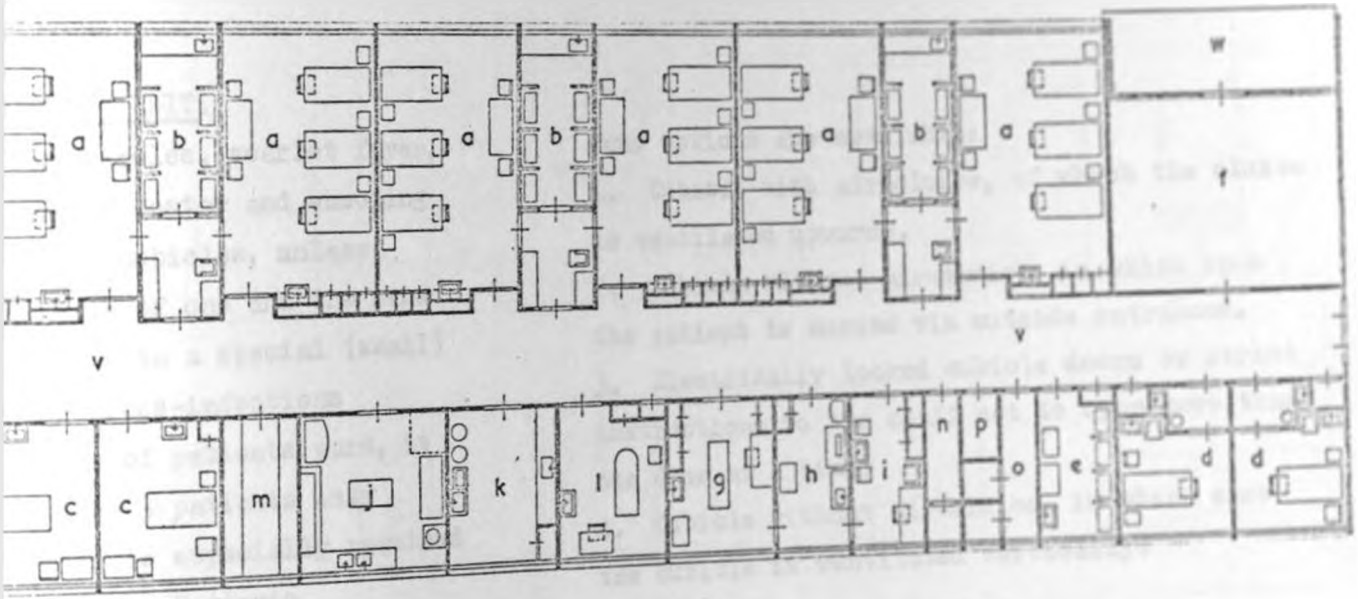
14 baby bath

15 space for service pipes

LYING - IN WARD.



-OBSTETRIC NURSING UNIT




th sluice

reatment

h utility room
i nurse's station
j serving pantry
k bed-pan closet
l bathroom
m clean linen
n nurse's toilet
o patients toilet

p janitor's closet
q delivery room
r scrub-up
s sterilizing
t doctor's room
u stretcher storage
v circulation in unit
w balcony

NURSING UNIT.

from measles, scarlet fever,
, herpes zoster and whooping
rsed in cubicles, unless
nt cases of one and the same
nursing in a special (small)
er of cross-infections
number of patients ward, it
rse 2 or 3 patients only
--this is especially required
coughs. Patients
ectious diseases of
typhoid fever, dysentry, etc.
general ward with other
certain precautions are
in cubicles is safer.
should not be addmitted to
tment for infectious disease,
like those mentioned above
solation measures as far as
ncerned.

nts:

e risk of cross-infection,

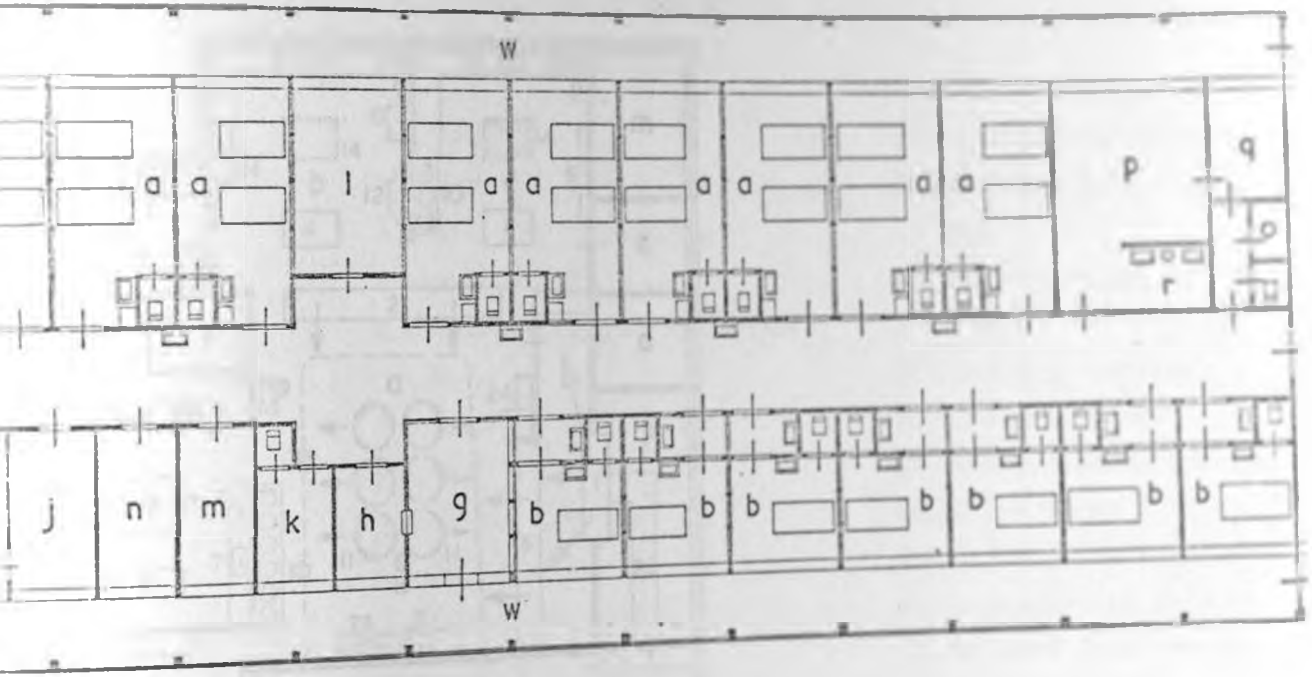
four options are available:

1. Cubicle with air-sluice, of which the sluice is ventilated upwards.
2. Cubicle without air-sluice, in which case the patient is nursed via outside entrances.
3. Electrically locked cubicle doors or strict instructions to the staff not to open more than one door at a time.
4. Cubicle without air-sluice, in which case the cubicle is ventilated vertically.

The cubicle should be fitted with complete sanitary facilities, i.e. w.c., slopsink and disfecting facilities, and washbasin.
The w.c. should be located on the corridor side in order to recieve day-light. Check on the wind direction also.

Visitors should be kept out of the department, instead provide open or covered terraces near cubicles outside the building for the use of visitors.

INFECTIOUS DISEASES NURSING UNIT




g serving pantry

h washing- up kitchen

j staff nurse's room

k dressing room for nursing staff

l work room for nursing staff

m linen room

n storage space

o janitor's closet

p operating theatre

q sterilizing

r scrub-up

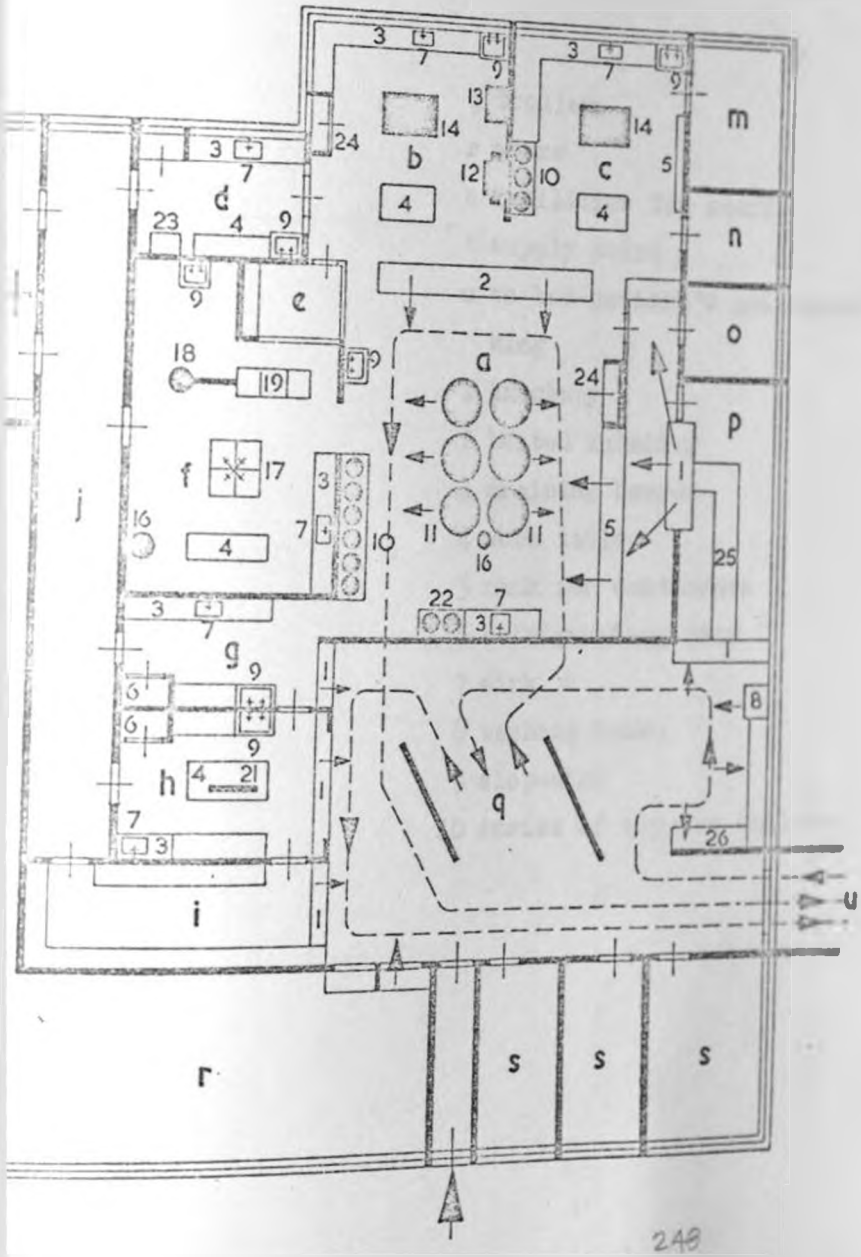
s stretcher

t ward sluice

w balcony or terrace

patient's

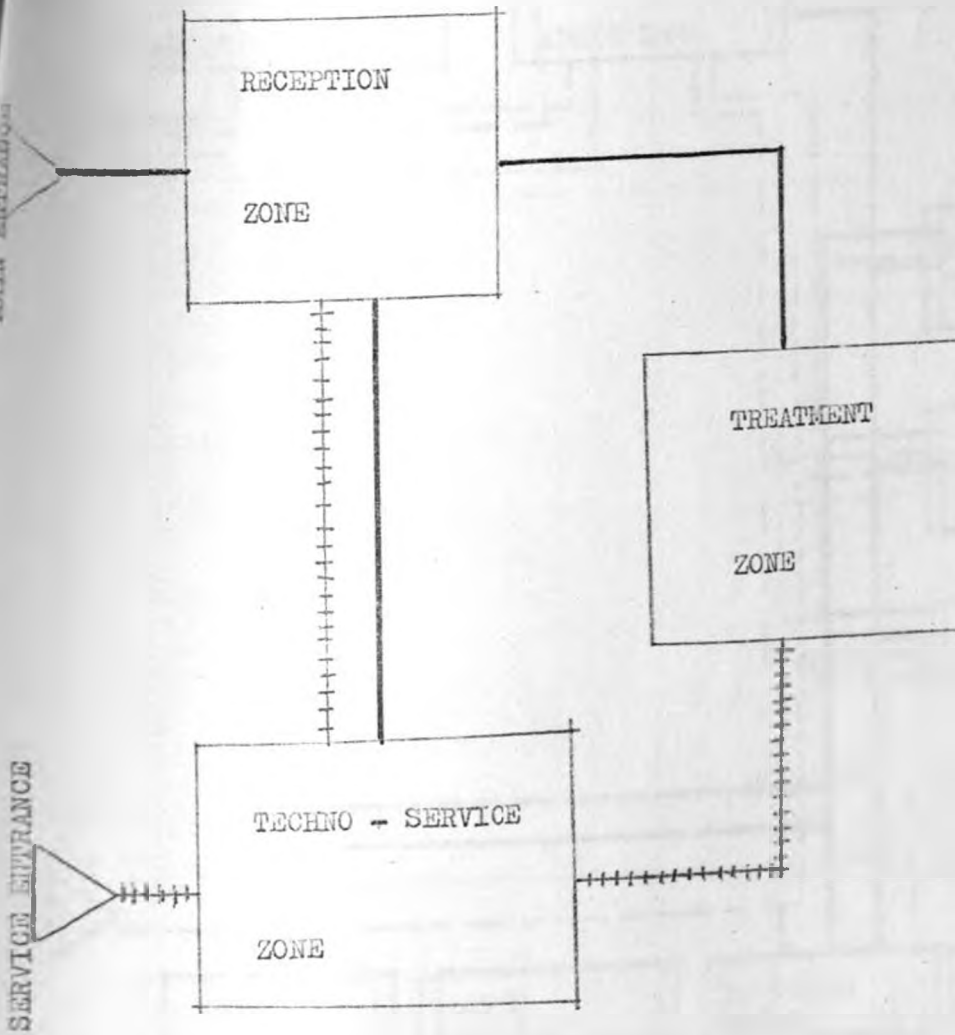
THE MAIN KITCHEN.



MAIN KITCHEN

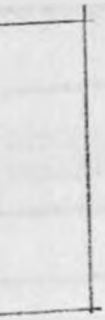
Lengend.

a kitchen, general
b kitchen, meat
c diet kitchen
d preparation of meat
e office
f vegetable kitchen
g milk kitchen
h bread kitchen
i pantry
j supply passage
k supervision
l office
m storage space
n refrigrating space
o equipment
p scullery for cleaning
q trolleys
r store
s facilities for staff
t supply point
u to bed-patient's and nurse's wing
1 hatchway
2 heated hatchway
3 draining boards
4 work table
5 rack for containers
6 refrigerating room
7 sink
8 washing tanks
9 slop-sink
10 series of tipping boilers
11 steam-heated boilers
12 roasting dish
13 oven
14 kitchen range
15 mixer
16 shredding machine
17 vegetable tanks
18 potato-peeling machine
19 potato tanks
20 meat-slicing machine
21 bread-cutting machine
22 coffee-making machine
23 chopping block
24 cupboards
25 washing and drying machine
26 waste


MAIN ENTRANCE
RECEPTION
ZONE
TREATMENT
ZONE
SERVICE ENTRANCE
TECHNO - SERVICE
ZONE

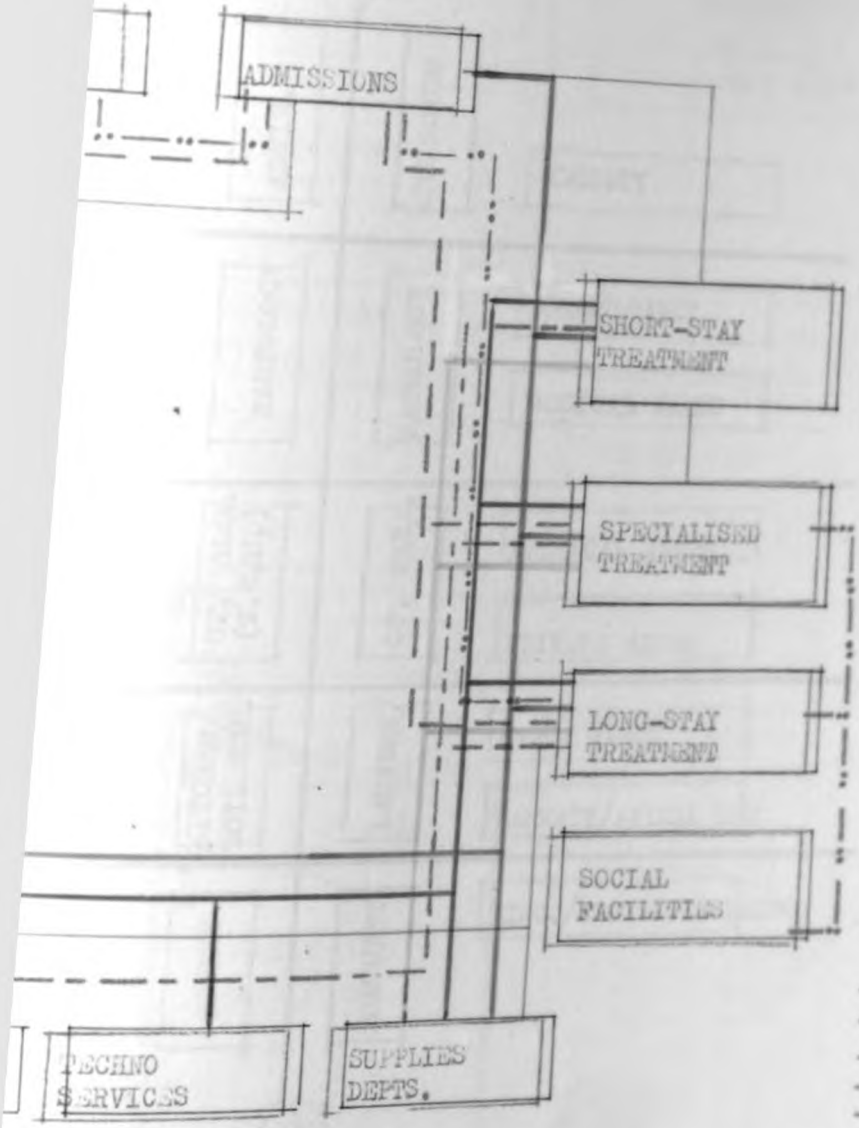
HOSPITAL ANALYSIS

The hospital complex can be broken down into three general segments or ZONES.
Hence a very general and simple saturation diagram follows.



STAFF and PATIENTS.

SERVICE TRAFIC.

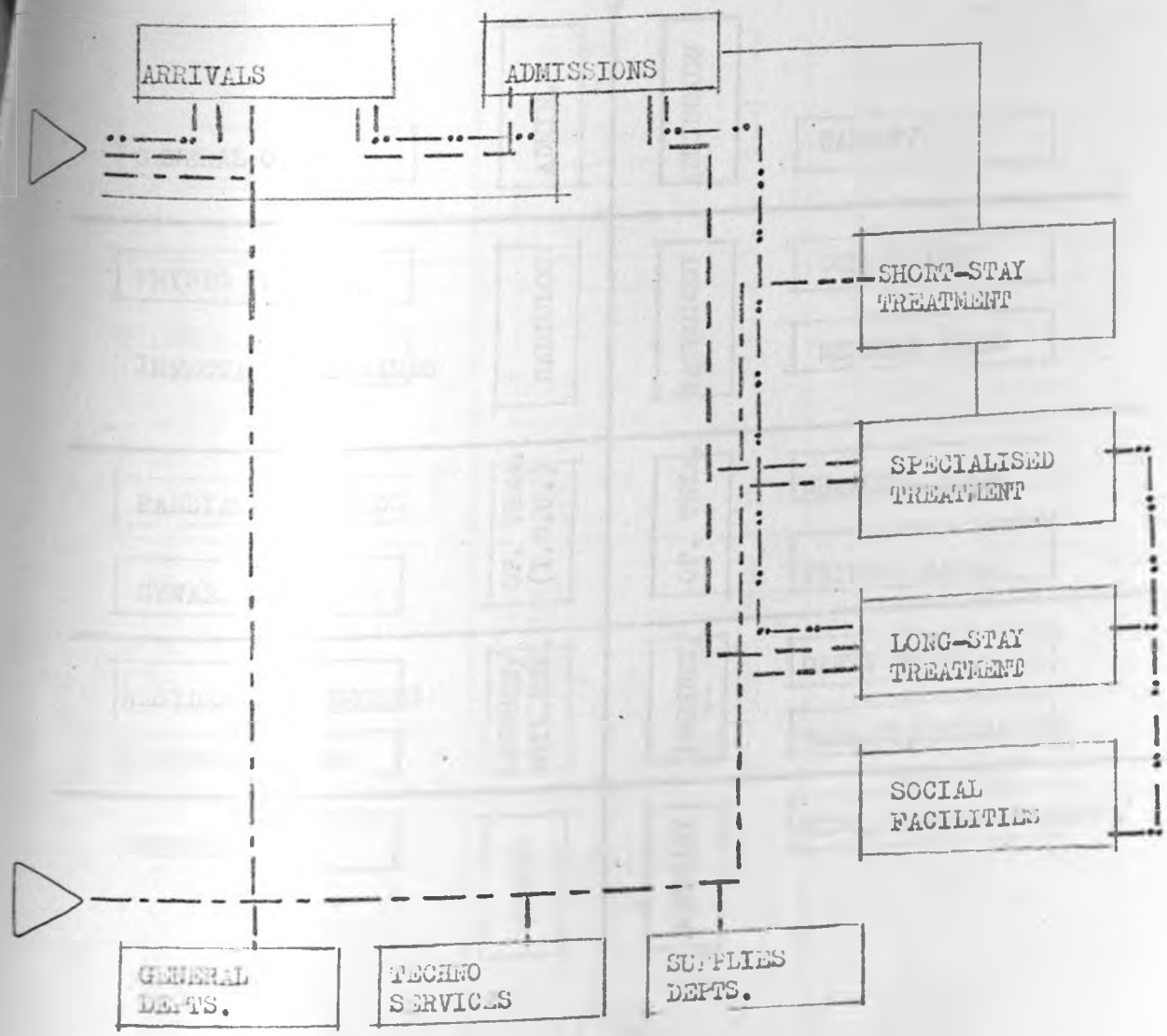

ADMISSIONS
SHORT-STAY TREATMENT
SPECIALISED TREATMENT
LONG-STAY TREATMENT
SOCIAL FACILITIES
TECHNO SERVICES
SUPPLIES DEPTS.

ACTIVITIES FLOW CHARTS
PATIENT & STAFF MOVEMENT.
SERVICES

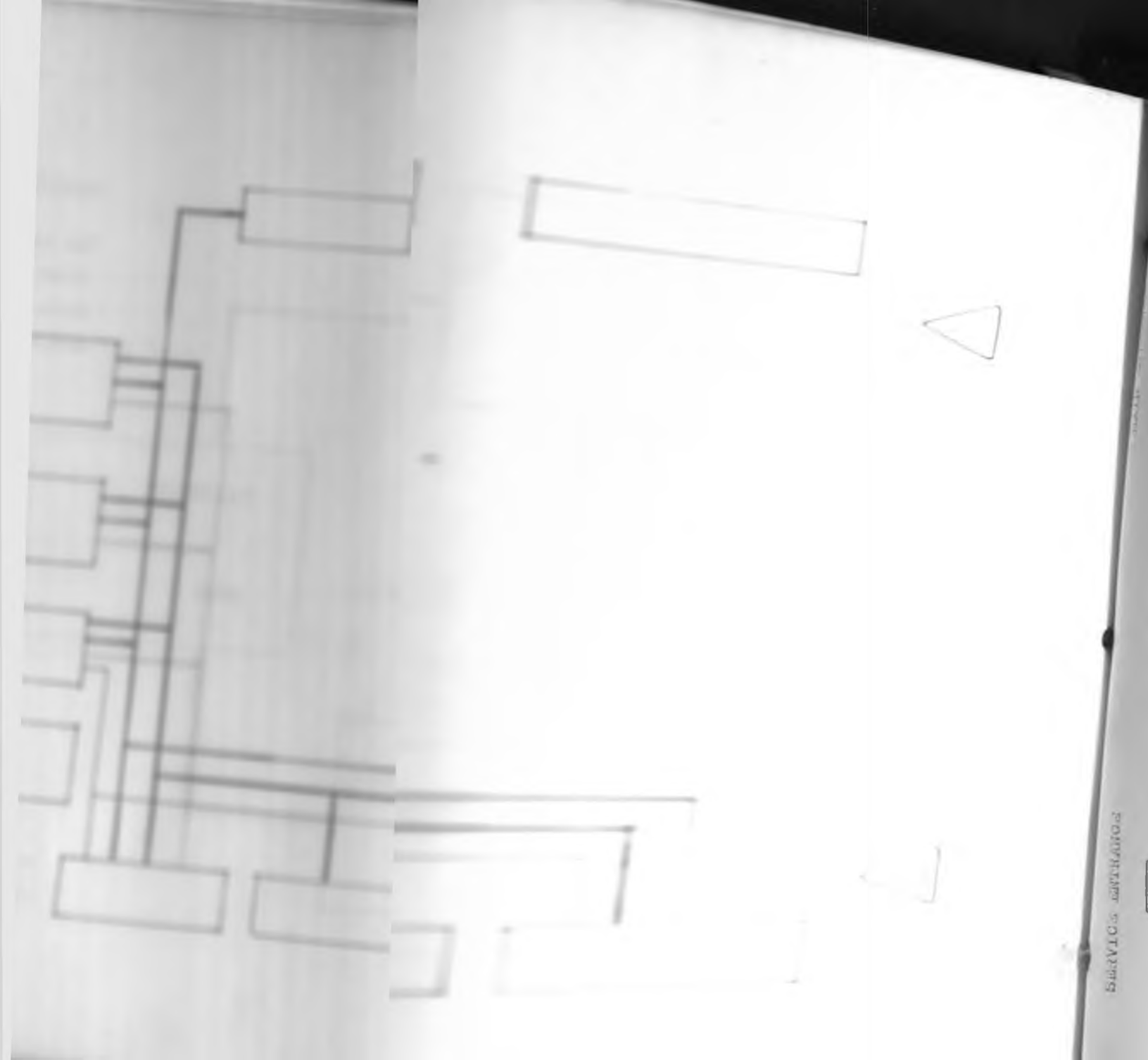
STERILE + PHARM. SUPPLIES
FOOD SUPPLIES
TECHNICAL SERVICES
LAUNDRY SUPPLIES

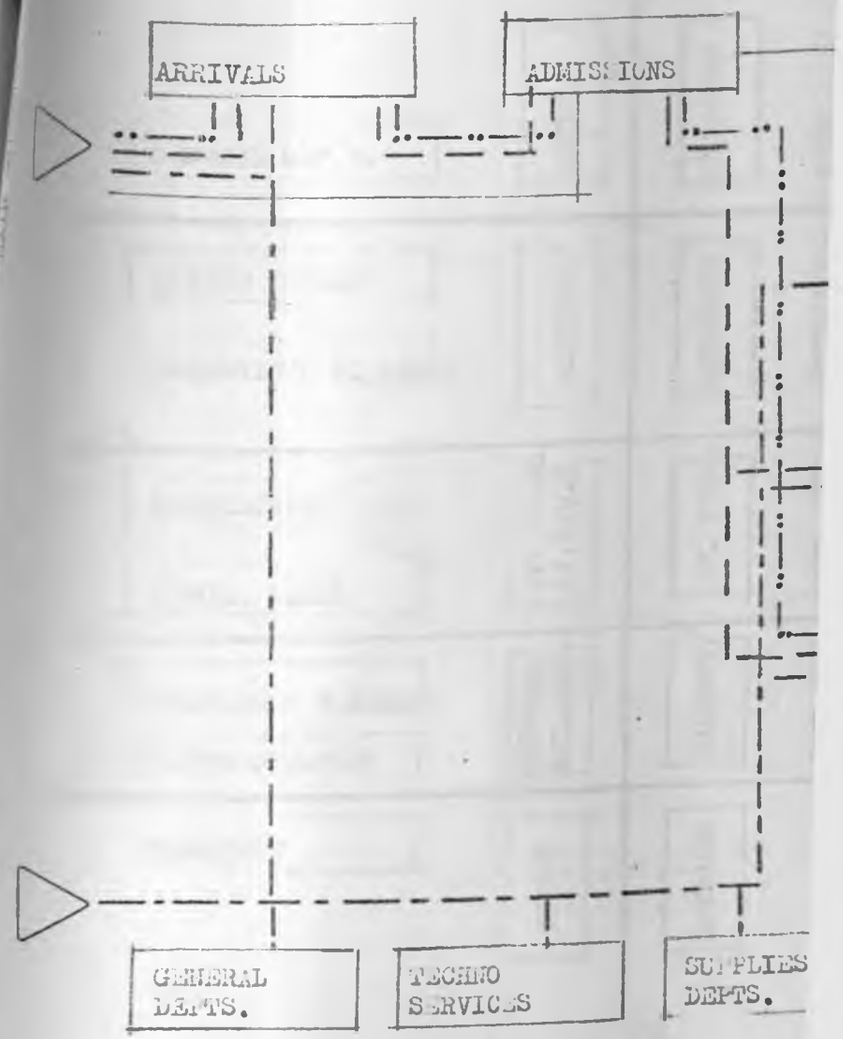
CASUALTIES
OUT-PATIENTS
IN-PATIENTS
MEDICAL STAFF
TECHNICAL STAFF

ACTIVITIES FLOW CHARTS
PATIENT & STAFF MOVEMENT.




CASUALTIES
OUT-PATIENTS
IN-PATIENTS
MEDICAL STAFF
TECHNICAL STAFF

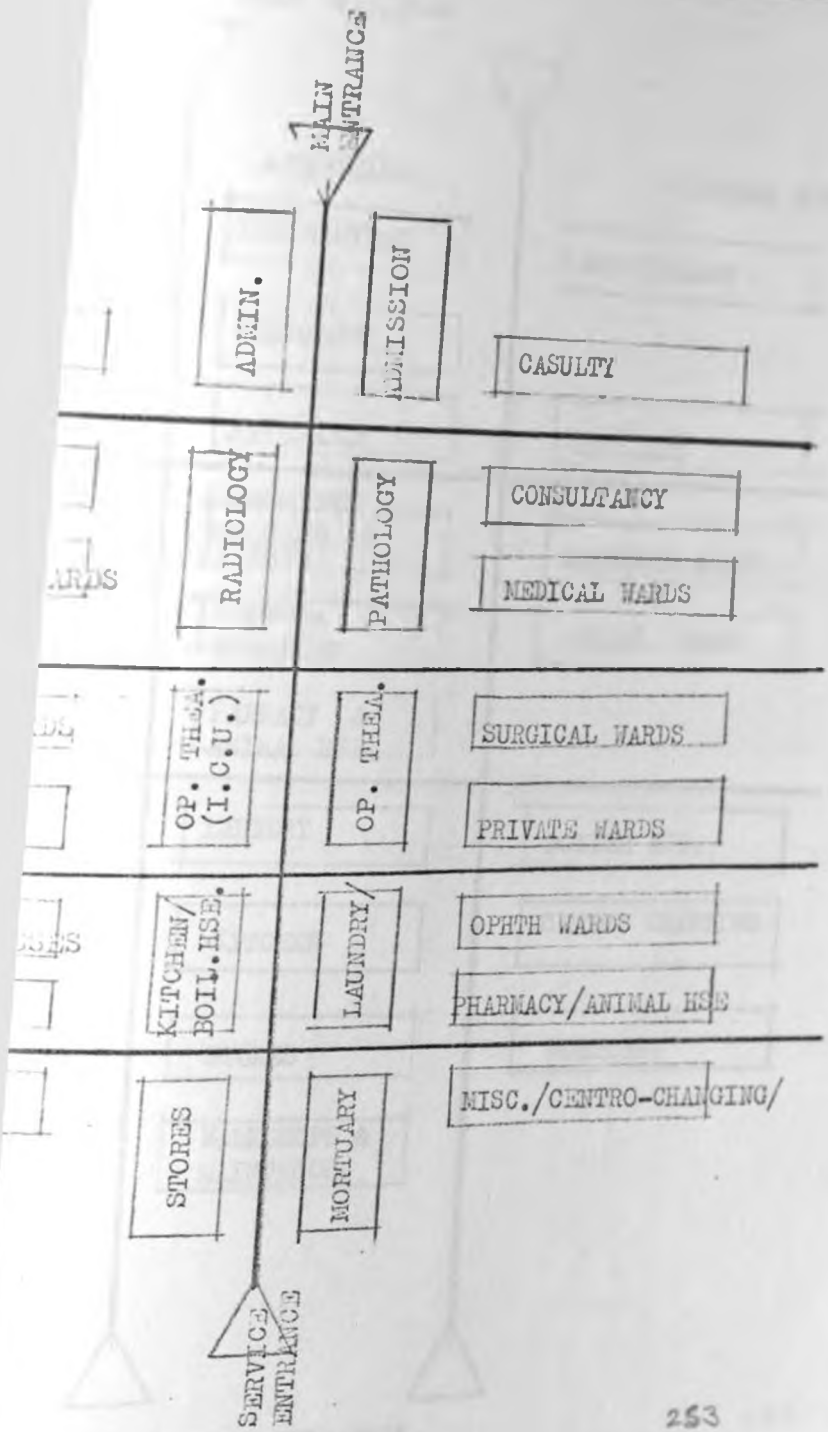




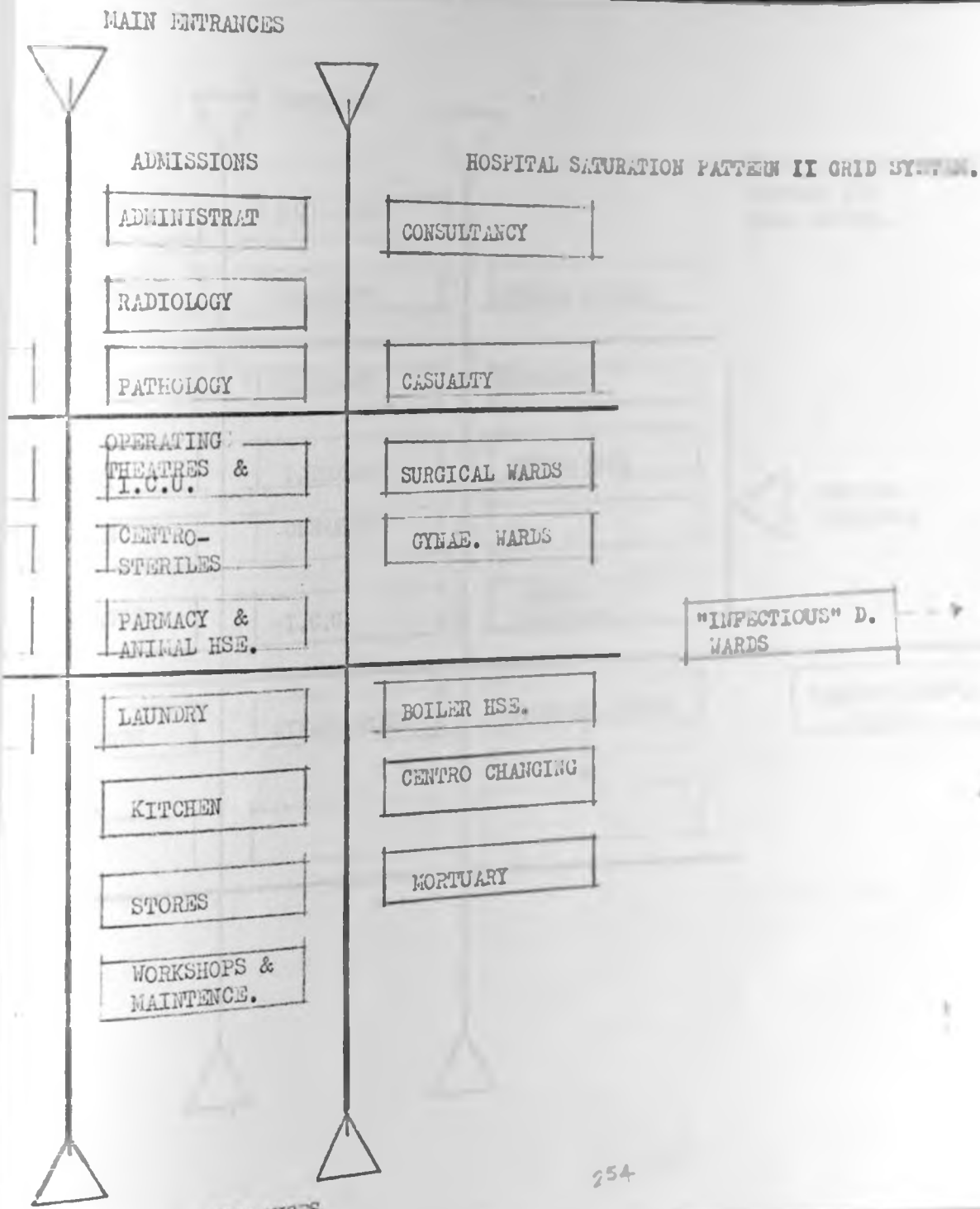

SERVICES ENTRANCE

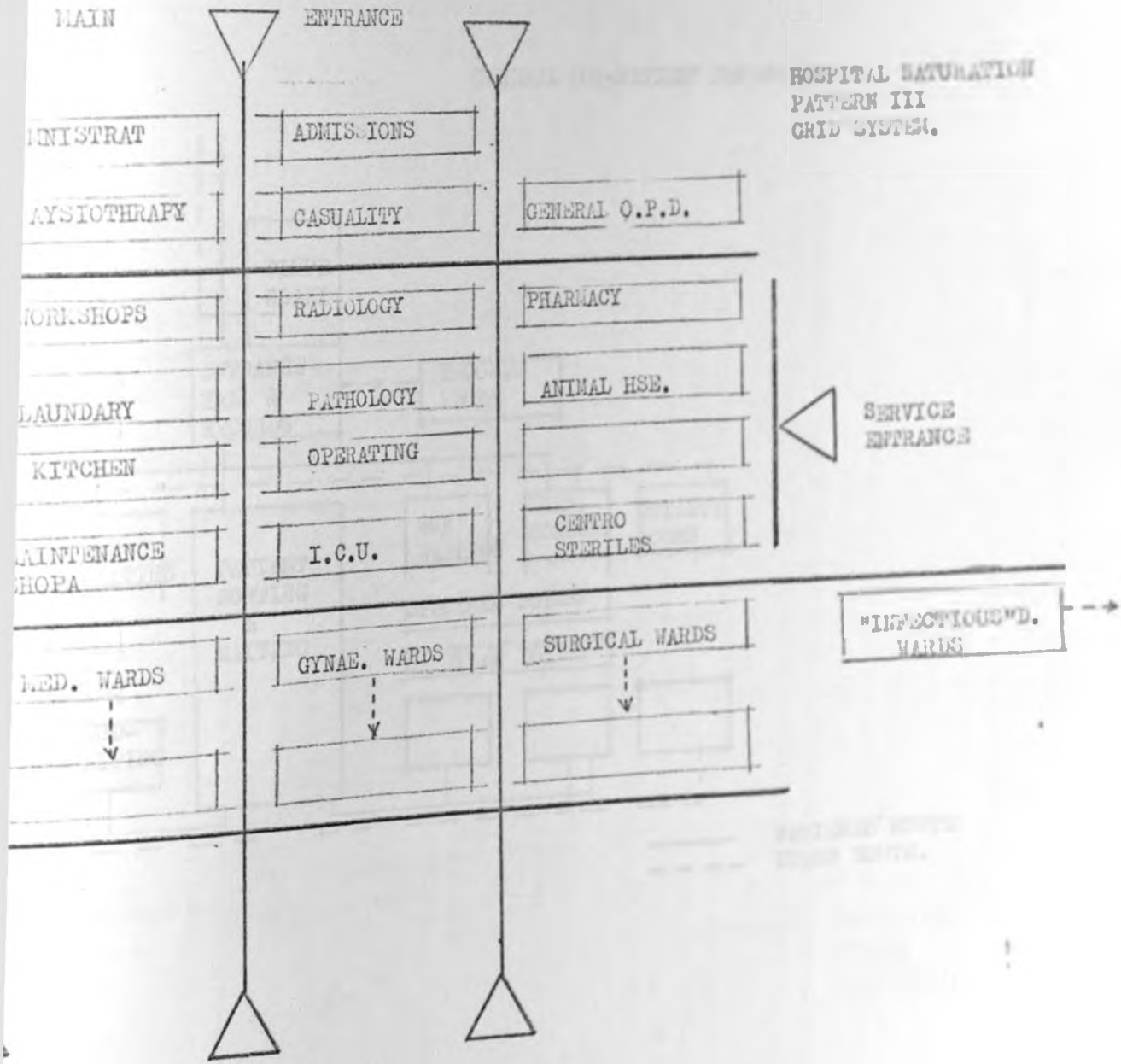
ACTIVITIES FLOW CHARTS
PATIENT & STAFF MOVEMENT.

HOSPITAL SATURATION
PATTERN I
GRID SYSTEM.

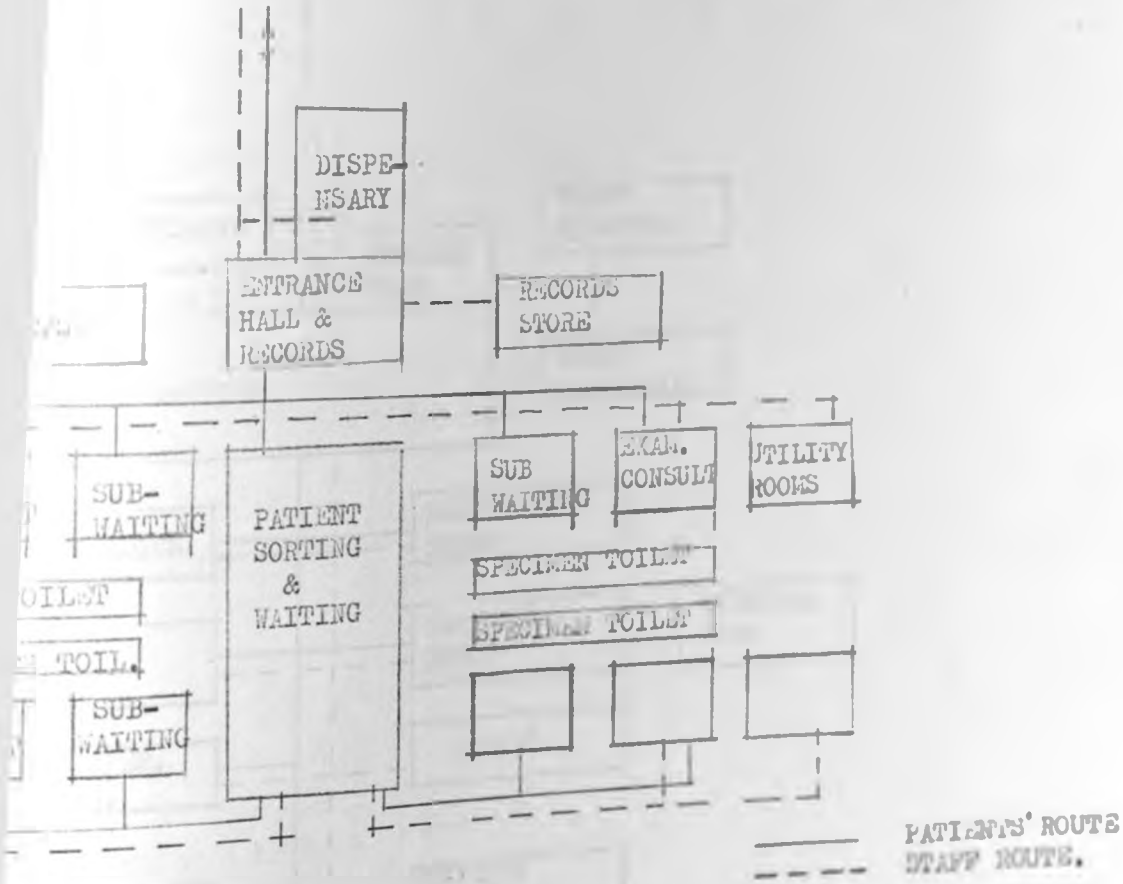


HOSPITAL SATURATION PATTERN II GRID SYSTEM.

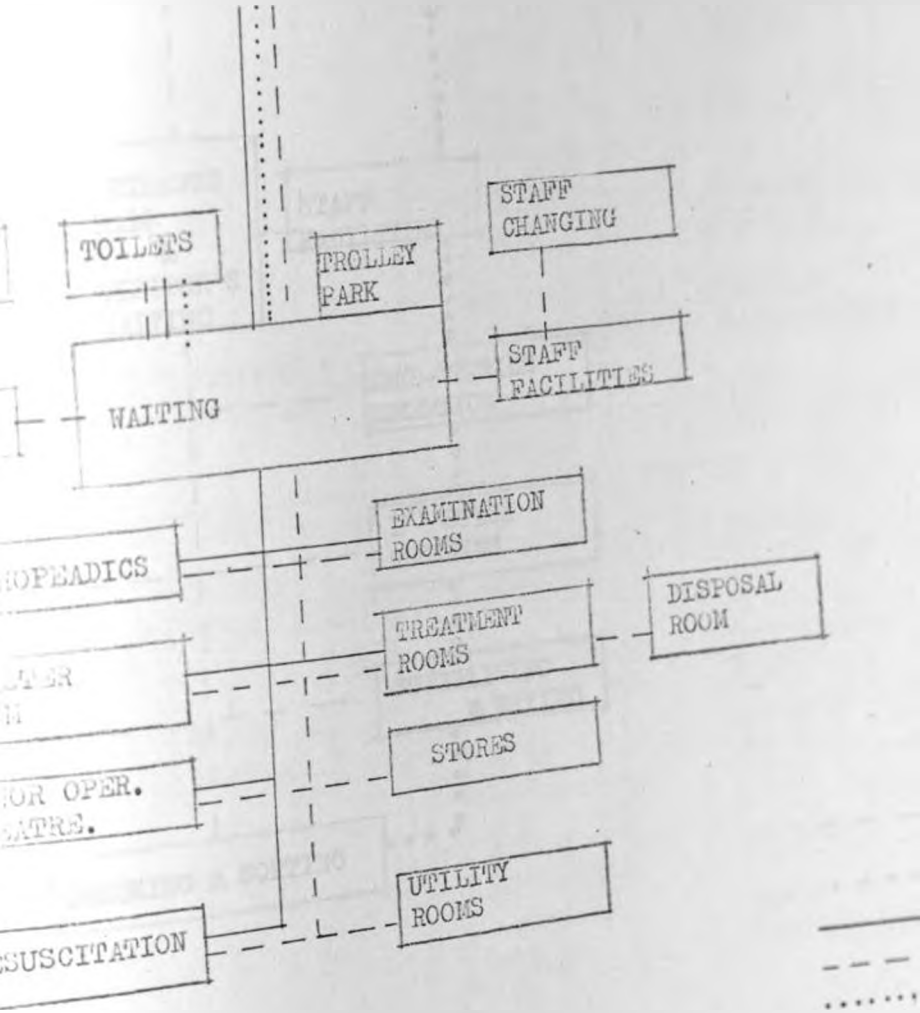



MAIN
ENTRANCE
HOSPITAL SATURATION
PATTERN III
GRID SYSTEM.
INISTRAT
ADMISSIONS
AYSIOTHRAPY
CASUALITY
GENERAL O.P.D.
ORKSHOPS
RADIOLOGY
PHARMACY
LAUNDARY
PATHOLOGY
ANIMAL HSE.
SERVICE
ENTRANCE
KITCHEN
OPERATING
AINTENANCE
HOPA
I.C.U.
CENTRO
STERILES
"INFECTIOUS"D.
WARDS
MED. WARDS
GYNAE. WARDS
SURGICAL WARDS

GENERAL OUT-PATIENT DEPARTMENT

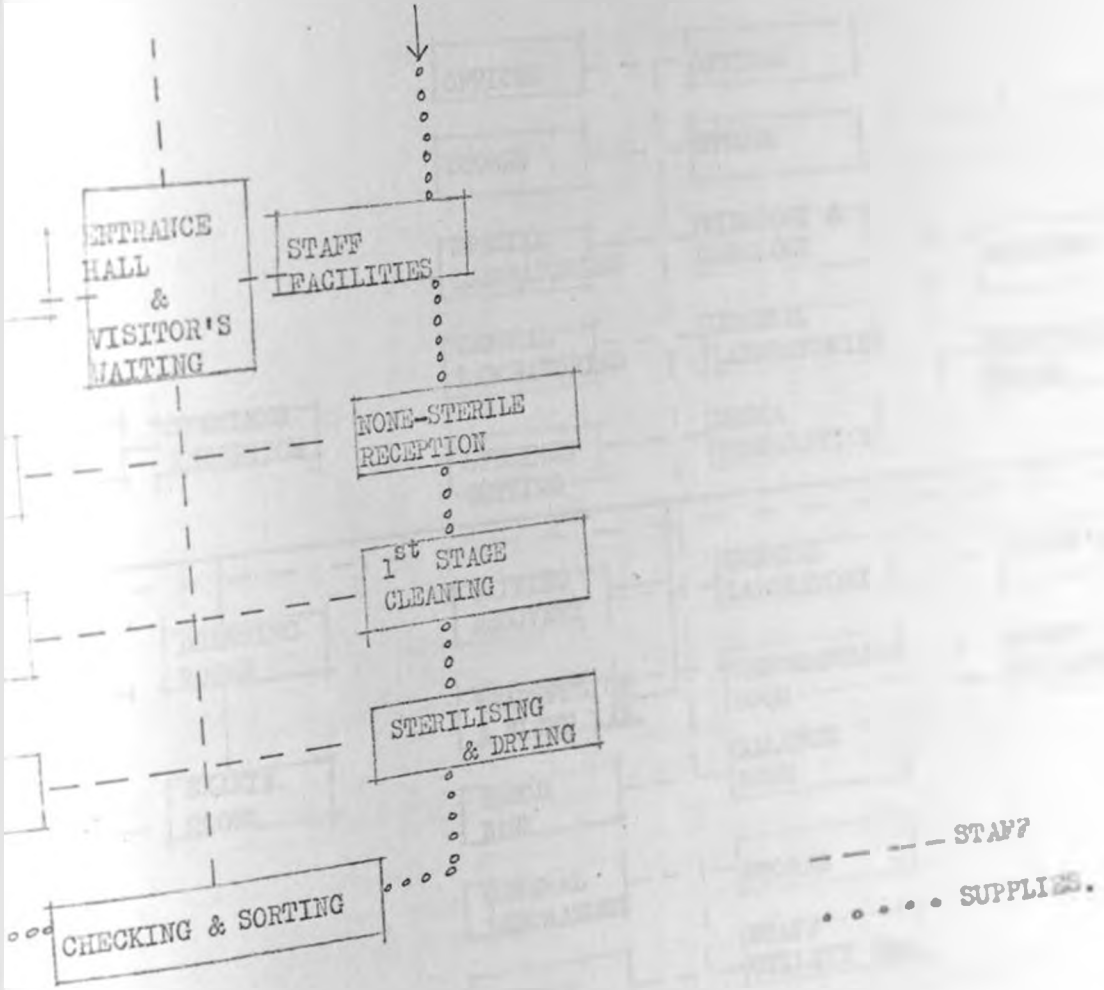


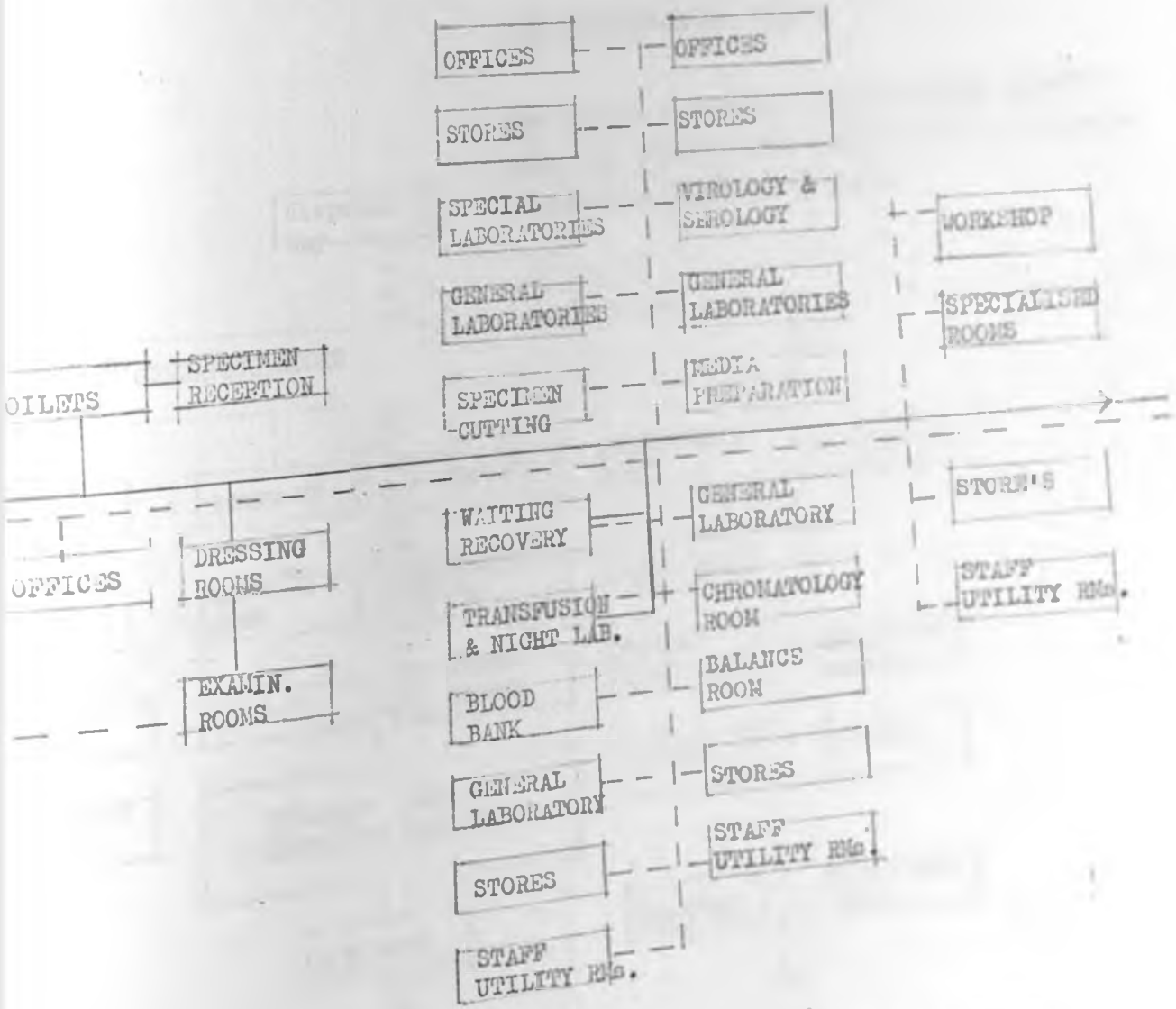
CASUALTY DEPARTMENT.



PATIENTS
STAFF
VISITORS

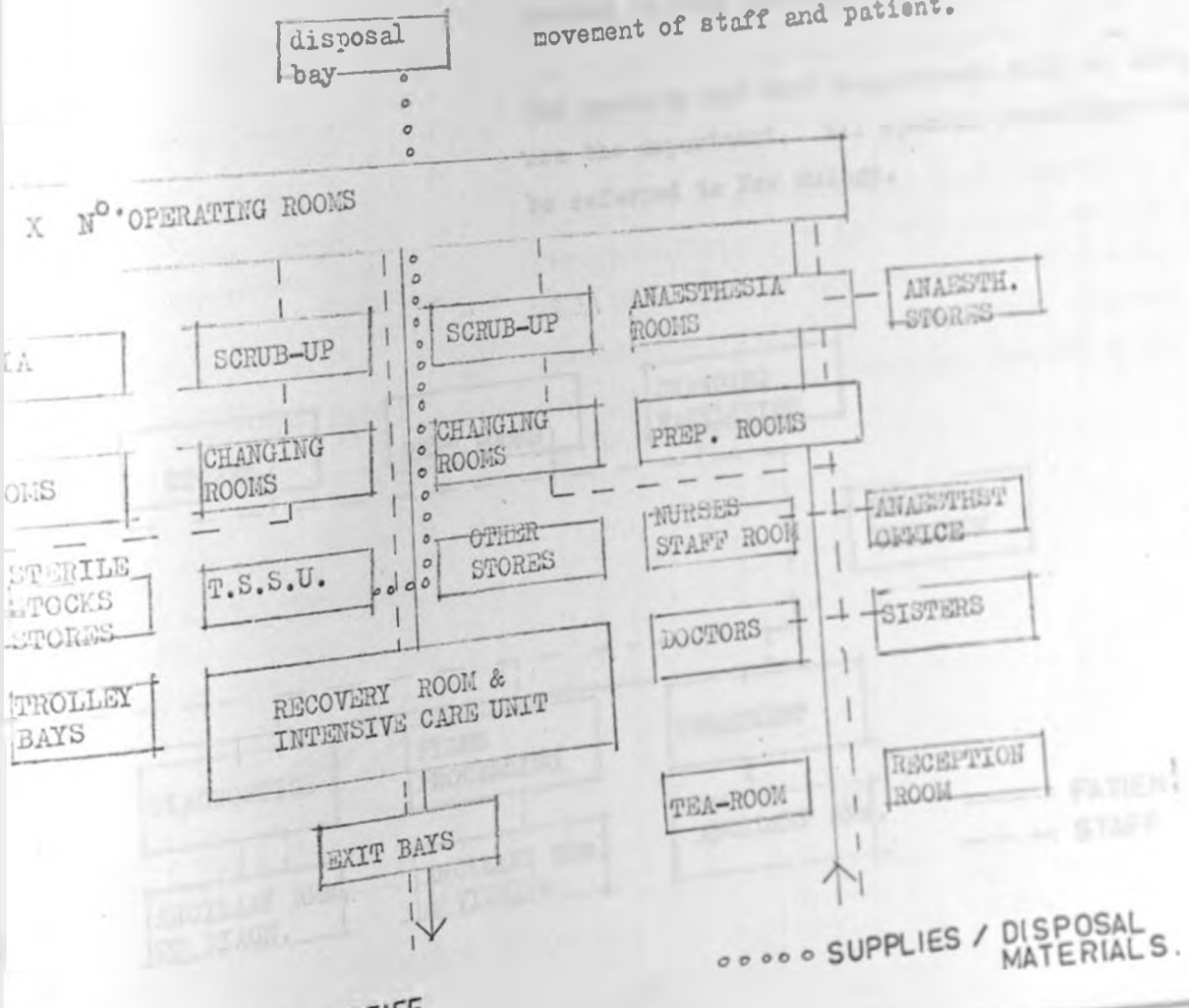
CENTRAL STERILE SUPPLIES




OFFICES
OFFICES
STORES
STORES
SPECIAL LABORATORIES
VIROLOGY & SEROLOGY
WORKSHOP
GENERAL LABORATORIES
GENERAL LABORATORIES
SPECIALISED ROOMS
OILETS
SPECIMEN RECEPTION
SPECIMEN CUTTING
MEDIA PREPARATION
OFFICES
DRESSING ROOMS
WAITING RECOVERY
GENERAL LABORATORY
STORES
STAFF UTILITY RMS.
TRANSFUSION & NIGHT LAB.
CHROMATOLOGY ROOM
EXAMIN. ROOMS
BLOOD BANK
BALANCE ROOM
GENERAL LABORATORY
STORES
STAFF UTILITY RMS.
STORES
STAFF UTILITY RMS.

OPERATING THEATRES SUITE.

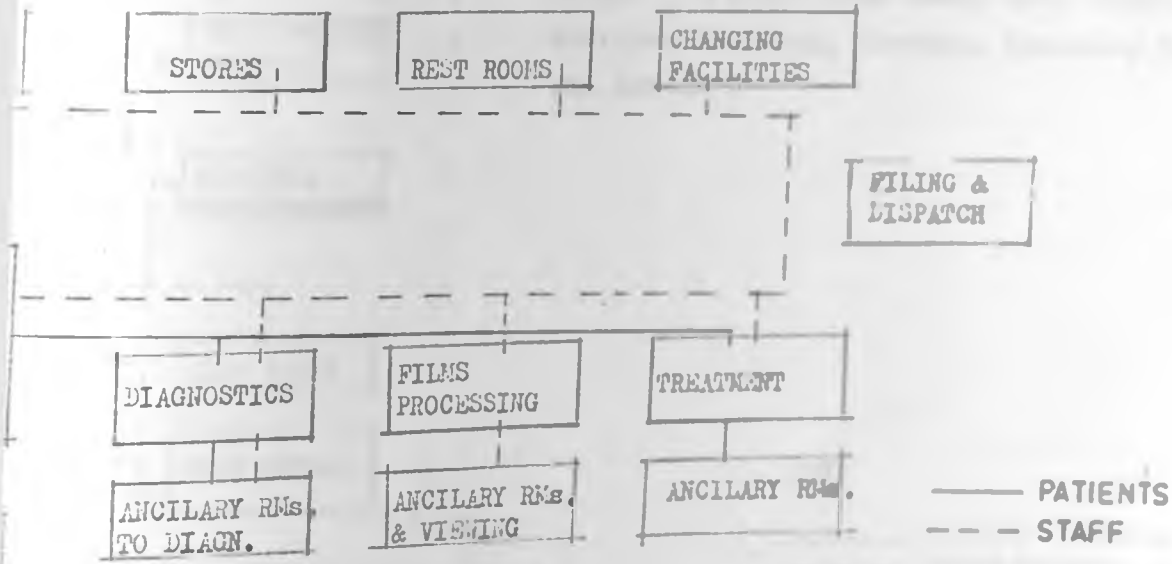
Two General corridors and one medical corridor have been provided for Non-sterile and sterile movement of staff and patient.



RADIOLOGY DEPARTMENT.

Double street or Access corridor system is adopted in this pattern.

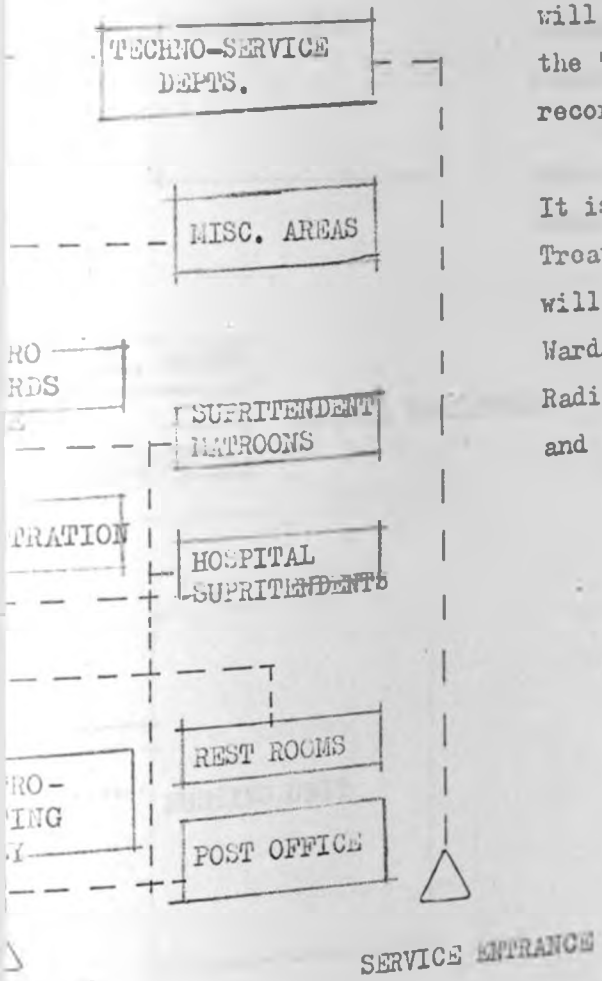
The casualty and Ward departments will be able to use the department. All special investigations will be referred to New Mulago.



ADMISSIONS/ADMINISTRATION DEPARTMENT.

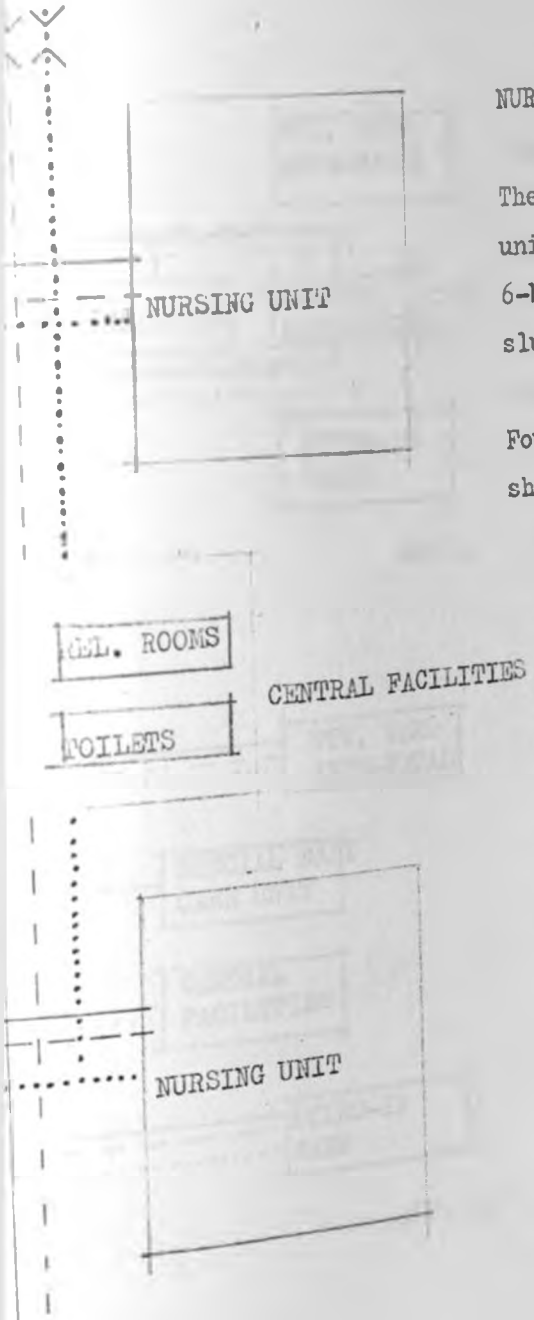
The traffic flow chart presupposes a large central waiting lobby, and that "live" records will be kept in each department concerned, while the "inactive" records will come to the central records store.

It is further accepted here that Diagnostic and Treatment Facilities for both in-and out-patients will be located in between the O.P.D and the Wards. The Departments namely are: Physiotherapy, Radiology Pathology, Pharmacy, Operating theatres and Mortuary.




KEY

——— PATIENT'S ROUTES
— — — STAFF ROUTES
..... VISITOR'S ROUTES




NURSING UNIT WARD FLOOR.

The flow chart presupposes that the basic nursing unit is a thirty-two bed system, five bays with 6-beds each and two isolation rooms with full sluice facilities.

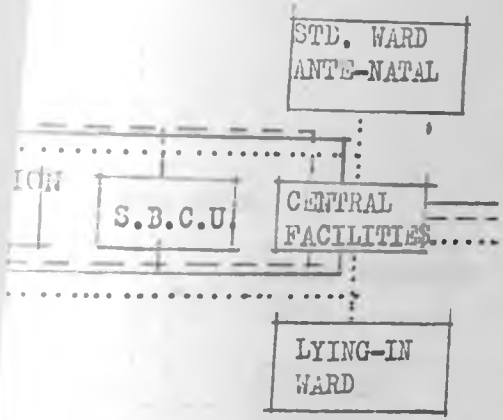
Four nursing units and a central facilities unit should make up a ward floor wherever possible.

KEY

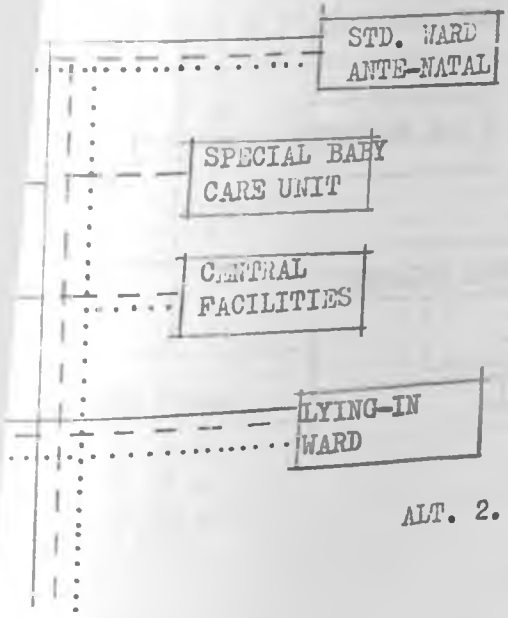
PATIENT'S ROUTES

STAFF ROUTES

VISITORS ROUTES




ALT.1.




ALT. 2.

GYNAECOLOGY-OBSTETRICS WARD FLOOR.

The flow chart presupposes that the Gynaecological Obstetrics ward flow will have "central Facilities; Special Baby care unit; Admission unit; and Labour Suite" as commonly shared facilities.

There are basically two possible arrangements (ALT. 1 & ALT. 2) for the departmental units. Alternative one is based on Double-corridor or Double Street system, whereas Alternative two is based on linear Approach system.

In each ward unit there will be two nurseries, each nursery with 8 babies - an ideal number for one nurse to care about.

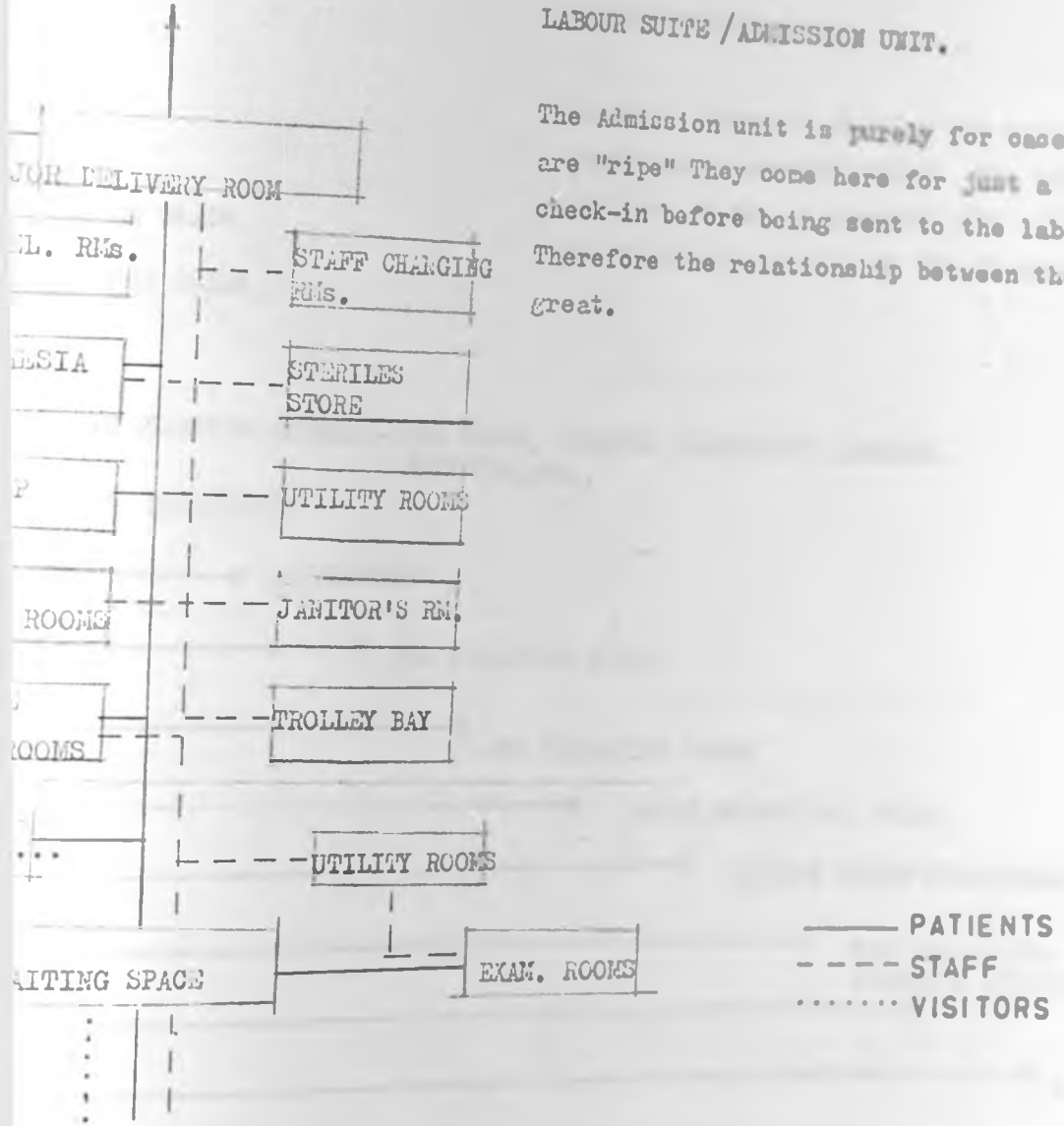
——— PATIENTS

– – – – STAFF

..... VISITORS

LABOUR SUITE /ADMISSION UNIT.

The Admission unit is purely for cases which are "ripe" They come here for just a brief check-in before being sent to the labour suite Therefore the relationship between the two is great.



MODULAR COORDINATION.

The chart below is showing the major modular coordination possibilities. The model will be utilized as far as possible for all components of the buildings as well as for Planning spaces.

HT-DUTY SLABS

AVY-DUTY SLABS

BASIC PLANNING-MODULE - FOR DOORS, WINDOWS, SECONDARY ELEMENTS, FURNITURE, etc.,

→ CANTLIVERS

→ CANTILEVERS

→ FOR ISOLATION ROOMS

→ FOR ISOLATION ROOMS

→ SHORT STRUCTURAL SPANS

→ MEDIUM SHORT STRUCTURAL SPANS

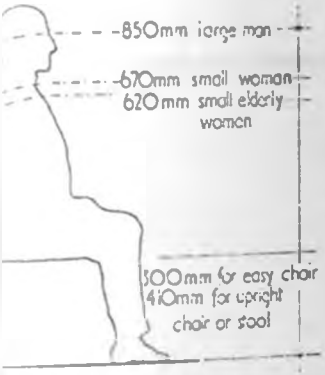
→ FOR WARD BAYS; STANDARD STRUCTURAL SPANS

→ LONG SPANS

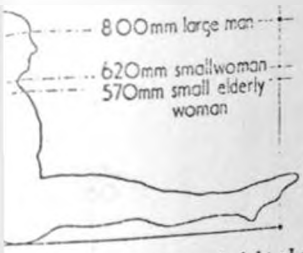
ANTHROPOMETRIC DATA.

Ref: A.J. Metric hand book.

rations **17.3** to **17.19** show some typical space require- for activities within hospital buildings. See also n 8 of this handbook for general anthropometric data.




*Sitting eye levels for large man, small woman and small y woman*




*Compressed mattress height showing eye levels for large small woman and small elderly woman*


**17.8** *Carrying a small child*


**17.9** *Walking helped by two people (large man)*


**17.10** *One person walking helped by a handrail. Height of handrail is a compromise between opposing criteria: the large man and the small elderly woman)*

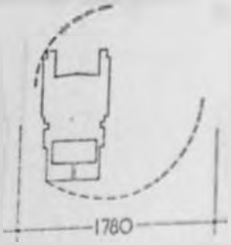

*g lavatory basin with elbow action valves (small
.i large man)*

*ing supplies onto racks or shelves (small man, where
volves men only)*

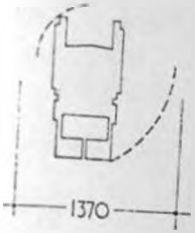

*ng towel dispenser (lower dimension for small
n wheelchair; higher dimension for large man)*


**17.11** *Lifting patient in bed (large man)*

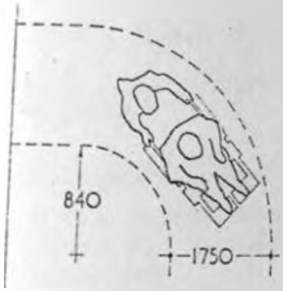

**17.12** *Lifting patient in bath (large man)*




**17.13** *Minimum turning space for independent chairbound person: one wheel stationary*



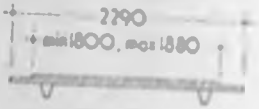

**17.14** *Minimum turning space for independent chairbound person: equal and opposite motion of wheels*



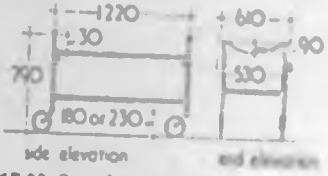

**17.15** *Minimum turning circle for assisted chairbound person*


**17.16**

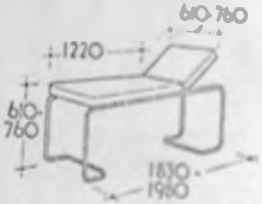

**17.17**



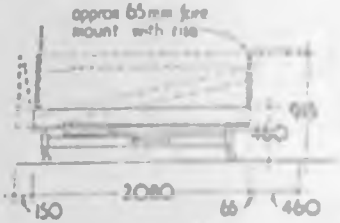

**17.21** *Stretcher*



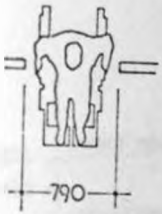

**17.22** *Stretcher trolley*




**17.23** *Treatment and examination couch*




**17.24** *Prototype hospital bed, overall width 970mm*




17.16


17.17

**17.16** *Width for circulation (large man)*

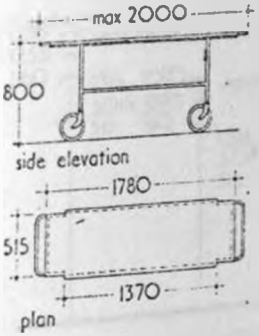
**17.17** *Width for circulation (large man helped by large man)*

**17.18** *Minimum clear width of openings (large man)*

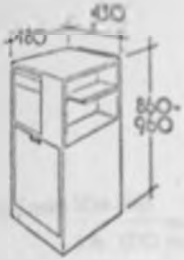
**17.19** *Minimum clear width of openings (large man helped by large man)*

## 3 Equipment sizes

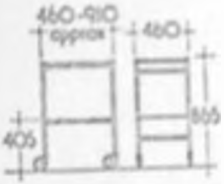
A selection of some common items of equipment is shown in **17.20** to **17.26**. Sizes given are only approximate (to the nearest 5mm).




**17.20** *Patient trolley*

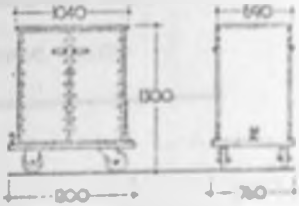



**17.25** *Bedside lockers*




**17.26**

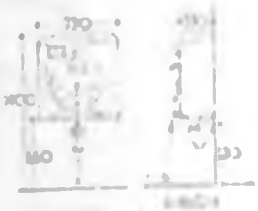
**17.26** *Front and side elevation of typical instrument trolley (Dressing-trolleys are similar size but of different design and overall height to top of handrail is 910mm)*



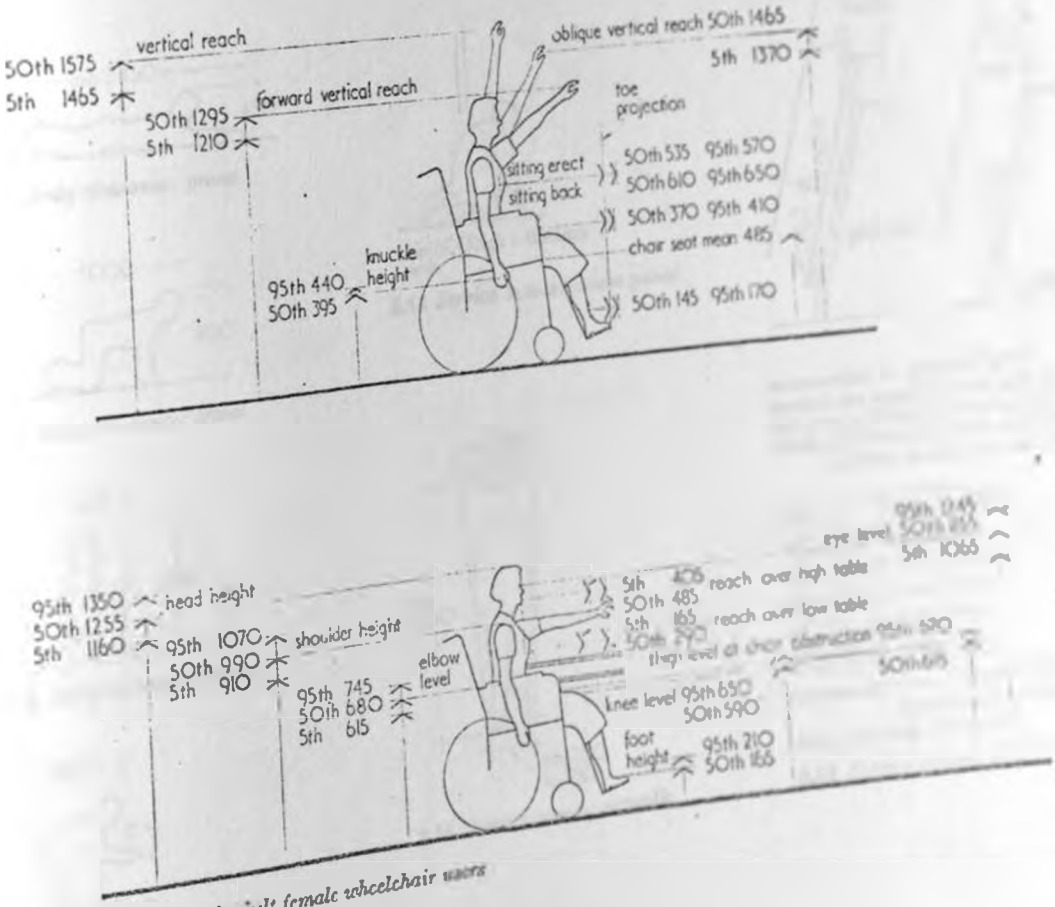

**17.27** *Heliomatic trolley for insulated trays*


**17.28** *Gas cylinder trolleys*

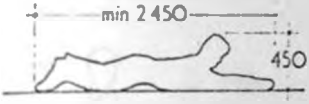

**17.29** *Standard self-propelled wheelchair*



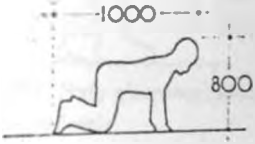

**17.30** *Surface mounted bedpan washer*



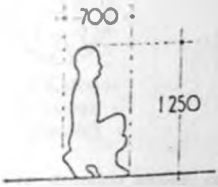

2.5 *Dimensions of adult female wheelchair users*




**8.6** *Body clearance: prone*



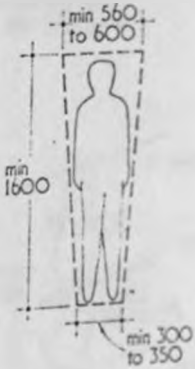

**8.7** *Body clearance: crawl*



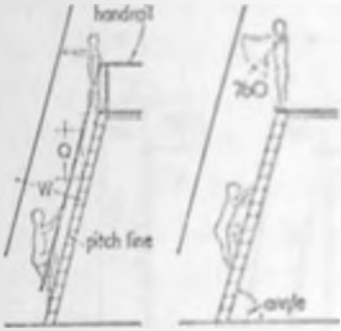

**8.8** *Body clearance: squat*


**8.9** *Body clearance: stoop*


**8.14** *Service access: access panel*




**8.15** *Service access: catwalk*

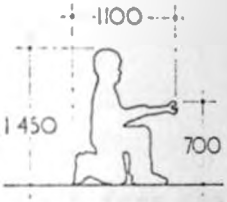



recommended for angles 50° to 75°
handrails are required on both sides if stairs are not
left open or if there are no side walls
width 500mm to 600mm with handrails
600mm min between side walls

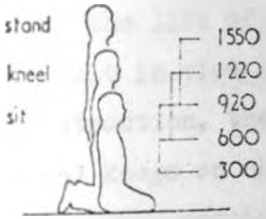
| angle | W(mm) | Q(mm) |
|---|---|---|
| 50°-55° | 1620-1570 | 880 |
| 57°-60° | 1500-1460 | 900 |
| 63°-66° | 1370-1320 | 910 |
| 69°-72° | 1270-1200 | 920 |
| 75°-77° | 1150-1060 | 950 |

recommended riser 180mm to 250mm
tread 75mm to 150mm
45mm diam max for handrail

**8.18** *Service access: step ladders*



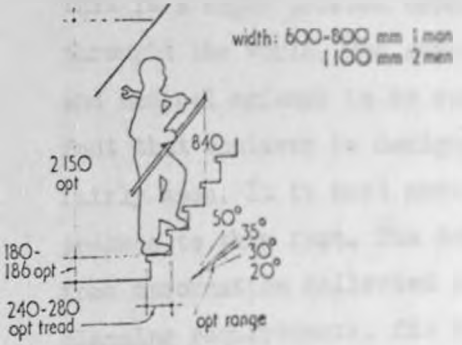

**8.10** *Body clearance: kneel*




**8.11** *Body clearance: maintenance reach levels*

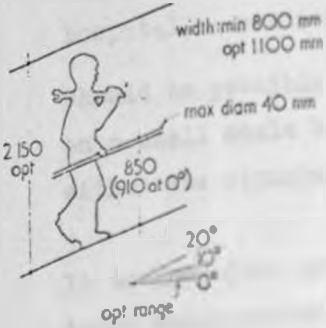

**8.12** *Services access: crawlway*


**8.13** *Service access: hatch*

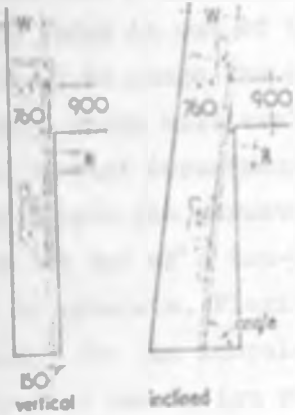



**8.16** *Service access: stairs*

min entries for one man (mm):
330-450 difficult
450-610 fair
610-920 good




**8.17** *Service access: ramps*




generally suitable for vertical movements from 75° to 90°
ladder frame should extend 900mm above platform
widths: 380mm min, 450mm desirable
600mm min between side walls
150mm toe space

| angle | R(mm) | W(mm) |
|---|---|---|
| 75·0° | 330 | 1150 |
| 78·0° | 335 | 1050 |
| 80·5° | 340 | 1000 |
| 83·0° | 350 | 950 |
| 85·0° | 360 | 900 |
| 87·5° | 370 | 850 |
| 90·0° | 380 max | 800 |
| | 300 min | |

provide back guard over 6 000 mm high

**8.18** *Service access: rung ladders*

ss to fully fore see the
ll assail the project from
the end of the life of
ry difficult in view of the
s of construction, the
e hospital keeps on changing
plex and hence requiring new
ion.

ctor-part of the project is
give thought to materials
pour and the site features.
t curbing unjustfiable costs,
strialization in our country
he construction will be
only off-site made
approved standards, while
al skeleton will be insitu

FLEXIBILITY

This is a major problem common to all large projects throught the world. The advancement of technology and medical science in so rapid that it is a recognied fact that whatever is designed today is out of date fairly soon. It is most necessary to gauge the design process to this fact. The design which will evolve from information collected on present departmental planning requirements, fit this into the structure, adapt the services to it ; at the end of a ten-years period the hospital may just be absolete. Flexibility in respect of the design concept for the Kampala Reference Hospital will imply that the design process should allow for continual updating of arrangement of the hospital departments. After completion of the hospital, a realistic degree of flexibility in use should be possible through adaptation and alterations on a small scale but without major changes to either the structure or the basic services layouts.

It is therefore envisaged that the best way to meet these requirements is by designing the volumes of the building as continuous spaces within which

nned.

ements, supplies route, and
rns will form the basic
principles for the whole

factors that go with the
ns of structural elements,
tes, vertical communications
light.

lication all over the
ght starting point though
have different requirements
tments for instance wards
a single type-plan though
as will be deamed

ng but economical spans
possible dead weight of
re will be brought to a
skilled labour should be

SERVICES INSTALLATIONS:

Engineering services installations in modern buildings are rapidly increasing in sophistication as is the demand for space in which to house them. Installations of services has become a major contractors task and the problem of the inevitable clash between finishing trades and services installation is almost insurmountable with the use of normal building techniques. The cost of the structure of the building is normally of the order of 20 per cent of the overall cost of the project. A relatively small increase in this cost in order to provide sufficient room for services installation for future ease of changes and for general flexibility is negligible compared with the running costs of a modern hospital. It is generally recognized statistically that the running costs per annum of a hospital are of the order of 30 per cent of its total building costs.
In order to avoid damage to finishes and to create an instataneous work phase of the basic finishing trades and the services installations it is

recommended that the design incorporates full interstitial floors between all treatment levels A demountable ceiling system immediately below the interstitial level is recommended so that services can be tapped almost anywhere.

This will greatly reduce the need for on-site drilling and for cast in conduiting. In the usual construction, services installations running above false ceilings result in serious disruptions, damages, vandalism and considerable expense in repair work as well as protection. Changes after completion are difficult and cause a disruption of normal working of that particular area. The convenience makes for a considerable serving in time and consequent costs as prices for everyone keep on rising. In this way the interstitial space pays for itself.

involves a number of
est of them, perhaps is

four (or five) points will
factors.

NTS.
l, everything is directed
very of patients. Too much tr
bs patients and may worsen
ch traffic involves risk
esults in dilution of
oo much traffic results in
this is money lost; and
e or be confused.

situation mentioned
utes will be provided
ration. This will helps
nning-costs saving is

achieved.

3 - SEPARATION OF DISSIMILAR ACTIVITIES.
Activities which have a common cord or link will be grouped together. In the separation programme clean activities will be separated from dirty operations; different sorts of patients will be separated; quiet operations will be separated from noisy operations. Pleasant and unpleasant functions will be separated; so will traffic within and outside buildings, and will workers.

4 - ENTRANCES.
The main entrance will be used by visitors, outpatients In-patients will also use this entrance on their way in and out of the hospital. The emergency cases will, however be separated from the general traffic as soon as beyond the entrance gate.

A second entrance may be considered for employees and deliveries. The service yard is essentially noisy and so will be isolated from the rest of the hospital.

in this design which call
rough the project are

e

ctors

site

ression.

PLANNING MODULE: This dictates the functional requirements of each and every space. This will normally set lower limits. At the broad end we have the main groups like medical supply; etc...

STRUCTURAL MODULE: The structural module which depends on materials used is relied upon for support of all activities. It will generally be pushed around to compromise with the planning module. Reinforced concrete will generally form the basic material for this module.

SERVICES MODULE: A boiler room will distribute steam to calorifiers which in turn will be used to heat water where it is required. All piping out-side building will be underground and within building, it will be by way of ducts and behind false ceilings.

ENVIRONMENTAL FACTORS: This covers two considerations the physical factors and the social factors. The physical are lake breezes; sun penetration and orientation; and seizimic tremors; and daylight factors. Socially, priority is given to patient's recovery conditions i.e. a set up that looks more like their homes, at least familiar setting.

t relationship is crucial too.
nd the buildings will give a

icular traffic and pedestrian
through one controlled point
e service yard and the mortuary
ys between blocks may be covered
l-weather communication possibi-
lings movement will be mainly
inimum of lifts will be provided
lybe used for non-ambulant

has to be the key factor in
ure and matirials. A very
ure will be put up; and the
ich as practicable minimize
enace costs. Permanent
ecified wherever possible

SITE AREA: The overall area of the site is about 18 hactares. A quarter of this may be required for the hospital treatment and other related facilities.

TOPOGRAPHY OF THE SITE: The site contours will be followed as far as possible in order to reduce levelling up costs.

BUILDING BY-LAWS: At present the by-laws are very thin and don't dwell on hospital development in a reasonable depth. However it is possible from common sence to design a hospital using basically foreign standards.

FLEXIBILITY: The internal planning will allow for re-organization of internal spaces, and adaptability of such spaces to different activities. Partitions will be the demountable type.

EXTENSIBLITY: The overall proposal will not ante-spate additions once the six hundred bed mark has been attained. However the hospital itself will be built in phases, thus the idea of extensibility comes at an early stage.

Phasing: The services pipes and related equipment will have to be installed in the first phase, otherwise it is only wards and domr parts of other units that will be phased.

Building Materials: While designing material s will influence the kind of structure provided. So they have to be form in mind all through.

Architectural Expression: The finished whole while a functional complex of social requirements, services and structural strength, it has to fulfil one more requirements: beauty. This being a works of art, it has to inspire as well as look like a hospital.

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