ONCHOCERCIASIS INTENSIVE CASE CENTRE SHAO.

(A BRANCH OF UNILORIN MEDICAL INSTITUTE)

BY

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D E D I C A T I O N

This thesis is sincerely dedicated

Honorably to - My father and mother - Mr and Mrs Ayanda, through whom I came into existence.

Fraternally to - My only brother, Oyewole Toyin A. Ayanda

Reverendly to - God, from whom all knowledge and wisdom flow, the greatest ARCHITECT of the Universe through whom I became what I am today.

PREFACE AND ACKNOWLEDGEMENT.

A fairly detailed outline and relevant studies carried out as the basis for architectural design is given here; which of course form the most important end-product.

Some problems were encountered in the course of the design which included the need for the knowledge of scientific Research requiring sufficient Scientific knowledge of Scientific Research in order to be able to know most pratical requirements or the practical architectural experience of designs on intensive care centre for the said disease (Onchocerciasis) This of course was not possible and so for the technical and scientific aspects, I relied majorly on the books and magazines I could lay hands on. All the books and magazines are duely indicated. Considerable amount of useful informations on Research laboratories, clinical departments etc for which I am indepted to (1) Planning medical centre facilities for Education, Research, and Public service by George G. Harrell.

(2) "Design of Research laboratories" Published by Oxford University press for the Nuffield Foundation

(3) "Practical laboratory planning" by W. R. Ferguson, and published by Applied science publishers Ltd; London

(4) "A guide to laboratory design" by K. Everett and D Hughes.

I wish to thank the Nigerian Institute for Trypanosomiasis Research Kaduna(NITR) especially the Head of Division of Entomology -Dr.".E Gregory for some vital information and contributions in defining the scope and ideas for the proposals. My thanks go to Dr. Edungbola D.L. Head of Department Histology and Parasitology of University of Ilorin for the assistance rendered when contacted. Alhaji Batunde of Basic Health clinic Shao for some technical assistance given me.

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My deep heart-felt thanks go to my dear cousin Mr. Ayodele D. Bello who has so enthusiastically taken me up like his own child since my childhood age until i become what I am (by God's grace) today, and his wife Bose M. Bello for their untiring moral and total support given me. Same thanks go to Pastor Paul R. C. Laval for being the architect of my Education. My thanks are due to Mr. Julius Akanbi, Anifowose Atolagbe, Cladeji O, Opaleye Amosa, Joseph Adigun, Joseph Durodoye, Yinusa Salami, Baki S. I., Bayo Kolawole, Clevolagba Bayo, Suleiman S.D.Y. I derive my confidence from their words of encouragement and advices.

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PREAMBLE

....."An extension to all people of the benefit of medical, Psychological and related knowledge is essential to the fullest attainment of health and of course the improvement of condition in the rural area where health facilities are most lacking and where a particular type of disease is rampant and local economy is the weakest which is the primary social objectives.

....."In our way of thinking, desease is maladjustment to the environment to which numerous factors contributes, disease therefore becomes an anthropological phenomenon with a geographical distribution; It is also that alteration of living tissue that jeopardizes survivals in the biological and social environment' involves environmental stimuli - physical, biological and situational and response from the host.

A B S T R A C T

The effect of Onchocerciasis is very much undisirable and unpleasant to human life: It affects human in the skin, and the Rye. This then results in dyspigmentation of the skin and or partial or total blindness. There hasn't been any centre for the treatment for the said disease and so the need for a treatment centre ia necessitated with the rate at which it spreads all over the country. The disease is found along the equitorial and sub equitorial region of the world. This thesis write - up therefore gives the account of architectural design proposals of an intensive care centre proposed for onchocerciasis In this proposed centre, there are three main sections:- Thay are the Treatment section which is the core of the centre, the Research Section and the general Administration Section. All the procedures, steps and methods adopted in arriving at the end product ie, a functionally and aesthetically designed centre are fully and detailly dealt within the five main parts to which this write- up is sub-divided. It comprise Ten main Chapters each dealing fully with specific aspects of the centre, relating from personal contacts with proffessionals and specialists in the field, especifically to Dr. Wambebe of Pharmacy departments Or. Aguije of A.B.U. Teaching Hospital, Dr. W. 0. Gregory of NITR. Kaduna, Dr. D.L. Edungbola University of Ilorin Teaching Hospital and Alhaji Babatunde of Basic Health Clinic Shao,) Clinical/midecal books, journals on the disease, Architectural books on Research and Hospital designs, Magazines read, up to the design stage. Though less of the personal contact was made because, there is not a specific tyre of its like in the country to which it can be likened and so Tor most of the technical data

collection, I relied majorly *on* the architectural magazines, text books, journals, and other medical magazines to aquiant me with the disease in questionand the technicality involved in the operative aspect of the centre. The five parts thesis write - up is briefly highlighted below.

The Introductory part is mainly on the research, and investigation so as to be able to organise a logical and accurate programme of requirements on which the design is based. Then the contacts made with interested personels and the proffesionals and specialits in the field and started building upon their knowledge and views. This some part also gives what the disease is, the treatment so far adopted, then what motivated me into designing the said centre, the purpose of designing it. In this part, there is discussion on medical research in Nigeria ie, Historical background of medical Research in Nigeria, the present, situation of medical research in Nigeria. Then there is the record of Research already conducted on Onchocerciasis and that is still being conducted. The Sample of existing related Institutions like the NITR kaduna and medical Science Building and teaching Hospitals at Hershey'. U.S.A. wherein in Hershey medical science building, there is the research section on cancer and general treatment for the community then there are teaching facilities all compounded in a single semi-circular complex with the Clinical section at the front and the research and teaching facilities at the background and quiet zone. The chapter that follows this deals with the centre, the concept of the centre scope and function of the centre, Operational and Organizational structure and finally in the same part is the architectural implication of the centre - the whole system set up - flexibility, Rerponao to the present need, and the convention of hospital design having a clinical

outlook and of course natural and the architectural philosophy of the centre.

The second part deals with the site for the proposed centre, guidelines for siting the centre and the analysis of the site. In terms of accessibility, proximity, views etc. The geographic and climatic setting of the locality on which the centre is to be sited i.e. the temperature, Rainfall, Relative Humidity, Sunshine, Windspeed and the geological nature of the site.

In the third part the architectural design studies undertaken as relate to the design of individual department is given in detail. The thecritical and technicality involved in designing and constructing a research and treatment centre together the facilities to be provided. While the other chapter deals with the general laboratory studies both for the research and clinical, the necessary precautions to be taken - architectural and personal. The different types of laboratory layouts. The work space, spaces between benches, laboratory offices and the different type of fittings. The different methods of articulating the fittings round a laboratory building.

In part 4 are the brief and schedule of accomodation of the Institution which are the planning data needed to start on the design the quantity, the quality of materials personels, land required. The general planning consideration which are suited for the design development thy are - means of fund for the institution, availability of adequate land, personels needed to work the institution. Those in Research, Clinical and Administrative sections. Where the design proposals are found in chapter eight (8) some departments are specially treated e.g. Ophthalmology department, the operating theatre, the functionality of the other departments are what matters most and not any confined shape

or form. There is a good general flow and interelationship of the clinical section and between clinical and research and administrative section.

The last part give the architectural character of the centre designed, the design solutions proposed for the problems encountered during the course of the research undertaken. The architectural, Structural and aesthetic Solutions given to the problems are also given. Then the last chapter gives the conclusion for the thesis, giving the archieved goals and objectives, the work ability of the concept used.

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PART I

I N T R O D U C T I O N

*THE DISEASE - ONCHOCERCIASIS

*STATEMENT OF PURPOSE

*MOTIVATION

1. MEDICAL RESEARCH

*Historical Background

* Research on onchociasis

*Present situation

*Scheme

*Existing Related Institutions

2. THE CENTRE

* Centre concept

*.Scope and function of the centre

*Operational and Organizational Structure

*Architectural Implications

THE DISEASE - ONCHOCERCIASIS

Onchocerciasis is a form of filariasis transmitted by gnats of the family similiidae. The adult worms live in subcutaneous nodules and the larvae or the microfilariae migrates within the layers of the skin; penetrates into the structure of the eye and are associated with pathological alteration, making an infected individual suffer from partial or complete blindness.

The worms have been reported from lymph glands, spleen, kidney, and mesenteries.

It has also been defined by Gould-Medical Dictionary 4th Edition as an infection with the filaria worm(Onchocerca volvulvs) producing tumors of the skin, papular dermatitis, and ocular complication in the humans, this is synonymous to River Blindness in West Africa. Although studies on onchocerciasis has already been conducted in some parts of Nigeria, areas where health and socio-Economic consequences are undesirable are yet unidentified and studied.

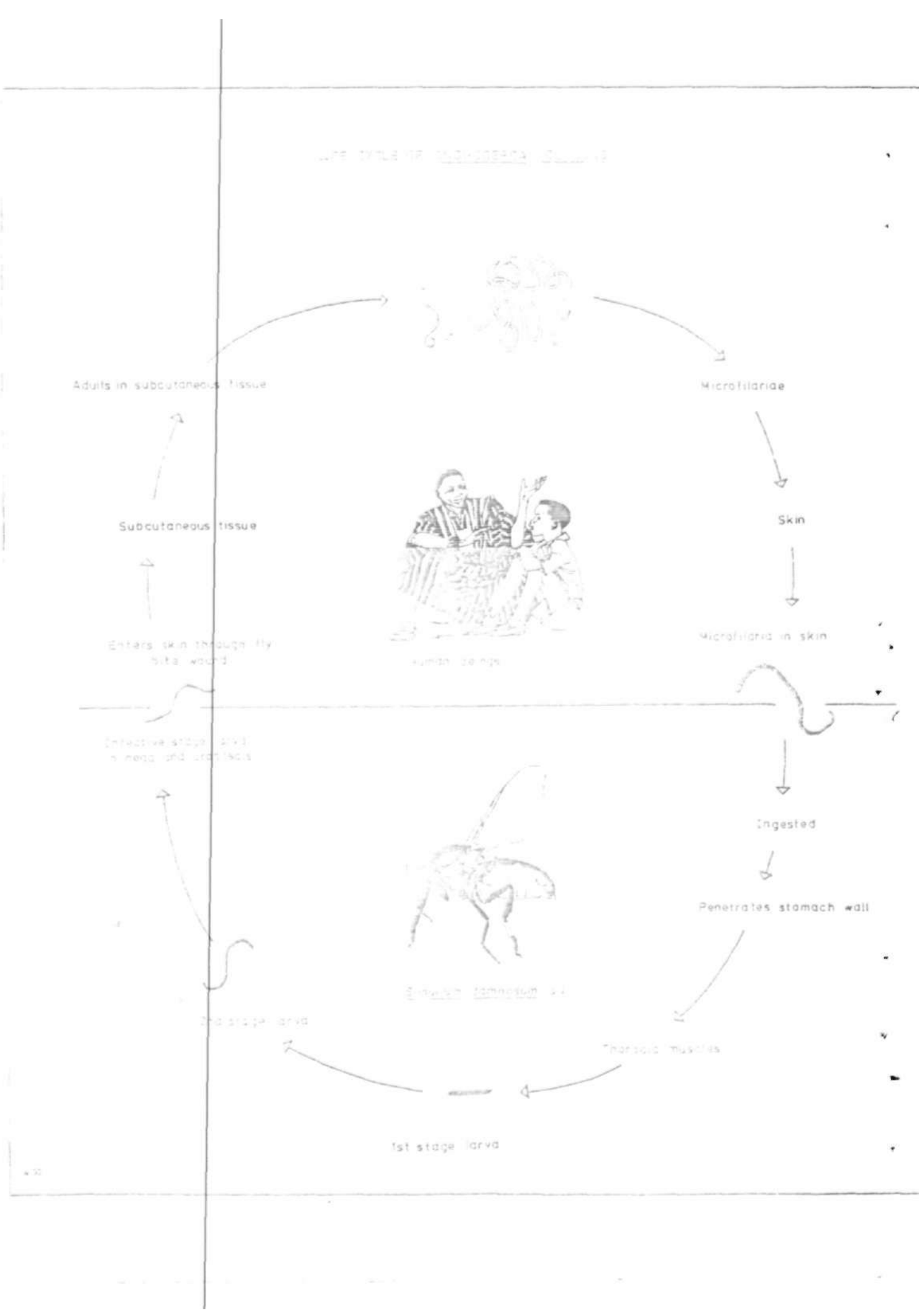
River blindness was first reported in Nigeria by Parsons (1908), Dyce-sharp (1926), Nwokolo(1950), Budden (1951,1956) Crosskey(1957) Crosskey & Crosskey(1959) Hodges (1959), Davies (1963, 1965) Wyatt (1971) Bradley (1976. Some factors have been found to have affected the epidemology of the disease.

i Increase in International movements including
ii Resettlement of deported Nigerians
-Some from endemic foci in Ghana, Gabon, Zaire,
iii Movement of refugees from the drought affected area of Sahalian Zone
iv Those attracted by economic opportunity folowing the advent of oil in Nigeria.
v Massive interstate movement of people in Nigeria from and to endemic area for development and Education.

It is well known that human onchocerciasis occure in Africa in a Zone which stretches from Senegal and Angola in the West to

Ethiopia and Tanzania in the East. The 15°N latitude is said to be roughly the Northern limit (WHO 1966 Duke and Anderson 1972). While distribution of the disease in Africa is fairly determined isolated foci had been reported in Northern Sudan, (Kirk et, al 1959) and Yemen (WHO 1962) G enerally Onchocercisis is said to have effected about 25o millions people within the tropical and sub-tropical region of the world. In Nigeria, it has assumed almost an uncontrollable dimension that it might in future attract the invitation of experts to come and rescue the Nation. Already, lots of data collection and researches are being conducted in Kaduna NITR-(Nigerian Institute of Trypanosomiasis Research Kaduna) Entomology department. It is indicated there that there is hardly any part or section of the country that is not affected. There are traces of this disease manifested in different forms or symptoms. This results in a lot of people being unhealthy due principally to onchocerca infection which can easily be controlled at least to certain extent just as is the case at Kainji Lake where the disease carrier (blackflies) have been reduced to minimum by spraying D.D.T) this action follows a research conducted there showing the presence of the disease in a very high proportion.

The disease carrying insect principally the anthropophilic blackflies-(Amukuru) and ecologically known as the simulum damnosium bites an infected man and the microfilaria develops in the thoracic point of the blackfly one of the later developmet develops into infective stage and then, the Ivm is in the head and probosces where it is transfered to another man. Thisis shown


Adults in subcutaneous tissue
Microfilariae
Skin
Microfilaria in skin
Ingested
Penetrates stomach wall
Thoracic muscles
1st stage larva
Subcutaneous tissue

diagramatically in fig. 1.

Manifestations for Onchocerciasis are shown in different forms in human varrying from region to region. Below are some of the forms by which it is manifested.

* Macular dyspigmentation
* Ocular complication
* hanging groins
* partial or complete blindness.
* palpable Onchocercal nodules.
* Adenolymphocole.
* Scrotal Elephantiasis.
* hernias.
* leopard Skin.
* Conjuctivitis.
* Keratitis .
* e.t.c. see plates I & II.

The health of a Nation they say is the life and strength of that nation. Hence the need to disburse a huge amount of money to the Health Sector cannot be over-emphasized. In Nigeria, much attention has not been paid on the preventive aspect of health or research has not much been properly co-ordinated, but towards the curing aspect. For instance, Researches has been in Small Units and in University Medical Institute since time past; worst still when researches are successfully conducted in any of the units, there is no means of Communicating it to the outside world, and in most cases, such researches ended up being dumped in libraries and Conference tables, nobody to check, approve or implement.

PLATE



Figure



Figure 3 The same case as figure 2 with a nodule on the face



Figure 4



Figure 5 Extensive "leopard skin" lesions of the legs and soles of an 80-year-old man whose vision is poor and relatives good

PLATE II



a) A patient with pulmonary tuberculosis with no lymph node involvement but had a tuberculous lesion on the left ankle which was first noticed three years ago. He has vertical depigmentation of hair on the head.

b) A patient showing inguinal and femoral lymphadenopathy. He had ulcero-infected skin lesion on the left ankle.

PLATES I and II ARE EXAMPLES OF THE SIGNS AND SYMPTOMS OF ONCHOCERCIASIS INFECTIONS.

PLATE I:

EXAMPLES 1, 2 AND 4 ARE FROM THE ONCHOCERCIASIS CONTROL PROGRAMME IN KENYA.

EXAMPLE 3 IS FROM ILE-IFE CLINICS IN KENYA WHERE HE WAS WORKING.

PLATE II

THE EXAMPLES ARE FROM WEST AFRICA IN ONCHOCERCIASIS CONTROL AREAS.

Some works are short-lived for inadequacy of equipment and of course, the atmosphere in some cases are not conducive for a successful implementation of the conducted research. Hence when epidemic break out occurs, it is then that mobilization for random vaccination against the disease starts. The effect is that, lots of casualities would have been recorded. This is simply caused by non-prompt attention paid to the controlling aspect before it start rearing up. Of course most health hazard would have been averted if careful and thorough analysis were conducted and recommendation promptly executed before the problem degenerates to an uncontrollable dimensions.

Hence to be able to successfully improve the health condition, there is the need for the provision of such amenities in such a manner that will enhance conducive atmosphere and efficient workmanship on the conduct of the research and its implementation.

In addition, with adequate consultation and thorough understanding between politicians, administrators, Scientists, physicians, and technical men, a lot of improvement and good basis could be achieved in the implementation of the good health programme.

TREATMENT

The principal microfilaricide is the treatment of onchocerciasis since its introduction over thirty years(3o years) ago is DIETHYCARBAMAZINE (DEC)

This of course is found to cause some adverse effect which are usually very severe but are temporary.

- causes severe but temporary systemic reactions during treatment of heavily infected patient.
- There is need for very close supervision of ocular function

Whenever DEC-therapy is used Onchocerciasis But Laughom et,al later detected that daily application of a 1% DEC, loition to the whole body of patient highly infected with onchocerca voluulus (5.5 ± o.25 microfilarine per suip) results in an almost complete clearance of microfilarine from the skin by the end of seven days.

- It is found to be safer and more acceptble.
- It was tried on 30 patients, all with Moderate to heavy infection (156 ± 27) microfilarine per suip) in the tugh area of high endemicity in the savannah of southern sudan.

This was later disproved by Professor Bird that generalised systemic reaction in the form of fever, headache, dizzleness and hymphadenitics were seen in the most heavily infected patients and were severe and of longer duration than the reactions to standard oral doses of DEC recorded into the anterior ocular segment.

References

- LANCET - July 1979 pg 46
- Ethiopian medical Journal - 1977(13) pgs 55 - 59
- Bull. WHO. Vol 54 No. 1 1976

Apart from the Diethylcarbamazine drug used there are also some used but not as frequent as DEC they are mepyrarum maleate, adipate, phosphate, citrate, hydrate calcolate

Diethylcarbamazine

STATEMENT OF PURPOSE

The main purpose for choosing this thesis topic is simply to satisfy my interest, need and my belief on the health of my people which consequently led me into thinking of:-

* proposing a centre for aquiring more knowledge in the field of medicine to help my people out of the perpetual health hazard.
* Interwovenly connect the research units with treatment section on onchocerciasis.
* Giving the medical students a vision of more balanced picture of of medicine and how it should be practised especially within the rural areas.

all these were proposed bearing in mind the presense of the University of Ilorin Medical students in the said area as the co-researchers and workers/ staff of the centre.

In the process of trying to get a solution to this problems specialists in medicine, administrators, scientific research, were consulted and journals, magazines, books and other publications dealing with the organization and design of similar centre were to be contacted as well.

A thesis design involves probing into science, Engineering, sociology and or even the arts carrying out experiments and trying to integrate or improve on the development of banking.

The scheme of thesis seems of course an hypothetical attempt to make a double contributions to.

- The architecture of Research building environment.
- the promotion of and development of science and specifically in the field of medicine.

The architectural objective therefore involved the planning and disign of an intensive care centre for the disease integrated with research and teaching which will comprise a complex of offices, laboratories and other ancillary research and teaching facilities within a flexible, adaptable and conducive architectural setting and environment with architecture that is functionally based on Nigerian experience and environment.

MOTIVATION

It has become an inevitable and or consequences that must happen to an indigine or people living in Shao to have the disease (onchocerciasis) River blindness)called "Olarun" (this is the belief of the people at Shao) just because they don't know the cause they think it is universal. This of course constitute one of the causes of morbility in Oloru District of which Shao is the only town there. Recently research carried out by a senior lecturer in University of Ilorin (medical Institute) who is also the head of department of Microbiology and parasitology has proved them wrong that it is a deadly disease transmitted from man to man and not through personal contact but through insect bites (The blackfly see fig .2.....

Hundreds of people have died as a result of thisdisease unknowingly and many are in their adult age left in their hidings now partially or completely blind or with ugly or unusual coloured skin (e.g.leopard skin see plate I This disease affects almost everybody in this area, no wonder why so many young ones are indulged in using recommended lenses.

All these have therefore motivated me into developing keen interest in proposing a complex or institution which will go in search of what the CAUSE is the different TYPES, TREATMENT to offer for such a deadly disease and how it can be controlled. This finally led me into proposing solution that will help not only Shao and its suburbs but the state, country and the equuitorial and sub-equitorial region of the world. -

ONCHOCERCIASIS INTENSIVE CARE CENTRE

MEDICAL RESEARCH

HISTORICAL BACKGROUND

Medical research was not in any where found in any record account in the country (Nigeria) until the advent of the colonial era. It has been the establishment of research institution for a particular post; for instance in 1920, Yaba laboratories was established and started functioning there and then. In 1925 the Rochefeber foundation established the virus research institute at Yaba to serve the West African Yellow fever commission. Then in 1954, various units of labs and research institute were brought together by legistilation to form West Africa Commission Medical Research. (WACMR) Comprising Ghana, Sierra Leone and Gambia including Nigeria in 1960. all these countries withdrew their support and services and was left to Nigeria. It was then that Nigeria council for Science and Technology (NCST) was established is, in 1970 and inaugurated in 1972. The Medical Research council of Nigeria (MRCN) was established and inaugurated in 1973 This body was charged with the following responsibility to perform:

- Indentify major health problems and their determinants.
- seek solutions and device new techniques of measuring monitoring, and eliminating environmental hazards
- co-ordinates research in the medical sector especially in the following centres.

* Research Institutes.

Organizations e.g Vector control unit and Federal Laboratories in each states and NITR - Kaduna

*Universities - in all medical faculties.

*Research projects - foundation or some data unit.

*Research grants - Universities Related bodies.

*Task forces - For particular Health hazards e.g.

CSM, Onchocerciasis control in Kwara

Cholera.

The offices are in Yaba - Lagos and far scattered all over the country with inadequate laboratories.

*few research laboratories scattered throughout the Universities

*Malaria and Vector control Unit.

*National Institute for trypanosomiasis Research, Kaduna, (NITR Kaduna).

* There is also the onchocerciasis unit in NITR

Research shows in Volta River Basin the manifestation of the disease in the following form.

*in a sign of ocular onchocercal with or without skin snip results.

-with microfilariae present in the eye eventually leading to partial or complete blindness.

-With onchocerciasis where sclerosing keratitis and or post-neuritic atrophy and or an onchocerciasis retinal leison of any degree were present.

A research was also conducted in an Ethiopian prison(Gondar Prison - a sample of the affected subjects are shown in plate II Report on onchocerciasis in North-West Ethiopia also gives some samples of the infection, those are also shown in plate I . Also from Kwara state of Nigeria is a research conducted by Dr. D. L. Edungbola the Head of Department Histology Parasitology, University of Ilorin, plate I5 give the sample Sakenic, leopard skin manifested usually on the legs and rarely on the hands.

RESEARCH ON ONCHOCERCIASIS

Research has revealed some environmental factors influencing the agents life cycle. These include:-

- Temperature governing the duration of the life-cycle in the vector e.g. Onchocerca can not grow and develop well if the temperature is below 70°F.
- It breeds principally in infant, adolescent and young streams that flows through rugged terrain and mature streams.
- Streams concealed by a dense canopy composed of three or four layers of vegetation.
- Emergent vegetation.
- overgrowth of grasses and other plants preferring a moist environment
- Shrubs and lowtrees, and tall trees.
- Temporary streams of only a few weeks duration

  *either open to the sun or well shaded by trees and shrubs

TABLE 1a

SUMMARY OF OPTIMUM STREAM CHARACTERISTIC OF VECTORS

	Simulium Ochraceum	Simulium Metallicum	Simulium Calidium
Width	2.5 - 12.5cm	2.5 - 20 cm.	30cm - 450 cm
depth	2.5 - 12.5cm	less than 30 cm.	less than 30 cm.
Current	2.5 - 27.5cm/sec	2.5 - 55.0cm/sec.	2.5 - 75cm/sec

Some species of these simuliidae prefer rocky rapid, water falls, cascades and cataracts, with well aerated broken water over most of its range. e.g. in trickles between pools of rearly dried up rivers in the Northern territories of Ghana.

The insect (Blackflies) carring the disease attack [illegible] in the following oder of frequency - legs, thigh, forearm, and elbow, back, very rarely the nape of the neck. Onchocerciasis is most prevalent in male in Africa due to constant exposure while hunting and working. The disease could be severe if the host lives in minimal or inadequate intake of [illegible] vitamin or other essential metabolite.

Factors associated with dry climate may explain the higher prevalence of onchocercal ocular manifestation in Northern Nigeria and Northern Ghana.

There are species of the microfilarias with each being peculiar to a particular type of environmental conditions as relayed above. for instance the followings are the species that readily attack man in central America

Simulium metallicum

S - Callidum

S - haematopotum

S - exiguum

S - Veracruzanum

S - Ochraceum

PRESENT SITUATION

Series of researches have been going on in locating areas of heavily infection of onchocerciasis in Nigeria. Most of these areas have been mapped out at NITR Kaduna and in NITR, recomendations is to go to the research control unit where prompt action on control is planned and executed Recently there has been some amount earmarked by the Federal government for the control of echecerciasis and its vector in Abuja (Federal Capital) but the success of the programme is threatened by re-invasion of the area by the blackflies (the carrier of the disease) from foci outside and probably within the control zones, and by the observations that even when the blackfly density has fallen considerably transmission may persist.

It is of course impressing that the Federal Government has been demonstrating willingness to improve health facilities and promote research and training various sector of health care. No wonder then, many states hospitals in the Federation have been converted to University Teaching hospitals where research, intensive care, special cases of health hazards are refered. There are malaria control programme, the epidemiological units, and control of communicable diseases. All these are to facilitate control and provide health services to all But as at now there is only research institute for onchocerciasis and no specific treatment centre for the endemic area But it will need knowing the degree of infection, the different types, founded arround certain area to know the solution to provide.

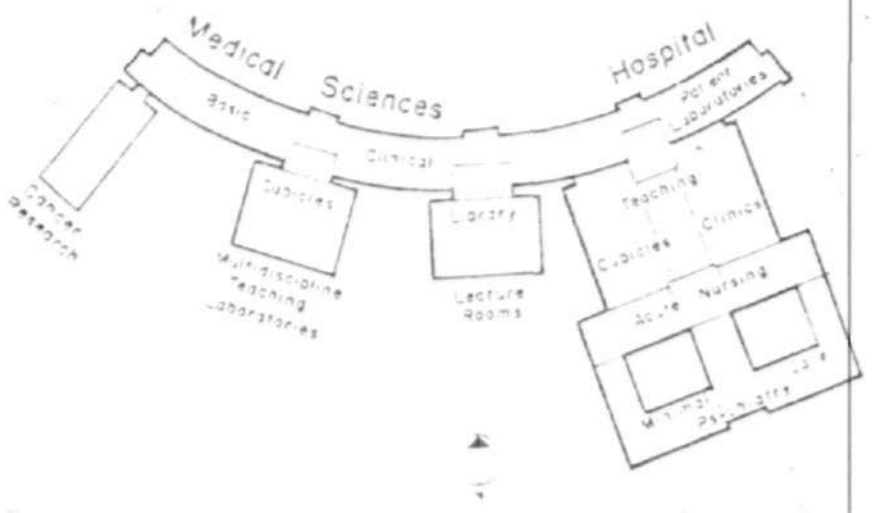


Figure 3. Relationship of functional units at Hershey, showing possibilities for initial lateral expansion. The three southern wings of the medical sciences building could be extended later. The hospital acute nursing and ambulatory in-patients' wings can expand vertically.

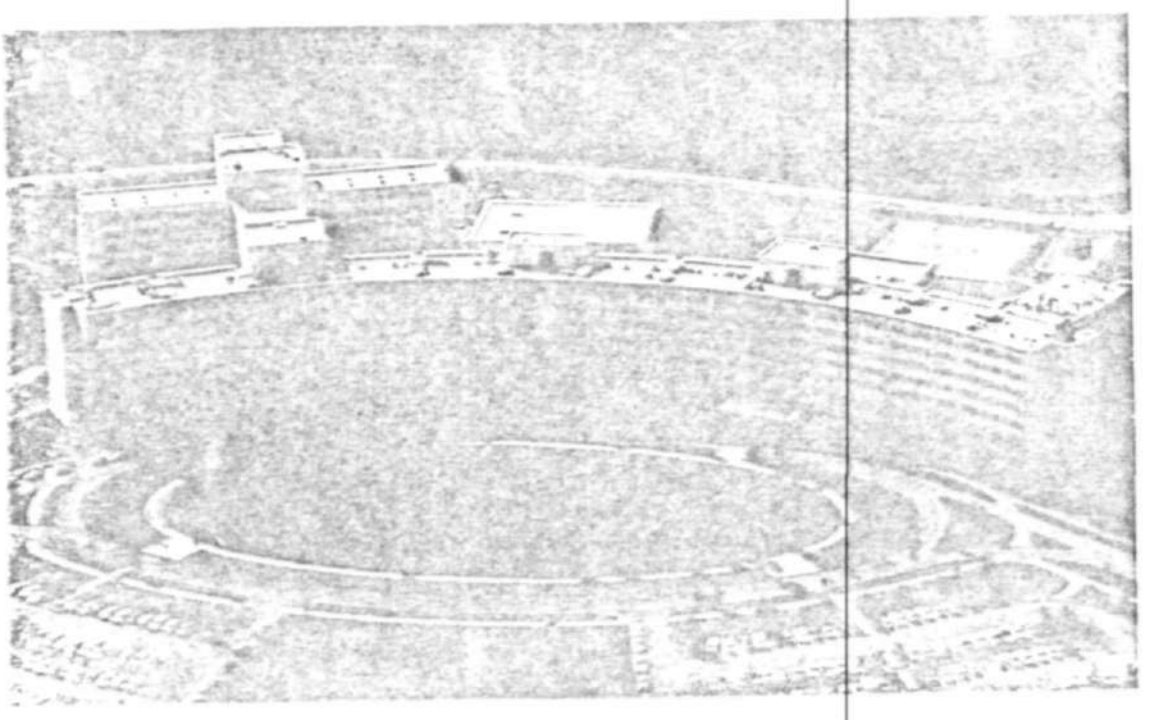


Figure 4. Medical sciences building and teaching hospital at Hershey.

SCHEME

THe scheme of this thesis will be establishing an intensive care centre for the said disease- onchocerciasis and attaching facilities for research on the same subject mainly where the students, fellow researchers from University of Ilorin medical Institute and other Universities in the country and/or any related body could easily perform their things. The Components include - Research section

- lecture/teaching and library
- treatment section
- Accomodation
- Administration

(1) This will in essence provide a forum for a conducive atmosphere and adequate equipment for the University medical students who come to Shao yearly for a case study on the same topic for their community medicine course work programme.

(2) Some of the problems will be solved alongway with Architectural solution to the combination of the research and treatment centre.

EXISTING INSTITUTION

Medical sciences building is said to be the chief educational facility space for teaching health centre.

CASE STUDY 1

Hershey medical centre,

- provides quiet, contemplative atmosphere
- away from airport, railway road, Express ways, freeways,
- Interstate highways
- Noise is muffled.
- aesthetics of site is preserved
- truck, ambulance, students staff traffic were all separated from that generated by patients and public in the location of access and parkings.
- Roads, landscape, green belts protect the surrounding environment from the traffic noise generated by an academic health centre particularly ambulances.
- There is a large site for future growth
- But it is on sloping site proviling different access to patient and services.

(2) NITR Kaduna.

(National Institute for Trypanosomiasis Research)

This centre or Institute deals majorly with the disease Trypanosomiasis and Onchocerciasis has been incorporated into the research work going on there.

* There are no separate laboratories for either of the two
* which ever case comes at hand will be handled.
* The complex is made up of offices and the laboratories.

FEDERAL GOVERNMENT ESTABLISHMENTS

ESTABLISHMENT	LOCATION	NATURE OF RESEARCH
West Africa Council for medical Research(Nigeria) (W A C M R)	Yaba	Research into pevalent and peculiar disease in Nigeria
Chemistry Division Federal Ministry of Health	Lagos Kaduna	Analytical chemistry of foods drugs, and Water, forensic chemistry research
Malaria and rector control Unit	Yaba	Malaria and alied parrasitic Research
Nigerian Institute for Trypanosomiasis Research (N I T E)	Kaduna	Research into prevalence of the disease-sleeping sickness and later on onchocerciasis(river blindness) the vector and control

MEDICAL NEEDS

The scientific and technical knowledge to give the best possible care to the sick is made as the main aim of the thesis. Equal importance is therefore attached the quality and range of medical services available as is given to community and individual health conditions. So that while improving health standard, efforts should be geared torward improving knowledge, equipment, materials and working conditions of personels. Hence to achieve these, disired goals, some priorities are ascertained.

(1) need to assimilate and foster medical knowledge

1- its allied technology

- avoiding wastage of resourses and time.

(2) Need for high level specialist care

(3) Need of analysing the current social-medical and hyginic situation of the country's population

Priority should be given to useful research and training to be able to make a direct contribution in increasing the level of efficiency of pratical health care. As in Nigeria the MRCN is the sole controller of medical research. There is therefore the tendency to have an institution that centres for the technical requirements of the researcher and office accomodation for the policy makers. There will also be a tendency of making provision for contact with the public. It is therefore creating a forum for discussion between workers of medical research field on onchocerciasis, from the endemic zone and also a forum for imparting certain basic ideas on the particular disease to the public residing around the institution.

This is therefore very obvious that the endemic areas in tropical and subtropical regions today needs an intensive care centre of a complex nature serving as research and treatment unit.

CENTRE CONCEPT

Research could be defined as -

Methodical, systematic, directed - study of a subject which is still largely unknown. In the modern days, there are two types of Researches.

* Basic Research
* Applied Research

Basic Research - Theoretical-exploration of the basis of existence undertaken solely to increase the general store of knowledge

Applied Research. - Definite project directed towards practical application of knowledge uncovered and has a specific end

But Medical Research is applied because many institutes or research centres were established for one particular type of problem or other (health hazards) e.g. vector control unit, Trypanosomiasis, Malaria disease etc of course there is a research centre at Kaduna to locate endemic areas in Nigeria (on River blindness disease) and some of the common species but there hasn't been any control or treatment centre for those effected in most areas. It is therefore felt that an Institution whereby both the treatment of the various types of diseases caused by onchocerca volvulus microfilariae and some research to be conducted in the same centre. This will alongway solve to certain extent some health (visual, and skin) problems and at the same time help in increasing knowledge in the field of medicine, and aquaint the medical students to the real picture of what medicine is and as it should be practised especially within the local community.

SCOPE AND FUNCTION OF THE CENTRE

The proposed centre (Onchocerciasis Intensive Care centre Phase) is supposed to cater for all the infected area throughout kwara state and more precisely in the already discovered areas of high or pronounced endemicity e.g - Ifelodun, Edu, and Moro, local government areas. In the centre the patients recieve treatment, and specialists conduct research on various types of the diseases and the vector, means of controlling or eradicating the disease, and possibly controling the vector carrying the disease. This is of course not to cancel the support from the control unit but just to supplment it. This is expected to be an executing branch of the research institute. It is supposed to work hand in hand with MIR Kaduna which is responsible to the medical governing council in the country (MRCH) which controls, verifies tests, and approves result of researches conducted.

OPERATIONAL AND ORGANIZATIONAL STRUCTURE

In this centre, there is a Director through whom the centre is directly responsible to University of Ilorin medical institute. Under this Directors are three deputy Directors (D.D) each heading a section of the institution as spelt out below. One D.D. in charge of Administration. another incharge of clinical matters and the other in charge of Research. Of course, there is hierarchy of heads of sections and their supporting departments.

The operational departments include medical services pharmacy, social services. welfare services, Internal and External Administration, library physical Research laboratories, clinical laboratories chemical labs, Ecological labs and maintenance departments. Operations and activities in all the departments are closely related. This of course is well pronounced in the clinical department and the Research sections. Take for instance, in the Research section, the type of or method of Research advocated for is the -'project' method of attacking research problems' of course this requires the efforts of individuals having many kinds of specialized training in order to focus on the particular research job at the particular time. If the research staff is large, it will be possible to take on many research projects at a time by just assigning a project team to each research job. Each research jobs being tacked by a muti-disciplinary team headed by specialists on the field to which the Research essentially belong.

DIRECTOR
D
D
D
D
LIBRARY
INT ADMIN
RESTITUTION/FINANCE
SST ADMIN
CONFERENCE
WELFARE
SERVICES
LABS
WORKSHOPS
LIBRARY
MEDICAL
SERVICES
TREATMENT
PHARMACY
COMPOUNDING
DISPENSING

[illegible] FUNCTIONAL INTERACTION

Considering the degree of functionality, inter-relationship expected to operate here, i.e., between treatment and research sections, the centre should have a very functional buildings, carrying or harmonizing same functions in the research unit with the functions in the treatment section. e.g. laboratories, cafeteria, library, approaches, circulation, etc. it should also allow for flexibility and expansion in the site.

Hospital or Educational health centres are rather like ships, the psychology of their designs is very similar. There is the same sense of purpose and ceaseless activity throughout day and night. For both patients and doctors or phisicians, it becomes of necessity a home as well as a place of work, One may work for 48 hours or more at a stretch without leaving the building. Under this circumstances, light, quiet and spaciousness are important. Communication, the way in which people come into contact with one another is a fundamental consideration.

ARCHITECTURAL DESIGN STUDIES

5. Design studies.

* General principles
* Teaching, Research in Hospitals
* General and ancillary facilities
* Supporting facilities

6(a) Laboratory Studies.

* Basic concept/unit of laboratory
* Architectural precausions
* Laboratory Work and spaces
* Laboratory offices
* Laboratory fittings
* other precautions

6(b) Research laboratories

GENERAL PLANING PRINCIPLE

In a design of any medical Research establishment, the following are to be taken into consideration for a successful archievement in functional, aesthelic and conducive environmental design.

* Concentrate Similar activities into functional sub-complexes
  * Noise level
  * Privacy
  * Other environmental considerations e.g. wind directions
* Zoning of facilities with regards to prevaling wind direction
* Zoning of facilities to climatic or reduce the problem of noise or vibration due to heavy traffic; for instance:
  - quiet area for research Labs.
  - far from heavy vehicular interference of highways etc.
* Maximum close e communication link between individual functional area of the centre with minimum vehicular traffic hazard and to maintain the tranquil enviroment necessary for research and treatment(medical) work.

- like multiple cul-de-sac vehicular access.

* Anticipate change - flexibility of usage is desired which could be in the following ways.
  - Reduction of columns.
  -consclidating mechanical shafts
  -keeping elevators, shafts, starrs and other vertical circulation from dividing floor spaces into small compartments.

* provide for growth without distruction of already established values having the following in mind while designing.

- plan each department with corridor leading to an outside wall so that it can be extended when need be.
- Corridors are not blocked with rooms or other fixed elements. But where such is impracticable, e.g. in small departments'soft spaces' (space with minimal mechanical services) is planned adjacent to such space; the soft space could be relocated relatively easy hence permitts the required expansion.

- Develop Circulation and utility arteries.

-consolidate for free usable space.

-a rectilinear pattern provides maximum flexibility is maintained.

-Separate as far as possible the various kinds of traffic.

- pedestrian from vehicular and patients, staff, visitors, and service from each other.

The followings are in addition considered and decisions on which are to adopt.

-plan composed of buildings of common use in central focal area with regards to the other building, e.g. library, canteen. etc. ie 'CENTRAL FOCUS'

- MULTIFOCI - Multiple foci from the start of the institution, but of course distribution of service is expensive..

- COMPACT - All [illegible] offices and central amenities are in one main building. This is of course suitable for small projects, but a compact and expandable complex is [illegible]

It cuts down cost of service distribution

There is close link between component department

- LINEAR CENTRAL - Central facilities in a linear form

  * Library, workshops, stores, etc along a street running down the centre of the site.

  * Open ended and can be extended when necessary.

- Careful consider ation is given to orientation

  - Sun control, and material used for the building envelope are important

  - Selection of exterior wall materials

Air Conditioning and high level artificial illuminationhad a significant effect on hospital design - Natural lighting and air imposes limit on width of buildings.

- The artifitial lighting (Electricity) reduces walking
- distance and less surface is exposed for the heat loss or gain. Thick walls will absorb the heat during the day and radiateheat during the night and relatively small windows will reduce glare effects.

TEACHING, RESEARCH IN HOSPITALS

Small basic issues underlying the relationship among teaching, Research and training in hospitals are as follows.

- The potential Confflict between patient care and physician training;
- The potential conflict between the need of the medical school and the needs of the community focused on the hospital and the patient.
- The question of which patient should be used as teaching material
- The number and distribution of types of patients needed for medical Education.

(6) The issues of functional flexibility versus terrtoriality

In these, distiction between clinical Research and laboratory research is made.

Clinical Research - Work done that requires the physical pre sence of the Patient and a location proximate to patient care area.

Laboratory Research - Work done in a more remote location and without the pre sence of the patient.

The amount and type of spaces needed depends on the following factors.

* Number of students
* The population of patient expected
* Sizes of the laboratories
  - for researches
  - for Treatment section
* Those, to be accordated
* Level of the researchers

- In Research section, there is also the need for privacy for the research workers so as not to be disturbed by Visitors (officials and non officials) as well as staff of other departments.
- There should be no thorough fare through laboratories.

GENERAL AND ANCILLARY FACILITIES

The basic areas in the centre are

- The treatment section
- Research section
- Administration and other facilities
- Supporting or public areas

  Service facilities of maintenance, stand -by generator etc.

SUPPORTIVE FACILITIES

For efficient functioning of a research and treatment centre, the followings are of great importance.

Medical archive; Cafteria, public information and some basic services for the public e.g. conference Room, Health Education Rooms, etc. These are the facilities that serves as links between the research section, treatment unit and the public Hence imparting medical knowledge new findings and new developments in the field of medicine to some interested individuals and specifically to students, fellow researcher or bodies that might find it useful.

The medical archive should be accessible to workers medical proffesionals, and workers from other medical institutions. The rescent day medical archives are the informations and resourse centre used exclusively by lecturers, researchers, students, other medical proffesionals and hospital workers to obtain or increase their knowledge from various types of media - books, magazines, newspapers, pamphlets, film strips, microfilms, recordings, still pictures, art works, all are found in a medical archives.

Medical Archive/medical library

- should be located centrally.
- in a quiet place.
- Provide emergency exit
- seats 15 - 20 users at a time.
- 20 books users approximately.
- 2.7sqm of space per user.

Components of Medical Library.

- Librarian work room.
- Magazine storage/shelf
- Conference Room
- Librarian office
- Catalogue
- Control desk
- Toilets.

See flow diagram for medical library!

CONFFERENCE ROOM

A small conference hall is necessary, this is where activities of the institutes are made known to the outside world. It is there results of researches done are made known to the general public for critisism, and trials in other research centres. Therefore the following are to be provided for effective functioning of the hall.

* Audio visual areas, storage of equipments
* Small room for small screen shows
* Staff and public canteens.
* Some areas for sale of magazines and journals.

MAINTENANCE

THere will be the need for the provision of the followings

* Incenerators
* Repair yards and workshops
* Garages/Parking lots
* Storage Room
* Administrative offices

LABORATORY STUDIES.

The basic corcept is providing suitable environment for the performance of specific scientific discipline, Enough space, equipments and fittings for successful runing of his work should as well be provided

Generally there are three types of laboratories

(1) Teaching laboratories

- purely scientific or medical purposes to teach methods of investigation

(2) Research laboratories.

- Studys and development of new possibilities to a flexible programme.

(3) Services laboratories.

- for control and testing products and conditions

Teaching and Research laboratories are commonly found in the same complex.

In medical laboratories, infection is the most serious problems, for accidental infection, Note the followings:-

* Don't take unnecessary
* Safety equipment adequatly and properly used
* Smoking and eating in Lab is prohibited

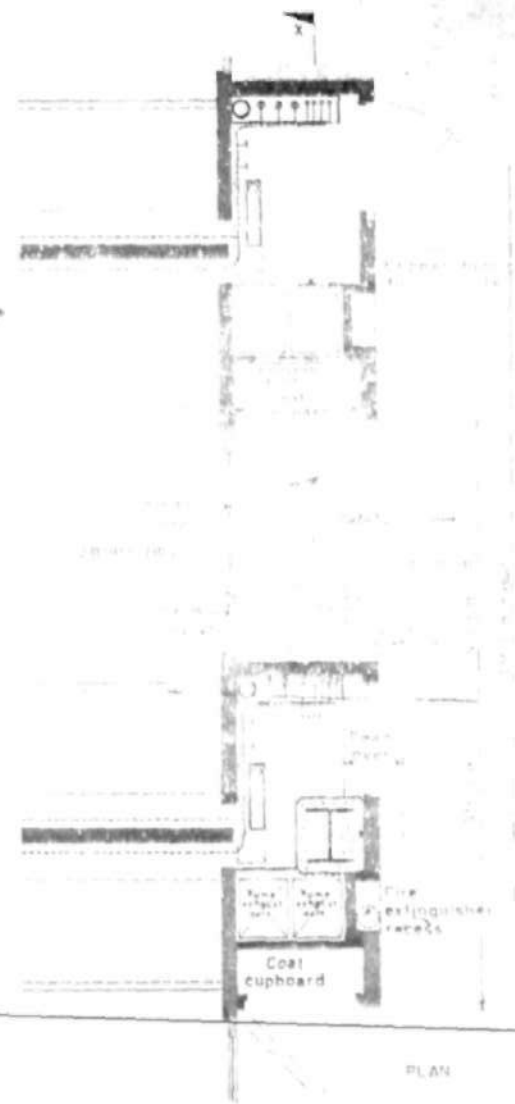




FIGURE 25 *Plan and section showing corridor service shafts; Homer Research Laboratories, Bethlehem Steel Corp., Pennsylvania, USA.*

ARCHITECTURAL PRECAUTIONS.

The followings are some of the architectural precautions to be taken while designing a laboratory.

*Provide disposal system for equipments

*A complete self-contained suite housing all the equipment for processing specimen from receipt to final report

*Proper ventilation system maintaining air flow from clean area to less clean areas.

*An exhaust system(with bacteriologic fitter) discharging air into the outside of the building out through the roof or side into an area where the possibility of return to the building is minimal.

*Separate Room within the suite designed as the isolation room and containing a biological safety cabinet for opening of specimen, preparation of slides and innoculation of cultures.

In considering the sizes of a laboratory the number of workers/Researchers in the room is taken into consideration and the type of equipment, work space and circulation spaces.

A scientist working base is provided which is usually considered the centre of laboratory activities. This is usually in the work-tops and services on tables.

To consider total area by a laboratory work we take into consideration the length, and width of benches. Length - total length of bench, equipments, e.g. Fume cupboards, bio-safety cabinets.
Width - Width of bench, plus clear space for circulations

LABORATORY WORK AND SPACES.

Bench space per person.

One measure of good laboratory accommodation is adequate bench space. A bench length of 12' to 15' (3.6 - 4.5m) per person is generally accepted standard, and an uninterupted length is preferable to several short lengths.

Apart from the general bench length needed by any scientist he occationally need a greater length than this. Hence provision should be made for flexibility. It has been found after a research on satisfaction levels of bench for scientists that, apart from biochemists, (1.8m) giving 97%, of satisfaction for one scientist. The value should not be double if two scientists are working together, since two need less than twice this value. In the table below it is shown that it is of economy when more people are grouped in one Room.

Note Satisfaction level - (percentage of scientists' time at which he has enough worktop by the bench length provided for him)

TABLE IIIa.

No. of Scientists	Bench length in feet to give 90 and 95% satisfaction level in High, medium and low group workers.						
	No. of Assistants	HIGH		MEDIUM		LOW	
		90%	95%	90%	95%	90%	95%
1	0	13.4	15.0	11.4	12.8	8.8	9.8
	1	17.6	20.3	15.3	18.0	12.8	15.5
	2	20.7	23.5	18.4	21.2	16.13	18.9
2	0	19.6	22.6	16.2	18.9	11.5	13.8
	1	22.5	25.6	19.2	21.9	15.0	17.5
	2	29.3	33.0	25.1	25.7	19.5	22.9
3	0	24.2	27.5	19.9	22.8	13.5	15.9

The length of sinks and fume, cupboards must also be added to the bench length. Even though in medical laboratories, fume cupboards are not used much some few ones should be provided to be shared by various scientists.

RETICULATING PIPES AROUND BUILDINGS

There are series of proposals for reticulating pipes around the buildings. among them are based on the following arrangements

(a) External wall.

- Vertical duct at each module e.g. a removeable cover extending to the ceiling or vertical duct in dummy culumns at interval of 3 modules.

(b) Corridor walls.

- Series of shafts for vertical pipes and ducts 90cm apart between the laboratory and the corridor.

(c) Space above false ceiling.

- providing excellent flexibility and preferable to floor ducts.

(d) Service corridor.

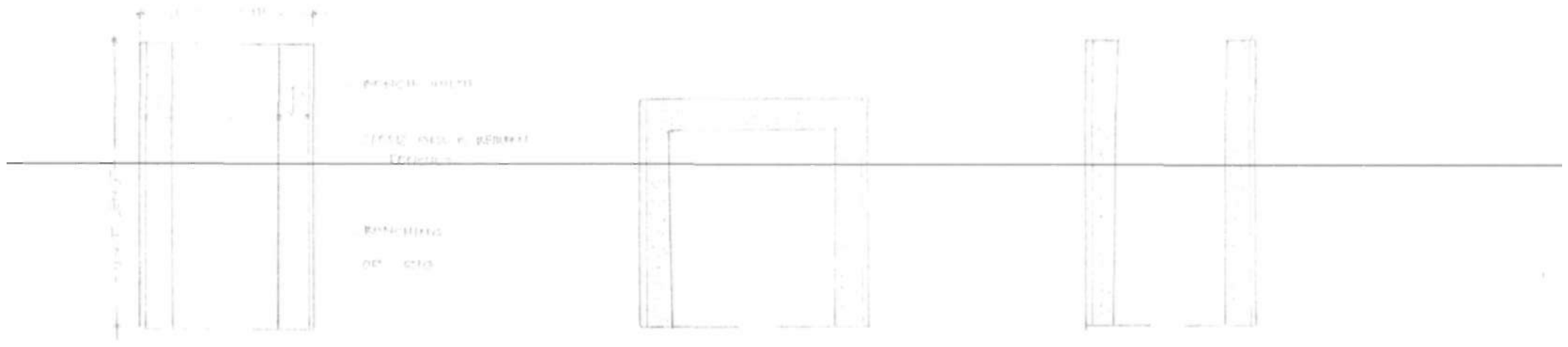
- space seperating two rows of laboratories or a row of laboratories and a row of offices usually
- Extending through the length and height of the building
- Contains all the vertical and horizontal pipes and ducts

The space above false ceiling piping is, aesttetically good and maintenance, repair and cleaning is made very easy. Hence from the above analysis, of the various types of pipings in the building, I therefore propose the use of space seperating two rows of laboratories or a row of labs and of offices - services corridor.-the different types of pipings are also shown in figure ... .

Number and position of outlets.

It is always good to be generous in providing services outlets but not to be extravagant. e.g. on a particular bench of 4.5m, the following are necessary.

2. cold water, over a central trough
1.-gas , Zair,
4-6 power outlets
1 hot and cold water and
2 cold water over sink at end of bench.



- A service unit got enclosed running on three sides. Less efficient
- It is more expensive to run services around three sides of a unit
- It is unreliable at this type

- It is advisable to allow a clearance space between the end of the unit and the external wall of the building in order to provide a clear way between rooms in a quick an alternative direction of escape in the event of fire or explosion etc

UNITS OF LABORATORY

Type of benches

There are 3 types of benches

- punisular - projects from the wall
- Island - free standing
- Wall

The use of penisular benches at right angles to the windows has become almost mandetory because of

- easier installation of service
- and less costly

Minimum shadow when filled with reagent shelfe's

Wall benches under windows should be avoided facing conditions on the east and West Elevation makes working conditions quite intolerable. Windows facing North, screenning the low angle sun is not always satisfactory, even South facing windows, glare can be a problem,

Wether it be one - two or three module lab, the combination of penisular and wall bench at right angles to the external wall produces the simplest layout.

Width of Corridors: adequate - 1.6m This is the recommended size of the corridor width.

Layout of building:

Each laboratory building has its individual problems, the ranges is narrowed down to a few which have been found satisfactory. Also these depends on the size of project and the availability of the space.

(1) Off-centre corridor.

- Application for relatively small schemes
- all labs can have a South facing aspect

- The two room depths provide flexibility in planing
- There are four variaties of this lay-out shown below

Fig. II

CENTRAL CORRIDOR

- suitable for large schemes
- grouping of labs is more compact because they are on both side of the corridor
- Provides a greater assignable space
- Same with corridor serves a wider bldg than that of the off centre layout.

See Fig 13

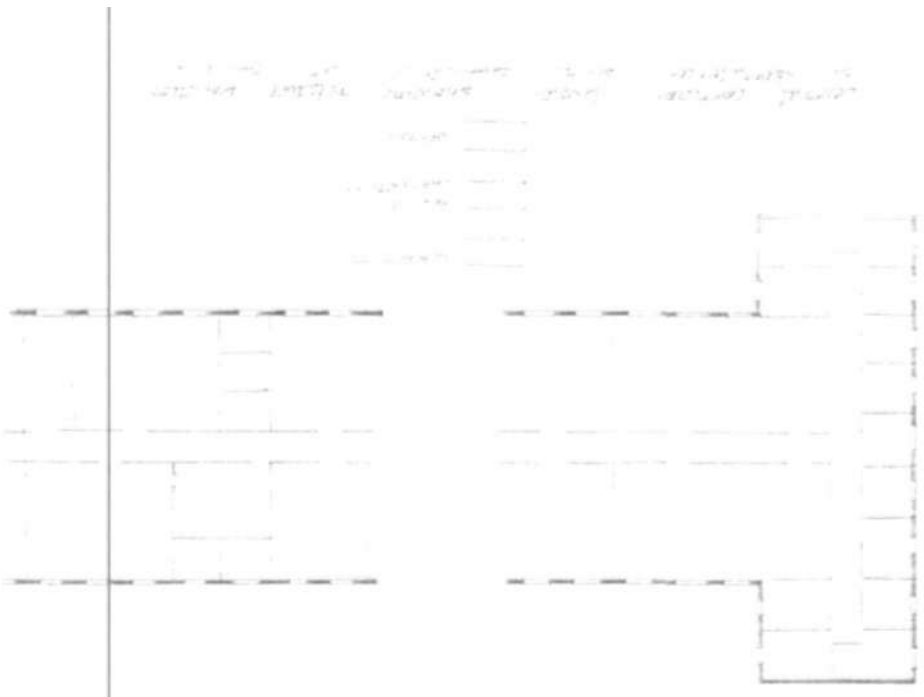
Double corridor

- provides a good interrelationship between labs, lab office and service lab.
- Offers best solution when width of the building is fixedwithin certain limits.
- The service labs are windowless, it's easier to obtain accurate tempt control
- absence of natural light is in many cases an asset

See Fig 14

Service Corridor

- suitable for large schemes
- for more complex lab services
- when temperature control is critically needed
- increased area at one level contributes to more efficient operation because scientific staff are brought together and sharing of equipment is facilitated.



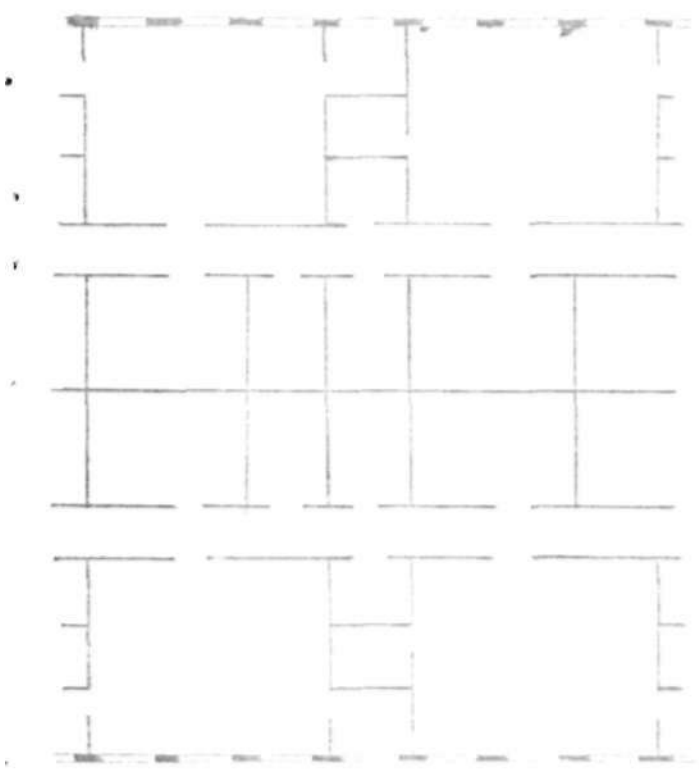
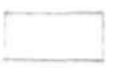


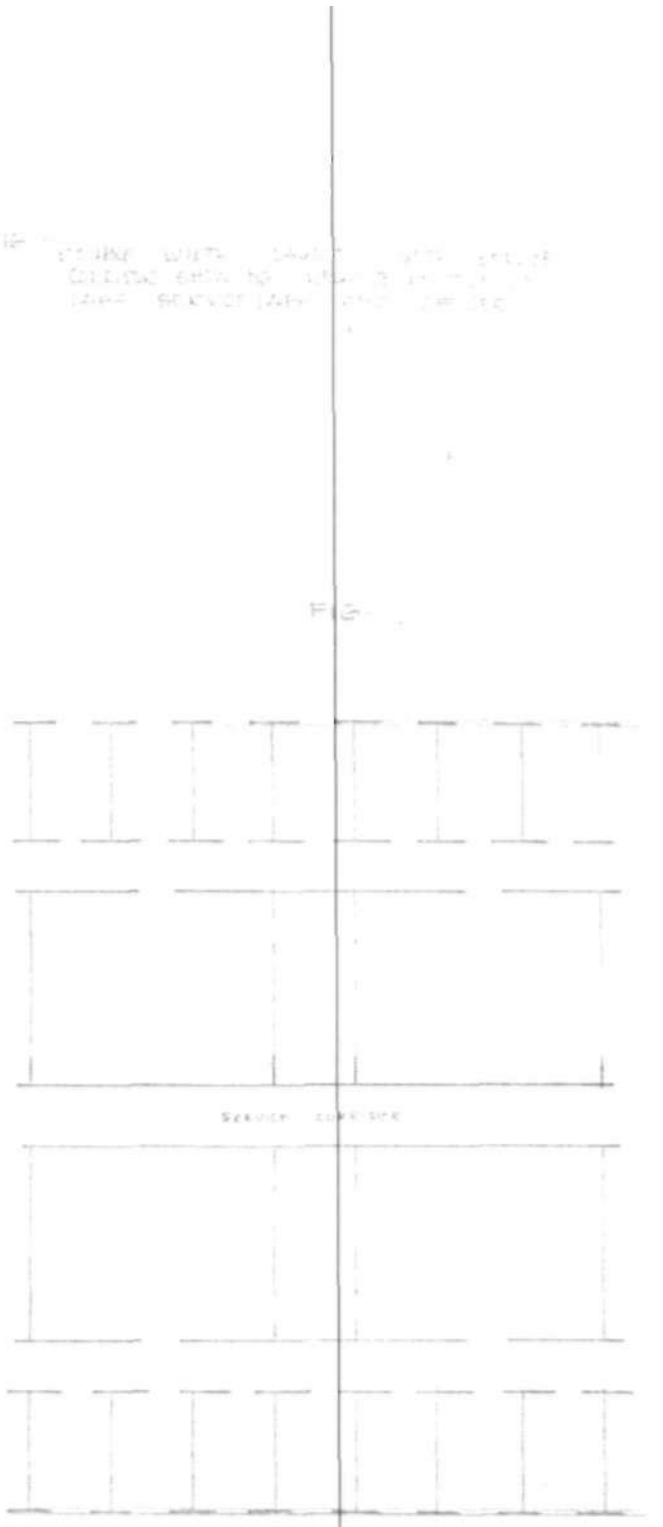
FIG ...



SERVICE LABORATORIES



DOUBLE CORRIDOR LAYOUT SHOWING RELATIVE POSITIONS OF LABORATORIES, SERVICE LABORATORIES AND TOILETS



SERVICE CORRIDOR

Laboratory offices

There are lots of controversies over best location for laboratory offices. Is it

- within the labs ?
- adjoining the lab?

or opposite side of the corridor?

or grouped in a separate part of the building?

or is it essential for all offices to be on an external wall?

- Adjoining lab - closeness.
  - can be larger than internal office
  - but use the more expensive serviced area.

-Opposite side of the corridor.

- Seperation from lab -undisirable.

  the further away the offices from the lab, the more serious the undisirability becomes

The absolute minimum size of offices are:

$3 \times 3m^2$

$3 \times 3.6m^2$ or 3.6×4.2

when it is along one side of the corridor. 4.2m makes it more satisfactory to get layout for stairs, toilets store etc. see figure 11, 12, 14

Depth of labs - 4.8,7.2. or 7.5m and some going to 8.1m, all resulting in a better utilization of space.

Fume Cupboards.

-This should not be located where they will block an exit for the accident risk is greater with fume cupboard

-It requires an exhaust duct with diameter 200m to 30cm discharging it above the building roof.

Piped services that may be required to be provided in the laboratories

TABLE VI IIIb

SERVICES	AVAILABILITY	PER OUTLET
Cold water	1.20kg/m^2 - 2.4 kg/M^2	0.228 liters/sec.
Hot water	0.4 - 1.44 kg/M^2	0.076 " "
Distilled Demineralized water	0.1 - 1.44.Kg/ M^2	0.076 " "
Steam baths	0.24 - 0.72 "	45.4kg/hr.
Special purposes.	0.72 - 4.8 "	45.4kg/hrs.
Gas	12in Wg	as Required
Oxygen.	0.72.	Varied.
Compressed air	0.24- 0.72	6.1m/mn.
Vacum	10 - 15 mttg	-
Electricity	- -	60A 13A

Cubic space and floor space required to hone the heating, ventilating, air conditioning system and multiple pipes of various lab services e.g. water, gas, vacuum and oxygen.

In designing laboratory buildings, safety precautions are taken against hazards of two kinds.

(1) Accident

(2) Long term cumulative effect on health.

Design factors affecting safety.

Layout

* fremovement
- *Escape Routes
- *Width of corridors
- *Gangways
- *Bench spacing
- *Multiple exits.

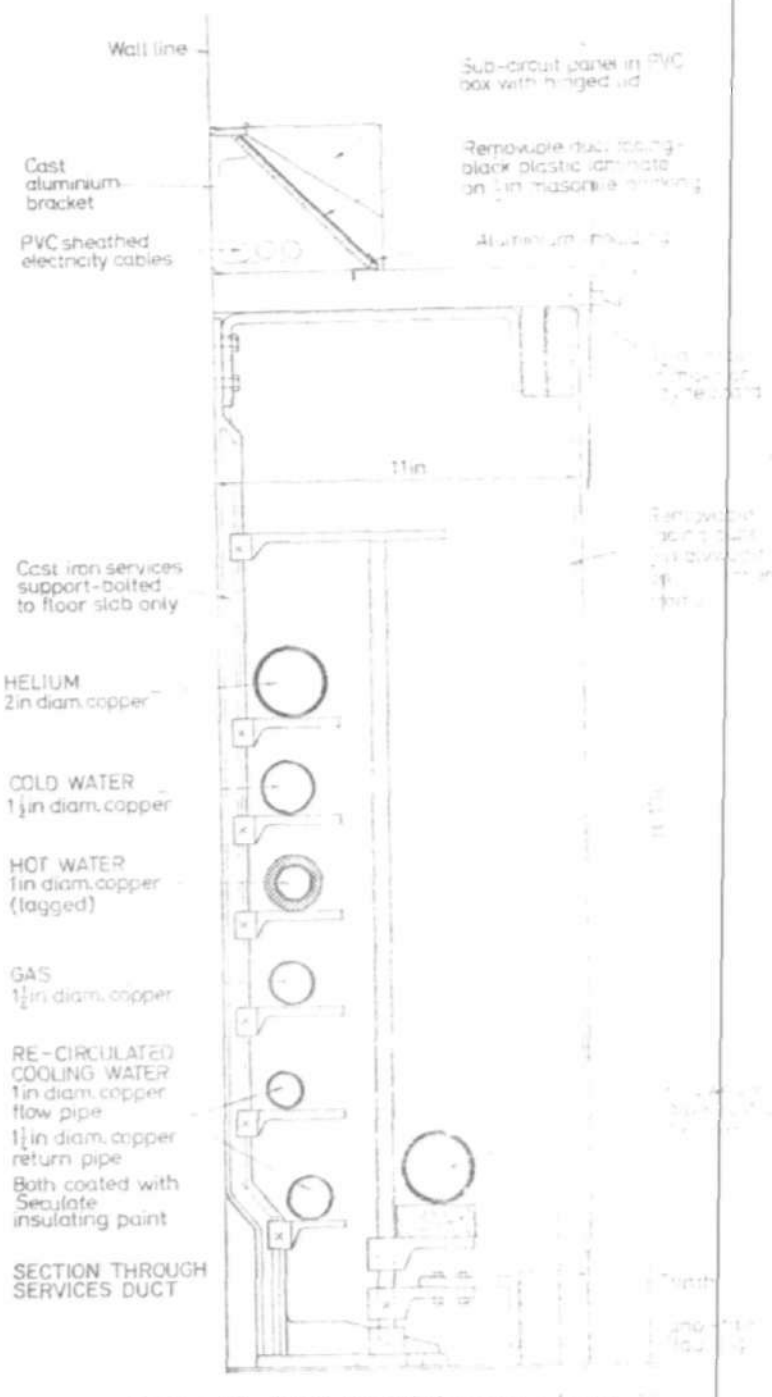


FIGURE 42 *David Rivett Laboratory, section*

Funiture - Bench with - 630mm for safety and efficiency.

Benches, tables, chairs cupboards to be stable.

Storage. depth of lockers/drawers - 540mm (1'9") safer to handle

LAB. FITTINGS

Benches fume cupboards, reagent , shelves, balance and instrument benches, fixing for bio-safety cabinets etc.

PROBLEMS.

Noise and noise control

- Noise reduction and structural vibration
- Reduction of structural vibration is necessary for sensitive instruments and apparatus.
- Quiet and conducive atmosphere in laboratories
- Noise insulation between different rooms.

METHOD OF REDUCTION

(1) By planning

(2) at source

(3) structural Reduction

(1) By planning

- site not be near the noisy zone.
- other building as noise shadow
- Dark Rooms as buffer within the same Building
- In multi - Storey building, noisy zone should be at the ground floor or basement.

(2) AT SOURSE

- though expensive
- good design and choice of materials and equipments
- materials - Silent door closers

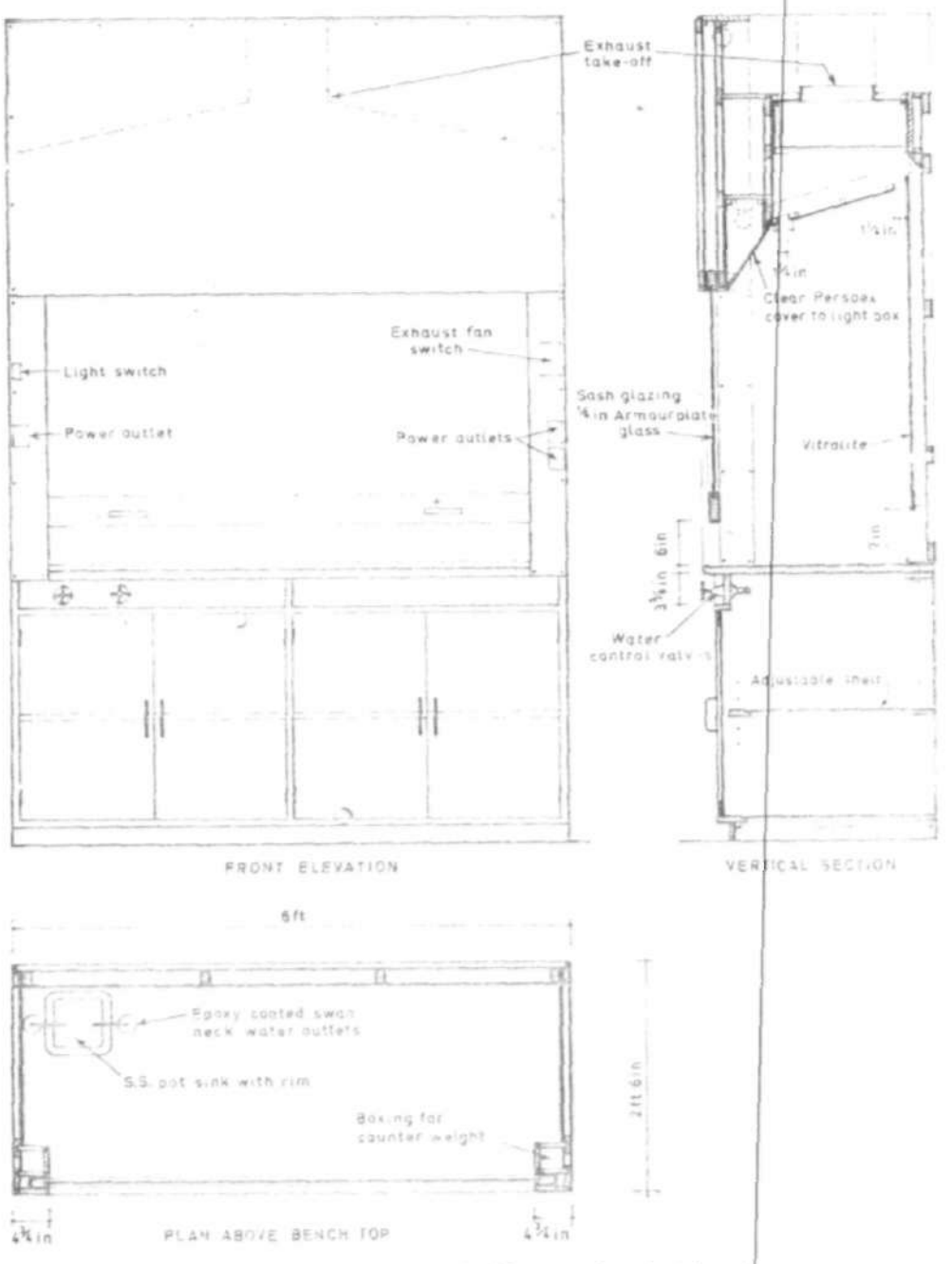
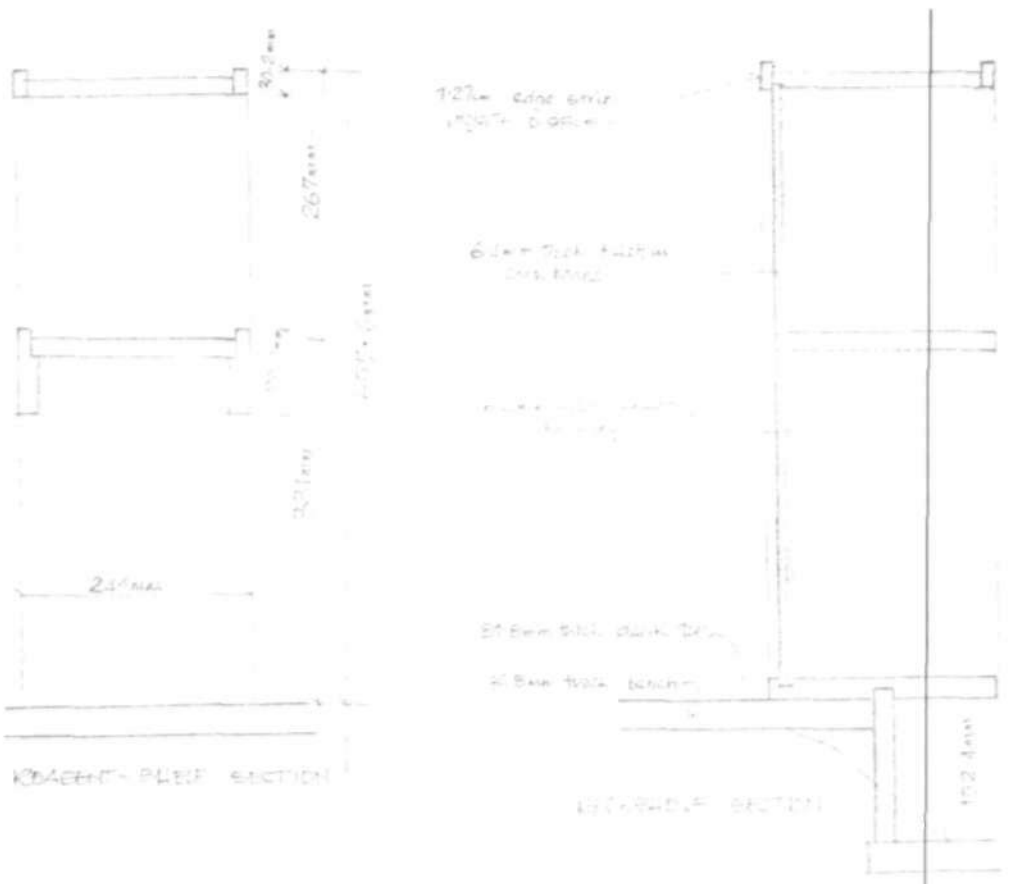


FIGURE 14 *CSIRO standard fume cupboard with sash*



CONSTRUCTION DETAILS FOR CLOSED STANDARD CABINET
SHEET UNIT



CSIRO STANDARD MICROSCOPE CUPBOARD.

- Resilient type of moveable equipments
- Choise of quiet equipment e.g. Electric fan motor, Compressor, water system, ventilation, and air-conditioning system
- Resilient floor finish

(3) STRUCTURAL REDUCTION

- absorption - sound absorbing surface
- Insulation between different Units. e.g. floor to floor and Room to Room
- Reduction of system that causes vibration

Vibration Reduction

This is very necessary in laboratory design becaus of the sentive instruments like balances, galvanometer, mirror, optical, and photograph apparatus and Electronic equipment

Source of Vibration

- Roads and Rail road traffic
- Electrical or mechanical machinery
- Door slamming
- heavy pedestrian traffic within building.

To limit the vibration Incidences or prevent transmission, we consider the following resources

- suitable position on a suita le or stable and more rigid position to suffer last possible inteference from vibration
- Isolate known mechanical vibration premises

PRECAUTIONS

SAFETY PRECAUTION

Should be taken against accidents and cummulative effect on health. To eliminate or reduce health hazards.

- Escape routes in case of emergency
- Regulation concerning fire protection considered
- strong funiture provided
- Specific Chemicals have separate storage
- General storage near laboratory reducing delivery distance on frolley
- unwanted contact avoided by providing conveniently placed service outlet.
-adequate dramage and waste disposal system
- All electrical installation earthed, insulation of floor finish and bench tops to prevent injury.
- Fume cupboards near the vetical ducts-work
- Fume protective and first aid equipment.

The followings are to be conspicuorsly seen in tables

- protective clothing
-Fume cupboard, plastic sheld, gloves boxes, and remote handling equipment
- Emergency show and wide spray fittre
- first aid boxes easily accessible
- fire fighting apparatus

FIRE PRECAUTION

There are two ways

(1) Preventive

(a) depending on staff discipline and

(b) handling of equipment and materials

(2) precautionary

Categories of fire hazards

- Damage hazards to structure and its contents
- personal hazard to the occupants
- Exposure hazard to fire spread from surrounding

Fire gradings in Laboratories exposure hazards, is same as in other buildings.

(a) according to damage and Exposure hazard

(b) according to personal hazard.

(a) It is as it affect structure in relation to building size and Combustible contant

(b) It is as it affects planning

Damage Hazard

Expensive and heavy equipment not easy to move so it is necesary to place labs in a higher rotten than lower fire grade.

Personal Hazard

Structural walls and floors remains intact and safe and the occupants escape

Factors -

* Restrict flame spread by using incombustible lining in circulation spacers - (stairs, corridors) and for floors hard wood, rubber, linoleum or plastics.
* Restrict spread of smoke and hot gases
  - confined to fire origins
  smoke stops at building corridors
  Half air-hour resistant to flame penetrating
* Limitation of building size
* Planning against personal hazard.
  Take fire risk into consideration

as a major factor in planning of the building. Conclusively, in designing or planning Laboratory, note the followings.

- suitably located and sufficient exits.
- limited travel distance to exit.
- corridors and staircases of adequate width.
- adequate escape route from working position
- floor of incombustible materials
- glazing - heat resisting glass.
- highly inflamable substances
- fire alarm system
- fire fighting system

RESEARCH LAB

More convenient/satisfactory size are (6.90X 5.49)M^2

There are supporse to be offices adjoining or near labs.

Desk spaces in the labs for one or more technicians

*supplied by a unit inserted under the sit-down-height- at the windows

* Also provided for graduate students or for medical students and other students whose stay ranges respectively from one year or more and for short terms stay in the range of several months.

* graduate students desk is next to the door on the corridor wall.

Ceilings need not be finished

* utilities runs can remain exposed
  - for reduction in cost.
  - ease of maintenance
* light fixture could be suspended below the pipe levels
  - to improve appearance.

Some investigators often stay for a longer period of time, therefore a resilient flooring such as vinyl or vinyl-asbestor tile is preferable.

- Asphalt tile cheaper but hard on feet and wears more quickly.
- Quarry tile & terrazzo Resistant to chemicals & pills. unyielding & Expensive

FIXED EQUIPMENT

- lab bench of either stand-up height 92.5cm or sitdown length 77.5cm always required one wall, adjacent to a utility chase
- Plumbing restricted to one "wet" wall.
- avoided in the window counter due to distance to vertical drains.
- Wall opposite fixed bench remains free of fixed equip. requiring drains and be reserved for free standing, moveable pieces.
- Utilities like Electricity, air gas & vaccum attached to the wall and free-standing equipment plugged in
- Selection of cabinents or drawers is an individual matter since a wide veriety is available.
- Don't use cup-sinks they are unsatisfactory
- End sinks should be large & deep enough to accomodate the rinsing of all pieces of glassware.

* If very corrosive chemicals are to be used, a stone sink is the traditional choise. But in hershey block resin sinks are used which have been entirely satisfactory and are cheaper, less breakage of glass-ware than with stone skins.

- Stainless steel pits with weak acids it is also difficult and costly to maintain.

* working surface may be of alberene, stone if many corrosive chemicals are to be used.

- most expensive
- breakage of glassware used is high

* Traditional surface is carbonized wood - satisfactory except where heating units will be used on it.

* Plywood with plastic is resilient, colourful, light-reflective and satisfactory.

- But melts with strong heat.
- stains with some dyes and solvents

* Storage cabinets - often hung on the wall reserved for moveable equipment
- placed above the highest piece anticipated
- a commercially available household refrigerator

* Provide fume hoodss for discharge of toxic fumes and volatile solvent It is to be located next to the utility chase for workers in the labs not to pass through it before they get to corridor door in case of fire hazard.

*Fan is to be on roof in the vent- preventing flow back or reflux in to the lab.

* A householder freezer where sera or virus are stored or an inbubator holding sensitive strains of tissue culture may have to be connected to the emergency generator.

Supporting facilities

* Recieving and store have access to perimeter road and highway
* Explosion proof rooms should be built both for flammable liquids and solvents and for anesthetic gases
* Motor pool - reseved parking spaces.

PART III.

SITING.

3. GEOGRAPHICAL AND CLIMATIC SETTING.

* CLIMATE, RAINFALL, AND WIND.
* TEMPERATURE, AND RELATIVE HUMIDITY.
* GEOLOGICAL PROPERTIES

4. LOCATION.

* PROPOSED SITING GUIDELINES.
* ANALYSING THE SITE.

GEOGRAPHIC AND CLIMATIC SETTING

CLIMATE; RAINFALL AND WIND.

Generally the Nation's climatic condition is gorverned by the influence of the two alternative wind systems determining the the seasons and atmospheric condition of any part of the country. They are the North-East Trade wind blowing from the sahara desert along with very dusty, dry air which is the time we have harmattan and the other South-West Trade wind blowing from the Atlantic ocean and carrying along with it moist and warm air which of course causes rainfall In addition to these two pronounced trade winds, there are local wind created from the nearby rivers and the hill very close to the site and so the area enjoying a very cool and conditioned atmosphere. Shao town shares the same climatic data with Ilorin, the only difference comes in, no political and administrative boundaries Shao is just eleven (11) Kilometers from Ilorin.

Rainny season covers a period of about eight months (8 months) commencing from march and ends by October. There exists double peaks in June and september. During which period we record highest rainfall of the year. The dry season lasts for a period of about four months (4months) ie, November to February. The record of the rainfall taken for a period of thirty years (3o years) (1949-1978) from the research conducted by Geography department University of Ilorin is shown in the table below (Table IId) - Minimum Rainfall of 66mm and maxima are 214.4mm and 243.8mm in June and September respectively.

The drainage of this area is such that it is surrounded by rivers and streams ie, Oyun, Awon-ga, Moro, Busamu, rivers and Alarum, Jeje, and Iyadu streams

TEMPERATURE AND RELATIVE HUMIDITY

The temperature in this region is moderately hot, it ranges from 75-80F ,anwuvally, ie average temperature is 27°C . The table bellow (Table IId) shows the annual temperature. Relative humidity is influenced by the Equitorial maritime air with higher Relative Humidity during Rainy season as compared with dry season. This ranges from 62.5% in March to 86% as the peak in September while there is a little variation in dry season 59% in January and 58% in December

TABLE IId;

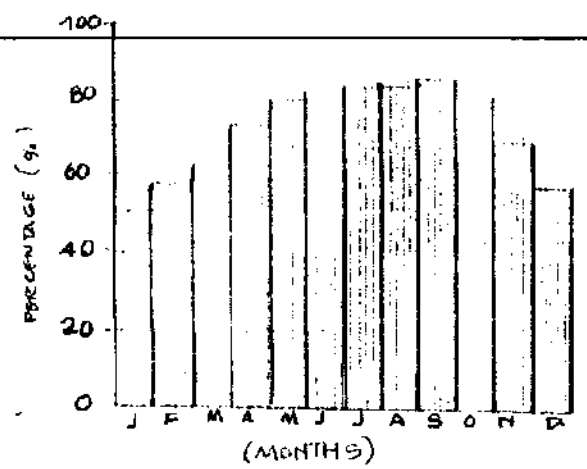
Geographic and climatic Data for Ilorin and its environs. Shao inclusive

	Jan	Feb	Mar	April	May	Jun	July	AUG	Sept	Oct	Nov	Dec.
Air temperature ^{o}C	26	28	29.9	28.9	27.5	26.3	25.2	25.0	25.4	26.0	26.6	26.0
Sunshine. hrs/day	5.7	7.3	6.7	6.5	7.0	6.3	4.4	3.3	4.0	5.6	7.6	7.7
Relative Humidity(%)	51.1	58.5	62.5	74.1	80.8	83.7	84.6	85.0	86.0	83.9	70.8	58.9
Total Rainfall(mm/mts)	17.5	13.5	66.0	121.9	152.4	214.4	154.4	121.9	243.4	180.3	22.9	10.2.
Wind Speed	0.46	0.62	0.8	0.8	0.51	0.4	0.5	0.43	0.26	0.77	0.78	0.76.

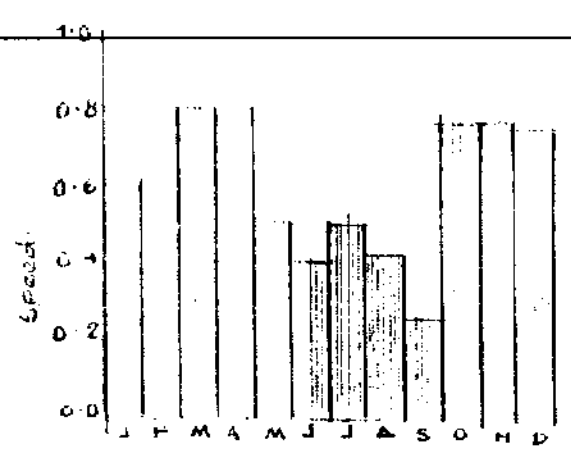
NOTE. All the average values have been computed using five years (5yrs) (1974-78) data except for Rainfall for which thirty years (30yrs) 1949-1978 record has been used.

Sources - Research conducted by Geography Department of University of Ilorin 1979.

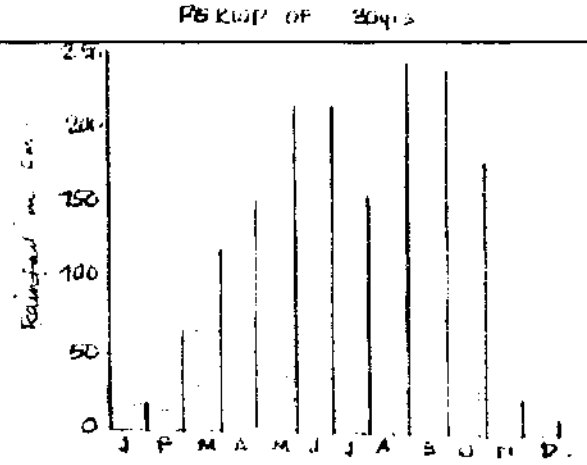
MEAN MONTHLY RELATIVE HUMIDITY.



AVERAGE MONTHLY WIND SPEED



ANNUAL MEAN MONTHLY RAINFALL FOR PERIOD OF 30yrs



RELATIVE HUMIDITY.

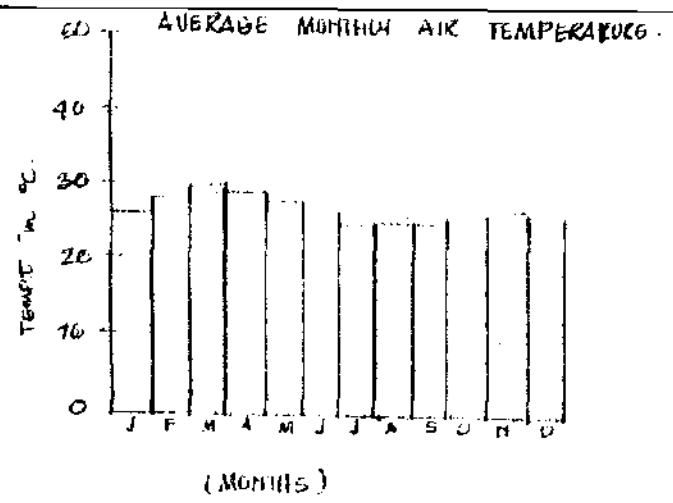
- Usually high at the peak of Rainfall between July and September and
- It is low during dry season.

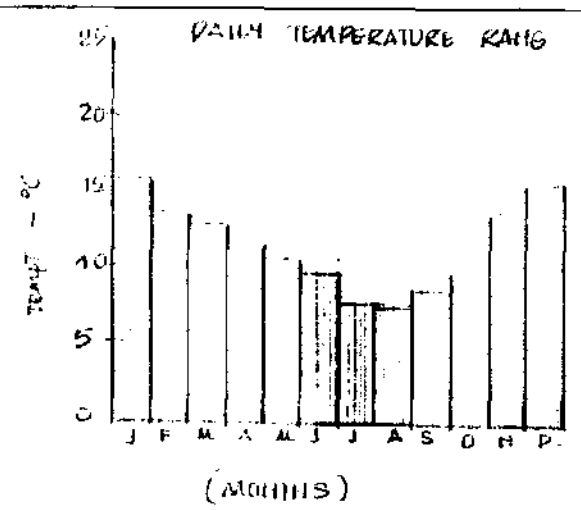
MONTHLY WIND SPEED.

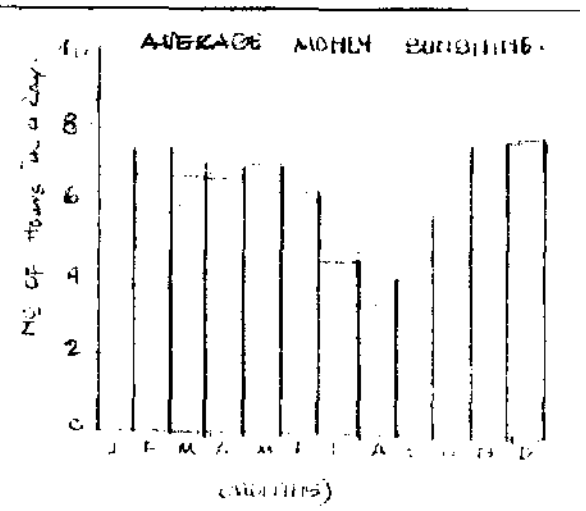
- Sometimes, wind is violent at the onset of rainfall.
- Violent and torential at it's start of and the end of rainy seasons.

RAINFALL.

- There are Eight People with the most Sycamore
- Rainfall - highest in
- Kano City Station represent
- for a period of 30yrs - 1941
- from Umaru Geography dept







NOTE.

TEMPERATURE — moderately hot
averagely 27°C.

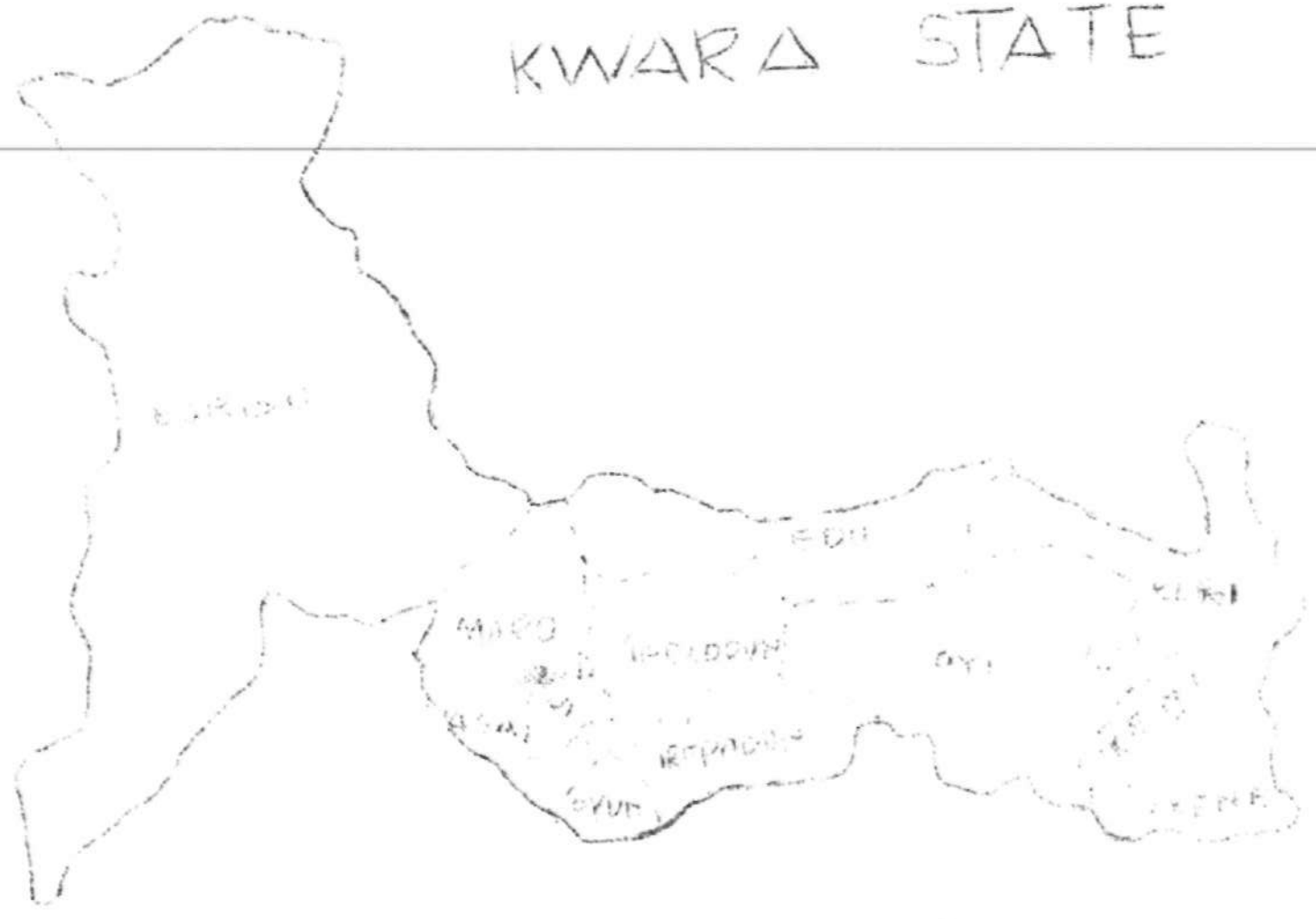
SUNSHINE. — days are moderately bright
— cool and fairly cloud between July and September.

GEOLOGY

The soil of the site is mainly laterite substrata of an undifferentiated basement complex of meta-morphic nature, analytical survey on this type of soil shows that it is capable of carrying heavy structure of building and requiring ... ontrol cost of foundation.

The vegetation of the area is such that, there are not too tall trees found there but dominating features are tall grasses and generally it has the features of the guinea savanna.

KWARA STATE



S.C. - STATE CAPITAL
/// - THE SITE

L O C A T I O N

LOCATION OF THE CENTRE

In the country, (Nigeria) survey of where this particular type of disease (Onchocerciasis) is rampant has been and is still being conducted. The predominantly affected area are Kainji Lakeeido in Burgu local government area, Ile ire in Ifelodun local government area of kwara state and shao in Moro Local government of kwara state.

Of all these places some are over 150km, or more and other are over 50km, to the state capital and the University teaching hospital Ilorin, but Shao is about 12Km to the state capital and this Shao happens to be one of the centres in the state where the University Medical students conducts part of their community medicine course work. It is in this process that the said disease (Ochocerciasis) was discovered.

Shao is a Yoruba town in Kwara state there are some Agatus/ Bassa residing as farm labourers in the town. Shao is in Oloru District of Moro LGA of kwara state and has a population of about 13,355 Inhabitants from 1963 census. It is situated 12 KM North. Ilorin the Kwara state capital. It is almost centrally located geographically in the state. It is on latude 8^{o}N and longitude $4^{o}34'$E. There are chains of hills making up the topography of the town. This of course affords it the unique scenery. It is founded on a hill and surrounded by chains of hills like - Yelu hill, Baba mogba hill Oke Agogo, Oke bomnbomu, Oke Isaa. This is evidently shown while entering Shao, whichever side one approaches to enter Shao, he'll definitely ascend or climb hills(though with gentle slop) Then the town is found on flat zone after the ascension.

At the outskirts of the town are rivers almost encircling it Souths of Shao ie between Shao and Ilorin is the Nigerian Army Barack with a population of about 6,676. The River Moro creates physical boundary between shao and the army barack. This particular river form a loop sort of around the town having different names at different places as shown in the map of Shao - There are rivers and streams like - River Moro River Awon, River Oyun, and streams like - Alarun, Iyadu, Jeje and Busamu streams. The features arround the town - the rivers valleys, and hills makes it arable agriculturally almost all the year round and of course gives reasons as to why it is susceptible to the disease's(Onchocerciasis's) breading area. This is becauseit satisfies almost all conditions favourable for the breeding of the Carrier of the disease (Black flies) or the simulium Damnosium. fig. 5

With the research conducted some data were gathered to help in planning stages. They are as shown below in the tables

TABLE IIa - Prevalence of Onchocerciasis (based on double skin snip) among male and female subjects in different Age groups

Age group.	MALE		FEMALE		BOTH SEXES	
	No. Examine d	% Positive	No. Examined	% Positive	No. Examined	% Positive
0 - 4	168	17.3	134	21.1	302	18.9
5 - 9	528	49.5	570	40.1	1144	44.9
10 - 19	262	61.1	256	58.6	518	59.8
20 - 29	186	70.4	197	68.5	303	69.5
30-39	202	75.2	213	73.7	414	74.5
40- 49	368	82.1	254	79.9	722	81.0
50 - 59	291	81.1	288	80.6	579	80.8
71 - 60	188	79.3	185	76.2	373	77.7
TOTAL	2239	64.4	2197	61.7	4436	63.1

TABLE IIb

Prevalence of Onchercia nodules (by age and sex) among subjects whose skin biopsies were positive for microfilariae.

Age group	Male		Female		Both Sexes	
	No Examined	% Positive	No Examined	% Positive	No. Examined	% Positive
0 - 9	313	11.2	258	8.9	271	10.2
1 0-19	160	33.8	150	26.7	310	30.2
20 -29	131	48.9	135	40.7	266	44.7
30 -39	152	61.8	157	52.9	309	57.3
40 -49	302	71.2	283	68.2	585	69.7
50-59	236	75.0	232	76.3	468	75.6
=/ 60.	149	73.8	141	77.3	290	75.5
TOTAL	1443	51.9	1356	50.1	2799	51.1

TABLE IIc.

Microfilarial counts (x + S.E.) per single snip taken from the buttocks of 1566 male and female subjects in different age groups.

Age group (years)	MALE		FEMALE	
	No of positive case studies	no of mf/ skin simp.	No. of positive case studies	no. of mf/skin simp
0 - 4	57	18 ± 3	72	11 ± 2.
5 - 9	164	41 ± 8	136	25 ± 5
10-19	90	73 ± 11	125	49 ± 8
20-29	75	138 ± 13	63	119 ± 6
30-39	115	152 ± 17	98	141 ± 16
40-49	186	195 ± 15	120	139 ± 11
71 50	129	131 ± 7	132	108 ± 8
TOTAL	820		746	

Below are also some figures relating to some other forms of manifestations of onchecerciasis and their respective frequencies or percentages.

(a) The subjects with leopard skin - 267 about 13.9% of the 1918 infected subjects. They are mostly about 20 years of age. Out of the 970 infected males, 15% had leopard skin and out of the 948 infected females 11% had leopard skin and most of the affected 73.6% had leopard skin on legs.

(b) Subjects with papular rash is 42.9%

" " Macular dyspigmentation is 35.3%

" " Hanging groin is 19.4%

" " Alenolymphocele is 0.9%

" " Scrotal Elephantiasis is 0.03%

" " hernias - found in traces.

Rate of blindness in men is higher than in women

Blindness in 918 men - 5.4%

" in 919 women 3.1%

Overall prevailence is 4.2% of blindness.

Prevalence of Onchocercias as measured by skin snips among 4,436 subjects was 63% - 63.1% - male 64.4% and females 61.7% subjects under 10 years (1446) infected was 39.5%. while 74.5% of the older ones (2228) individuals were infected. 63% were positive for mf. of onchocercal volvulus in their skins snips and 51% of those had palpable onchocercal nodules.

Shao is along the road going from north to South ie. Kaduna - Lagos just by the new bye-pass under construction which makes an easy communications with the body(NITR Kaduna) to which the centre will be responsible and also, it is so close and accesible to the University of Ilorin medical Institute (Teaching Hospital). Of course, it has once been recomended to the state Government for an establishment of such an institution or clinic dealing with the said disease by one of the suppervisors of the research from University of Ilorin medical school. Shao is also almost centrally located in the state compared with the location of other affected areas.

This would therefore be logically concluded that an infected area with close proximity to the state capital and the University teaching Hospital- who of course forms the largest percentage of the workers in the centre- should adequately serve and of course be more acceptable for a centre for the project.

These factors given above make Shao a suitable place for the centre.


EL PASO
EL PASO
MORO

PROPOSED SITING

GUIDE LINES:

In planning a site plan for a w nedical science buildings the followings are to be considered,

(1) - Separation of different kinds of traffic

(2) - development of circulation and utility arteries

(3) - careful consideration given to site access for public and staff and for services and emergency vehicles.

- Ambulance and services Entrances are screened from patient areas.
- Ambulance may not be required to pass through the parking area where they may be subject to delay
- There should be a land bank for future growth, an open place for expansion without any obstruction to the on-going services
- Zoning site promotes orderly site development
- There should be reserved land/areas for future functions like Medical office building extended care or skilled nursing, primary care, mental care, child care, or other health related facilities.

ANALYSING THE SITE

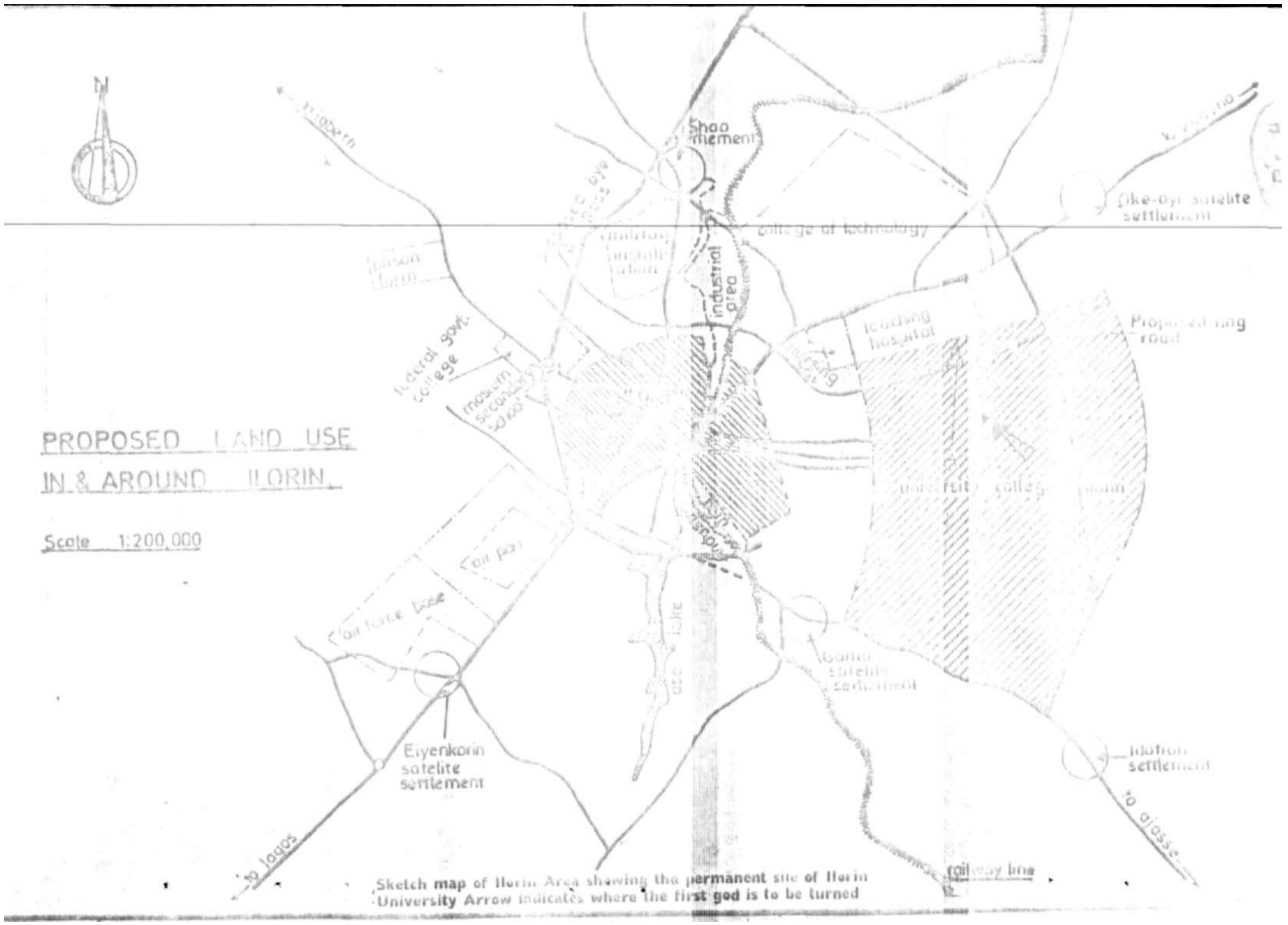
The site of the centre at shao is proposed to be located south west of the town, close to the bye-pass leading to Kaduna - the site is fairly plane and of course accessible to the locality and including the staff

By the West of the site is the bye-pass which of course is envisaged is going to be of heavy traffic in future and of course it is not advisable to create a direct entrace from the major road. Noise and disturbances and vibrations created by the highway makes the site to be far into the quiet zone of the area.

This site is chosen again considering the problem to be solved, River blindness disease which of course breeds well in the rivers and streams since the solution sought for is to create an intensive care centre for Onchocersiasis it will therefore be appropriate to make the site a little bit farther away from where there are a net work of streams and rivers, so that for a successful treatment to be achieved, the patient will be a little bit save after recieving treatment

Also it is located on an easily accessible area of the town to both the locality and the suburbs and even from Kaduna through Lagos-Ilorin Road to Kaduna going through the new bye-pass.

In addition the plot or portion of the land on which it has been located has been earmarked for health building by the local planning body in the locality. And so makes it easy to locate the centre there.



Sketch map of Ilorin Area showing the permanent site of Ilorin University Arrow indicates where the first god is to be turned

THE SCHEME OF DESIGN PROPOSALS.

8.01 Brief and accomodation schedules

8.02 general planning Considerations

8.03 studies and proposals

- Clinical Unit
-
- Research Unit
- Laboratory Units.

BRIEF AND ACCOMODATION SCHEDULE

The Institution consist of majorly three main sections which are basically - the medical section -(the core of the centre)

- the Research Section
- and the Administrative section

The Administrative section coordinates all the activities of the Institution. Each of the section is still having sub-sections as shown below.

Clinical (Medical)section)

(a) Ophthalmology department (b) Dermatology Department

(2) Venepuncture Unit (d) Pharmacy

(e) Nursing Unit (f) Operating Unit

(g) History taking Unit/consultation (h) Clinical laboratories

Research section

(a) Heamatology (b) Serology

(c) Histopathology (d) Parasitology

(g) and Administrative Unit

Administrative Section

(a) External Admin (b) Internal Admin

(c) Finance Unit (d) Canteen

(e) Conference/Information (f) General matters.

There are some laboratories that occur in both the clinical and the research sections. This brings about close relationship between the clinical works and the researchers or research teams. Some of the laboratories include -- Haematology, Serology, Microbiology. etc, Each of the section is given its own distinct position and with the detailed components as listed below

CLINICAL (MEDICAL) SECTION.

Department	Space	Size(M^2)	No	Occupancy No of persons	Remarks
Ophthalmology	Consultation/Exam.	16	2	1	made adjacent to the operating theatre the shape of the Retraction is of tunnel shape the length varies depending on the consultant.
	Refraction Room	18(varies)	2	1	
	Treatment Room	16	1	2	
	Record off/Receptionist	10	1	1	
	Waiting area	varies	1	-	
	Toilets	9	2	-	
	Store	10	1	-	
Dermatology	Consultation/Exam	16	3	1x3	Should be very close to the
	Treatment	9	2	2	aperating theatre and emergency
	Doctors louvre	20	1	varies	entrance. and the surgical ward
	Nurses' station	10	1	2, 12	
	Store	12	1	-	
	Toilets	6	1	-	
	Equipment	10	1		

Department	SPACE	Size	No.	Occupancy No. of persons)	Remarks
Venipuncture	Pathologist office	16	1	1	Vevery close to the History taking and waiting area and accessible to the clinical labs
	Blood Bank	10	1	1	
	Cold Room	9	1	1	
	Waiting Room	varies	1	varies	
	Head Technician	10	1	1	
	Transfusion Lab	18	1	2	
C.S.S.D	Receiving/Sorting	15	1	2	It should be made accessible to the operating theatre and the clinical laboratories
	Instrument washing	10	1	2	
	Sterile storage	9	1	1	
	Supervisor office	10	1	1	
	Clerk office	10	1	2	
	General store	10	1	-	
Pharmacy	- Pharmacist	15	1	1	Should be located in a conspicuous place and placed as that which is the last stage of the journey in the centre
	- Compounding and dispensing	30	1	3	
	-active storage	15	1	-	
	- Dispensing	15	2	3	
	-Alcoholic vault	9	1	-	
	-Sterile room	10	1	1	
	- Staff Rest room	20	1	-	
	- Injection Room	15	1	2	

DEPARTMENT	SPACE	SIZE(M^2)	Occupancy No.	Occupancy No. of persons	REMARKS
Operating theatre	main operating room	$24m^2$	1	4	
	Scrup-up	10	1	1	
	Anaesthesia room	15	1	1	
	Sink room	9	1	1	
	Sterile supply room	10	1	1	
Nursing Unit	Record officer	18	1	1	
	Admission officer	15	1	1	
	Admitting and Interview	15	1	2	
	Surgical ward	varies		3	
	Porter	10	1	1	
General Medical History taking	Consultation/Test		2	1	It is to be close to the operating theatre and the clinical laboratories
	Record office	1	1	1	
	Waiting Area		-	-	
	Clerical assistance		1	2	
Clinical laboratory	Clinical pathology	54	1	4	It is near the surgical wards operating theatre and dermatology department
	Chemical lab	36	1	3	
	Histology lab	36	1	3	
	Balance Room	10	3	-	
	Haematology	36	1	3	
	Microbiology	44	1	3	
	Storage Equipment	10	1	-	
	Glass washing room	10	1	1	
Administration	Receiption	16	1	2	
	Main waiting	varies	1		
	Deputy Directors Office (medical)	18	1	1	
	Personal Asist.	15	1	1	
	General office	30			
	Personal sec.	10			

DEPARTMENT	SPACE	SIZE	NO.	OCCUPANCY	REMARKS
Administration cont'd	Board Room Meeting Room Conferences Coffee Room	varies	1	varies	adjacent to the director's office or very accessible to his office
	Chief medical off.	15	1	1	
	Personal Asst.	10	1	1	
	Medical officer	15	1	1	
	Matron	15	1	1	
	Secretary	10	1	1	
	Senior Health Officer	15	1	1	
	Health Officer	10	1	1	
	Toilets	9	1		
RESEARCH SECTION					
Laboratories.	General laboratory	72	18	6	This is to be located in a remote and quite place to prevent disturbance vibration etc on sensitive Instruments
	Special labs	32	3	4	
	Lab. office	15	1	3	
	Service Rooms	6	1	-	
	Store	9	1	-	
	Seminar rooms	70	-	-	
Administrative Unit	Deputy Directors' office(Research)	15	1	1	
	Personal Assist	10	1	1	
	Secretary	10	1	1	
	Clerical Assist.	10	1	1	
	Record office.	10	1	1	
	Information office	16	1	1	

GENERAL ADMINISTRATIVE SECTION

Department/Unit	SPACE	size	No	Occupancy No.of persons)	Remarks
-	Main Entrance Hall	varies			
	- Reception area				
	Record/Registration	18			
	Director's Office	18	1	1	
	Personal Assist	15	1	1	
	Typist	10	1	1	
	Clerical pool	20	1	1	
	Board Room	60	1	3	Very close to the diretor's office and accessible to him
	Conference Room	-	-	-	
Etenal Administration	Head External Admin. and publicity(P.R.O)	10	1	1	
	Assist. Head.	10	1	1	
	Information officer	10	1	1	
	and Asst. Inform. officer	10	1	2	All these could be found in a single complex with out much seperation hence sharmy some things in common like toilets, finance department etc.
	Toilets	9			
Internal Administration	Head Internal Admin.	15	1	1	
	Personal Assist.	10	1	1	
	Clerical Assist	10	1	2	
	Stationery store	10	1	1	
Finance	Head finance	15	1	1	
	Deputy finance officer	15	1	1	
	Accountant office	10	1	1	
	Clerks	18	1	1	
	Cashier	10	1	1	
	Paying off	10	1	1	
	Purchasin officer	15	1	1	
	Audit officer	10	1	2	

Department/Unit.	Space	Size.(Me).	No.	Occupancy	Remarks
Library	Reception				
	Librarian Office	15	1	1	Should be centrally located
	Workroom -	30	1	Varies	as to be easily accessible
	Books/Readers	150	1	2	accessible from Research and
	Stores -	10	1	-	Clinical section including the
	Periodicals	20	1	varies	administrative section for
	Medical records	18	1	-	references
	Toilets	9	2		
Staff canteen	Main Dining	90	1	2	
	Cooking/Kitchen	40	1	4	
	Storage	20	1	1	
	loading	-	1	-	
	toilets	9	1	-	
	office	15	1	1	
	Changing	18	1	-	

SUMMARY OF TOTAL NUMBER OF STAFF.

SECTION	DEPARTMENT/UNIT	NO. OF STAFF	TOTAL
Clinical	Ophthalmology	7	
	Dermatology	6	
	Venipuncture	6	
	Pharmacy	10	
	Operating theatre	8	
	Nursing unit	8	
	History taking	5	
	Administration	8	
	Clinical labs	17	
	C S S D	8	83
RESEARCH	Haematology	21	
	Serology	21	
	Histopathology	21	
	Parasitology	21	
	Microbiology	21	
	Entomology	21	
	Administration	6	132
ADMINISTRATION	General office	6	
	External Admin	4	
	Internal Admin	5	
	Finance Unit	10	
	Library	4	
	Staff canteen	8	
	Conference	2	39

Total number of staff in the three main sections is 254 people.

SERVICES AND MAITENANCE DEPARTMENT

This department is not architurely detailed in the design but it is shown in the general layout of the plan and zoned for efficient function and expansion possibilities. The workers needed are gives . It is as listed below. Usually there is the head manning the services and maintenance section, his assistance and clerks and

- Central (Bulk) Store
- Instrument Repair shop for Electrical Machanical appliances
- Automobiles repaire workship for vehicles
- Carpentar's workshop
- Building Repair unit
- Petrol filling point for the Institution and staff.

SERVICES

. Water is obtained from the More Dam which presently is serving the Nigerian Army Barrack and is supposed to serve the barrak and the Shao community. In the Institution is one Minor water supply tank on nearly all the building units that are purposely two-storey!

Electrical Supply - The Electrical supply will be by NEPA whose connection is from Jebba provisionis to be made for automatic stand-by-generator.

Hot water and steam- There is a central boiler house proposed.

Telephone - There is both Intercom and External in collaboration with Nigerian Telecommunication authority (P & T)

Refuse disposal

A central incimiration plant is proposed

Gasses, Vacum and
Coprised air supply

A central depot and supply in the cylinder is made to labs and then they are connected to the runs Oxygen, Nitrogen the mort gass have to be supplied in cylinders

Sewage disposal

Central sewage system proposed, the Water/liquids from the labs or clinical section are specially treated before the effluent could be discharged into public sewer.

Suface water Drinage

The natural drainage patterns is exploited and a rgumented by drainage Channels, down to the nearby river.

Housing Accomodation

There is provission for accomodation of the students of the University of Ilorin and Relatives of the patients admited. There is no provision for Researchers considering the distance of the centre to the University teaching hospital to which the centreis responsible Also in the Town Shao which is mainly residential zone could easily accomodate the junior and Intermediate staff.

GENERAL P LA NING CONSIDERATION.

While proposing the project, what first accured to me was some problems to be encountered in funding, land availability, personels to man the centre, and availability of utilities and other essential social amenities.

During the process of research the problems were solved with the following as the answers to each of the needs. The funding of the project will be jointly by the Kwara state government and University of Ilorin Teaching Hospital and also some assistances coming from the body to which it will be directly responsible to ie. MRCN, Medical Research Council of Nigeria. Hence there is guaranteed flow of fund for the Uptake and maintenance of the centre The question of land suitable for the project is solved with the ample space earmarked for health/Health Education in Shao. The problem of personels to man the centre is solved with University of Ilorin Medical Institution sponsoring personels and some other Universities in the country to carry out research on the disease. The clinical part will be handled by both the state ministry of Health and the Teaching Hospital . Shao being very close to Ilorin, social amenities and other utilities are of little problem. As of now there is NEPA light in the town though yet to function and water from the Army Barrack which is less than half a Kilometer to the site. Already there is telephone line as far as to Army barrack and so could be tapped . There is also an all year round usable road linking Ilorin, Kaduna and even Lagos. Shao is very close to Ilorin so allthe problems are partially solved.

The followings are the main factors guiding the planning of the proposed centre for functional, comfortable and easthetic purposes.

(1) Concentration of Similar activities into functional sub-complexes.

(2) Maximum close communication link between the individual functional areas of the centre with minimum vehicular traffic and to maintain the tranquil environment neccessary for treatment(clinical) and Research work.

(3) There is maximum expansion possibilities with minimum distruction of vehicular accesses to all parts of the centre.

(4) Maximum reduction of Solar control problem.

(5) Courtyards flowing gradually into one another to have proper circulation of fresh air.

DESIGN FACTORS.

The total population of the known area of high endemicity -

- Borgu LG A

- Ifelodun L G A and

- Moro LGA all of Kwara state is - 354,243

From the Research conducted, 63.1% have positive skin snip tests,

i. 63.1% of 354,243 = 223,527.

I want to provide for 20% of the affected subjects,

ie 20% of 223,527 = 44,705.

Those therefore with nodules = 20.33% of 44,705

= 9,088

and those with skin disease is 78.2% of 44,705

= 34,959

Those with partial or complete blindness is 42% of 44,705

=1,878.

Hence in the centre I expect 0.5% of the infected subjects

ie = for Nodules - 45 Patients

for skin -175 "

blindness - 10 "

This therefore sums up to 230 patients daily so it ison this that the design of the centre is basel.

CLINICAL SECTION

The clinical section which of course is the major centre of attraction to the community and the endemic area consists of six major department. they are - O phthalmology, Dermatology, Pharmacy, Venipucture, Operating theatre and the Nursing Unit. All these Units or departments are built around a rectangular c courtyard which of course and actually makes it very simple, airy, and more clinical in outlook, All the department are linked together by corridors or varandah. The Operating theater and the CSSD are located at almost the rear part of the clinical section this is so to avoid disturbance from the patients flowing into the area. The Clinical laboratories and the studeuts Experimental laboratories are located on the first of dermatology and Nursing units. Then the library is placed in such a way that it is accessible from the three arms of the Institution ie. from the administrative section, the clinical and the research zones.

For convinience sake each of the unit has a waiting area that is to ease transportation, movement from place to place.

The operating theatre is of a rectangular shape for economic use of the space of course, there are different types of shapes of which the operating theatre can assume first as shown in the diagrams below, there are those samples of the designs by Jean Walter - circular 1937, thleptical by Paul Nelson, Iregular shape designed by W. Vetter and J.P Vouga 1946, and the Rectangular type by the United state public Health Service 1952.

On the other hand the shape of the Roofing or ceiling are usually curved sometimes semi-circular in shape all these aiding to concentrate high on the operating tables at the centre and above the dome shape of the ceiling is the gallery and provision for



H. AITH SERVICES 1952

EXAMPLES OF VARIETY IN THE SIZE AND SHAPE OF OPERATING THEATRES

observation through view slits, where the student and other observers could sit/stand and watch the operation taking place. The shape are also sometimes flat/shape like that at the canton and University Hospital Lausanne with the shape of the section as shown below.

Ventilation in operating theatre is usualy very important and there are variable in an air conditioning system which are temperature, Tumidity, velocity, direction and degree of filtration of the air supplied to the rooms. While perceptible air movement may be disirable in an operating theatres for the surgeon and his assistance druughts, particularly at the operating table level must be avoided. Hence British standard code has recommended 80°F to 82°F temperature and various groups or individuals have arrived at a different range of temperature ranging from 65-80°F with 4-20 air changes per hour.

OPHTHALMOLOGY

The ophthalmology unit consists majorly of the Refraction Room, the treatment Room, the reception and Record room the Nurses room, then the specialists office very close or adjacent to the refraction room, there is also the waiting area store and toilets.

In the refraction room there are instruments for the orthoptics, tonometry and gonioscopy which is used for complete examination and treatment of the eye. There is also provision for the visual lane with routine examination equopments ie. the chair stool, traial lenses refracting accessories,slip lamp. Then there are some field-Equipments ie, the perimeter tangent screen, consultation desk there is also the medicine room treatment cabinet, treatment table

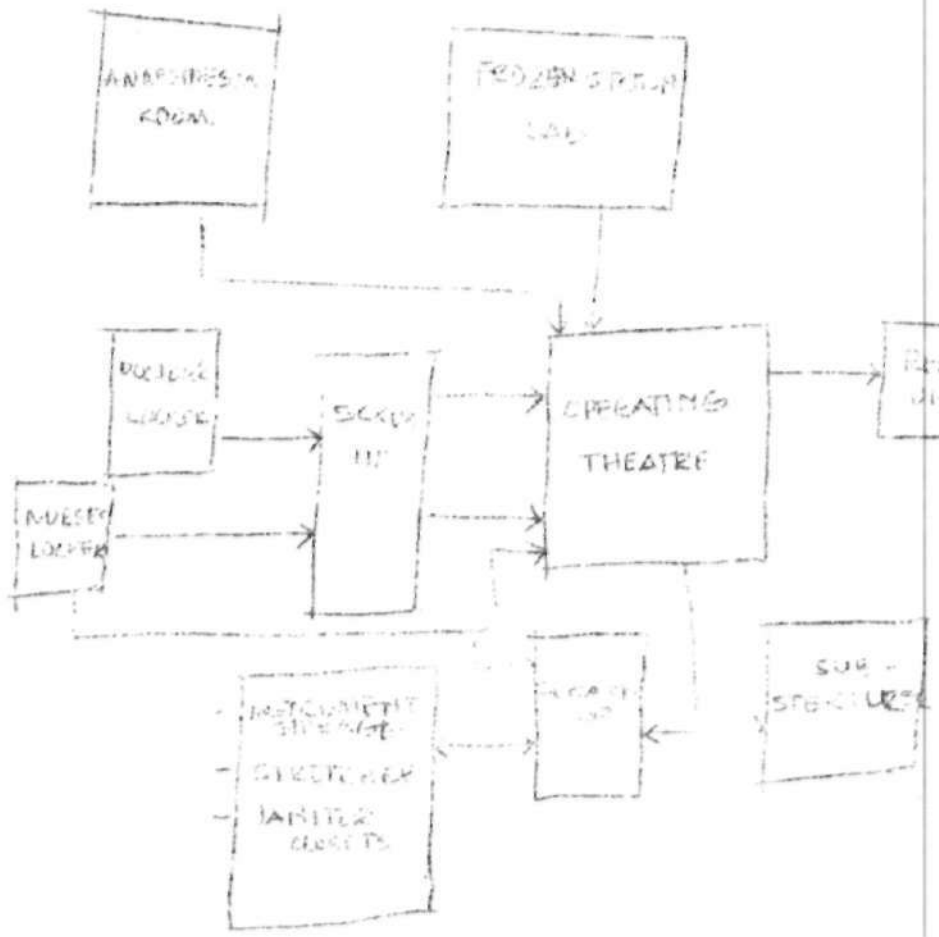
In some cases, some specialists. Uses the exammination room as the refraction roof, treatment room, minor surgery room field s rooms, photography rooms, muscle orthoptic room Usually there used to be refraction, treatment and fields in the same room, but now I wish to separate them into their functional arrangement size of refraction room depends on predication of the practioners Some have it as at least 6m, some from 4.5m - 6m. is satisfactory when long distances are considered Tunnels are used - The tunnels c could be that which extends from floor to ceiling or constructed above file opening out into a different room . The visual lane.

The tunnel type of Refraction room along which the visval lane is located is best for its type because if is economical when there will be two of the refraction room. In each room are projector lens cabinet, slit lamp, the screen on the end of the tunnel the Doctors table, for Examination.

Layout of An Operating theatre.

The design and construction of general Hospital by U.S. public Health service, U.S. Department of Health, Education and welfare 13.

OPERATING THEATRE



RESEARCH LABS

In determining the size of a laboratory the number of workers must be taken into consideration,The laboratory is to be adequately supplied with laboratory space where the services are supplied The laboratories are all to be equiped with the conventional l laboratory benches or fittings.

Rooms associated with the laboratory include- Controlled environmental Room, Scientist offices, balance rooms and stores(shared)

The length and width of benches define the flor area needed per person where the length is total length of benching, sink, flume cupboard etc, all these are very necessary for researchers/scientist for their work and the width is the width of benching plus the clear floor spaces needed for movement while working, and for circulation In designing (working out the area per person required in research labs) it is reasonable to assume such standards as would be applicable to room designed for two or three workers. The minimum bench length is 4.6m which includes the buer space for fumecupboards, sniks, storage, reading and writing activities. Arm reach from standing or sitting position controls the width of bench lean manual operations I can be carried out without leaning forward over the bench. It has of course been found out by Nuffield Foundation that if allowance is made for leaning, a width of 60cm will be easily manupulate over it with the service taps and outlets.

The followings are considered in allocating spaces between benches.

* space taken up when actually working at the bench

* space taken while working parallel and close to the bench and for an Emergency movement.

*Spaces needed for bending infront of a bench to take something from cupboards below.

* Spaces needed for use of trolleys carrying supplies or Equipments.

* spaces needed for 2-persons working back to back and one person passing then.

ARCHITECTURAL CHARACTER OF DESIGN AND CONCLUSION

10. * Design solutions.

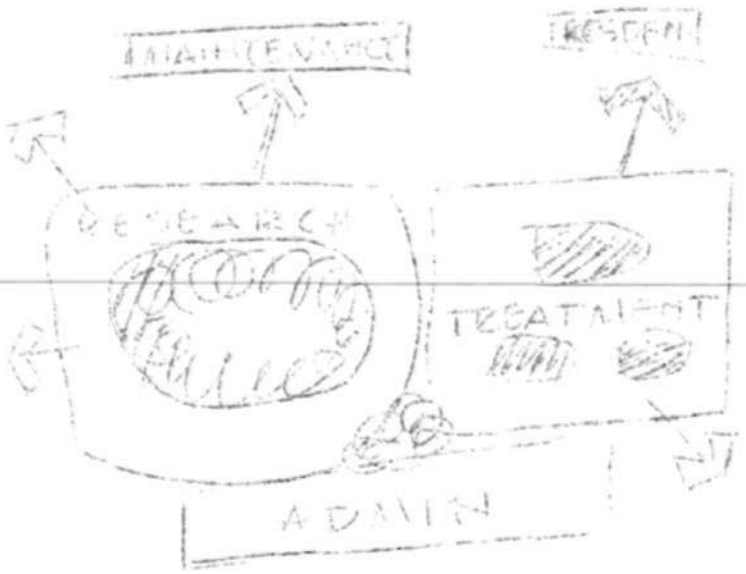
* Conclusion.

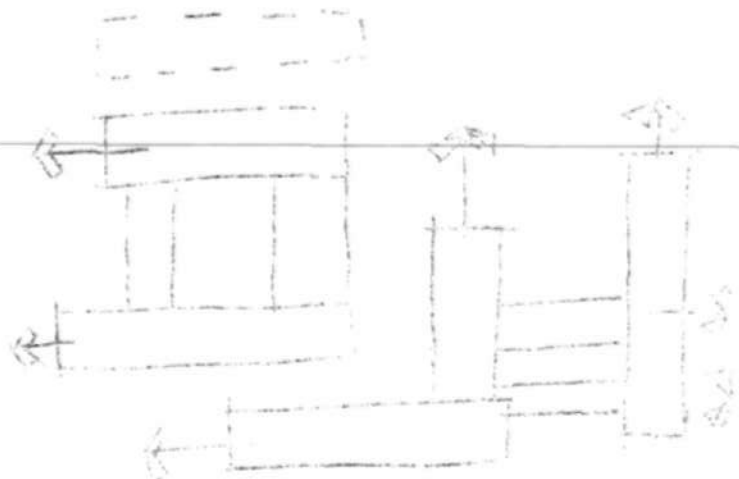
ARCHITECTURAL CHARACTER OF DESIGN

By nature of the institution - treatment and research combined· Centre - of the scope proposed it is imperative for a unique(if (if not symbolic) image to be created and so this given it the clinical or research outward appearance ie. it has a character. Hence a strong and imposing architecture with clear complimentary identities for the three main institutional functions are created ie, functions of the Intensive care centre-the treatment, the research and the Administration.

Conceptually, this is diagrammatically explained in the later stage here ie.below are detailed explanation of the concept used. These are the zoning concept, planning for Expansion and the courtyard system adopted to facilitate the cross ventilation of the centre, where necessary or needed and even the site zoning.

The various department are located where they are in due consideration of the interelationship with the adjacent department just in the sequence shown below.

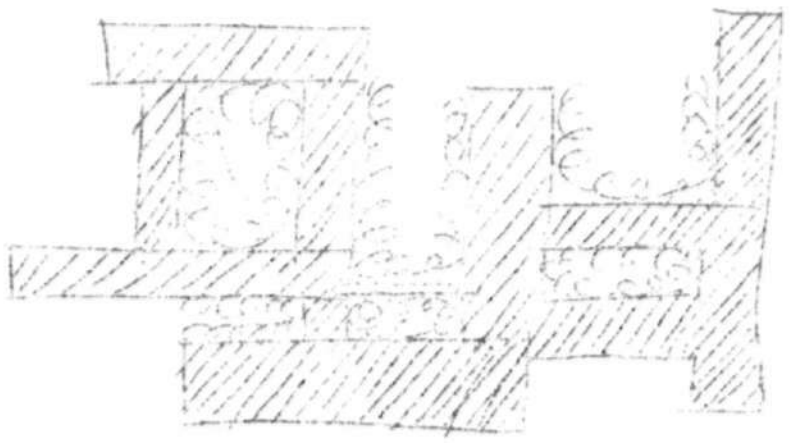






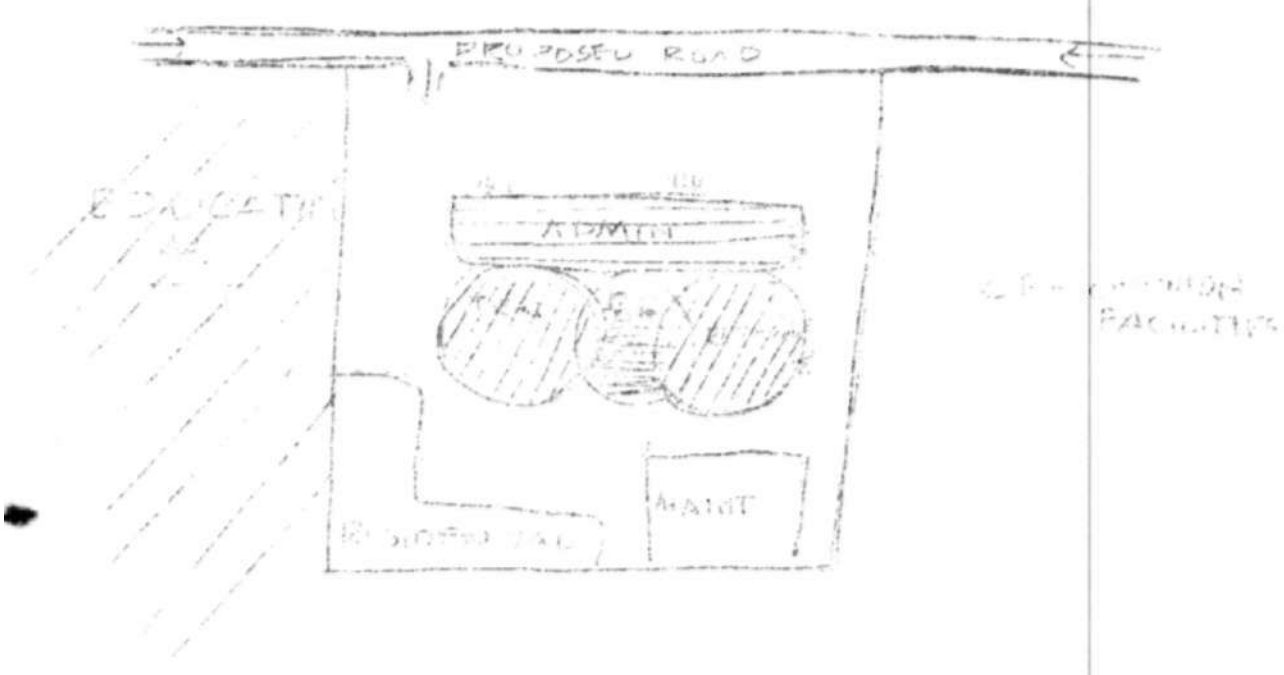


CONCEPTUAL ANALYSIS



THERE IS NATURAL VENTILATION AND LIGHTING CREATED BY INTRODUCTION OF COURTYARDS (OPEN OR CLOSED)

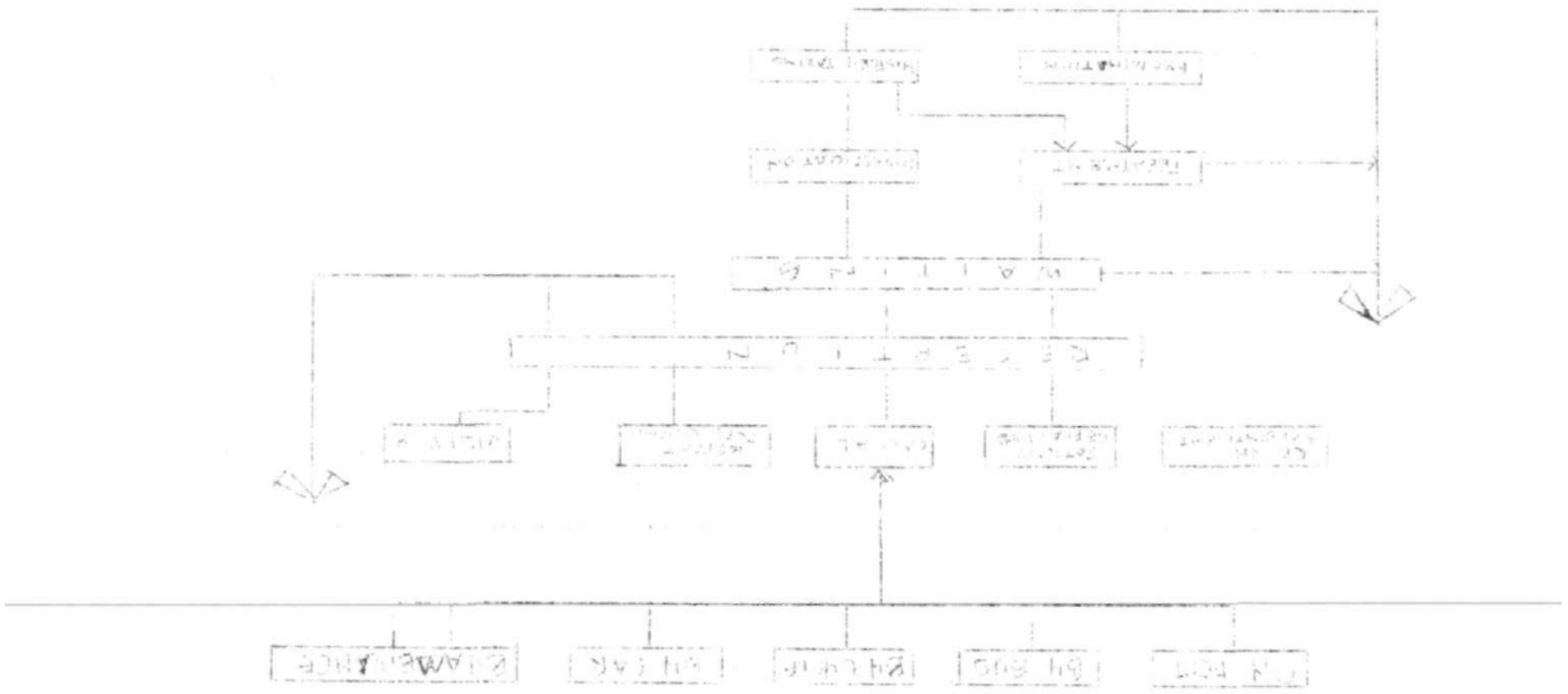
SITE ZONING



Generally, the design is based on the concept that the simplest diagram for an extensible building is one where primary communication route or spine is straight from which other communication links to different departments branch out at right angles.

In reality, Hospital or Educational health centres are rather like ships, the psychology of their design is very similar. There is the same sense of purpose and ceaseless activity throughout day and night. For both patient and Doctors or physicians, it has of course become of necessity a home as well as a place of work. One may work for forty eight (48) hours or more at a stretch without leaving the building. Under this circumstances, light, quiet, and spaciousness are important. Communication, the way in which people come into contact with one another is a fundamental consideration. Hence the shape and the form of the centre merely emerge from a design concept that allows few concession to visual formality. The building therefore consists of series of functionally differentiated, individually designed department linked together according to functional requirements.

The clinical part is located in such a way that the portion is first to be seen and reached from the heavily trafficed road and so is the emergency, part which is by the approach side. Also creation of varied sizes of enclosed, or semi enclosed courtyards are purposely meant to give a non-monotonous experience, giving the whole complex a clinical look. The main clinical part is located much closer to the main approach than other departments or sections



STRUCTURE. The concept of free span is used in the research building the floors and roofs one of reinforced concrete space deck using post-and pretensioned and prestressed, precast reinforced concrete lattice grid. For instance there is the advantage of free space of about 12mc/c which can be flexibly partioned and used as labs, offices and or seminar rooms.

But in the main building ie. the treatment centre and the administration section, conventional reinforced concrete floor slabs are used including the students hostel, maintenance and the visitor's lodge.

By using heavy construction, variation is kept minimum, load bearing brickwalls with reinforced concrete floors are the most effective.

The universal scientific methods and procedures of treatment and research are to be followed, then the conditions for the efficient use of equipments have to be controlled. Then the disire to have quiet vibration free, dust free, controllable thermal environment of labs and clinics would remain the same; climatic zones notwithstanding; Using artificial light, air conditioning can not therefore be availed.There is provision for authomatic standing generator for the centre.

CONCLUSION.

The theme of this Thesis is intensive care centre for Onchocerciasis - Shao, it is of course an hypothetical contribution to the promotion of medical, research institute with due consideration to the disease Onchocerciasis in the endemic areas.

Planning for flexibility, adaptability and expansion can not be overemphasized, also the need for efficient functioning of the treatment and research centre is very important because adaptability poses problem to success of any scheme and this has been tackled.

This design thesis (through the research personally conducted) has enabled me to understand the basic problems encountered in hospital planning. The functions and requirements as regards spaces, and location of the hospital elements has been clearly understood. This has been in conjuction with the study of medical care requirements need, to propose a hospital or an intensive care centre for a chosen community. The thesis therefore resulted in a hospital or Intensive care centre of right size for the right community in the right location.

The different ways of judging the success of a hospital design as an artifact are - Economic efficiency

- Visual interest for use.
- total traffic efficiency
- Organizational and departmental Identity
- Sense of concern for patient
- Social acceptability
- Visual acceptability for community

All these to the best of my ability are looked after and satisfied with them.

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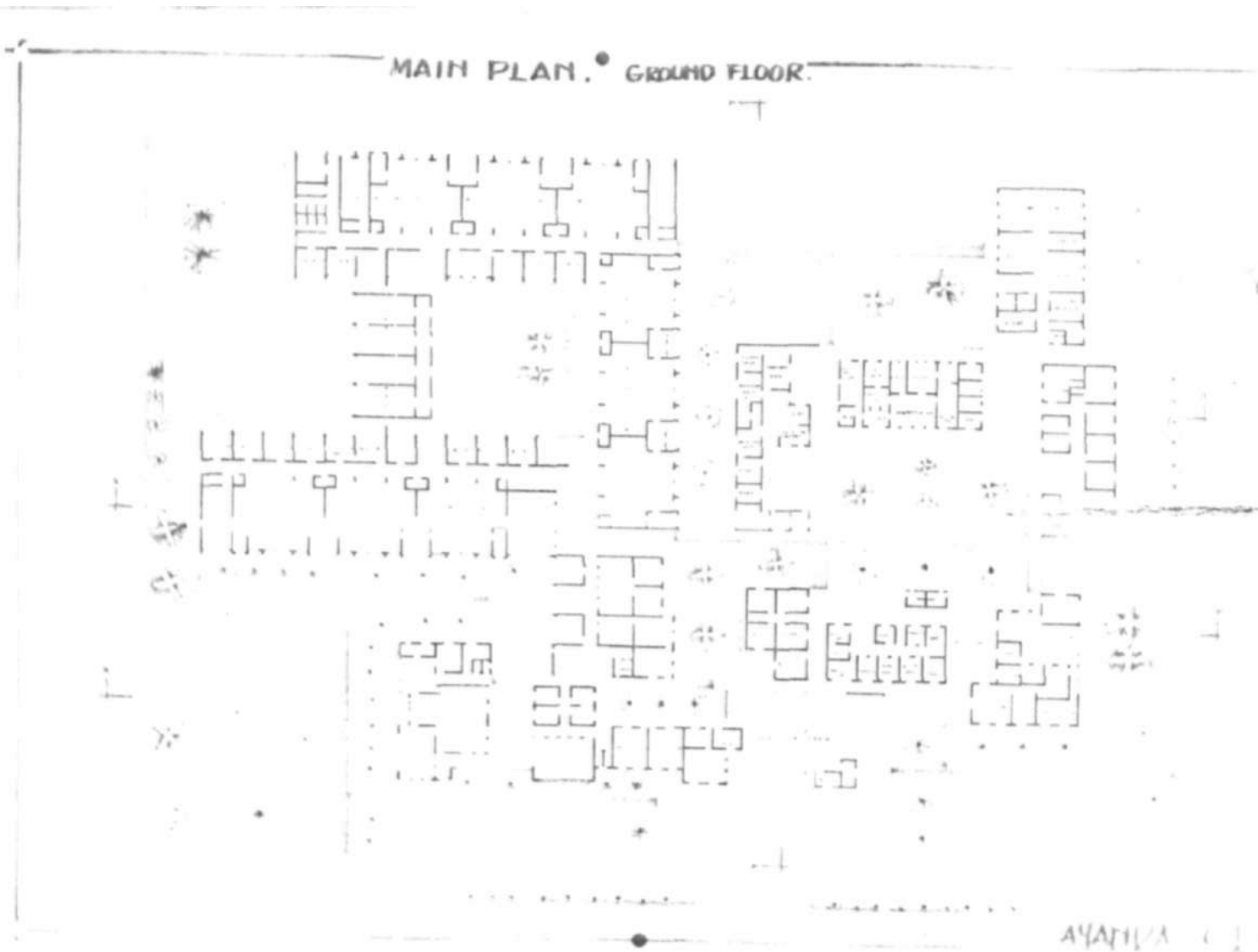
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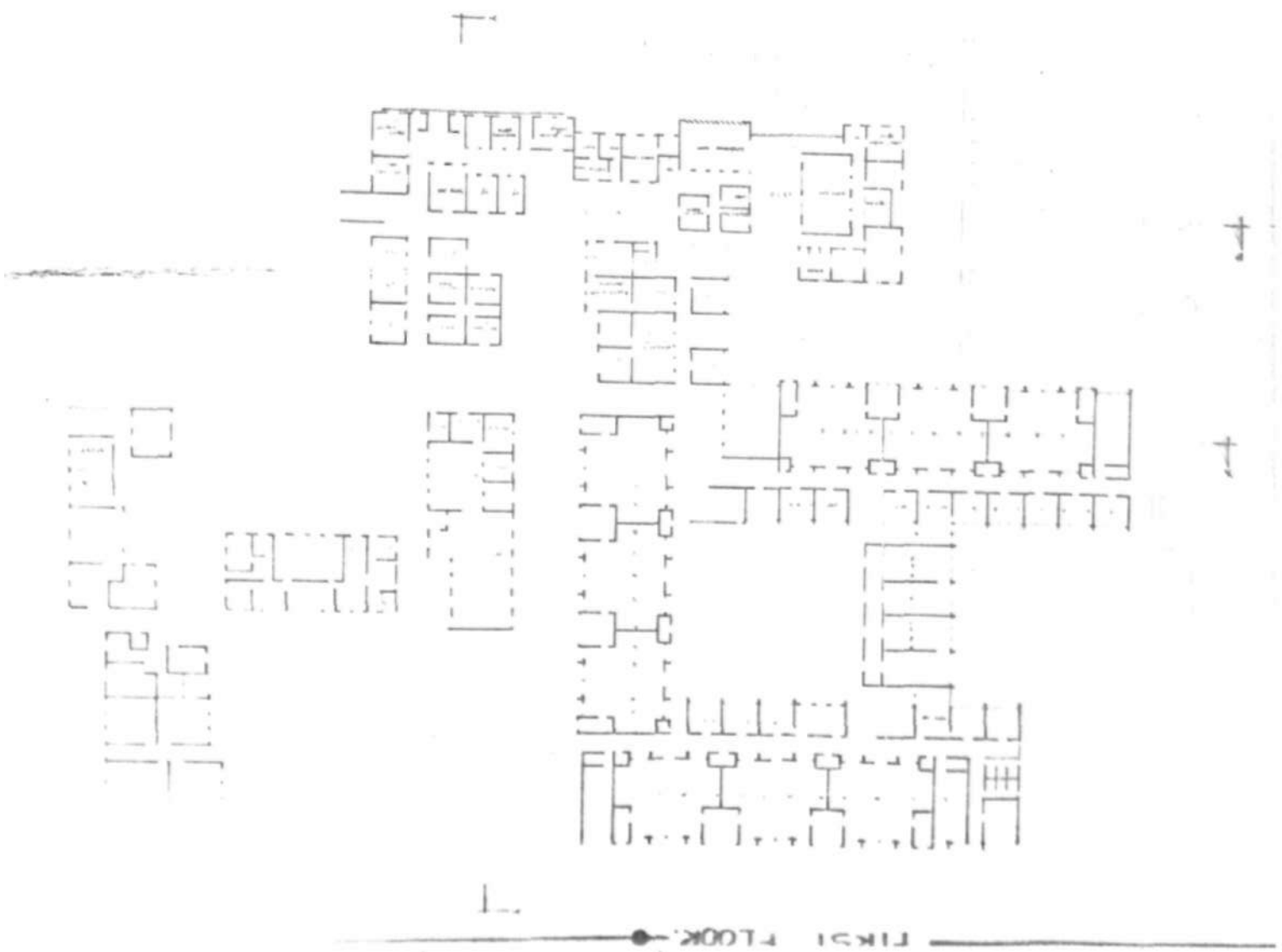
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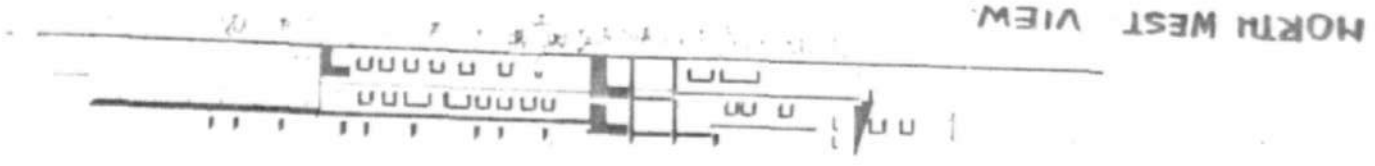
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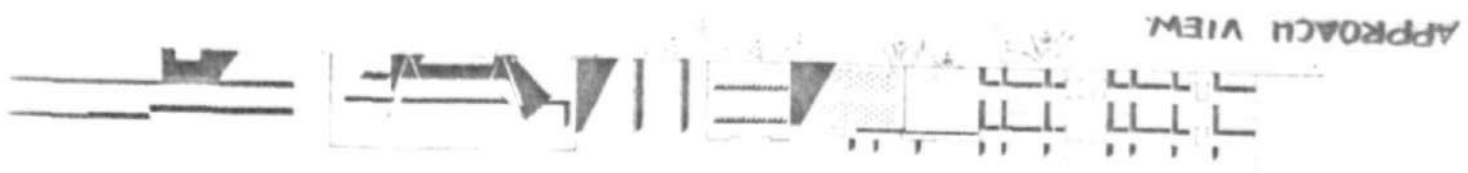
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MAIN PLAN. GROUND FLOOR.



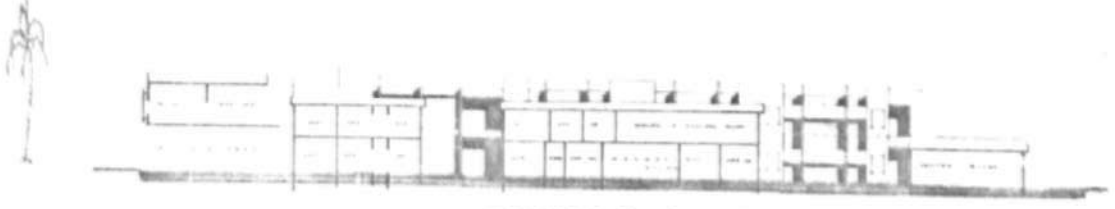

FIRST FLOOR


NORTH WEST VIEW


APPROACH VIEW



SECTION K-K



SECTION Y-Y

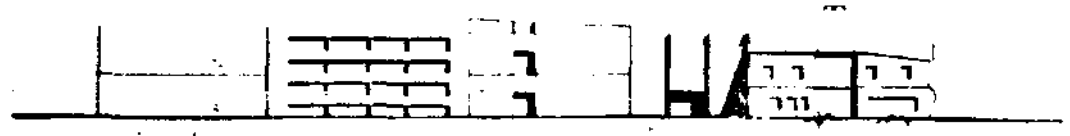


SECTION X-X

AVAN

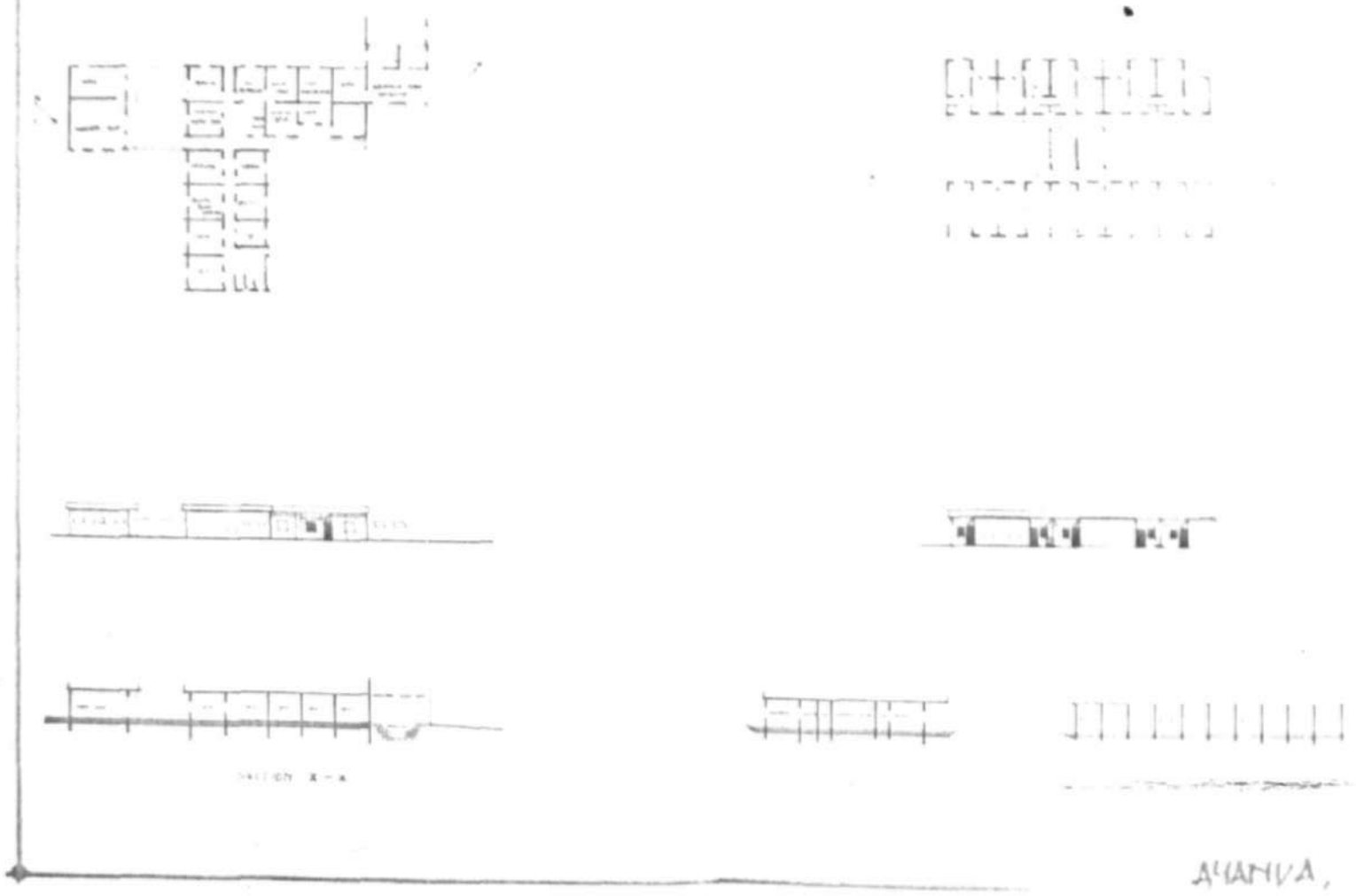


REAR VIEW



SOUTH EAST VIEW

MAINTENANCE and STUDENTS' HOSTEL



AVANVA,