

SUBMISSION

A THESIS

Presented to Department of Architecture, Faculty of
Environmental Design.

OF

Ahmadu Bello University

Zaria

In partial fulfillment of the requirements
for the Degree of Master of Science in Architecture

BY

Titus Olusanya Ajumobi

On

Central Library, Ilorin

In

June, 1982

SYNOPSIS

The choice is clearly one. To choose from an educated enlightened society, easy to govern, difficult to deceive, alert to her responsibilities or remain in a stagnant society of gross illiteracy riddled with superstition and institutionalised dogma, perpetually subjugated mentally and politically suvenile. There is no neutrality.

I hear patriots give their okay to the former with unreserved vigour. I hear them call on various organs and facts of the society to be alive to building a society where acquisition of thorough and proper qualitative and quantitative education is as pleasurable as air; where every Nigerian knows and is briefed quite easily on on-goings.

DEDICATION

"You only, only you saw it through,
Standing firmly like a sail
Piloting the ship ashore,
Against the turbulence of the sea".

- SANYA.

To you, my mother 'Bimpe who
knows it all.

"The years have rolled by,
The fading memories rekindled,
Virtues and deeds appraised,
Yet you stood a man in every inch,
A radiant inexhaustible source of inspiration,
Though yours was a very short stay"

- SANYA.

To you my father, OLATUNJI.

ACKNOWLEDGEMENTS

I owe much of the success of this thesis to

- (a) My mentor Architect Gniazik for the masterly piloting role played.
- (b) My Head of Department Professor E.A. Adeyemi and Co-ordinator Mr. E.A. Beeko for a prompt redirection.
- (c) To the friends I leave behind, Mike, Joe, Matt who provided a psychologically balanced spectrum for such studies.
- (d) To my dear mates for the ~~same~~^{rare} opportunity of studying together, perhaps flocking together, sharing and going through same milling process.
- (e) To my brothers and sisters for what they are and
- (f) To my God for the grace.

CONTENTS

CHAPTER I

- INTRODUCTION
- RESEARCH PROCESS

CHAPTER II

- GOALS AND OBJECTIVES
- WHAT IS A LIBRARY AND FUNCTION OF A PUBLIC LIBRARY?
- TYPES OF LIBRARIES.
- HISTORY OF LIBRARIES

CHAPTER III

- PLANNING A PUBLIC LIBRARY
- ENVIRONMENTAL STANDARD IN A PUBLIC LIBRARY

CHAPTER IV

- SPACE RELATIONSHIP
- FUNCTIONAL RELATIONSHIP
- STRUCTURAL MODULES AND CASE STUDIES

CHAPTER V

- THE PROGRAMME
- ACCESS TO SITE AND LOCATION
- CLIMATIC DATA.
- LAND AVAILABILITY
- VEGETATION

(CONTENTS)

- SCOPE AND ANALYSIS
- SITE BRIEF AND POPULATION PROJECTION

CHAPTER VI

- MY THINKING PROCESS
- INFERENCE FROM EARLIER CASE STUDIES
- RESOLUTION AND CONCEPTION
- DESIGN SPECIFICS
- SERVICES CONCEPT
- SECURITY IN LIBRARIES

CHAPTER VII

- CONCLUSION.

INTRODUCTION AND PREAMBLE

"For he who is deprived of knowledge is the twin brother of an ass". That voice is that of a man, a blind man, so distinguished in his own rights that he's being conferred with a honorary doctoral degree of letters for outstanding contribution to vernacular literature in Hausa. This man is Mallam...Aliyu..Shehu.Namangi..... and the event was at the December '78 Convocation ceremony of the Ahmadu Bello University. This cursory abstract from his paper on conferment of the honorary degree underlies the absolute necessity for acquisition of knowledge.

Education itself is the process of acquiring knowledge. It is learning process transcending literary exposure and acquisition. It is an all embracing phenomenon involving all the arts of imparting knowledge to one either through the formal read and learn rigid process of the school or the informal process of a daily exercise taking place in the homes and places outside the school

The quality of education of the recipient can only be thorough if institutions that serve these functions are well provided for. In particular, the various organs responsible for education principally the school, the home and the society, the public spirited organisations and institutions like the public library must be properly organised.

For obvious reasons, the library, the third realm of the division is getting the least support from both the government and the private institutions. This is partly due to our colonial past which never gave prominence to its development and partly because of lack of realisation of the priority role the library plays in acquisition of knowledge and its not-too-directly-felt impact like other social amenities like electricity, water supply, road construction and public housing. Thus the library development in Nigeria remained for a long time underdeveloped until recent governmental efforts at providing each state capital and ultimately each local government headquarters a library gathered momentum.

CHAPTER ITHE RESEARCH PROCESS

A research is an exercise out to find out that which is unknown from the known.

The research pattern adopted in this case is out to find out from the existing library structure the adequacy, demerits in its planning and seek possible alternatives to its planning. It is a problem seeking, problem solving research approach; a research approach which is termed Applied Research as against pure research.

Applied Research is a research carried out to seek findings for immediate application while a Pure Research is a research carried out whose result may not have direct use at the time it is understudied.

METHODOLOGY OF INVESTIGATION

The methodology of investigation is directed at finding answers to the following posers.

POSER I: To look into the functioning of a modern library and see to what extent its functional flow affects planning, space relationship and structural model of a library.

POSER II: To find out if these functions are so

4

rigidly interlocked that they dictate the extent of flexibility in the design of a library?

POSER III: To find out if the present design pattern wholly satisfies the need of the reader or the librarian and ascertain to what extent the contribution of the two is felt?

The appropriate methodology thus chosen is fourfold.

(1) The conventional questionnaire format sent to library institutions and librarians?

(2) The informal random sampling by inquiring from the potential readers that is those within the active reading age, of 5-60 years;

(3) To examine the documented finding of earlier researchers both locally and internationally.

ANALYSIS OF DATA

(a) Studies are carried out on public library buildings only.

(b) Case studies carried out on local public library building not very exhaustive since most of the libraries are accommodated within temporary building and hence dependence on foreign case studies.

(c) Most of the foreign standards on public library assume an hundred percent literate society and rightly too. All these standards had to be corrected.

CHAPTER II

- GOALS AND OBJECTIVES
- WHAT IS A LIBRARY AND FUNCTIONS OF A PUBLIC LIBRARY?
- TYPES OR LIBRARY
- HISTORY OF LIBRARY.

A library is essentially a store for treasured library works; rendering services directed at enlightening, informing, educating, training and acculturating.

The services and functions of a library are:

- (a) Lending;
- (b) Reference;
- (c) Reading;
- (d) Research;
- (e) Technical;
- (f) Education.

LENDING: Normally, this is the biggest service provided by a public library. Facilities are provided for control issue, return of books on loan, classification and storage of loan books. Since Borrowers select the books themselves, the public lending service is related to open access book storage.

REFERENCE: The reference section in a public library is more related to the lending section to encourage easier use by less serious readers. The reference section provides bookstocks for consultation only within the library.

READING: These are spaces provided for reading and making notes. The current trend is to provide a number of relatively small areas adjoining the subject bookstocks rather than a large reading space. In public library, the reading areas are incorporated within the lending library.

Outdoor reading areas on terraces and courtyards are becoming an integral part of the library design.

RESEARCH: These are special facilities provided for research e.g. enclosed or partially enclosed carrels (study cubicles typing rooms, microfilm, reading rooms and space for reading desks.

TECHNICAL: Facilities provided for technical service include tape and record listening facilities, projection facilities (studies, cinefilm, microfilm) document copying, photographing and binding.

EDUCATIONAL: Educational facilities include group study rooms, seminar rooms, auditorium or lecture/conference hall. Display and exhibition space are other facilities rendered by a public library.

TYPES OF LIBRARY

NATIONAL LIBRARY: Its function is primarily to collect all nationally published material plus a wide selection of representative foreign publications and to provide facilities for advanced research.

Often national libraries accommodate national archives e.g. the Nigerian National Library, Lagos state library, Berlin, East Germany and State Library Pahlavi.

PUBLIC LIBRARY: This library renders services directly to the people around its location. There are principally three types of these:

(a) Central or state library: the state library co-ordinates library activities at state level e.g. Kaduna state library, Kaduna.

(b) The municipal library: This type of library specifically caters for the urban centre only.

(c) The country or local government library: though still relatively underdeveloped, it provides services at the local level in the local government headquarters.

ACADEMIC LIBRARY: This serves precisely the academic community. It enjoys far more defined and precise readership than the earlier types of libraries e.g. the Kashim Ibrahim Library, Ahmadu Bello University, Zaria, Nigeria.

PUBLIC LIBRARY: This type of library serves directly to the people around its location. There are principally three types of these:

(a) Central or state library: the state library co-ordinates library activities at state level e.g. Kaduna State library, Kaduna.

(b) The municipal library: This type of library specifically caters for the urban centre only.

(c) The country or local government library: Though still relatively underdeveloped, it provides services at the local level in the local government headquarters academic community. It enjoys far more defined and precise readership than the earlier types of libraries e.g. the Kashim Ibrahim Library, Ahmadu Bello University, Zaria. Nigeria.

EDUCATIONAL LIBRARY: This type of library serves

schools, primary, secondary, technical and commercial colleges. It enjoys maximum readership and forms a vital component of a well planned educational institution.

SPECIAL LIBRARIES: These are libraries for professional institution and governmental organs e.g. the law library, Supreme Court, Lagos, Nigeria.

Other types of special library are the Blind readers library, Hospital library for the sick, welfare libraries for the aged and old and inmates of the prison and memorial library specifically set up to collate the collection of all materials relating to a famous figure. These materials could be figures, letters, manuscript book by and about him.

HISTORY OF LIBRARY PLANNING

The basic plan of a library is a combination of different quantities of and relations between, the three elements of a library viz readers, books or any printed documented materials and the staff.

The various historical periods in library development are therefore related to the development and improvement of these three elements in a library.

CLASSICAL PLAN PERIOD

In this period, there were few readers, the plan consists essentially of the library decorated with sculpture and mural painting with book cupboards and shelves against the walls and galleries. This originated in Ancient Rome and developed during the later years.

It is important to note that prior to this period, there exists literary works comparable to the books of the present day but the mode of storage was such that made them only available to a selected few e.g. the stone carvings of Ancient Babylon, the Hieroglyphics of the Mesopotamia and the papyrus a roll got from reed obtained from the Bank of River

Nile in Egypt. The classical plan failed because of its unsuitability for increased number of books and readers, open access to high shelves and noisiness of a large open hall.

Example of the classical plan is Ephesus AD 107 with monumental hall which was not originally intended for vast number of books and readers and therefore not truly a quiet area for reading. SEE FIG. 1

MEDIEVAL PLAN

Essentially it is a small library for Monastries, Cathedrals and small cottages with few books and few readers.

In plan, it consists of mainly one room with Bookshelves projecting from walls like church pews and central aisle. Early example had shelving and seats combined back to back with a sloping reading shelf above the shelving. This later developed into the double sided bookshelves alternating with double sided benches e.g. Queens college Cambridge See Fig II.

To accommodate more books and readers, systems of alcoves containing tables was introduced e.g. Trinity College Cambridge designed by Sir Christopher Wren.

Since the medieval plan took small number of readers into consideration, it proved ~~fairly~~^{fairly} satisfactory.

19TH CENTURY PLANNING

PLAN FOR CLOSED BOOKSTOCKS: With the development of education and production of books as a result of printing and consequently more readers to the library necessitating the separation of elements of the library by keeping bookstocks away from the readers accommodated in a large reading room, there evolved three types of plans.

(a) Reading Room above and Bookstock

below e.g. Bibliotheque Saint Cenevieve Universite de Paris 1843, FIG 3a.

(b) Central reading room surrounded by Bookstack FIG 3b.

(c) Bookstacks in tower as in FIG 3c where library staff are placed between the readers and Bookstack or Fig 3d where the Bookstack occupies a central tower surrounded by reading areas or Fig 3e where a central closed access Bookstack area, artificially lit, is surrounded by open access Bookstack and reading area.

(a) OPEN ACCESS PLANS

The open access plan provides readers with open

access allowing them to choose books freely.

PLAN: The form is a one room library in which readers help themselves to books e.g. the Carnegie rectangle, with informal loan desk near the Entrance in the centre of the long side SEE FIG. 4a.

(b) RIGHT - LEFT PLAN:

This is a development of Carnegie rectangle to separate certain functions. In plan; it is essentially a rectangular form with a large room on either side of the loan desk and the entrance. SEE FIG 4b.

A small third room is sometimes found immediately behind the loan desk for either a reference collection or the staff.

(c) LANDING ON GROUND LEVEL AND REFERENCE UPSTAIRS

With the growth of the library, it becomes necessary to separate the quiet reading and reference department from the busy talking activities of lending by placing the latter on the ground floor with upto about 45,000 books for the convenience of borrowers and the reference department on the quiet upper floor e.g. the British Public Library. This results in a practical compact and economical building.

(d) OPEN PLAN FOR LARGE LIBRARIES

In style, it is essentially made of a flexible open ground floor for readers in which movable partitions between the department allow for change of subject area for convertibility of use.

In plan, it is a large open access collection on street level, divided by subjects using bookcases or screens, each subject division having access to a reserve in the closed bookstacks on the floor immediately below e.g. the American Memorial library FIG.5.

(e) SUBJECT DEPARTMENTATION:

Occurs where the library is divided into a series of subjects fields on separate compartments each run by experts e.g. the Edinburgh Public Library.

(f) SCANDINAVIAN PLAN:

It consists essentially of a large space and attractive lending department. It has a lending department on the ground level supplemented by a gallery and a separated reference library e.g. Fredericksberg Public library Denmark FIG VI.

V CONTEMPORARY PLANNING CONCEPT

The shape of the library building now in use varies from the square to the rectangle, circles and other informal geometrical shapes. The circle seems most

frequently used because it is regarded as the symbol of Universality of Knowledge contained therein e.g. Racliffe Camera, CXFORD. The 20TH Century trends to be more on modular planning, open access planning with subject departmentalization.

ECONOMY AND FINANCE

The finance of the public library is the responsibility of the state. Since governmental resources are by themselves limited and ephemeral in deposition, the library can generate considerable fund by:

- (a) Letting out its conference unit for conferences and seminars.
- (b) Training library staff for school library. Government agencies and private firms.
- (c) Provision of chargeable technical services like recording, photography and photocopying.

CHAPTER III

- PLANNING A PUBLIC LIBRARY
- ENVIRONMENTAL STANDARD IN A PUBLIC LIBRARY

LAYOUT OF A PUBLIC LIBRARY

The layout of a public library is dependent on the following factors.

(a) FLEXIBILITY: This is the degree of flexibility required for future rearrangement of the section of the library and expansion of individual sections.

Modern trend now uses a completely flexible modular planning related to Bookstack and reading table modules where the only permanent elements are structural columns, services and staircases.

(b) EXPANSION: The population and literacy growth rate has an effect on library planning. This necessitates the availability of adjoining land for future building expansion or possibility of future additional floors.

(c) BOOKSTORAGE

(i) BOOKSTACKS:

Accessibility: The shelving area should be as compact as possible in plan to facilitate accessibility

both for finding and placing books.

Possible arrangements include:

- (i) Multi-level bookstack tower with minimum horizontal distances from the book lift at each level. Disadvantages are lack of flexibility in plan and possible difficulty in providing staff at each level.
- (ii) Large bookstack areas in a minimum of levels. This is a more flexible arrangement but mechanical conveyors are needed to transport the books horizontally.
- (iii) Compact storage: this is used when space limited and frequent easy access is not required. In this case, the aisle can be reduced to as little as 65 cm width.
- (iv) OPEN ACCESS/CLOSED ACCESS STACKS. Open access stack is a situation where bookshelf units are aligned to give easy access to readers. The closed access stacks allow fewer people principally the staff to circulate. A central stack has the advantages of accessibility from both sides.

(d) READER:

(i) Control: This is related to the type of book storage. For close access, the books are made available by the library staff to readers only on request as against the open access where readers pick on the books they require themselves.

(ii) Reference: Close access stack is used on the reference library where readers sign for books and ^{the books are} are brought to them by the library staff. Added to this is a quick reference collection and Bibliographies adjacent to the public catalogue and reference services with consulting benches and stools rather than the tables and chairs.

(e) NEWSPAPERS: This is often provided in a public library in a section near the entrance.

Microfilm: These store information magnetically.

Carrels: This is normally used by research workers needing a collection of books and reference over a long period. It could also be used by readers for reference to rare restricted materials or for readers reading aloud e.g. the Blind to a Braille Recorder the carrels could be enclosed, partially enclosed or open.

STUDY ROOMS: These are similar to carrels but larger. They are at least large enough to accommodate twenty people.

TYPING ROOMS: It could be sound proofed carrels or special rooms provided with individual or multiplace tables.

MAP ROOM: This is adjacent to the geographical subject division of the library and contains large reference table and illuminating tracing table.

BROWSING: This is often integrated with the Newspaper for general or recreational reading. It may also have displays of recent acquisitions. Browsing area should be informal and relaxed.

OUTDOOR READING. These are either flat roof or terrace area which is quiet and can be made accessible to readers in fine weather. Internally planted courtyards are suitable.

(f) GUIDE AREA.

CATALOGUE: This should be easily accessible to the reader after entering the library and equally to the various reading spaces. The room for cataloguing staff is often placed near the catalogue to avoid waste of staff time or expense of duplicating the catalogue for staff use.

STAFF AREA: The organisation of the staff area follows the pattern of book progress through the various process from delivery to shelving and of the various services required before it is made available for use.

(1) Delivery and despatch: This should be at the goods entrance with close connection to the acquisition area and in a multistorey building, the service lift. It should be large enough to handle large bulk consignment of books and stores. Storage shelves for reprocessed collections or materials for dispatch to branch libraries or binderies or as interloan exchanges should be adjacent.

(II) STOREROOMS: These are for furniture equipment, packing materials, stationery, clearing materials etc.

(III) REFUSE ROOM: These are collection point for waste paper and refuse.

(IV) ACQUISITION: This should be near the delivery area, the catalogue and other Bibliographical aids necessary for recording current periodicals and preparing files for binding and providing reference and guidance services for readers.

(V) CATALOGUING: Cataloguing will need to be near the catalogue and other reference tools and with easy access

to staff in reference area and records in the acquisition area.

(VI) WORKROOM: These are areas for stamping book-plating, and jacketing of materials. It should be near the service lift or otherwise accessible to bookstack as new material is dispatched from here to shelves.

(VII) LOANS AREA: This should be adjacent to the main lobby and reference service area but separated from the reading and other quiet area.

COUNTER

The counter provides space for registration of readers, issue of books and charging of loan records and return of books with space for shelving of loan records and return of books with space for shelving and booktrolleys. Space is required for storage of loan records and clerical works connected with lost or overdue books. In public library, separate loan area exist to handle:

- (a) Loans for external use.
- (b) Loans for use in carrels.
- (c) Loans to other library or from other library.
- (d) Issues from reserve collection.
- (e) Issues from closed stack area.

(C) CONTROL AND SUPERVISION

I(i) For prevention of book losses or unauthorized borrowing.

(ii) For prevention of damage to book, furniture or equipment.

(iii) For prevention of conduct which may^{be} disturbing to other readers.

II EXIT CONTROL: In large libraries, the exit control may be separated from the loans desk located in a more favourable position near other staff areas and is less obstructive of access to bookshelves.

Turnstile are perhaps nearly retrogressive method of exit control to ~~prevent~~^{prevent} high losses. Turnstiles have additional merits of controlling the number of readers and discouraging undesirables from entering.

III ADMINISTRATION: These are offices such as the librarian, deputy librarian and secretarial staff which will normally be located near the main staff work area.

BINDERY: This takes care of urgent book repairs, restoration work, special binding and manufacture of pamphlet boxes.

The bindery should be close to the central communication core and staff work area and with easy access to and from goods delivery bay.

DARKROOM: Though darkroom may be away from the perimeter of the building, the finishing room should have natural lighting if possible.

H. SUPPLEMENTARY ACTIVITIES

These include lecture, discussions, debate, story hours for children, musical recitals, exhibitions, poetry reading, artistic literature and display of painting and sculpture.

AUDITORIUM: This is required especially when the site has no such usable space.

EXHIBITION AREA: This should be close to the main entrance lobby or form part of it but not impinge on the main library areas.

FURNITURE: The display of library treasures, rare books could be stored behind glass.

I ANCILLIARY ACCOMODATION

(i) Lavatories. This should be accessible without readers having to pass through the exit control and may be contained within the main service core area. In public libraries, lavatories should not be located outside the control to prevent use by casual readers.

(ii) Staff facilities:

Common Room: These are provided for two groups:

- (a) The professional and clerical staff.
- (b) The general, technical and maintenance staff

Kitchen: Each common room with own kitchen facilities for coffee and tea during daytime breaks, midday and evening meals for staff on roster duty.

J INTERNAL ENVIRONMENT

- Internal Environment

Airconditioning and Ventilation:

- (a) AIRCONDITIONING: Preservation of books in the library requires that temperature and humidity levels be maintained constant. This can be achieved by fully airconditioning the space or by a mechanical ventilation supplying warmed air to the central area of a medium in a large library.

Since natural ventilation only would provide enough ventilation not for a too-wide a building like a public library.

(ii) FIRE PROTECTION.

BOOKSTACKS: For prevention of fire, an automatic detector system which is activated by heat, rapid rise in

temperature or presence of smoke can be mounted on or near the ceiling with one to each 40m² floor area. Alarms should be connected to automatic detector system and direct to local fire station.

EXTINGUISHERS: Dry extinguishers, wet hose reels and portable extinguishers should be available for dealing with outbreaks locally.

K COMMUNICATIONS

(1) TELEPHONES.

(2) TELEPRINTER: This facilitates inter-library loans, service and transmit passages from books.

(3) TUBE TRANSMISSION SYSTEM: For transmission of requests between lending counter and stacks,

(4) CLOSE CURRENT TELEVISION: This is used for communication between branches.

CIRCULATION: This is necessary for transportation of books and readers. Books by (a) books lifts for heavy vertical transportation; (b) Book conveyor providing continuous delivery which may be vertical or horizontal. Its use is not justified where demands for bookstock is neither heavy nor urgent since its operation requires constant staff attendance at each station.

Passenger lifts if needed should be large enough to take a book trolley.

FURNITURE The following items of furniture are required:

I STORAGE.

- (a) Compact shelving.
- (b) Shelving
- (c) Periodicals
- (d) Microfilm cabinets
- (e) Map cabinets.

II READING AREAS:

- (a) Tables
- (b) Chairs
- (c) Carrels.

III GUIDE AREAS

- (a) Catalogue cabinets
- (b) Reference shelves
- (c) Loans counter
- (d) Control desk.

IV STAFF AREA.

- (a) Desks.
- (b) Chairs

(c) Book trolleys.

V EXHIBITION AREA.

(a) Exhibition cases

(b) Display boards.

L. CLEANING

Accumulation of dust in a naturally ventilated building is the biggest cleaning problem.

Cupboards for accommodation of cleaners apparatus and materials and for waste bins.

ENVIRONMENTAL STANDARD

- NOISE CONTROL

- LIGHTING AND HUMIDITY

(a) NOISE CONTROL AND ACOUSTICS

NOISE SOURCE:

External: Traffic, Aircraft and Playgrounds.

Internal: Traffic, Walking, Typewriter, Telephones
Telex, Catalogue drawers, Windows, Doors, Book trolleys,
Ventilation system, Impulse clocks, Fluorescent lighting
and Control gear, reader activities such as dropped
books, rustling of pages coughing and furniture noises.

NOISE PREVENTION:

PLANNING:

Quiet areas 30-35 dB are:

- (1) Reference
- (2) Reading
- (3) Open bookshelf area.

Low Noise area 45-50 dB are:

- (1) Catalogue and consultation
- (2) Staff working areas
- (3) Loans
- (4) Control
- (5) Exhibition.

Noisy areas 60-70 dB.

- (1) Lobby
- (2) Stairs
- (3) Cloakroom.

The direction and magnitude of external noise should be established and consideration given to locating those parts of a library where noise can be tolerated as screens between quiet areas and noise source e.g. closed stack.

Internally, quiet, noisy and low noise areas should be separated by enclosing elements having insulation values equivalent to the difference in acceptable back-

ground noise levels in each area. Main traffic should be routed away from reading area and access to reading areas should be preferably arranged through open shelves.

CONSTRUCTION

Externally enclosing walls should have a sound reduction value of not less than 50DB which implies use of double glazing with a large airspace and sound absorbent rereals.

FINISHES: These are chosen where necessary to reduce impact noises e.g. foot traffic and absorb airborne sounds.

Examples are:

(a) Acoustic ceiling, curtains and fabric covered fibreboard, even books in shelves can also act as a good sound absorbent.

LIGHTING OF LIBRARIES

There are generally two methods of lighting.
NATURAL LIGHTING.

(a) The artificial lighting (b) The natural lighting.

Though psychologically desirable, natural lighting has great disadvantages:

(a) It poses severe restriction on flexible and economic use of floor and wall space.

(b) It requires protection against committant heat, cold and glare and is, as a result, costly for use.

(c) Natural lighting has ~~deteriorating~~^{deteriorating} effect on books especially those in close stack. Its ultraviolet component destroys the quality of book with time.

ARTIFICIAL LIGHTING

The modern trend is towards artificial lighting since it supplies a more regular intensity of light which could be regulated to suit the different lux required for each section of the library.

For effective artificial lighting, floors should be of light colour for light reflection to lower shelves of the bookstack.

Ceiling should be of light colour for this some reason.

Bestlighting is achieved by smooth graduation in Brightness from the Books itself to the immediate surrounding and finally to the Background. Reflectance of table top required is about 0.2 to 0.3 and is achieved by polished surfacing.

PROCESS OF ARTIFICIAL LIGHTING

Fluorescent light is cheaper than filament bulb lighting.

Tungsten lead incandescent lamp however emit very little ultra-violet rays unlike many fluorescent light tubes that do.

Best result of lighting requirement is obtained from the fluorescent by use of diffusers.

Fluorescent lamps should run across the direction of stack at 9.00m intervals if the top of the stack is more than 25cm from the light source. If otherwise use of filament lamps that run on the same direction as stack and in between the ends of the tubes should be more than 6.00m.

Modern and usual lighting of the library reading areas consists of fluorescent lights recessed into a false ceiling and covered by diffusers.

Advantages of such fluorescent lighting are flexibility and low consumption of current.

RECOMMENDED ILLUMINATION	LIMITING GLARE
Reading room	
Wall paper and Magazine	19
Reading tables (lending)	19
Reading tables (reference)	16
Counters	19
Closed bookstack	-
	(On vertical surface)
Building	22
Cataloguing & Stackroom/ Sorting	22.

HUMIDITY.

For a site bounded by a river flowing and in a hot and humid climate, humidity is an important factor.

One way of obtaining and limiting the humidity requirement to the level of 45 percent to 55 percent is by installing dehumidifying apparatus essentially on equipment containing dehydrating element like copper sulphate.

Other form of dehumidifiers include a refrigerant circuit in which air from a room at normal atmospheric pressure is cooled to below dew point by passing it over evaporator coils where excess moisture is condensed out. Heat extracted is absorbed by the refrigerant which in turn gives it back to the air as it re-enters the room. Trough and tubing are installed to take the water discharged to drains. The effectiveness of dehumidifiers is reduced unless window are kept closed to retain the treated air.

A much cheaper method is the provision of spot dehumidifiers.

CHAPTER IV

- SPACE RELATIONSHIP
- FUNCTIONAL RELATIONSHIP
- STRUCTURAL MODULES AND CASE STUDIES

SPACE RELATIONSHIP

In all types of library, central or academic, There is a common basic organisational pattern arising from the main functions of a library viz selection and acquisition of material, its indexing and storage in a way that enables readers to find what they want and provision of facilities for readers to borrow or consult the material. There are three main elements viz (a) materials mainly books (b) Readers and (3) Staff.

The relationship between each of the three and the effect on the physical plan of the library will be influenced by:

- (a) Size of library (b) Relative space requirement
- (c) Book storage policy whether close access or open access plan.

OPEN ACCESS: In predominantly open access libraries, there is direct contact between all the main elements although the catalogues, bibliographies must be consulted. The stored material itself is regarded as an essential

companion to the main reading activity.

CLOSE ACCESS PLAN.

In close access libraries, there is no contact between readers and materials, except through the staff. So readers selection of materials is made through by consulting the catalogue, bibliographies and staff. These should be grouped together in one area.

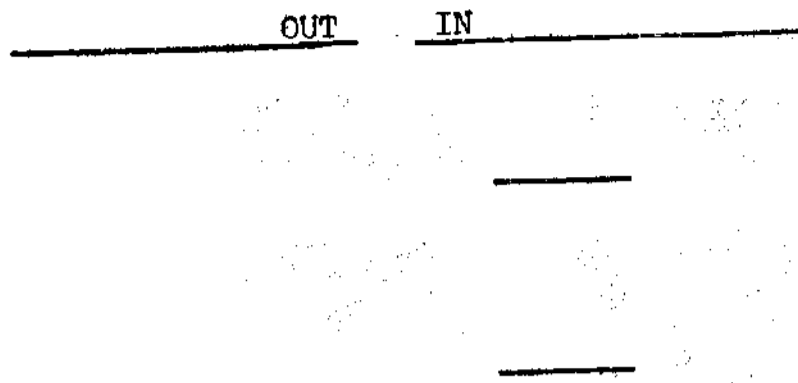
FLOW DIAGRAM

There are principally two flows:

- (a) That involving the process in which the reader is involved in obtaining a book or other library material classified as READER FLOW.
- (b) That involving the work pattern of the staff following the material flow.

CONTROL AND LOANS COUNTERS

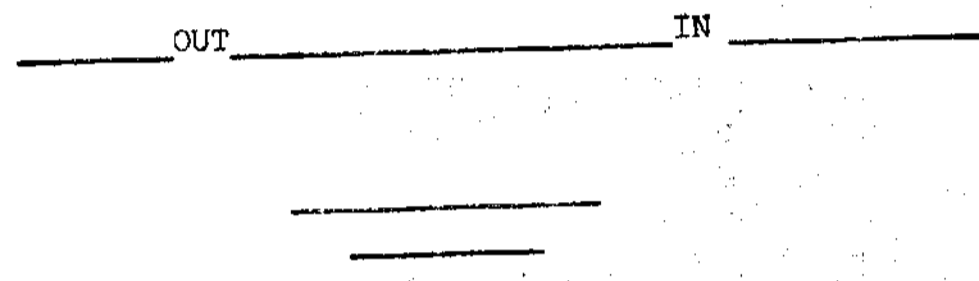
The Basic arrangements are:



CONTROL AND LOAN COUNTER ARRANGEMENT

For small library.

Disadvantages: Crosstraffic and inability of staff to connect other staff working area.



II. ISLAND CONTROL AND LOAN COUNTER.

Advantages: Separation and control of traffic allows one librarian to handle all services at off peak times e.g. the Kashim Ibrahim Library. Inability to connect to other staff working areas is its advantage



III CONTROL AND LOAN COUNTER ARRANGEMENT IN A LARGE LIBRARY.

CONTROL and LOAN counter arrangement in a large library where adequate staff is available at all times.

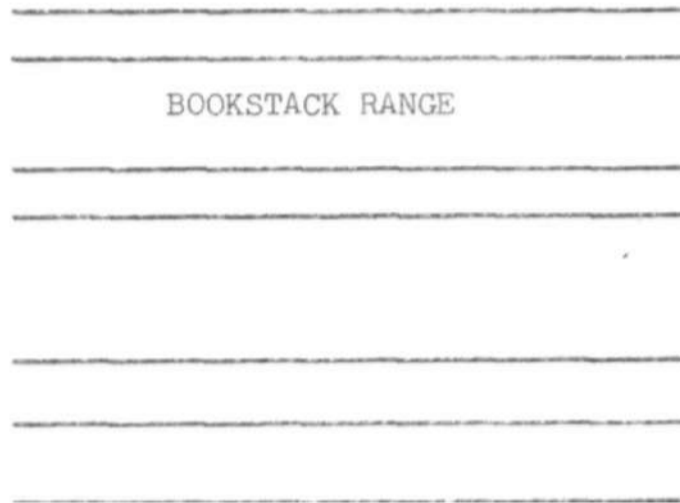
STRUCTURAL MODULES

(I) DIMENSIONAL RELATIONSHIP BETWEEN STACK CENTRES AND STRUCTURAL GRIDS OF VARIOUS SPANS.

SPAN OF STRUCTURAL GRID	STACK CENTRES CLOSED ACCESS	OPEN ACCESS	PERIODICAL DISPLAY
5.40m	1.12m	1.35m	1.82m
6.00m	1.21m	1.52m	2.02m
6.85m	1.04m	1.35; 1.65m	1.69m
7.31m	1.221m	1.43m	1.82m
7.62m	1.12m/1.26m	1.52m	1.89m
7.75m	1.12m	1.28m/1.37m	1.92m
8.35m	1.17m	1.35m/1.69m	1.62m or 1.99m

II. RELATIONSHIP BETWEEN BOOKSTACK AND STRUCTURAL GRID.

STRUCTURAL GRID.



BOOKSTACK CENTRES

B. CASE STUDIES

(1) Studies into existing library buildings and analysis of two of these (a) the Edinburgh library and (b) Lancaster library all in the United Kingdom.

(II) Studies of attendance rates of the temporary library in Ilorin.

At the very beginning of this write-up, I highlighted the lack of suitable public library building and hence dependence on foreign data as one of the externally imposed constraint limiting the scope of my thesis. It is therefore to be expected that most of the library buildings to be analysed in this case studies are obtained outside the country.

(I) STUDIES OF EXISTING LIBRARIES VIZ THE EDINBURGH AND LANCASTER LIBRARIES.

In the analysis of these two libraries, various terms have been used namely functional areas, auxillary areas and circulation spaces.

Functional areas are areas provided specifically for book processes and reader activities. The auxillary areas are areas whose services are supplementary to the primary function of the library. The areas comprise of

(a) Service and maintainance e.g. ventilation and airconditioning plant, electricity plant, service

Equipment store, cleaners rooms, stores, distribution duct etc.

(b) Sanitary.

(c) Welfare; cloakrooms, restrooms, canteens, staffrooms. Bicycle stores, garages etc. Circulation spaces are specifically provided for circulation

(b) SCOPE OF EDINBURGH LIBRARY AND LANCASTER LIBRARY

		<u>FUNCTIONAL AREA</u>
EDINBURGH	-	249,600m ²
LANCASTER	-	131,400m ²

(c) EFFECT OF SITE ON PLANNING

Edinburgh: Townplanning authorities enforced height restriction and the university required the building to seat on a pedestal podium at ground floor level with traffic circulating at a lower ground floor level.

The site slopes from North to South.

Lancaster: - Building is central with respect to University complex and provides other amenities including a bookshop, an exhibition hall, coffee, snack bar and recreational public library. *See P18 XIX.*

(d) REQUIREMENT:

Edinburgh:- Open access planning was used to encourage undergraduate to explore the stacks, some closed stacks are used for rare books. Floor structural loading

permits complete interchange of bookstorage and possess no horizontal voids over the floor below.

Columns are kept at the same spacing as stacking unit of 1.0m x 1.5m and laid out on a module of 9.0mx9.0m See FIG VII.

Lancaster:- A diffused modular library was required. Its design was modified after discussion to provide a bookstack core with perimeter reading bays and open access lending together with closed stack for rare books. A module of 6.0m x 6.0m was adopted for convenience and economy. Full Bookstack loading was allowed throughout to promote flexibility for future planning. SEE FIG IX and Fig. X.

(e) SPATIAL ANALYSIS BY PERCENTAGE.

	FUNCTIONAL	AUXILLARY	CIRCULATION
Edinburgh	87	7	6
Lancaster Phase I	70	17	13
Phase II	78	12	10
Phase III	75	18	7

(f) PROVISION FOR READER ACTIVITIES

Edinburgh:- Open access stacks and reading areas, Reading rooms, Periodicals room, Study rooms, Carrels, Typing carrels, Listening rooms, Microfilm area, Map room and lounge.

Lancaster:- Open access stack and reading areas, Research rooms, Periodical rooms, Microfilm unit, Blind readers carrels, Readers typing carrels, Exhibition space and Xerox unit.

(g) ANALYSIS OF FUNCTIONAL AREA BY PERCENTAGE

	ADMINISTRATIVE PROCESS	READER PROCESS
Edinburgh	12	88
Lancaster Phase I	26	74
" II	16	84
" III	9	91.

Functional area are dominated by books and reading areas.

ANALYSIS OF AUXILLARY AREAS

This is divided into service, sanitary and welfare. The location of sanitary facilities is to some extent determined by circulation planning but the number of separate unit has a bearing on the amount of disturbance caused by people moving about.

Thus it is better to have these facilities arranged within short walking distance from all parts of a stack.

Reader circulation as shown in FIG VIII and FIG XI has great effect on catalogue facilities and exert a dominant influence on the planning of the main entrance and primary circulation of a library.

VOLUMETRIC ANALYSIS

Two factors decide the vertical dimensions:

(a) The height of bookcases.

If open access, then the height of shelves should be limited to that which is anthropomorphically possible to reach by a reader that is about 1.8m to allow for visual scanning of books unlike in close access where storage can be mechanical.

(b) FLOOR Thickness:- This depends on floor loading and horizontal distribution of services where floor must sustain maximum loading over the whole area due to complete flexibility for future rearrangement and at the same time allow for horizontal distribution of services, its thickness may add up to 1m to the floor height.

COMPARISON OF SIZE AND DESIGN CAPACITY OF LIBRARY

	NO OF VOLUMES	POPULATION	NUMBER READERS	NUMBER OF LIBRARY STAFF	GROSS AREA M2
Edinburgh	2×10^6	4,500	1,943	120	29,950
Lancaster	450×10^3	4,000	1,000	50-60	8,700

COMPARISON OF SIZE RATIO

	NO. OF STUDENTS PER READER PLACE	NO. OF VOLUMES PER STUDENT	NO OF VOL. PER READER PLACE	NO. OF STUDENT PER STAFF MEMBER	AREA PER STUDENT
Edinburgh	2.5	413	1,030	40.5	62
Lancaster	4.0	112	450	73.0	27

CASE STUDY OF TEMPORARY LIBRARY, ILORIN

As shown in the attendance chart FIG XIII, the maximum daily attendance of the state temporary library is 100 and falls within the months of June and December when obviously the General Certificate of Examination are on.

Part of the reason for the low attendance is

- (a) Non central location of the library away from majority of the residential areas.
- (b) Lack of adequate provision of facilities like books both lending and reference.
- (b) Lack of enough reading spaces and wide variety of books on ranges which attract more groups than the school leavers e.g. Carrels, microfilm, conference centres and technical services like photograph and photocopying.
- (d) Lack of adequate planning since the building being used now is a residential building, rented and converted to such purpose.

All these imply a need for a better planned library well located, provided with all required facilities to take care of a wide range of interest group and having a sense of identity to the purpose and function it is serving.

CHAPTER V

- (a) THE PROGRAMME
- (b) ACCESS TO SITE AND LOCATION
- (c) CLIMATIC DATA
- (d) LAND AVAILABILITY
- (e) VEGETATION
- (f) SCOPE AND ANALYSIS
- (g) SITE BRIEF AND POPULATION PROJECTION.

(A) PROGRAMME

SITE: The site for the state library, Ilorin; is located in the central part of the city close to governmental offices, schools and post office in one hand and bookshops (Gaskiya Bookshop), Departmental store (the Midland stores) on the other hand. It is bordered on the Eastern side by the Petrol station (Total), western side by the flowing dammed River Asa, Northern side by the Gaskiya Bookshop and fleets of professional offices of Architects and Lawyers and on the Southern side again by the River Asa.

Thus the greatest site constraints are noise pollution and humid effect of the River Asa whose

flow though regulated by damming up the stream to provide the municipal water supply could have profound effect on the books if unregulated.

The topography of the site is generally flat with gradient below 5°. The vegetation is mainly shrub with interspersed grasses. Much of the site is undeveloped except for the skeletal structure of a church and other illegal structures which are gradually being vacated to pave way for the proper use of the area according to the Master Plan proposals.

(B) ACCESS TO THE SITE

Being located in the central part of Ilorin in a zone allotted by planning authority for civic use, it is served by a dual carriage road, the Emir Road. In addition, there is an access road to the Eastern Boundary.

FOR GEOGRAPHICAL DATA, RAINFALL AND COMFORT CHARTS, POPULATION SEE ~~FIGURES XIII and XIV~~. FIG XII

SITE CONSTRAINTS

Two major site constraints were identified.

- (a) The noisy environment in which the library site is situated. The noise comes from two main sources viz

the Railway line not too-far away from the site and the vehicular traffic of the urban downtown.

(b) Solar effect due to exposure of the library to the River Asa on the west.

WHY ILORIN?

The selection of the site in Ilorin is not borne out of any chauvinistic, parental lineage cum back-to-the root identifying reason common of most thesis works.

My reasons for choosing Ilorin are purely scholarstic

(i) Ilorin is in the core of the humid and hot climate which embraces Makurdi, Ibadan, Ijebu-jesa, Enugu and Calabar exis ~~is~~ an area, I had prepared my mind to design for.

(ii) Of all these location, Ilorin as a state capital requires more than others a library building since others have manageable structures.

(iii) It is only in Ilorin that suitable undeveloped site is found within the urban centre.

SCOPE AND ANALYSIS

AGE STRUCTURE OF ILORIN

<u>YEARS</u>	<u>PERCENTAGE OF POPULATION.</u>	
1. 0-5	17.2	CHILDREN POPULATION
2. 5-12	23.4	
3. 12-40	46.6	ADULT POPULATION
4. 40-60	5.4	
5. 60-75	2.7	
6. 80+	0.7	

(3) and (2) are the range understudied.

FACTS AND FIGURES.

Using 15% as the literacy rate amongst the children and 10% as the literacy rate amongst the adult (from UNESCO SOURCES) and the population of Ilorin is year 2,000 by projection being 400,000.

The population of potentially literate children under consideration then becomes

$$\begin{aligned}
 &15\% \times 23\% \times 400,000. \\
 &= \frac{15}{100} \times \frac{23}{100} \times \frac{400,000}{1} \text{ children} \\
 &= 13,684 \text{ children.}
 \end{aligned}$$

The population of adult also becomes $56\% \times 10\% \times 400,000$
 $= 22,400$ adults. Total population under consideration of potentially literate public = 36,084.

Allowing for population of readers from nearby cities in the state, the total population is projected to 40,000.

Knowing that the percentage of active users to population is normally 25% by UNESCO standard the Basic figure for readership becomes 25% of 40,000 = 10,000.

From survey conducted by the Danish Library authorities, one seat has a frequency exchange rate of 1:20. This implies the total number of seat required for a readership of population of 10,000

$$= \frac{10,000}{20}$$

$$= 500 \text{ seats.}$$

By International Federation of Library Association Standard (IFLA), the reference departments in public libraries require a seat for every 500 population served.

For the projected population of Ilorin of 40,000, the number of seats in every department

$$= \frac{40,000}{500} = 80.$$

SEATING ARRANGEMENTS

Number of fixed seats space allowed per seat
= 2.5m^2

Adult reference = 80 seats = 200m^2

Arts and Social Science = 80 seats = 200m^2

Science and Technology = 80 seats = 200m^2

Acturial Science, Management Courses and Accounting
= 80 seats = 200m^2

Legal and local history division = 80 seats = 200m^2

Children reference = 80 seats = 200m^2

Newspaper Room = 13 seats = 32.5m^2

Youth section = 13 seats = 32.5m^2

Total number of Seats = 506.

STANDARD OF BOOKSTOCK(a) CRITERIA USED

FACTS: 3 VOLUMES per head of books are required by International Federation of Library Association Standard of which about one per head must be provided for lending service to the adults and above 1 volume per head for the children library.

This implies that for an adult population of 22400 and population of children of 13,684, each adult lending section with a bookstock of 26,000 and children lending of 17,000 volumes satisfy the IFLA standard.

STANDARD OF BOOKSTOCK

ADULT LENDING: = 26,000 x 4 = 104,000 volumes
(1 volume perhead).

The various divisions are (i) Arts and Social Sciences
(ii) Acturial Science (iii) Science and Technology
(iv) Legal and local history division.

ADULT REFERENCE: 4,500 volumes

CHILDREN REFERENCE 17,000 volumes (1 vol./head)

WEAR STACK: 10,250 volumes

TOTAL VOLUMES = 136,750 volumes

= 3 volumes per head.

AREA REQUIRED FOR SHELVES AND BOOKS

Allowing 15m^2 for every 1000 volumes in Adult lending and 10m^2 for every 1000 volumes on Reference with open shelves (IFLA standards) we have for 26,000

$$\begin{aligned} \text{volumes on lending an area} &= \frac{26,000 \times 15}{1000} \\ &= 390\text{m}^2 \end{aligned}$$

which is equal to 324m^2 minus the staff control area of 66m^2 .

For reference area, area required for Books

$$= \frac{26,000}{1000} \times 10 = 260\text{m}^2$$

For children department, lending area

$$\begin{aligned} &= \frac{17,000 \times 15}{1000} \\ &= 250\text{m}^2 \end{aligned}$$

SPATIAL REQUIREMENT(I) ARTS AND SOCIAL SCIENCE

$$\text{Lending} = 324\text{m}^2$$

$$\text{Youth Section} = 39\text{m}^2$$

$$\text{Study Room} = 49\text{m}^2$$

$$\text{Newspaper Reading Seat} = 39\text{m}^2$$

$$\text{Local Collection} = 54\text{m}^2$$

$$\text{Control/Services} = 30\text{m}^2$$

$$\text{Sorting Area} = 13\text{m}^2$$



Near Stack = 72m²
 Reading Space = 200m²

(II) REFERENCE AND SERIAL SECTION

Service counter = 30m²
 Sitting area = 13m²
 Reference seats = 200m²
 Reference lending shelves = 260m²
 Near stack = 72m²
 Map Room = 50m²
 Serials Room = 75m²
 Bibliography space = 100m²

(III) CHILDREN DEPARTMENT.

Lending = 250m²
 Reference seats = 200m²
 Study Room = 39m²
 Crafts studio = 42m²
 Control and Service = 30m²

IV) TECHNICAL SERVICES.

Loading and Unloading = 150m²
 Receipt and despatch = 60m²
 Ordering = 100m²

Cataloguing space	=	150m ²
Photographic Unit	=	40m ²
Printing space	=	20m ²
Store for Discarded Books	=	30m ²
Arts design	=	40m ²
Bindery	=	200m ²
Offices	=	45m ²
Workrooms	=	250m ²

(V) EXTENSION SERVICES

Store for Books	=	30m ²
Store for Books to other library	=	30m ²
Mobile library parking space		175m ²
Books/Materials preparation		200m ²
Offices	=	45m ²

(VI) SCIENCE AND TECHNOLOGY

Control	=	50m ²
Reading space	=	200m ²
Shelves and lending		324m ²

(VII) ACTUARIAL SCIENCE AND MANAGEMENT

Control	=	50m ²
Reading space seating	=	200m ²
Shelves/Lending	=	324m ²

(VIII) AUDIO-VISUAL SECTION

Control = 50m²
 Language Recording Room = 35m²
 Film and Television = 35m²
 Music Room = 36m²

(IX) LEGAL AND LOCAL HISTORY DEPARTMENT

Control Unit = 40m²
 Reading space = 200m²
 Shelves/Lending = 324m²

(X) CONFERENCE UNIT

Exhibition and Conference Hall = 228m²
 Store = 30m²
 Seminar Room for study groups = 150m²

(XI) ADMINISTRATION

Librarian = 48m²
 Lending Librarian = 45m²
 Reference Librarian 24m²
 Children Librarian 36m²
 Cataloguing = 96m²
 Secretary = 12m²
 Despatch and delivery 18m²
 Staff Room = 60m²
 Unallocated space = 60m²

TOTAL AREA REQUIRED.

$$\begin{aligned} \text{TOTAL BUILT-UP AREA NEEDED} &= \text{Net Area} \times 1\frac{1}{2} \\ &= 1\frac{1}{2} \times 5,412\text{m}^2 \\ &= 8,238\text{m}^2 \end{aligned}$$

$$\begin{aligned} \text{Total Built-Up area} &= 60\% \text{ of the total area} \\ \text{total area} &= 5/3 \times 8,238\text{m}^2 = 13,730\text{m}^2 \end{aligned}$$

PARKING REQUIREMENTS

Staff car parking spaces = 10

Using standard ratio of 1:500 adult readers and considering the total number of adult being 224,000 from Age Group Analysis

$$\begin{aligned} \cdot \cdot \cdot \text{Total number of potential car owners and readers} \\ &= \frac{224,000}{500} = 45 \text{ cars.} \end{aligned}$$

Allowing for readers from nearby cities with cars say

$$\begin{aligned} 5 - 15 \text{ cars daily the total number of cars} &= 60+10 \\ &= 70 \text{ cars space per car allowing for circulation } (25\text{m}^2+15\text{m}^2) \\ \text{Total area for 70 cars} &= 70 \times 40 = 2,800\text{m}^2 \end{aligned}$$

$$\begin{aligned} \text{Allowing for open spaces and greenery together with} \\ \text{projected expansion, we have } (13,730+2,800) \times 2 \\ &= 3,706\text{m}^2 \\ &= 3.7 \text{ Hectares.} \end{aligned}$$

CHAPTER VI- MY THINKING PROCESS

- (I) IN-FERENCE FROM EARLIER CASE STUDIES
- (II) RESOLUTION AND CONCEPTION
- (III) DESIGN SPECIFICS
- (IV) SERVICES CONCEPT
- (V) SECURITY IN LIBRARIES

(I) INFERENCES FROM EARLIER CASE STUDIES

(a) From the studies of Lancaster and Edingurbh Libraries, certain things stand out clearly.

(i) That the present trend in Library design resolves around the concept of flexible, free-space, modular planning; a planning concept which is gradually finding use in virtually all other fields of design e.g. offices and departmental store.

(ii) That the process of activities in a library from the Entrance through the catalogue, exhibition, reading space down to the carrels are not too factory-like related to hinder flexibility though they are clearly related.

Example of Edinburgh and Lancaster libraries with two different approaches yet achieving a similar goal in planning drives the point home. Lancaster adopted a central court planning concept vis-a-vis the strip design of Edinburgh Library.

(iii) That exteriorly, the purported flexibility in planning are not phenotypic or rather expressive enough; though cases of later library design show a corrective trend.

(iv) A rather important observation on library design is on data. These data are drawn largely from statistics from the international federation of library Association IFLA; a body which is wholly librarian in nature and rightly so. The extent of involvement of other professional bodies in drawing up these data is not therefore defined. Hence most of the data tend to enjoy the sympathies and background training of the ^{librarian} ~~librarian~~; a case which seemingly mortgages the professional interest of other bodies say the Architectural profession and perhaps explains why most of the library building around haven't really expressed the character of Architecture as a

multidimensional and exceeding variable art abhorring stagnation in development.

One then becomes less surprised that conventionalism expressed itself that rigidly on most library works.

(v) Yet another critical observation of present day library design is their intr^ovent nature both in planning and servicing making them look more like a machine serviced and maintained by such processes which are so inward looking that the external climate or environment plays no part.

This explains why the present library buildings completely lack identity with reference to their environment since they are mostly mechanically service dependant in function.

II RESOLUTION AND CONCEPTION

DESIGN PHILOSOPHY

II RESOLUTION AND CONCEPTION.

My type of library while embracing the advantage of free open space planning of modular planning must be responsive enough to its immediate environment making it only an integral part of the entire ecosystem.

I conceive of a public library financed largely from fluctuating public fund as primarily a function-intensive programme dependent only peripherally on costly mechanical services for performance.

I conceive of a public library in an urban centre as a relief from noisy, hustle-bustle, chaotic environment of the master-like motor car technology in the urban environment. Its planning is therefore such that provides welcoming greenery with noise shading landscape from the urban noise.

I conceive of a public library as an organic institution capable of amoeboid growth internally and externally by duplication in response to anticipated increasing literacy growth rate.

I conceive of it as an institution completely classless socially allowing free interaction of different groups and classes of readers. Hence its planning is dependent on pedestrian traffic with clearly separated and segregated pedestrian and vehicular traffic externally.

I conceive of a public library in an informal riverine environment as a free, informal shape exposing much of itself to natural scenery of the Bounding river yet shaded from the atmospheric hazard such pleasures incur.

DESIGN PHILOSOPHY

All the above get summarisedⁱⁿ my design philosophy.

(a) EXPOSURE TO NATURE

Loose enough for primary functional activity. And at the same time outflowing to its environment namely the River.

(b) EXTROVERT IN PLANNING

Providing welcoming relief in a noise infested Environment.

(c) INFORMAL, SUBCONSCIOUS responsive to the dictates of the site.

(d) AN ARCHITECTURAL COMMENSALISM

Enjoying a marriage between science (my work) and nature with little or no sacrifice to either partner, rather each partner complements the other.

III DESIGN SPECIFICS

- (a) CONCEPTUAL ANALYSIS
- (B) SOLAR PHYSICS AND FORM GEOMETRY
- (c) FORM GENESIS AND ANALYSIS.

(a) CONCEPTUAL ANALYSIS

In the conceptual analysis, effort made was in direction of analysis of the site with zoning into different noise levels viz noisy, less noisy, quiet zone related to appropriate activities for such levels. SEE FIG ~~XIII~~.XIII

Possible parking spaces were also identified. The second stage of the conceptual analysis deals with analysis of the site itself with reference to buildingform, the L shape facing the riverside was tried and modified later FIG ~~XIII~~.XIV

(b) SOLAR PHYSICS AND FORM GEOMETRY

Solar physics and form geometry analysis was a research approach into the possible solar effect of walls in various positions viz vertical and inclined. In summary, vertical walls if solid absorb appreciably

greater solar radiation if normal to itself than an inclined wall.

The inclined wall, on the other hand, creates angle of incidence and reflection with a normal light and solar ray resulting in reflection of the incident ray and absorption and transmission of the rest.

This implies that inclined walls, say at angle 60° , either used as a sunshading fin or external wall, are functionally suitable for East and West wall, a conclusion which is reflected in the design process.

(c) FORM GENESIS AND GRID ANALYSIS

The search for a structural pattern that conforms with the wanted slant walls of the East and west led to studies in Grid desks of various forms namely the triangle, circle, rectangle and hexagon.

Finally the Hexagonal Grid desk was adopted for the following reasons.

- (a) As grid, it is a very stable structure
It has been tested in Bee-hive comb.

- (b) It has a great surface area for lighting and at the same time offers possibility for shading of external walls by simply projecting one of the side walls.
- (c) It can be used as a megagrid encompassing many microgrids of triangles, four in number, and two squares.
- (d) It is easily duplicated.
- (e) Used in furniture design, It does not allow two people seating on the side of the Hexagon to have or share distracting visual communication as against the normal rectangular reading table where two people on the same side enjoy limitless distracting reciprocating gestures e.g. the furniture of the Kashim Ibrahim Library, the University Library of Ahmadu Bello University, Zaria.

IV SERVICES CONCEPT

TYPES: AIRCONDITIONING AND VENTILATION.

ILORIN: Situated in a hot and humid climate, Ilorin has relative humidity of over 75%.

It is therefore most appropriate to induce breeze in cross-ventilation for comfort. The use of airconditioning ~~isn't~~^{isn't} imperative since the air is humid enough.

Besides such use would comprise the primary function of the library as a noise free zone since airconditioning plant alone creates far greater noise than any other external source within the site premises and the insulation of which incurs more expenditure.

Another disadvantage of the use of Airconditioning plant is that it poses a major constraint on form generation and plays a dominant role on design pattern.

In order to achieve maximum ventilation, single banked wall free design allowing uninterrupted flow of breeze throughout the building was adopted.

NOISE LEVEL AND FURNITURE

To further enhance noise reduction to acceptable level, the following precaution was taken

in the design of the furniture.

(a) All bookshelves are made of locally available timber on rolling tyres as against noisy steel bookshelves.

(b) Reading compartment or cubicles are made of plaster board serving as insulating medium.

DAYLIGHT

Ilorin enjoys between 7.30 a.m. to 6.00 p.m. daylighting, a period of about 11.00 hours. Between 10.00 a.m. and 5.00 p.m., the intensity is over 400 luman, Below this duration and above, spot-light on ceiling is provided to supplement daylight.

The daylighting intensity on a sunny day is between 400-600 luman, good enough to daylight even the bindery, counters and reference tables, ~~at 600 lumen~~ ~~at 600 lumen~~, At 400 Lumen, cataloguing and reading tables.

At 200 Lumen, general reading. On a less sunny day, the daylighting intensity falls to between 200 to 400 lumen only good enough for general reading, cataloguing and reading tables.

LIGHTING PRINCIPLE

From simple physics, of all mirrors, concave, convex and parabolic mirrors, parabolic mirror has the greatest field of view and sends out parallel rays in all directions. This characteristic of the parabolic mirror makes it find easy use in searchlight lamps used by hunters and security agents like police.

Findings show that a parabolic lighting pattern lights about 9.0m^2 floor area quite better than the fluorescent Bulb with a floor area of 7.5m^2 . Having parabolic lighting pattern with appreciably high ceiling level of say 4.00m allows a greater area to be lit.

V SECURITY IN LIBRARIES

Once upon a time, the princely collections of libraries were chained to the shelves to protect them from the hands of Barbarians, iconoclasts and acquisitive scholars. Today, libraries encourage public use of their treasures of knowledge and serve communities which seem unaware of the sanctity

or value of their open collections. The printed page, the film and the manuscript are taken for granted and all too often taken "for free" if the library does not reinforce their protection of its collections.

Indeed, librarians themselves avoid the issue with an euphemism for theft viz "unauthorized borrowing" in part because they believe the act of stealing knowledge is punishable only in the Eighth circle of Dante's Inferno and as a whole because they prefer to develop, organise and promote the use of their library collections rather than police their users; a case clearly similar to the stowaway on commercial flight.

Yet Police they must, because they know that library crime, such as theft and vandalism, represents much more than a financial loss. It deprives the public of access to irreplaceable books, rare manuscripts and other reference materials.

Equally important, it inflicts hardships on library budgets drawn into deficits to replace

increasingly expensive works. Stolen library materials are a real social loss. They diminish the educational potential of the library, erode its services and tax its budgets.

Individual Institution loss rate of between 2% and 10% are common.

Cases of caught book thieves are rare to find locally either because they are not reported or there are no statistics on such theft.

Even the Kashim Ibrahim Library, the University Library of Ahmadu Bello University in Zaria rarely want to discuss or give the statistics of book loss; a keep-our-secret-secret approach perhaps.

However cases are found externally. On July 16, 1971, the American FBI recovered the first volume of the elephant folio edition of Audubon's Birds of America, a very rare collection, stolen from Shaffer Library, Union College, Schenectady, New York. Results from American survey, also show that in public libraries.

~~(a)~~ With more than 100,000 volumes, 26% to 46% of adult fiction books were missing.

TYPES OF SECURITY

(i) GUARD SYSTEM

This is easily compromised by a tired library guard. It is commonly used.

(ii) ELECTRONIC SYSTEM:

Effectiveness range from 70% to 95% the effectiveness could be purposely reduced by a hardened thief by removing from the books the sensitized tags that could trigger alarms.

TYPES OF ELECTRONIC SYSTEMS

(a) Checkpoint system is based on Radio frequency.

(b) Table tape, Knogo and Gaylord, Magnavox on electromagnetism . Nevertheless all function similarly.

They provide detector tags, sensitized (specially treated) tags or strips, which are to be affixed to library materials and which signal a series of alarms if tags are detected.

With the exception of checkpoint which I will describe in detail much later, all employ specially treated data due cards to shield detector tags.

Installation is an uncomplicated process and requires proper and dedicated wiring.

WHY GUARD SYSTEM WAS ADOPTED
FOR THE LIBRARY DESIGN

With the enumerated advantage of the electronic system, it's perhaps surprising that the guard system was adopted for the library design in question. The reasons are:

(a) For a public library financed by the public purse, careful cost - Benefit ratio analysis must be taken care of in the design. The electronic system involves expenditure of such limited fund on initial installation, annual service, operating costs, cost of new detector tags that are added as the collection grows which must be resolved against savings as a result of book loss.

To my mind, rather than invest so massively on the electronic system, a decentralised guard system with each department having its control is cheaper and better since though agreeably electronic system control theft better, they lack the human element which the guard system introduces and which performs other roles rather than security like prevailing on those readers whose conduct are not tolerable in a library.

(ii) Local experience proves that the electronic dependent security is subject to a lot of manipulation by readers.

Such manipulation is by (a) interfering with the proper reception of a signal by the sensing screens using the portable magnet; (b) by completely mutilating the detector tag or by taking advantage of the fluctuating power supply prevalent in our present day society.

Except all these reservations no longer exist and the society gets more sophisticated in services, the guard system still remain at least for the

time being our best bet.

Looking unrepentantly optimistic into the future however, the check point level could be adopted into use in the main Entrance doors.

THE PUBLIC LIBRARY AND THE SOCIETY

The present day public library has graduated from its primarily primordial ^{role} ~~role~~ as centres for ^{storage of} ~~storage of~~ documented knowledge to centres for research into local history, entertainment and recreation, and forum for public information.

Increasingly too, the public library is taking on functions which are directed towards the enlightenment of the public on social behaviours which are anti-thetical to the accepted norms of the society.

Concurrently too, the society itself is gradually turning to the Public library as the last link with formal education. All these go to show that today's public library building must be more than the "warehouse" styled library of the yesteryears. It must be more than just any available rented building converted to library use.

It must be a building which the people identifies completely with. It must be able to arouse their subconscious mind to the function it is serving expressively.

In a society where the seasonal rural urban drift of school leavers to the urban centres still remains prevalent, the public library serves as rest-stop to the job-seeking youth.

The local examples of public library building are not too encouraging. Some are either rented building like the Bendel state Bungalow Building, and the state library Ilorin; Both of which are badly located with respect to the better part of the city. In some cases, the supposed library building often give way to new offices and is displaced to yet another temporary building.

All these result in lack of identity of the user to the library as a public facility.

The few recent public library building like the Kaduna State library and the Zaria public library are

not only badly located on the outskirts of the town but in the case of Zaria close to the criss - cross junction. In addition, both lack such facilities which could easily "sell" them out to the people as their own property. Such facilities include outdoor spaces and lecture rooms.

These deficiencies therefore make the proper planning and siting of most public library imperative.

Architects and librarians must be involved in the preliminary planning of a public library. The relation of a suitable site and the trend of the design must be the sole responsibility of these professionals. The prevalent practice of first selecting the site and thereafter inviting tenders for consultancy ^{isn't} helping the situation and should be discarded.

THE GOVERNMENT AND THE PUBLIC LIBRARY

The public library in a developing country derives most of its fund from the public purse. The impulse of the money flow is therefore dependent

on the type of government, its orientation and priority and in the case of civilian government its manifesto.

Quite naturally, the civilian government expectedly tend to give more focus to education. Rather suprisingly however, the role of the public library in proper education is underplayed partly because unlike the other physical quantities like school and University, its beneficiary cannot be easily quantified and partly because it is still not as potent a factor in campaign strategy at grassroot level as perhaps schools, roads and pipe borne water because the rural community is still largely unaware of the priority role the library plays.

However, there have been noticeable efforts here and there. One of such is the formation of the National library Board at the federal level changed with the sole responsibility of developing library facilities throughout the country by liasing with the local state library board.

At Kwara state level, the first conscious attempt at developing a state library started on 1st April 1968 when on dissolution of ICOSA (an institution incorporating all common assets of the states in the former Northern Nigeria), 7,900 Book volumes and 1 trained staff started a library with a government book vote of a paltry sum of ₦3,000.

In 1969, the ten-year Development Programme for library services was developed, a programme which if adhered to would have positively affected library development in the state.

The reaction of the various governments since 1969- to 1979 to the programme has been that of Do-it-my-style.

Interestingly, the present civilian regime seems to have found the programme worth trying and is already giving concrete translation to its proposal by commencing the planning and subsequent building of a public library.

One can only appeal to the various government and the public spirited individuals and organisation to give the development of a public library more attention than it presently enjoys.

The various government should be more definitive on annual grants to the library for Books acquisition rather than adopt the present ephemeral funding which library projects suffer.

CHAPTER VIICONCLUSION

It is the continuity of knowledge and the quest for the unknown that makes human appetite for knowledge insatiable and it is precisely for this reason that any finding of thesis or research in any field of human endeavour is only a catalyst in precipitating a chain reaction just like an activated Neutron in an atomic Energy Emission.

It is therefore my fervent hope that future thesis in this direction will seek to dig into the abyss of the unknown and positively bring up alternative solutions which could be a further catalyst in solving the problem of library, design whose architectural feature gives it a primary sense of identity while accomodating all the values in modern contemporary planning of library, based on open access, modular framework.

In doing this, the architectural profession will be contributing rather significantly to the

evolutionary development of library architecture; a measure which in turn has an echoing effect on both the quality and quantity of education in our local environment; the effect of which is even more resounding on the overall development of the mind, man and national manpower¹.

If there is any need to reflect on the contribution of this thesis; its development and utilization of the Hexagon as a functional and structural module in library planning; adaptability of the design to the local environment; harmonious and balanced ecological relationship between the site and the built-up area and its primarily participatory role in propagation of knowledge and advancing the cause of education are perhaps some of the things I will like to remember and be proud as part of.

SANYA AJUMOBI
JUNE, 1982.

B I B L I O G R A P H Y

- (1) Building for Daylight by R. Sheppard.
- (2) Modular number pattern, Flexibility through standardisation. By Ezra D, Ehrenkvantz.
- (3) Public library Building by Wernier Merissen.
- (4) Manual for tropical Housing by Koenigsberger and Ingersoll.
- (5) Architectural Journals, Reviews and Publication.
- (6) Library Buildings: Innovation for changing needs by Alphonses F. Trezza.
- (7) Design of Library Buildings, by Anthony Thompson.