"MEN'S RESIDENDE HALLS, INTERMEDIATE COLLEGE OF
MOULMEIN, BURMA."

Submitted in partial fulfillment of the requirements for the degree of Bachelor of Architecture from the Massachusetts Institute of Technology.

May 13, 1957.

Kyaw Minn

Lawrence B. Anderson
Head of Department
3 Ames Street,
Cambridge 39, Massachusetts.
May 13, 1957.

Pietro Belluschi, Dean
School of Architecture and Planning,
Massachusetts Institute of Technology,
Cambridge 39, Massachusetts.

Dear Dean Belluschi,

In partial fulfillment of the requirements for
the degree of Bachelor of Architecture, I herewith
submit my thesis, "MEN'S RESIDENCE HALLS, INTERMEDIATE
COLLEGE, MOULMEIN, BURMA."

Sincerely yours,

Kyaw Minn
Acknowledgement.

I wish to express my thanks to Professor Beckwith, Dean Belluschi, Professor Gelotte, Professor Newman and other faculty members in the Department of Architecture of the Massachusetts Institute of Technology who were so helpful in my thesis endeavors.

I also wish to express my thanks and appreciation to Professor T. Ba Hli, Dean of Engineering College, University of Rangoon, who stimulated my interest in the problem, without his help and advise this thesis is impossible.

Finally, to these students and friends, whose ideas and desires have been instrumental in the direction of the development of this problem.
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Abstract

It is needless to say that to achieve the total purpose of education, the student residence hall plays an important part. In order to understand better kind of building project one must look at the college residence both as a totality made up of four closely interrelated parts: Students, staff, structure and program. Neglect of any one of these parts in planning an operation will reduce the effectiveness of the hall as an educational instrument.

In dealing with these parts the following arises:

(1) Who is to be housed? What are their backgrounds, interests and needs?

(2) What are the specific purposes to be supported by the new project? What kind of informal programs are to be emphasized?

(3) How many are to be housed? What types of social patterns should be encouraged? What kind may be the social effects of the particular designs?

(4) What are the functions of the hall, and how may they be most efficiently performed? What are the best available means for assuring better habitability? How is the hall to be administered?

(5) Where should the hall be located? What is the campus plan? What building form should be given the greatest consideration? Will the proposed site permit proper orientation.
(6) What shall be the acceptable standards for structure, its furnishings and services?

(7) How may economies be achieved so that the financing plan can be successfully met?

Thus the solution of the student housing problem lies to the key by meeting these questions.
INTRODUCTION
**Introduction**

Nationalism, socialism and industrialism are the three forces which observers have noted as being the directing impulses of developing in the country like Burma and with independence achieved or imminent, they may now be seen in active or violence motion, bringing with us problems that test the new found capacities of the people to our interest.

Once more Burmese people are on the move towards new objectives, and for many number of years lived undertake shadow of colonial power, now undertake the management of their own destinies and shoulder the compelling responsibilities of government.

The future of Burma, being a young nation and a developing country, depend on its future scientists, statesmen, educationalists, and technicians, in developing our country. Education is the greatest social investment, which a nation can make. By teaching the youths to appreciate its own rich and distinctive culture, education fosters deep pride in the Burmese way of life. The educational system under the British did not generate in the Burmese a feeling pride in their culture; it did not teach them to use the tools of modern technology; it did not give them enough scope for teaching the ways of democracy nor for the expression of patriotism and citizenship.
Realising these facts the government had mapped many educational programs, but we are forced into shortage of teaching spaces, shortage of teachers, and at the same time more students crowded in all over.

University of Rangoon has also shared the same problems. In attempt to solve these problems the University authorities planned many affiliated colleges in major key parts of the country; Intermediate College of Moulmein is one of them. Because of financial reasons only the classroom building was built at the Intermediate College.

"The purpose of education, whether in kindergarten or in University is threefold: To aid young people toward the attainment of intellectual competence; toward the development of personal and social responsibility; and toward the formation of pattern of behavior, thought and spirit which will best foster their living happily and generously".¹ The formal curriculum of the educational institutions is the basic means towards accomplishing the first element of the purpose of education. This element contributes substantially though indirectly, the other two elements. The other two elements can only be achieved through the informal program comprising extra-curricular activities. There is a powerful non-curricular agency which can be utilized to facilitate realization of the full purpose of education, particularly its second and third element.

¹. Aims of Education - Whitehead
This agency is the student residential system. This fact has also been realized by the authorities.

The University authorities had planned to build the rest of the buildings—living units in the Intermediate College. There will be three separate units of living, namely: for students living in halls or dormitories; staff living in houses; and college servants of all descriptions living as a community. To be specific, at Intermediate College of Moulmein:

- 2 men's dormitories for about 150 students with dining hall.
- 1 women's dormitory for about 150 students with dining hall.
- 10 double storied for staff.
- 10 single storied for staff.
- 30 menial quarters.

In this thesis, the author deals with a program for two men's dormitories. Student housing, above all the other kind of housing, is a special one. The project is to house a special kind of people, a privileged community, somewhat removed from the turmoil of life, and devoted to the study of the truth behind the appearance of a wide diversity of things.

Experiences of three and a half years at University of Rangoon hotels and three and a half years at M.I.T. dormitory life gives the author a privilege in solving this problem.
GENERAL BACKGROUND
BACKGROUND
(1) Burma - geographical

Burma lies between 10 and 28 degrees north latitude and extends from longitude 92 to 100 degrees east. The greater part of the country covering an area of approximately 261,789 sq. miles. It has a population of about 19 million, and almost the whole population inhabits the region south of 25 degrees north latitude. On the west, north east and south, India, Pakistan, China and Thailand abut on the frontiers of Burma. About 90% of the population are Buddhist. The country is made up of rich alluvial terrin, sparcely populated by several hill tribes speaking different language and dialects. It has three great river valleys, one of which is navigable and serves as an economical transportation artery. This is the river Irrawaddy and the Irrawaddy system is to Burma what the Mississippi is to the United States.

The city of Moulmein is one of the seaports of Burma and lies on the mouth of the Salwein River. It has a population of 102,777 and it's one of the important towns being an economic base of Tenesserin.

(2) Climate

Burma has tropical monsoon climate and is classed under hot and humid region, which could be divided into three seasons:
(a) The warm and humid rainy season from May to October, where the south-west monsoon is dominant;

(b) the cool dry season from November to February which the north-east monsoon blows, and this is the pleasant time of the year;

(c) the hot dry season from March to April, characteristic by intense heating of the land variable winds and occasional thunderstorms.

The annual rainfall varies from about 25 inches in the dry zone area of central Burma to over 200 inches in the Arokan and Tenesserim areas.

At Moulmein the annual rainfall is about 176 inches and has a mean average temperature of 76. degrees (1955 data). The meteorological figures of Moulmein can be seen from the chart at the end of this chapter.

(3) Economical

Burma is an agricultural country and about two-thirds of her working population are engaged in cultivation, mainly rice production and stock raising. Economically, Burma is a developing country.

The people of Burma today realize that there is an only way to develop our National economy that is industrialization and are now striving toward it. Lack of sufficient technicians and equipment are the main obstacles in achieving our goal.
Architectural

Burma architectural heritage and peculiar artistic temperament of Burmese race formed the Burmese style in architecture. Typical Burmese styles and forms can only be seen in religious architecture. Since the unfortunate annexation of Burma by British about a century ago, domestic architecture has been, full of adaptations of the west, both successes and failures. The one suitable for domestic, the most suitable for our climate and people has not been developed yet, and lies in the successful fusion of twenty-century technology with ancient and permanent spiritual values of the younger generation.

Heritage, the Burmese people made is proud and strong but their true history lies only in the future.
<table>
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Fig. 188.—The climate of Burma.

From "ASIA by L. Dudley Stamp"
THE SITE
The Site

The site is located at North East of Moulmein, 3 1/2 miles away from the downtown section. This area of the site for the Intermediate College is 417.87 acres and is bounded by Moulmein-Taungwaing, Mainroad and Moulmein-Amherst main roads.

On the east side of the site there is a mountain half a mile away from the site. On south and west by residential areas and just across on the Moulmein-Taungwaing road about a quarter of a mile away there is an aerodrome. This is the only drawback that this site suffers, otherwise the existing beautiful landscape and its environs is an ideal site for the college.

The ground is rather flat but the contours are not available
SITE FOR THE INTERMEDIATE COLLEGE
MOULMEIN
DESIGN CONCEPT
Design Concept

(a) Sociological Concept.

In order to facilitate the total elements of the purpose of education, the design must be approached with a social concept.

The student residence hall is a great deal more than reinforced-concrete and bricks, it is people--life energy and growth. This the purpose can be facilitated to its full realization, only if, one can set up a social environment in it.

A distinctive element of the social environment is "the group", which result from the long established habit of individuals to live together and associate together. This living group with which the students is in physical and mental contact is important for a number of reasons. It can do much to satisfy his need for belonging to provide a greater sense of security and thus to contribute to better emotional adjustments. The living group can furnish informal training in the learned ability to get along well with others. It can provide experience in the giving and receiving of loyalty. And again, "the small face or primary group tends to be a significant transmitter of behavior patterns." ¹

"Group influence on behavior exerted in several ways. A decision by a group appears to be a potent factor effecting behavioral change in the individual member.

¹. Group Dynamics - Cartwright, Dorivin and Zander
A group standards sometime act as compelling pressures towards a peculiar course of action. One result of group influence is a tendency towards comformity. When carried to extremes conformity has undesirable effects in individual initiative. At the same time, the urge to conform to certain standards may strongly inspire the student to pontive and desirable action."

In the total education process, the living group has an important use. If desirable growth is to occur in the student, some efforts might be directed toward a modification of the values and stands of significant group or groups to which he belongs. On this way, living groups within the hall provide extraordinary opportunities for effective and enduring teaching.

(b) Physical concept

Interest in the individual social environment has tended to overshadow consideration of his physical environment. In a society that is rapidly encasing itself in concrete steel and glass, elements of physical environment may be shaping the individual's behavior, development and social patterns. For this reason, more attention should be given to physical environment in which the students live.

2. Ibit
The sizable proportion of a student's twenty-four-hour day spent within his constructed residential environment gives particular emphasis to the question of its habitability.

The physical environment functions as a materials structure envelope encasing the student. It channels the movement of the student and controls the amount of life, heat and air that reaches him. It effects the physiological processes of the human organism, which is constantly striving to maintain a state of equilibriam. An excessive amount of stimulation from one source may absorb so much the adaptive energy of the organism that it becomes unable to cope adequately with other stimuli. If some physical element of the student surrounding requires an undue energy remaining to study at maximum effectiveness or to harmonize his activities with his fellow students. For example, distracting noise can disrupt an evening planned for study. Continued raucous singing in the shower room down the corridor can arouse uncontrolable irritation in the person who hears it. It is also possible that physical surroundings may effect the direction of a student's activities. If the appropriate physical stimuli for study are not present the student may fail to study.

3. Introduction to psychology, Hilgard - Chap on learning, Perception and Thinking
It might be concluded that the conditions for work and human associations as well as work and associations of themselves are factors in development and growth of students.

Thus from the standpoint of growth, the principle elements of the physical elements are, space, illumination, control of noise, temperature and ventilation. Such an environment is not necessary depend on added cost, careful planning alone can achieve the goal.

(c) Architectural Concept

Architecture is not only the length, breadth, height and space, but it is the reflection of a society's need, desire and tradition. It can enable us to judge one society through the deepest meaning of their lives. Expression in designing this project, the problem of selecting an expression to meet the pressure of the idea of the university. Quality is the keynote both of the university and of the expression in architecture, as of no other compression is it so clearly demanded that the outcome shall be a work of art.

Ours is a modern age. There are new materials available. Since architecture proceeds towards its artistic ends through satisfaction of practical demands, the fact that it is contemporary and not the copy of some past style means that these demands can be met without deceitful adjustments made for the sake of appearances; and design carries its full load of meaning.
Thus the expressions have to meet the modern need and desire within the bound of economic reasons and functional reality.
DESIGN CONSIDERATIONS
Design Considerations

(a) Sociological Considerations.

In connection with the development of the groups within the student housing complex the consideration of how large or small should the group be? "The best size for a group seems to be from eight to twenty four". 1

Hence within the bounds of economic reason and functional reality a face-to-face or primary group of two students in a room and a social group of twenty students are placed as a group on a floor, each sharing the common toilet facilities. An effective living group is one which various members know each other well, engage in cooperate activities and experience a satisfying sense of belonging. A research at a residence hall in one of the American Universities "was found that proximately facilitated friendship development and that friendship tended to form along the same floor of the halls rather than between floors". 2 It seems entirely possible that probability of friendship and group formation.

Hence, the arrangement of interior building space and the resulting proffice patterns is the significant important for the student residents. The length of a corridor, the location of a bathroom or lounge, and placement of the exit stairways and doors may be the answer to the formation and maintenance of groups.

1. Planning Functional College housing - H. C. Riker
2. Ibit
(b) **Physical Considerations**

The importance of physical environment had been stressed in previous sections. The principle elements of this environment include space, illumination, control of noise and temperature control and ventilation.

**SPACE:** The quantity of space provided in a hall is a matter not only of activity but also of behavioral adjustment. Too much space in height or length gives rise to feelings of formality and social distance, thus affecting the quality of human relationship. On the other hand too little space could lead to irritation, a feeling of oppression.

The amount of space for the student room is the most important. The attention to the creation of an illusion of space may be help ways in view of pregnant limitations, color and types and arrangements of furnishings. An impression of freedom rather than confinement is to be sought. Here a students room is provided with a space of about 236 sq. feet of floor area per two students.

**ILLUMINATION:** Adequate illumination is an accepted requirement for good living and body conditions. Both too much and too little illumination causes eye strain and over-use of eye.

Among factors involved in good natural over-all building illumination are building orientation, window size, and proximity of adjoining buildings and landscape.
Hence, general over lighting shall be provided in such a way that it is diffused. At the same time, specific illumination shall be furnished for more limited areas such as study desk and mirrors where more concentrated eye tasks are to be performed.

Glare is also an undesirable. A common source of glare in the students room is mostly from highly reflected surface of the desk top. If this surface is also dark an undesirable contrast with books and papers is created. The problem can be solved by careful selection of the furniture.

Glare from outside buildings can be solved by preserving and planting trees. In the hot sunny climate the outdoor plaza is highly undesirable. It could not be used during the day because it's surface will be hot and cause glare. Grass courts are highly desirable. The greeny soothes the eye and it is also economical.

For fixtures in public areas, including corridors brighten contrast can be reduced when shall amount of the light is direct towards the ceiling.

NOISE: - One of the most common student complaint about the college residence hall is noise. There are many instances that, administrators blame students as principle noise source and take disciplinary measures. However, there are good reasons to believe that students are not alone responsible for noise and that unsatisfactory phycical conditions.
Defined as unwanted or undesirable sound, noise originated by people and by mechanical equipment. Noise sources are located both outside and inside the hall.

Within the hall noise came through partitions, from the floor overhead, from rooms along the corridor and through open windows. These can be checked by careful detailing in the construction and planning.

Noises originating outside the hall a partial solution may be found in site selection and building orientation. The greater the distance from noise source is the less possibility of disturbance. The hall shall be located as far as possible from heavily traveled roads.

Planting bushes and hedges can act as partial sound barriers; vines or exterior walls will reduce reverberation between buildings.

Within the hall common-use space may be used as a buffer between exterior noise source and student rooms.

Problems involving the transmitting of sound between floors or partition walls may prove more expensive to solve. The greater the weight of materials used for floors and walls will, greater the insulation values. Air space within the comperite walls will also reduce sound transmission.

Materials used are not the only factor. Adequate sealing of masonry units are also required.
Noise transmission may also take place through structural vibration. Structural breaks is the means to reduce the transmission.

Hence, the careful planning in construction and detailing will reasonably reduce the sound transmission rather than expensive acoustical treatment and thus lower the costs.

TEMPERATURE AND VENTILATION: Because of the economic reasons, air conditions our artificial ventilations are not used. The control of sun heat and natural by proper considerations of the construction is the usual answer to this problem.

In warm, humid climate, the prime object of the design is to provide free air movement through the building and to prevent the temperature of its inside surface rising above shade temperature. To obtain the greatest benefits from air movement on days when there is only a slight breeze, orientation in its prevailing direction is a first consideration though this must be balanced against the optimum shade provided when the long axis of the building faces north-south.

Dead air pockets on plan as well as in section should be avoided. Ventilation at ceiling level is desirable and still of openings should be low, so as to allow the movement of air through the lower parts of a room where the occupant may be seated or in bed; ventilators below still level may be provided.
Walls and ceiling should be shaded from the sun so that they are not heated much above the shaded air temperature.

Roof and walls exposed shall be painted white so as to reflect heat.

The building will be protected from the sun and the rain and the glare of a humid tropical sky.

Canopies and hoods act as sun shades, and permit windows to be kept open for ventilation when it is raining.

In the hot-humid zone elongated buildings in the east-west direction are good. Buildings located on the north-south axis receive relatively the most penalty compared to all other climatic zones. Hence the room faces north-south to avoid the hot rays from the west side.

The room facing west side will have to be shaded and this will be done by using trees with spreading branches and dense foliage.

On the roof the sun must shine on. There is no way to protect the direct sun rays hitting on the roof. Only means to soothe this problem is to provide adequate air movement between the roof and the ceiling.

To provide comfortable and heatless dwellings, the floor should not be wet or even noticeably damp. During the raining season many buildings had experienced this defect.
To get the maximum comfort in living, all the student living quarters will be confined on second and third floors. Only lounges and other social, administrative and service spaces will be on first floor.
THE DESIGN
Design

Domitory facilities for 320 students.

I. Student Area

(a) Rooms for 320 students occupants (All these rooms will be on the second and third floors, and all the rooms will be occupied by two students.)

(b) Insufficient toilet facilities for the domitory occupant. There will be sufficient toilet facilities for every 20 students.

II. Social Area

(a) Lounges
The lounges will be placed on the first floor and should be near the vertical circulation core of the building.

(b) Dining Hall
The dining hall and its adjacent kitchen and preparation facilities should be capable of seating and serving all the occupants at any one time. Meals will be served in family style. This comparatively have-over may be used with success for social functions, converted with domitory life.

(c) Recreation Area

(d) Social and Reading Club Room

III. Administration.

(a) Domitory Desk
This area should be capable of direct access from Service area to facilitate to handling of mail, laundry and newspaper and magazine sales.

(b) Supervisor's Office
The main of the domitory Supervisor should be of sufficient size to allow storage of records.
IV Services

(a) Mail

Mail shall be handled through the main desk.

(b) Laundry

Laundry shall also be handled through the main desk, with allowance made for sufficient storage area to take care of the pick-up and delivery.

(c) Kitchen

The kitchen shall be directly accessible to the dining hall and shall be conveniently accessible to food preparation area, the dish washing facilities.

(d) Food Preparation

Food preparation area shall be directly accessible from a loading platform.

(e) Garbage Disposal

An enclosed area for garbage container, shall be located adjacent to the main food loading areas and shall be shielded from view from the dormitory.

(f) Employees Lockers and Rest Rooms

(g) Porter's Closets

Porter's closets sufficient for the storage of the equipment necessary to the porters shall be located in the plan of each living floor.

(h) Public Rest Rooms

Public rest rooms must be provided for use of men and women.

(i) Bicycle Stands
SITE PLANNING
SITE PLANNING

The scientific way of thinking about the problem of site planning is to imagine all the conditions and requirements bearing upon it to decide which are the governing ones.

Two factors are all important: the sun and the breeze. They both affect the comfort.

The sun is too hot and too bright. It will bring heat into the room even by reflection. To avoid glare from ground pavements, grab, foliage, our trees shall be of use - these will not only avoid glare, but for soothing effect on the mind and because of the air near growing things is cooler and better human consumption.

Attractive features of nature should be preserved as much as possible. Nature trees in good locations are priceless assets. They lend not only informality and interest to the buildings but also give shade against the hot sun. Their existence also contributes a gracious and restful unity. Some trees should be grown in order to avoid the barren appearance of the building and to create space.

Groupings of buildings is as to give a sense of orderliness and belonging. The buildings are designed in J shape and inside the space created by shape there can be used as outdoor informal games such as batminton, volleyball etc.
The roads will be run around the building complex. This gives the maximum accessibility and also to create the complex a sense of unity.
GENERAL SPECIFICATION
General Specification

Structure

The main structural framework of the building shall be of reinforced concrete beams and columns with brick fillings.

Exterior Walls

The exterior walls are made up of precast perforated grills, (or clay pipes or hollow concrete blocks). The framework of reinforced concrete has been designed to receive these panels of which itself connected to main columns.

Interior Walls

The interior walls shall be covered with 1/2 inches of plaster.

Walls on veranda side are louvered which are operable.

Windows and Doors are all operable louvered and are made with wood. Insect screens may be used behind the louvered.

Roof

The roof consists of dense untreated concrete and is sloped to one side. Under the roof slab there will be intermediate beams resting concrete paines. There will be a lower slab and are fixed to upper slab to form a monolithic honeycount. The ends of the roof will be of precast concrete grills, thus providing the free air movement between the upper and lower ceiling.
Floors

**Floor Surfaces** shall be wood tiles (1 3/9" X 9" X 2") laid on the concrete floor with hot layer of asphalt 3/4" thick. Two coats shall be applied.

**Ground Floor** There shall be plinth filling under the ground floor and shall be watered and well ramped in 6" layers, and on this solidated filling, 3" of briar bats to be provided. On top of which will be 3" to 4" lavae concrete and on top of the concrete comes the finished surface.

(b) Others: shall be with granolithic finish, with 3 to 1 1/2" thick cement concrete with 1 1/2" gauze stone aggregate (1,2,4)

**Other Floors** are concrete slab on compacted fill and reinforced slab.

Ventilation Ventilation shall be natural, with no air conditioning apparatus included in the building.

Furnishings The basic furniture shall be supplied by the dormitory, and shall be designed to provide a maximum of interchangeability. The furnitures shall be of Teakwood. This specific kind of wood is strong, hard and very durable and one of the five products of forests of Burma. Annually neize and medullany rays are distinctly mowed and take a good polish.
There will be in every room, 2 beds (6 1/2'X 3'), 2 dressers, chair (2 X 2 feet), book case (3/4 X 3 feet) and storage closet designed with wood. This closet shall also be so designed so that there will be ventilated itself when closed.
CONCLUSION
CONCLUSION

The dormitory has been considered from a point of view largely stressing the social importance of such a building upon the development of the student.

It is hoped that the dormitory is planned not only as a functional unit presented to the student, the necessities of student life, but with an eye towards the importance of student housing as a link between the individual student and the organization to which he belongs.

The success or failure of the buildings depends on the control and careful use of nature climate. The buildings in tropical countries have to be designed according to the nature. Thus has been stressed.

A basic program for the design of the student residence hall has also been presented, a program which may well be expanded or controlled under the influence of further design and consideration, but form the basic framework of on which the structure is built.
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