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THE CAPE JEWISH AGED HOME, CAPE TOWN

S. CHAPMAN, L. G. COHEN & A. G. VERSINO, MM.I.A., ARCHITECTS

The site is in Rocklands Estate on the slope of Table Mountain overlooking the City of Cape Town and Table Bay. It is a large tract of land with steep falling contours and is bounded by two roads at the top and bottom and having an access from two side roads. The site, being on the mountain side, was covered with sandstone and other mountain-type stone.

PROBLEM :

A new Home for Aged People was required embodying the principal of a hospital with certain other additional accommodation. One special stipulation being that the Home was to be designed to enable the inmates to move freely about the grounds and their portion of the building, and to enable them to do so, a number of entrances were to be provided at all ground levels.

The inmates are divided into three groups—the aged persons who are able to move around, the chronic sick, and the bedridden.

In addition, a complete hospital wing was to be provided to allow for operations both major and minor. For the inmates able to move about, a Synagogue was required based on the orthodox principle of the men on the one floor and women on the floor above. A mortuary and chapel had to be embodied in the scheme and placed in such a position as to not make the inmates themselves aware of this section of the Home.

Further accommodation required included the Administration Section, Matron's Quarters, the Nurses' Home and the Non-European Staff Quarters, with provision for future extension.

SOLUTION :

Owing to the nature of the ground, the building was designed on several levels. The inmates' section was placed in such a position as to face due north, with a complete and unobstructed view of the town and sea, with protection against the south-east wind which is rather severe in this neighbourhood. Owing to the falls of the ground, the Administration Section was placed facing the mountain, with access from the top road, while the Kitchen and Non-European Staff Section were grouped to allow access from the side road. The Synagogue which is required to face towards the east, was placed in this position having the mortuary directly below with direct access link over

Municipal park land to the other side road. This driveway is at the back of the inmates' section and is therefore well concealed. The Dining Room linking on to the Kitchen Section is directly opposite the Synagogue. The Administration wing is at a level one floor above that of the Kitchens, Dining Room and Synagogue, while the Ground Floor of the inmates' section is a floor below the Dining Room. All these sections have direct access to the lawns and gardens which have been provided.

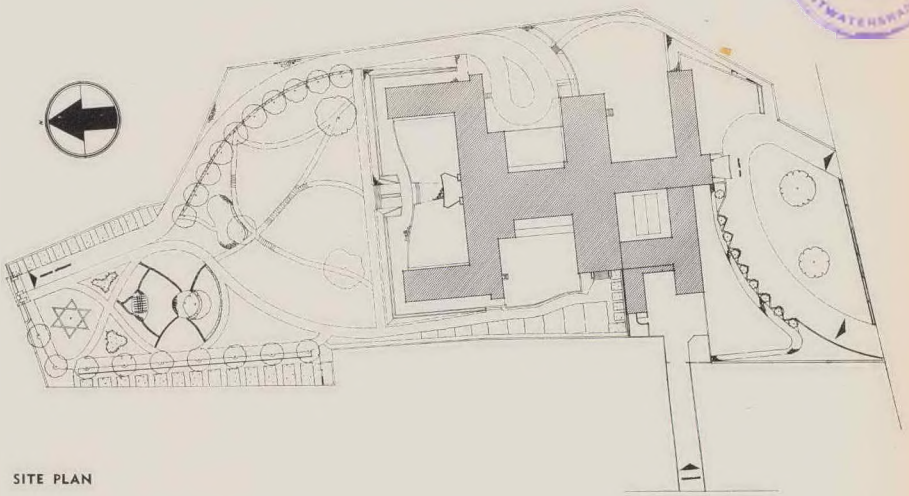
As regards the inmates' section, Ground Floor provides lounges and wards for the semi-bedridden who are able to be moved about, while on the next two floors the aged ambulatory-type inmates are accommodated, and the permanently bedridden placed on the top floor.

EXTERNAL TREATMENT :

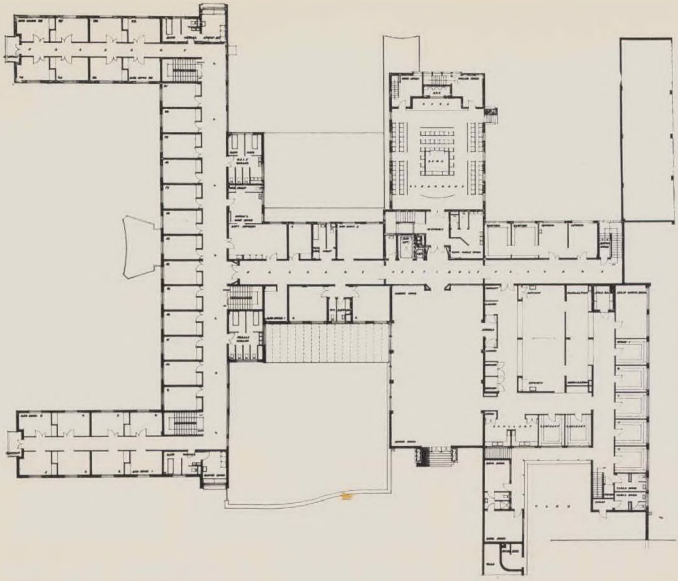
This was kept as simple as possible, and use was made of the mountain stone found on the site. Future accommodation has been allowed for over the inmates section of the building, while the lifts and motor-house have been taken to their full height in readiness for future extensions. The roof itself is temporary and is merely propped up on the concrete slab. This building was designed in 1938 and building operations commenced in 1939 and continued somewhat slowly during the war. Owing to the shortage and scarcity of materials a great deal of substitute materials had to be used. Asbestos, being the only available roofing material at the time, was substituted for the original, which was to have been light-weight copper.

INTERNAL FINISHES :

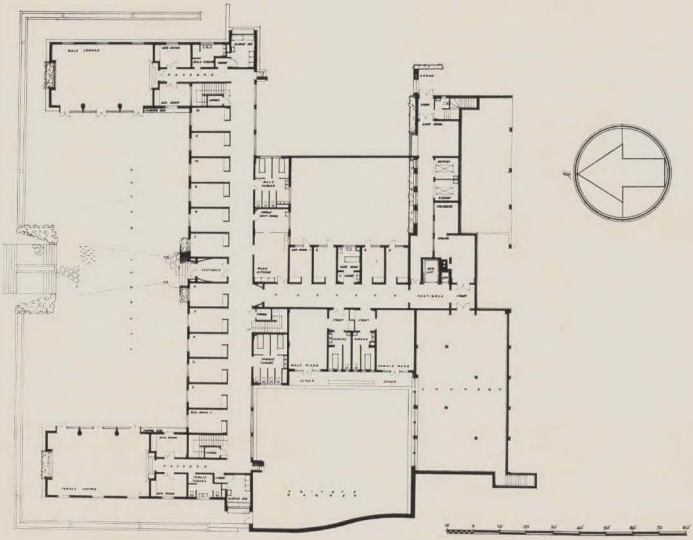
These are similar to the usual hospital requirements. A feature which was embodied was the use of double doors on the principle of $1\frac{1}{2}$ leaves. This was necessary in order to allow for any inmate from any bedroom to be moved to the hospital or for burial purposes. Under normal use the half leaf was closed and the other leaf, being the normal size, used as the door proper. Sound proofing of all walls was taken into account by the use of cavity type walls, and all furniture in the bedrooms was built in. In order to reduce glare and strain on the aged inmates' eyes, all walls were toned down with colour, depending on what direction the rooms were facing.



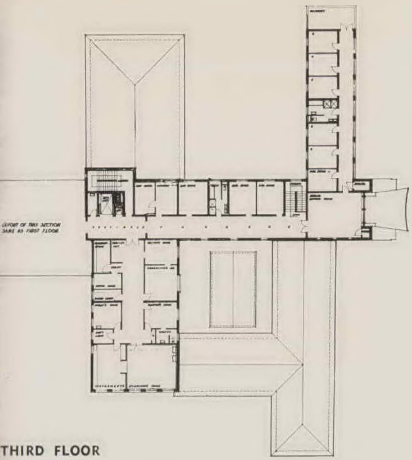
SITE PLAN



FIRST FLOOR

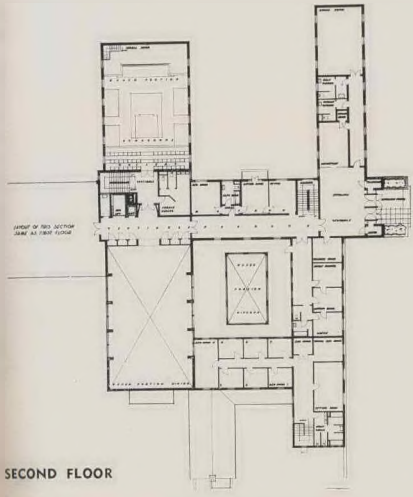


GROUND FLOOR

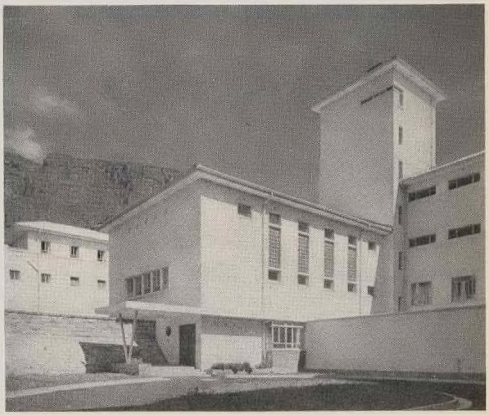


THIRD FLOOR

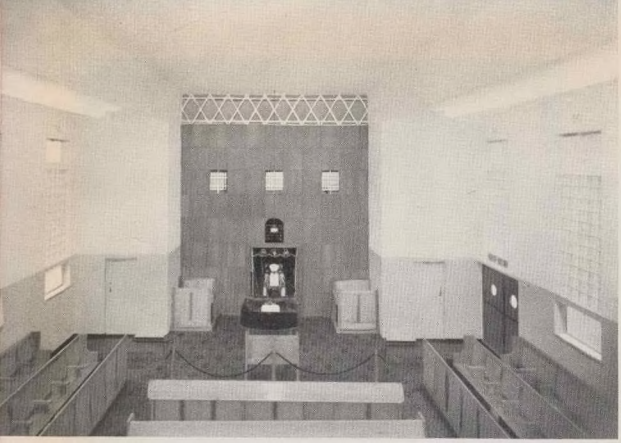
ABOVE : The entrance to the Administrative and Staff Section from the upper road, and which occurs on the "second floor" level. BELOW : The wing containing the Synagogue located over the mortuary with its separate entrance. The lift towers extend to the full height in readiness for future extensions.



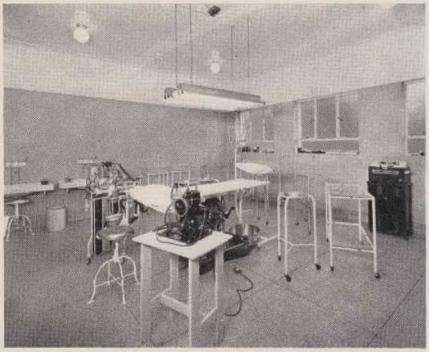
SECOND FLOOR



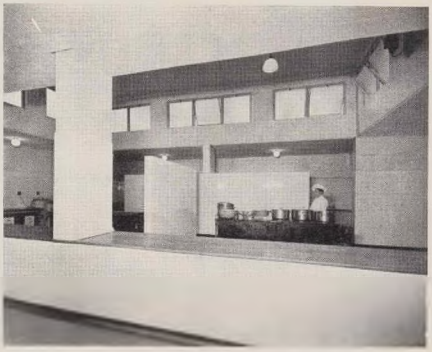
PHOTOGRAPHY: ROBIN SUMMERS



The Synagogue viewed from the women's gallery. Extending through two floors this wing is "balanced" on plan by the dining room, which is of a similar height.



ABOVE, LEFT : The dining room with its large north windows shown curtained. ABOVE, RIGHT : The operation and examination room of the hospital wing.



RIGHT : A view of the kitchen seen from the servery.

THE ADVENTURE OF HOME BUILDING

On five successive weeks commencing on September 30th last the Transvaal Institute of Architects, together with the Council of Architectural Students of the University of the Witwatersrand, presented a series of symposia under this general title ; each symposium being followed by an appropriate film. The sixth evening was devoted to a Brains Trust which dealt with questions posed by the audiences of the previous sessions.

The purpose of this undertaking was to explain to the public the sequence and significance of the various steps to be taken in building a new home, covering all the aspects of finance, site selection, controls and regulations, construction and character, and, throughout to underline the functions and professional services which the architect would perform. It so often happens that a young couple, or not so young couple, who decide to embark on this kind of adventure do not realise the complexitiés, delays and often disappointments which may beset them. For it is unfamiliarity with procedure, with technical and constructional matters, which can so easily cause unnecessary waste of time and money. The services of the architect in this regard, together with the meaning of good design, the merits of sound construction and the procedure to be adopted were explained. And it was to supplement this aspect of the lectures as well as to give point to pitfalls that the Brochure was produced, containing in humorous form the diary of a layman who had decided to build his new home !

Concurrent with the lectures an exhibition was mounted in the Johannesburg Public Library illustrating architectural publications and photographs of contemporary houses.

The series has proved an undoubted success, and in response to many requests it is likely that a similar series will be held in Pretoria later this year.

The Administrator's Foreword in the Brochure :

The family is still the basis of our Western European way of life and everything that tends to strengthen the family deserves our support. It is true, there are other equally important factors in the establishment of a family. There must be communion of mind and spirit, many insist that there should even be unity of tradition.

Be that as it may, among the material pre-requisites for a successful family the Home ranks high. It is almost impossible for the citizen who dwells in a hired house and moves every few months to fulfil his obligations to society. The backbone of every social institution is the person who considers himself settled and has staked a permanent claim in a community.

I accordingly wish the Transvaal Provincial Institute of Architects and those associated with them for this purpose every success in the series of lectures on The Adventure of Home Building.

WM. NICOL.

Editor's Foreword :

This summary of the proceedings does not purport to give a verbatim account of the seventeen lectures which comprised the series. It is based rather upon memories of each evening's discussions, fortified by notes of a rather sketchy cryptic nature. Many of our readers will have attended the discussion evenings ; to them the outline of the proceedings will perhaps serve as a reminder of many evenings pleasantly and instructively spent To those who were unable to be present, the following will serve as a precis of the ground covered.

DISCUSSION EVENING No. 1. Sept. 30, 1953

First Steps in the Building of a Home.

Mr. HENRY TUCKER, speaking for the South African Building Societies, talked of the importance of the home to our modern way of life. The house, he said, is the foundation upon which the home is built.

The crucial question in house building is the wherewithal to build. It is in this connection that the Building Societies made their greatest contribution.

Building Societies are part of the English tradition, said Mr. Tucker. In South Africa Building Societies go back over 100 years. Growth has been slow, but progress sure. Today, the average savings per capita (considering only the European population) is six times as great as those in England. Investments exceed £300,000,000 and loans granted exceed £250,000,000. In the year ended 1952, £70,000,000 was lent, mainly for house building.

The Building Society makes three major contributions. It encourages safe saving, it makes available those savings for building purposes, and it increases the quality of houses by maintaining strict supervision on the houses erected on Building Society loans. Mr. Tucker emphasised that Building Societies cater only for economic houses. To solve the urgent problems of sub-economic housing, he said, it is necessary for Building Societies to work in co-operation with Architects, Quantity Surveyors and Builders.

Mr. LESLIE V. HURD, a Johannesburg estate agent, gave the building public much valuable advice. He discussed firstly the financial aspect, and considered the various sources available for the financing of a building project, notably Building Societies, Township Owners, and the National Housing Commission. He made the point that the cost of a home does not consist only of the cost of the site and the house on it, but also such items as transfer duties, and the cost of furniture.

He dealt at length with the many factors affecting the selection of a site, and stressed particularly the relationship of the site to schools, public transport, shopping centres, places of entertainment, and other amenities. Mr. Hurd cautioned the prospective home builder to make enquiries regarding the rights which his site enjoys under any town planning scheme, and suggested that enquiries be extended to cover adjoining stands as well. Ease of delivery to view sites and out-of-town sites should also be considered, said Mr. Hurd. He also commented upon the physical nature of the site, which might seriously affect building costs.

In dealing with the building, Mr. Hurd said that while it was not essential to employ an architect, yet his employment might be regarded as an insurance, especially in view of the large outlay which the average home represents. The architect will sort out the ideas of the home-builder and his wife, and evoke a plan in keeping with his client's purse.

Mr. Hurd concluded by saying that despite the many pitfalls inherent in a building project, patience, thought, commonsense, and consultation with experts can smooth the way to the fullest enjoyment of owning a home.

Mr. BEN FLETCHER, a builder, spoke strongly for the employment of an architect in the Adventure of Home Building. He made the point that the architect planned the house to suit the possibilities of the site. Mr. Fletcher stressed the fact that the most important aspect in building today is the economic use of materials. An architect considered all reasonable economies, and also by his supervision protected the client from the less legitimate forms of economy which less reputable builders might practice. He discussed the advantage of a properly administered building contract, which would curtail the risk of dispute.

Finally, he had a word of advice to give to all men contemplating building : Let the architect deal with your wife, he said, for in his experience he has learnt how to cope with the female of the home building species !

Mr. ERIK TODD, a Pretoria architect, had the last word of the evening. He acknowledged the tributes paid to the architect by the earlier speakers. "The architect, he said, was not there just to put the owner's plan on "a blue print." The architect's chief problem is the pre-conceived rigid ideas of his client, from which he is loth to depart. The prospective owner has given his plan much thought : the architect, however, is expected to do all his work very quickly. Mr. Todd submitted that the architect, if he is to be conscientious in earning his 6% fee, should spend much longer on the planning and documentation of his work than he is normally allowed time to do. In America, he said, the architect frequently spends as much time on the preparation of documents as is spent on the actual construction of the building. Adequate preparation time is especially essential in domestic architecture, for the design of a house is one of the most complex of all planning problems.

DISCUSSION EVENING No. 2. October 7, 1953
" DESIGNING THE HOME "

The Client states his wants.

Mrs. W. EYBERS, speaking for the National Council of Women, dealt with the sociological aspect of the problem of home building. She said that it is recognised that character is influenced by both heredity and environment, and it is the latter which we can control. Care of the homeless and the badly housed is our most urgent problem, as slums cause promiscuity and degeneracy. Our large overcrowded flat areas reproduce many of the evils of the slums as little provision is made for social amenities. In flats hive life has replaced home life, and delinquency is spreading to even well-to-do areas. Mrs. Eybers emphasized the psychological value of home ownership as against mere tenancy, and saw in the urban African's separation from ownership of ground a root cause of many social evils. She said that delinquency, crime, sickness, and high divorce rates all stem from bad housing, and the community's need is therefore more and better housing.

Miss VERONICA WESSELS, of the Maria van Riebeeck Club, dealt with the client's wants and needs from the personal angle. She said that the home must not only be comfortable from the inside but attractive from the outside. She decried the poor aspect of most houses, their dull uniformity, their boxlike character, and their choice, in yellow facebrick, of a glaring colour unsuitable to our harsh bright atmosphere. She pleaded for a committee of responsible experts to control "monstrosities." She said that each home could have its individual and unique character, if it were designed specifically for its particular site, and for the characteristics of the family who were to live in it.

One of the characteristics of a good architect, Miss Wessels stated, was an understanding of nature. He must be sympathetic to the resources of the site, should treat house and garden as one unit, and should provide outdoor living space to enlarge upon indoor space.

Miss Wessels ended upon the note that good design is ageless, and that the architect in creating a good design is building a monument to himself.

Mr HENRI JOUBERT, an architect, dealt with the problem of home building from the architect's point of view. He considered that the design of a house which adequately meets the problem of living is highly complex, and requires to be tackled by an expert.

He thought that sentimentality, although a strong emotion, should not be the keynote in designing a house, as it often endangered both comfort and amentity.

Today comfort has replaced pretension as the aim of the house builder, said Mr. Joubert, and the success of the modern house is measured, not only by its good looks, which are most important, but by its convenience, workability, and the way that it panders to the owner's needs and habits. Mr Joubert then discussed the general sub-division of the home into day and night zones, and analysed planning trends in both those areas. He showed how there is a general tendency towards economy in the use of space, especially in such cases as circulation areas, and how such economy has been necessitated by the high cost of building and by a probable shortage of servants for maintenance. He suggested that the living areas of the house should be designed in the main for the informal living of its inhabitants rather than the rarer formal occasions upon which visitors are received ; and in the detailed discussion of the various rooms of the house one could discern a plea for a house which is really a place to live in, designed first and foremost for the needs of its occupants. Finally, dealing with the external appearance of the house, Mr. Joubert advised the audience to avoid pitfalls of the stylistic approach to design, the tricks of style such as Dutch gable or half timbering. He suggested that the character of the house should stem rather from a judicious choice of materials, and an accurate and studied placing of windows, terraces, pergolas and other design elements. It was this care in design, Mr. Joubert said in conclusion, that only the architect was trained and equipped to provide.

DISCUSSION EVENING No. 3. October 14, 1953
YOUR HOME AND THE NEIGHBOURHOOD.

Municipal Controls and Township restrictions in the interest of the Community.

Mr. H. SCHRADER, the Johannesburg City Engineer, dealt with the impact of officialdom upon the planning and erecting of a house. He explained the various aspects of Municipal control, both in the planning stage, through its various departments ; and in the actual building stage, through building inspectors. Mr. Schrader made the point that it was only by enforcing controls and demanding adherence to standards, that attractive and structurally sound houses could be ensured.

The responsibility of the home owner in these respects went beyond the confines of his own site, and extended to the community, as all homes should be well integrated into their neighbourhood.

Mr. A. M. MEHL, of the S.A. Bureau of Standards, also stressed the communal aspect of home building, and pointed out that inferior buildings which did not conform to standards of safety and amenity are potential hazards not only to oneself but to one's neighbours as well. He mentioned that in his opinion control must be based upon law, but that law should be a living thing, readily adaptable to new conditions and techniques. In this respect, he made reference to the set of Model Building Regulations which committees of the Bureau of Standards are at present engaged in preparing.

Mr J. W. SCOTT, a land surveyor, dealt with the problem of land costs, and explained how the provision of roads, services and amenities added to the cost of township layout. He made the point that the procedure of attaining approval for township layout was involved and protracted, and involved the township owner in considerable expense, especially as far as interest on capital was concerned. He considered that the time factor involved in the legal process of converting farm lands into developed townships considerably inflated the cost of land to the potential home owner.

Mr. Scott concluded by stating that the regulations and controls imposed by the township owners supplemented those of the local authority in helping to improve the community.

Mr. W. D. HOWIE, Editor of the S.A. Architectural Record, dealt with the purpose of building regulations, to maintain standards of health, comfort, safety and convenience for the benefit of the community. He explanned that although regulations are onerous in particular instances, they have real meaning in their overall purpose. He then spoke of the architect's responsibility in connection with Municipal control. The architect, he stated, must be completely familiar with the many regulations affecting building, and the client possessed in the architect an agent trained to cope with the intricacies of building bye-laws.

Mr. Howie discussed co-operation between the Institute of Architects and the Bureau of Standards in endeavours to modernise codes of building practice. This revision of bye-laws, he felt, would help to bring about more economical methods of building.

DISCUSSION EVENING No. 4. October 21, 1953

Does Good Design Cost More ?

Mr. T. H. LOUW, a quantity surveyor and President-in-Chief of the Institute of Architects, discussed the problem of the cost of building. In addition to detailed comment on how house design affects costs, he advanced the thesis that design cannot be good unless it was economical. He emphasised that it was incorrect to regard the initial cost as the cost of the house. There were other costs which also had to be considered ; such costs as interest payable on the bond, maintenance and depreciation, and insurance charges, also there was the resale value to consider. Good design considered all these auxiliary costs most carefully, and the well-designed house, though it might be higher in initial cost, would inevitably be cheaper in the long run.

Mr. J. E. JENNINGS, of the National Building Research Station, followed upon Mr. Louw's theme of initial and overall costs. But, said Mr. Jennings, the inconvenience, discomfort and lack of pride which result from a poor building, are more intangible, and are not measurable in terms of money. The man who builds a house has a right to expect the maximum of convenience, comfort, amenity and appearance in the building which can be provided for the money he has available to spend. However, although the cost factor was limiting to both client and architect, Mr. Jennings submitted that even the most humble of buildings, given proper thought and design, could be convenient and attractive. A house, he said, should serve the functions for which it is required ; should make the occupants' activities run easily and smoothly ; act as an effective shield against the weather ; and should excite a feeling of pride in its owner. To provide all these things, the architect must be a bit of a paragon, with a wide knowledge of man, aesthetics, and technics. Given such men, and there are many, we can expect good design which in itself is beyond price.

In conclusion, said Mr. Jennings, while it may be said that good design will cost more than bad design in the matter of first cost, it is evident that when all factors are taken into account a good design must be more economical.

Mr. H. H. le ROITH, a Johannesburg architect, delivered a long and interesting paper. He looked critically at the attitude of the conservative layman who has perhaps too much nostalgic interest in the past. Not only is the pseudo-house an

anachronism, but in its over-ornamentation it is most costly. Mr. le Roith drew attention to the many defects of the so-called traditional average house, and contrasted it with the architect's attitude to design today. The architect, he said, has evolved a new plan that is consistent with the new outlook on life and the new mode of living, that makes economical and logical use of space ; that is dependent upon comfort, convenience and mechanical devices for lightening labour, saving time and making housework pleasant. Space is planned, and a new external expression arises naturally from plan and construction.

Mr. le Roith deprecated the use of the phrase, " I can't afford an architect." The architect was sometimes considered as an individual who put the marzipan on the cake ; in reality he puts the ginger in the gingerbread. He tries to give the client the best value for his money, but in order to build an economical house not only is it necessary to use the most economical materials, but it is also essential to omit facilities which are not absolutely necessary for the particular family in question. To do this, Mr. le Roith said, the architect must have a picture of the social and living habits of his client. In considering the financial aspect, he cautioned that drawing up the perfect plan was one thing ; making dreams fit into a budget limit is another. Mr. le Roith then analysed in detail the siting and planning of the contemporary house, and indicated that with its open planning, with its use of partitioning or cupboards instead of walls, its simplicity and elimination of unnecessary ornament, it cost less than the traditional house.

In conclusion, he crystallized his talk into a series of do's and don'ts for the man contemplating building a house.

DISCUSSION EVENING No. 5. October 28, 1953
DESIGNING THE CITY WE LIVE IN.

Architecture as part of the broader concept of Town Planning.

The Mayor of Johannesburg, Councillor H. MILLER, spoke of conditions in Johannesburg. The centre of Johannesburg, he said, originated as a number of independent mining camps. Within a short period further independently planned townships were proclaimed, no steps being taken to co-ordinate their establishment. It has long been the function of the City Council, therefore, to bring some order and co-ordination to the City Design. It was only in the 1930's, after the Townships and Town Planning Ordinance of 1931 had given the Council the necessary powers, that the Town Planning scheme was put in motion, which scheme was finally promulgated in 1946.

The Town Planning Scheme stabilised development and brought order into the Municipal area. Complementary plans have been evolved. There is a Traffic plan, part of which is evident in th new bridges across the railway line. Other proposals provide for a " fly-over " at Clarendon Circle and on Jan Smuts Avenue over Empire Road. Plans for an East-West link via Smit Street are prepared, while a connection between Rissik Street and Oxford Road via a tunnel is a planned possibility.

The focal point of a city is its Civic Centre, the Mayor continued, and steps have been taken to acquire ground for a new civic centre on the ridge in Braamfontein. Large areas of ground have been purchased for the establishment of parks and recreation grounds.

The city should in its future development endeavour to ensure that sections of the city should have a distinctive appearance and provide for the distinctive designing of new buildings. Furthermore, sight should not be lost of the importance of public open spaces designed to provide lungs for the city and add to its beauty and attraction.

Despite the costs involved, a bold solution to traffic problems should be embarked upon so that the natural development of the city will not cause unnecessary congestion, including the introduction of well planned ring roads.

Large stands with single homes in areas on the immediate perimeter of the city centre should be re-zoned for " garden " flats with the necessary restrictions as to height and coverage in order to provide flat life with proper lungs in contra distinction to the congested flat area of Hillbrow. Parktown, for example, lends itself to this type of planning, which is human in its aspect and scientifically sound in city development.

Councillor Miller concluded by saying that the time has certainly come for non-European housing to be provided in properly planned towns providing all the necessary facilities and amenities for its inhabitants. The location system has become an anachronism in the economic life of the country and with the continued integration of the non-European into the economic life of South Africa, the time for proper town planning for non-Europeans is essential and also vital to efficient economic progress. Obviously, a great deal of capital monies will be required. The answer of financial stringency is short-sighted and must retard the progress of South Africa.

Professor FASSLER, of the Witwatersrand University School of Architecture, drew attention to the necessity for people maintaining contact with nature for their balanced development and the acquisition of a sound outlook on life. Up to 1800, when towns were small, the countryside was close by. The 19th century spread an avalanche of bricks and mortar over the countryside, particularly in England, and the sights and sounds of nature receded. Since 1850, however, a continuous effort has been made to introduce parks into urban areas. This movement has prospered, so that today the establishment of adequate park systems is an integral part of Town Planning Theory and Practice, and is the accepted objective of practically every Local Authority. Ebenezer Howard's Garden Cities of the first quarter of the 20th century were also influential in shaping the pattern of our suburban development.

The problem of laying out a garden, he said, is thus a common one in our society, but a glance at middle-class suburbs shows that the problem is often beyond the capacity of the average person.

Professor Fassler proceeded to summarise suitable objectives for a garden on a typical residential plot. A sense of privacy is an essential, on the High Veld open-air living and entertaining should be available, and must be linked closely with internal living areas ; there should be adequate provision for children's play activities, with a large uninterrupted stretch of lawn which will lend itself to many games ; a garden should be able to produce part of the family's needs, such as vegetables, fruit and flowers, nor is there any reason why some fruit trees should not be used ornamentally ; then there are the service requirements, access for delivery boys, refuse removal, and the hanging out of laundry, which needs suitable screening.

The listing of a set of requirements, he continued, is not sufficient. The space available must be arranged in such a way that practical needs are met imaginatively. The resultant atmosphere must be a satisfactory one from the spiritual point of view. A garden must not reveal itself at once. It must offer at least a few varying visual experiences and change of mood.

Sites of less than a quarter-acre are a special problem. Where there are no views, the principle of walling off the area to create an independent internal patio, or atrium, have fascinating possibilities rich in delightful historical precedents.

Professor Fassler concluded on the note that to lay out a garden considerable skill and experience is necessary, and it is important that the architect as creator of the internal living space of houses, should also be employed to solve the intricate planning problem presented by the landscaping of the site.

Mr. W. MALLOWS, Architect and Town Planner, discussed the big change that come over the planner's approach to his subject due to the impact of the idea of evolution as shown by the plant and animal words : in particular the multicellular structure of complex organisms, their continual adaption to environment, and the formation of groups and associations to assist survival.

Man's products, he said, no less than man himself were seen to be subject to the same laws ; and of all his products the town has always been his largest, most powerful and most significant. Its efficient functioning is highly important for man's survival and that depends on man's own understanding of multicellular structure ; with provision for its adaption to environment and the healthy growth of associations This necessitates the understanding and the planning of the basic cell, the family, which has always been the starting point of all urban societies. Last century the family was a self-contained independently operating unit, generally with three generations in one home ; today the grandparents have probably disappeared and the problem of the control and tending of children is devolving, from force of circumstance, on assistance from one's neighbours ; during the day, when children from several homes play together under one supervision ; during the evening, when baby-sitters are required.

Mr. Mallows argued that the old plan of a residential area based on a series of completely self-contained individual homes is no longer related to social reality, and that a more flexible plan is required, giving communal play areas and a safer way for children between neighbouring homes. The "Greenbelt" towns of the U.S.A. and the "Reilly Greens" of England arose from such considerations.

Mr. Mallows concluded by saying that with a new physical pattern the new social cell can begin to function healthily, and the life of a town has a sounder foundation. In this way the art of design cannot only follow, but foresee changes in the cellular structure of a town and those artificial mutations that are essential for any society in its fight for survival can be made in advance and so forestall the demands of a continuously changing environment.

THE NEW JAN SMUTS AIRPORT BUILDINGS

A COMMENT BY GILBERT HERBERT

For three hundred years, covering a nautical epoch from the "Dromedaris" to the "Pretoria Castle," Cape Town has functioned as the premier port of entry into Southern Africa. By the middle of this century, however, a new way of life and a new means of travel have threatened to wrest from Cape Town its honoured and traditional role.

In 1951 I wrote : "The recent announcement that more people enter the Union through Palmietfontein than via any of the seaports has served to underline the truism that this is the age of travel." Today it is apparent that the centre of gravity of passenger entry into this country has shifted from the coast to the interior.

With the increase in size and speed of aircraft, and with the introduction of a regular Comet service from England to South Africa, existing aerodromes and installations rapidly became obsolescent. Palmietfontein itself was a temporary airport, to be used only until a new air terminal could be completed : and it went out of active operation when the great new Jan Smuts Airport was opened to national and international air traffic during 1953.

The importance of the new airport—the first impact of South Africa upon the visitor from overseas—cannot be over-estimated. A major port of entry bears a tremendous responsibility to the country as a whole : and if we look at our historical gateway to Africa, we can see how conscious the authorities of Cape Town have been of this responsibility. Latterly, the services of eminent local and overseas planners have been called upon, and much thought has been given to the problem of creating a favourable first impression upon visitors to our shores.

Of course, the virgin soil of the Foreshore presented a wonderful opportunity for broad, imaginative planning ; equally, however, was there scope for bold conception in the level sweep of bare acres that was to become Jan Smuts Airport. This was a case of opportunity rampant, for in the problem and its solution lay a potential architectural demonstration of our achievements of the present, and our aspirations for the future. Here was a building which could be a monument to that superb technical achievement, the modern aeroplane.

Here could be, in architectonic form, an echo of the beauty and poetry of flight. Here could be a tribute to the energy and high courage of young men. This was not a site hampered by established buildings, restricted by traditional surroundings ; here was no architectural problem fettered by the chains of precedent. Here could be a building to echo the high technical and intellectual achievement of our age. Man has mastered the art of flight, and has created sleek graceful machines of the air. It was to these machines that Le Corbusier, a quarter of a century ago, pointed as examples of beautifully clean and functional design. Here, in South Africa, was an opportunity to design a building of international importance which would be commensurate with the functional yet imaginative aesthetic of the aeroplane.

Implicit in the problem of Jan Smuts Airport lay the promise of an inspiring solution. This was the Jan Smuts Airport that could have been. But what of the Jan Smuts Airport that is. Here we turn from the dream to the "desolation of reality." The Airport, so recently opened to fanfare and high praise, is a collection of heterogeneous buildings sadly earth-bound. It is true, and this is a negative virtue, that (apart from its entrance archway) it is not Revival Architecture ; but it is architecture of small distinction, acknowledging little either to the great technical developments of our age, or the broad current of contemporary architectural thought Internally, its atmosphere is bleak and barren ; its character ponderously monumental. Its furnishings and fabrics are desperately drear, and nowhere is the Airport graced by a sense of gaiety or adventure.

Let us not be so blase as to forget that, to the great mass of people, flying is an adventure. The fascination which trains and ships, stations and ports, have always exerted is to be found in great measure in the newest form of travel. I have spent a pleasurable Sunday morning on the observation deck of Schipohl Aerodrome, with many hundreds of other people, in an atmosphere which could only be described as exciting, yet festive. I have travelled miles to the Livingstone Airport, where I had no business other than to lunch, because the environment is so attractive a one ; and, on a day when no major airliner was due to arrive or depart, the dining room was far from empty.

The modern airport has an important social role to play. It acts as a large community centre, a place of gathering ; it brings, too, the much needed element of romance—the romance of travel, of long distances and far-away places—into many an otherwise drab existence. Its architecture must create an environment which exploits these social and romantic aspects.

The interior of the public concourse with the encircling gallery seen in the background. Photo : A. Gordon

In 1955 or 1956 a passenger on the south-bound Comet will leave the great new London Airport, now under construction. He will carry with him memories of the buildings of that airport. These buildings, designed by the eminent British architect, Frederick Gibberd, appear, from the illustrations recently released, to be of some architectural quality. In Africa, the Comet will touch down at Livingstone Airport, and he will find himself again in pleasantly designed, contemporary surroundings. At all times he is travelling in an aeroplane whose design is the epitome of refinement and finesse. Can Jan Smuts Airport form a suitable climax to such a progression and in such a context ? If the answer is no, then the impression made can only be a most unfortunate one.

Professor Nikolaus Pevsner recently wrote, in an article upon the architecture of Johannesburg, that "only public architecture lags behind." Jan Smuts Airport, at the time of Professor Pevsner's visit, was not yet built ; but I am confident that had it then been completed, it would not have caused him to re-evaluate public architecture on any higher a plane. It is not sufficient, however, to regret the great opportunity that has been lost at Jan Smuts. Buildings erected in the name of the Government are the concern of all of us, both as architects and as citizens. Other buildings of importance will be erected in the future ; these represent further opportunities of achievement, if we are alert and vigilant, and not afraid to condemn that which we think is harmful to the nation.

Photography: Lynn Acutt (Pty.) Ltd.

WINDMILL FERTILIZER FACTORY, MAYDON ROAD, DURBAN

CONSULTING ENGINEER: PAUL H. CONNELL · CONSULTING ENGINEER: THE LATE F. H. PREIJER

By W. H. CONNELL

" And departing, leave behind us
Footprints in the sands of time."

There are many to whom, like myself, Longfellow's " Psalm of Life " has made such appeal that they have in early life made resolutions to achieve some degree of fame in their chosen professions. Young architects perhaps visualise some gigantic State edifice or perhaps a civic centre. Junior engineers dream about a great bridge, tunnel, or of a railway through virgin territory.

To have done something which will be of sufficient service to mankind to warrant remembrance by those who come after us, is, to me, a very worthy ambition. The late F. H. Preijer was a friend of mine and I think that all who knew him will agree when I say that he had a great capacity for work and that he possessed creative ability is amply demonstrated by the new building which, in collaboration with Professor Paul Connell, he designed for Messrs. Windmill Fertilizers Ltd.

The structure is definitely functional in that the shape has been determined by its purpose, namely, the bulk storage of fertilizer with the greatest possible cubic capacity which could be constructed economically, with minimum column obstruction, over a given area.

With modern development in industry, the scientific planning of buildings, plant installations and production methods has created a demand for maximum uninterrupted floor areas.

Much could be written in merely describing the many methods which have been developed to permit the erection of large spans with the minimum number of supports, but it is perhaps sufficient to say that an enormous and costly amount of research has been devoted towards this end.

From a perusal of the early reports made by the late Mr. Preijer to his clients it is apparent that his investigation was most thorough. The Parabolic Arch, although economical in terms of the materials required and ideal for storge requirements, was discarded in favour of a circular shape for the following reasons :—

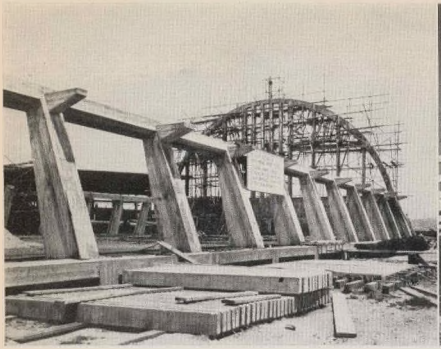
(1) The storage height at the sides is limited by the flatness of the parabola compared with the steeper circular curve ;

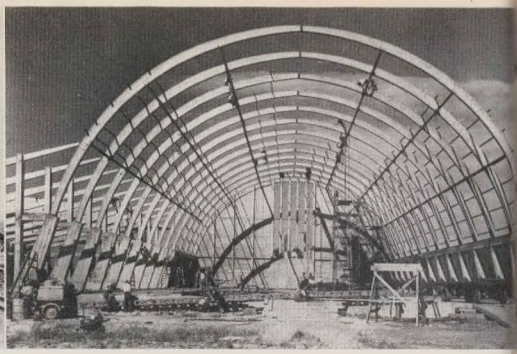
(2) The curved roof covering would have variable radii with consequent increased cost.

Both structural steel and reinforced concrete were considered as structural mediums. Figures derived for relative costs for one bay 14ft. 10½in. long gave the following :

Structural steelwork	£365
Reinforced concrete	£326

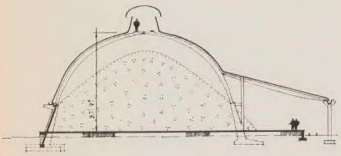
In addition it was estimated that the steelwork would involve an expenditure for painting of £7 17s. 6d. per bay every two to three years. The cross section of the building can be described as a circular segmental arch 90 feet span between springings with a lean-to roof on one side covering



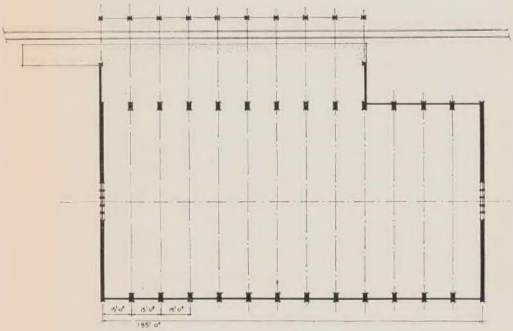


LEFT : The R.C. End frame with the inclined arch rib abutments. On the ground are the precast units which formed the panels of the lower retaining wall between the abutments. RIGHT : The "three-pinned" precast reinforced concrete arch ribs and tie beams in position. At left is the lean-to structure over the rail siding.

the loading platform and railway siding. Each arch rib, which was designed as "three-pinned," was precast in two sections.



SECTION



PLAN

They are supported by inclined R.C. abutments. The arch ribs are stiffened longtitudinally by 6in. x 6in. R.C. tie beams and by timber wind bracing at each end of the building. Steel purlins covered with "Everite" asbestos sheeting provide a roof covering with relatively low heat conductivity. The arch rings have a radius to the Extrados of 46ft. 6in. and they vary in cross sections from 21in. x 10in. to 12in. x 10in. Continuous natural ventilation is provided at the apex of the roof for almost the entire length of the building.

The lean-to roof over the loading platform and railway siding is supported by precast beams carried on the inside by vertical columns which are combined with the arch abutments and on the outside by R.C. columns designed for further lateral extension.

A precast R.C. gutter has been provided in the centre line of these columns. The roof beams taper to 6in. in depth at the ends adjoining the arch ribs, the maximum section being 21in. x 9in. over a span of 44ft.

The bulk storage space is approximately 13,600 short tons and the capacity 1,105,000 cubic feet. An underground conveying system handles the fertilizer which is delivered by rail to the factory where it is stored and bagged prior to dispatch.

It will be remembered that Messrs. Windmill Fertilizers Ltd. erected a similar structure in timber before the last war, but in this case almost the entire building was imported from Holland.

Messrs. Rush and Tompkins were the general contractors.

SCHOOL LIGHTING

WITH SPECIAL REFERENCE TO ARTIFICIAL LIGHT FOR SOUTH AFRICAN CONDITIONS

By Dr. H. D. EINHORN, A.M.I.E.E., A.M.(S.A.)I.E.E.
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This paper was presented at the Inaugural Meeting of the S.A. National Committee on Illumination. The suggestions put forward are the Author's.

Some lighting principles applicable to class-rooms are briefly surveyed and extracts from overseas codes of practice are given. A few new suggestions are put forward which may serve the specific needs of South African schools, taking economic and climatic conditions into account.

UNSATISFACTORY CONDITIONS SUSPECTED.

Although no general data on school lighting in South Africa are available to the author, a few chance visits to existing schools led to the suspicion that lighting conditions in many of our schools are far from satisfactory.

It is probable that teaching efficiency is in many cases impaired owing to inadequate lighting and that even the children's eyesight may be endangered.

A brief survey of the main principles of good school lighting seems to be warranted. Some original suggestions by the author may form a useful basis for future discussion and investigation, and it is hoped that they will ultimately lead to solutions tolerable to both the eyes of the children and the pockets of their tax-paying parents.

AIMS AND MEANS.

A school lighting scheme should aim at free and easy seeing conditions for pupil and teacher alike. It is convenient to distinguish "quantity" and "quality" requirements and we must appreciate that (i) natural daylighting, (ii) artificial lighting, and (iii) object surfaces as conditioned by painting or choice of materials, enter as factors of satisfactory environment.

The following notes deal mainly with aspects of artificial lighting, but it must be clearly understood that its design is closely linked with the day lighting and the surface treatment of the room.

DO WE NEED ARTIFICIAL LIGHTING IN S.A. SCHOOLS?

It is often argued that in our sunny climate the need for artificial lighting is not nearly as pressing as in less favoured countries. This is perfectly true and may lead to practical solutions of our lighting problems which differ from those adopted elsewhere. It does not, however, justify complacency and neglect.

Artificial lighting is needed in many regions, such as the Cape Coastal Belt, during dark winter mornings; wherever evening classes are held; in rooms where the day lighting design is inadequate, as in many cases of old buildings; where supplementary electric lighting is more economical than an elaborate window design.

Once the necessity of artificial lighting is accepted in any particular case, careful design is merited.

QUANTITY STANDARDS.

Quantity Standards of different countries are compared in Appendix I and reasons are given there to adopt a recommended level of 15 foot candles for class rooms in South Africa, while higher levels, at least 20 foot candles, would be required for sewing and drawing.

QUALITY.

Quality of lighting is far more difficult to specify than quantity. It depends on several factors and none of them is easily measured. To mention but a few; the absence of glare, uniformity of lighting, control of shadows, colour rendering, and control of brightness of pattern.

GLARE.

Glare is the most serious obstacle to good seeing conditions and surprisingly often neglected.

We have to consider both direct glare, caused, for instance, by bare lamps, or excessively bright patches of sky in the field of view, and reflected glare, caused by the reflection of light sources, e.g., from shiny desk tops, or from a blackboard. (See Fig. 4.)

Glare is a complex phenomenon and several factors have to be considered, especially luminance values and positions of sources, luminance-ratios in the field of view, and adaptation of the eye.

Glare can be controlled, in the case of artificial lighting by the choice and positioning of light

fittings ; in the case of daylighting by window design, use of screens and blinds, and in both cases by surface treatment, in the choice of colours and texture of paint and furniture.

Until more suitable calculation and specification methods are available for assessing glare, the following rules are proposed for South Africa (similar to those found elsewhere as shown in App. II) :

Light fittings shall be suspended at least nine feet above the floor. No part of a light fitting, visible to pupils within an angular range of 0 to 30° below the horizontal shall have a luminance of more than three candelas per sq. inch (or 1,500 foot-lamberts), no part visible between 30° and 45° shall exceed five candelas per sq. inch (2,500 foot-lamberts).

FLUORESCENT vs. INCANDESCENT LAMPS.

The relative merits of Fluorescent and Incandescent Lamps will be briefly surveyed.

There is no inherent technical superiority of either for the majority of class-room purposes. The choice will depend on economic factors.

The fluorescent lamp is nearly three times as efficient as the incandescent lamp and its energy consumption is correspondingly smaller for the same lumen output. (See Table II.)

But the installation cost of fluorescent fittings is as a rule higher than that of simple incandescent fittings.

Cost studies are required in each individual case, taking wiring costs and maintenance into account as well as price of fittings and energy. They are likely to lead to the following results :

If capital is very limited, incandescent lamps can be chosen with advantage. Large lamps, e.g. of 300 W. or 500 W. rating, could provide the recommended lighting levels with a minimum of initial expenditure, if the ceiling is reasonably high and suitable fittings available.

The heavy current consumption of incandescent lighting is not serious if running hours are short, say less than 300 hours per annum, under South African price conditions in larger municipalities. But if running hours are long or the electricity tariff high, fluorescent lighting will pay in the long run.

Existing buildings can often be best improved by substituting fluorescent lighting for incandescent lamps, since re-wiring costs can thereby be saved even if the electrical installation was already fully loaded. An increase of illumination to twice or three times the previous level can be expected.

COLOUR.

Whenever colour is important, fluorescent lamps may give the best results. They must, however, be carefully chosen and the difference between the appearance of a lamp and its colour-rendering properties should be appreciated.

For supplementing daylight in sections of a large room, any lamp which blends reasonably well with natural light will probably do, and a fair choice in the colour range between 4,000° K. and 6,500° K. should be possible. " Daylight " and " cool white " lamps fall into this range.

Where colour rendering is critical, as in art rooms, many of the more commonly used fluorescent lamps are likely to give disappointing results. " Colour-matching " lamps or a judicious blend of incandescent lamps with blue (or perhaps colour-matching) fluorescent lamps are most likely to satisfy the artistic user.

FITTINGS.

While the quantity of light depends mainly on the number, rating and type of the lamps and only to a lesser extent on the fittings chosen, the quality (apart from colour) is predominantly determined by the fitting.

When selecting a light fitting one should consider : Direct glare, reflected glare, horizontal and vertical illumination required, evenness of lighting and shadows, and maintenance.

The most serious shortcoming in numerous existing installations is severe direct glare due to insufficiently screened incandescent lamps, particularly if low suspension brings them near the line of vision.

Conventional conical shades are perfectly useless in this respect and even industrial reflectors with a 20° cut-off are often employed with too little regard for their function and limitations.

Figure 1 demonstrates the luminance limitations embodied in Table III.

Fitting types are arranged in decreasing order of glare, the most objectionable shown on top. Different countries would have to " draw the line " as shown. U.S.A., for instance, while permitting indirect lighting and louvred fluorescent lamps in 45° reflectors, would have to reject diffusing spherical fittings as well as fluorescent lamps in industrial fittings with the usual 20° or 30° cut-off.

In view of the climatic conditions in this country artificial lighting is rarely needed for long periods, and in order to meet the usually stringent

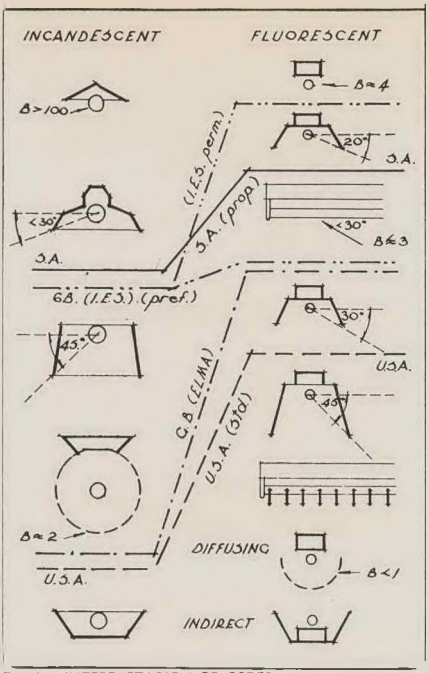


Fig. 1.—INTERPRETATION OF CODES
Only fitting types below the dividing lines are acceptable. (B = luminance in Cd./in²)

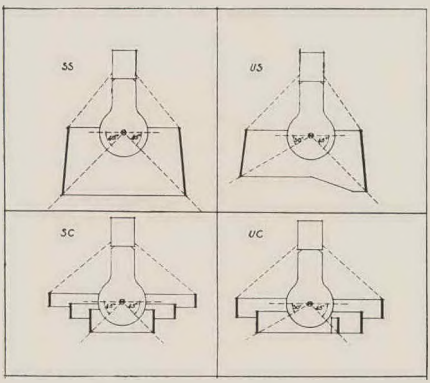


Fig. 2.—"ANTI-GLARE-RING" FITTINGS (for large incandescent lamps)
SS = Symmetrical simple
US = Unsymmetrical simple
SC = Symmetrical concentric
UC = Unsymmetrical concentric

limitations on capital expenditure the proposed figures in Table III would permit incandescent lamps with simple shades of suitable cut-off, alternatively bare fluorescent lamps mounted high up and parallel with the major axis of vision.

The cut-off angle for light from incandescent lamps towards pupils should be about 45°, while in sideways directions and in the direction of the blackboard a slightly higher cut-off might be permitted, say 30°-35° in order to allow better illumination of blackboard and wall exhibits without the use of local lighting.

A limit of 3 cd/in² would permit bare fluorescent lamps lengthwise but requires 30° shades for cross mounted lamps. It would permit 300 W incandescent lamps in 12in spheres, mounted high, but no bare lamps unless shaded above 45°.

There is, in the author's opinion, a lack of inexpensive shades for large incandescent lamps, with a cut-off angle of 45°. Nor are suitable unsymmetrical shades stocked by our suppliers. The recently-formed S.A. National Committee on Illumination might fulfil a useful task by sponsoring co-operation between lighting designers, manufacturers and school authorities for the purpose of arriving at a satisfactory design. Some simple "direct/indirect" patterns might be considered, similar to those shown in Fig. 2. The shades could be made of white enamelled sheet steel, anodised aluminium or asbestos-cement. Translucent diffusing acrylic plastics could be designed for a still better brightness pattern and might be considered more attractive, but their cost would at present be higher.

Another possibility is the adaptation of the "Grid System" (recently developed in America for fluorescent lamps (14) to incandescent lighting. Here the place of fittings is taken by large shields of inexpensive building materials such as hardboard or acoustical materials suspended from the ceiling. The layout shown in Fig. 3 is provisional and a satisfactory final design must be evolved for each room shape. A full scale trial on a prototype school-room would be required to test its suitability. The function of the shields could be acoustical as well as visual and if such acoustical improvement is desired, this layout may prove highly economical.

All these inexpensive designs are liable to cause reflected glare from desk tops. It can be minimised by avoiding glossy surface treatment of the latter.

POSITIONS OF LIGHTS.

Careful attention to the placing of fittings is perhaps the most economical factor towards achieving good lighting.

A common fault found is too low a suspension of fittings. The hope that lowering the lights will appreciably improve the average illumination in a large room is fallacious, and the resulting increase in glare and unevenness of illumination leads to poor seeing conditions.

For rooms up to 11ft. high, fittings are as a rule best mounted close to the ceiling.

Occasionally ceiling beams can fulfil a function similar to the shields mentioned in the previous section and may permit the use of bare lamps. This is rather fortuitous and requires attention to glare as well as to uniformity of lighting. Lamps would have to be placed carefully behind the beams to obtain the correct cut-off angle.

As to plan layout, the number of points should be large enough to avoid undue shadows and provide reasonably uniform illumination. It is usual, therefore, to limit the "spacing/height" ratio of fitting and their distance from walls (5, 7).

While a conventional symmetrical ceiling layout permits flexibility in the use of a room, it may advantageously be abandoned in a class-room with fixed chalkboard and more or less predetermined desk positions; e.g., by shifting lamps away from the chalkboard, the latter will receive light at a better angle. (See Fig. 3 and 4; also Ref. 3.)

CHALKBOARD LIGHTING.

The chalkboard (blackboard) should receive the same illumination as the desks, i.e., 15 ft. c. To achieve this by general lighting without glare to the teacher is not always easy. Special local lighting is therefore often desirable.

Fluorescent lamps are well suited for this purpose on account of their length.

If carefully adjusted parabolic specular reflectors are used, the fittings may be mounted close to the top edge of the board.

The more usual reflector types which disperse the light with little directional control should be placed at a certain minimum distance from the wall, in order to provide sufficient and reasonably uniform illumination. The angle α in Fig. 4 should be at least about 25° or 30°.

This means that the possible position of ordinary fittings for lighting the chalkboard, is limited by three planes as shown in Fig. 4; they must be high enough to avoid reflected glare to pupils and direct glare to the teacher, but far enough to light

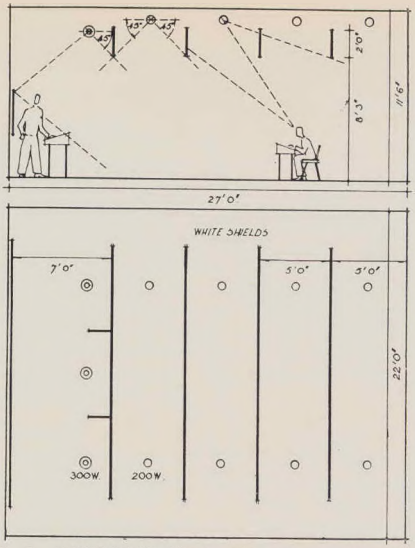


Fig. 3.—"GRID" LAY-OUT for 600 sq. ft. classroom, using eight 200W and three 300W incandescent lamps. The latter can be replaced by two 200W lamps if special chalkboard lighting is installed.

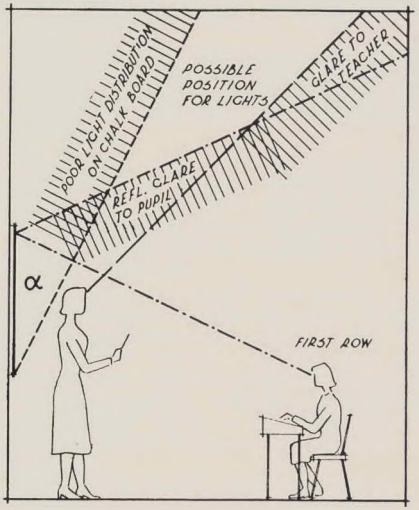


Fig. 4.—CHALKBOARD LIGHTING: Shading shows prohibited positions.

the lower half of the board reasonably well. This applies to general as well as local lighting.

Any lamps near the board must be carefully shielded against the class and even low luminance sources such as diffusing spherical fittings must be kept well out of the pupils' line of sight.

AESTHETIC ASPECTS.

The author feels that lighting design for a classroom should first of all be functional. Any attempts to make the installation look attractive should be subsidiary to its main purpose of providing good seeing conditions. In other words, beauty should be complementary to utility, not a substitute for it.

In practice, light fittings and lighting designs which fulfil both aims are probably more expensive than purely utilitarian ones. For instance, the concentric fitting SC in Fig. 2 is likely to have more aesthetic appeal, but will cost more than the simple shade SS. The choice resolves itself into an economic one and would ultimately rest with the financing authorities.

CONCLUSIONS.

Satisfactory artificial lighting in our schools would require illumination levels well above those frequently found. For minimum first cost, this can be achieved by using large size incandescent lamps.

Attention to glare by careful shielding and positioning of lamps is of greatest importance. The cheapest way, in the absence of convenient ceiling beams, would be the employment of simple low-cut-off shades or shields. Diffusing translucent fittings are satisfactory if carefully placed, considering both direct and reflected glare.

The practical designs suggested in this paper (Figs. 2 and 3) do not aim at ideal conditions, but are compromise solutions with an eye on minimum installation costs, intended as alternatives to the useless " conical shades " frequently found.

The rather moderate standard with which they comply (see Table III) seems justified in view of the short periods during which artificial lighting is usually required here.

If lighting is needed for longish periods as in rooms used at night, higher standards might be aimed at with advantage (15).

Where running costs are considerable either on account of long burning hours or high electricity tariffs, fluorescent lamps are likely to be economical. For this reason and on account of their colour, they are well suited for supplementing daylight.

Conversion to fluorescent lighting is likely to form the best solution if an existing installation yields too little light, but does not permit any increased electric loading.

Where the colour-rendering is critical as in art rooms, carefully chosen fluorescent lamps possibly blended with incandescent ones promise best results.

Aesthetic considerations should be complementary to function, not a substitute for it.

The recently formed National Committee on Illumination could fulfil a useful purpose by coordinating the efforts of school authorities, designers and suppliers, by drawing attention to the need for better lighting in schools and by sponsoring a South African Code for school lighting.

REFERENCES

(1) C.I.É. Proc. 1948, 1, pg. 624 ; 1951, **1**, Sec. 62b, pg. 8.
(2) Standards for School Premises Regulations 1951, No. 1753.
(3) Brit. Std. Code C.P. 324, 101 (1948).
(4) I.E.S. (London) Code Interior Lighting (1949).
(5) E.L.M.A. Bureau, " Light in Schools " (1951).
(6) Amer. Std. Practice, School Lighting, Ill. Eng. **43** 793 (1948).
(7) I.E.S. (New York) Lighting Handbook.
(8) Crouch, Ill. Eng. **45,** 343 (1950).
(8a) Weston, Sight, Light and Efficiency, 169 (1949).
(9) Harrison, Ill. Eng. **40,** 525 (1945). Trans. I.E.S. **13,** 121 (1948).
(10) Harrison and Meaker, Ill. Eng. **42,** 153 (1947).
(11) Logan, Ill. Eng. **43,** 1239 (1948). Trans I.E.S. **17,** 265 (1952).
(12) Hopkinson and Petherbridge. Trans. I.E.S. **15,** 39 (1950).
(13) Robinson. Trans. I.E.S. **16,** 61 (1951).
(14) Benson and Church. Ill. Eng. **47,** 15 (1952).
(15) Ill. Eng. **45,** 77 (1950) ; **47,** 10 (1952).
(16) Pott. Trans. I.E.S. **17.** 293 (1952).
(17) Farmer, Arch. Jour. Aug. 10, 1950.
(18) School Lighting (Special Number). Ill. Eng. **48,** pg. 291-353 (1953).

C.I.É. International Commission on Illumination.
Ill. Eng. " Illuminating Engineering," the journal of the Ill. Eng. Soc. (New York).
Trans. I.E.S. Transactions of the Ill. Eng. Soc. (London).

TABLE I.—RECOMMENDED LEVELS OF ILLUMINATION (IN LUMENS PER SQ. FT.=FOOT-CANDLES)

Country	Authority	Class-rooms	Drawing Sewing	Gymnasium	Wash-rooms
U.S.A.	Am. Std. Pract.	30	50	20	10
Great Britain	I.E.S. Code 1949	15	20	7	5
Great Britain	B.S.I. Code 1948	12	12	8	3
Great Britain	Min. Educ. Min. Reqs.	10			
Great Britain	E.L.M.A. Bureau 1951	15	20	10	7
Netherlands	Report 1950	20-25			
Sweden	Swed. Lighting Soc.	15	30	8	8
France	Industry	20-50	30-50		5-10
South Africa	Proposed by Author	15	20	7	4

I.E.S. —Illuminating Engineering Society.
B.S.I. —British Standard Institution.
E.L.M.A.—Electric Lamp Manufacturers' Association of Great Britain.

APPENDIX I

QUANTITY STANDARDS.

Table I shows an extract from the C.I.E Proceedings 1951 (62b pg. 15) supplemented from some of the original sources (1-7).

The difference between standards in different countries is apt to be puzzling. The reason is that there is no absolute optimum within the range of lighting levels normally achieved; one could increase lighting levels to something in the order of 1,000 ft. c. without any fear of "too much light," but the increase in cost yields a decreasing return in the benefits derived from it.

There is, therefore, a certain latitude, and one should distinguish between minimum levels (possibily enforced by law) and the somewhat higher recommended levels.

The choice of both levels is dictated by economic policy and although a scientific basis for the American figure is claimed (8) there is a good case to be made for being satisfield with a lower one under present financial conditions. Particularly for comparatively brief and intermittent use, common in South Africa, the author feels that the value of 15 ft. c. recommended by the British I.E.S. would be adequate, provided it is maintained throughout the life of the installation.

This means installation values in the order of those given in Table II. As an example, for a 600 sq. ft. class-room, six 300 W. or nine 200 W. direct fittings, alternatively six 500 W. indirect fittings, would be required. In cases of economic stringency one may wish to cut down on these installa-

TABLE II.—APPROXIMATE INSTALLATION VALUES FOR 15 FOOT-CANDLES

Type of Lamps	Incandescent	Fluorescent
Direct Lighting	3 W/sq. ft.	1 W/sq. ft.
General Lighting	4 W/sq. ft.	1.3 W/sq. ft.
Indirect Lighting	5 W/sq. ft.	2 W/sq. ft.

W/sq. ft. = Watts installed per sq. ft. floor area.

Note: These figures are only intended as a rough guide for a favourable environment. A proper design calculation has to take into account room shape, types of fittings, exact output of lamps, colour of ceiling and walls, etc.

TABLE III.—RECOMMENDED LUMINANCE LIMITS FOR FITTINGS (3, 4, 5, 6)

In downward directions (angles from horizontal)	0 - 30°		30° - 45°		45° - 90°	
Units (i)	Cd/in²	Ft. L.	Cd/in²	Ft. L.	Cd/in²	Ft. L.
U.S.A. (Stand. Ass.'s recommended)	0.5	225	1	450	2	1000
U.S.A. (Permitted for favourable surround)	1	450	2	900	4	2000
Brit. (E.L.M.A. Bureau) (ii)	1	(450)	5	(2260)	5	(2260)
Brit. (B.S.I. Code of Practice) (i)	3	(1360)	5	(2260)	5 (ave.) 10 (max.)	(2260) (4530)
Brit. (I.E.S. Code preferred) (ii)	2.5	(1130)	2.5	(1130)	no limit	
Brit. (I.E.S. Code maximum permitted) (ii)	5	(2260)	5	(2260)	no limit	
South Africa (Proposed by Author) (iv)	3 or	1500	5 or	2500 (iii)	no limit	

Notes : (i) "Luminance" is the standard term for what used to be called "Brightness." It is measured either in Foot-Lamberts (ft. L.) or in Candelas per sq. in. (Cd/sq. in). 1 Cd/sq. in. corresponds to 144 × 3.14 Ft. L. = 453 Ft. L. (Metric units are millilamberts Ca/sq. cm., etc.) Bracketed figures are not given in the original codes but converted for purposes of comparison.

(ii) All British figures refer to a minimum height of nine feet above the floor and the author proposes the same minimum height for South Africa.

(iii) Towards pupils ; towards chalkboard or side walls "no limit" from 30° to 90°.

tion figures ; but at least six 200 W. direct fittings must be installed if one wishes to obtain the minimum ten foot-candles required by the British Ministry of Education.

APPENDIX II

METHODS OF ANTI-GLARE SPECIFICATION.

To embody rules limiting glare in specifications and codes is not at all easy. Some quantitative methods have been proposed and are under investigation, offering promise for the future. These include Harrison and Meaker's "Glare Factor" calculation (9, 10) ; The American Ill. Eng. Soc.'s "Luminance Ratio Limitations" (7, 13) with prediction based on the "Interreflection Method"; Logan's "Zonal Flux" method (11, 13) ; Hopkinson and Petherbridge's "Glare Constant" calculation (12).

Simpler, perhaps, is the specification of luminance limitations of light fittings. Table III embodies American and British code figures and a tentative proposal for S.A. minimum requirements.

The practical implications of Table III are shown schematically in Fig. 1. Important factors such as position of fittings and adaptation have been disregarded and discretion is needed in applying these code figures. They are meant to give a rough rule and should not be pendantically enforced.

ARCHITECTURAL COMPETITION

CITY OF NAIROBI KING GEORGE VI MEMORIAL FUND APPEAL COMMITTEE

The Committee invites architects and others to submit, in competition, designs for the proposed King George VI Memorial Fountain to be erected at the corner of Connaught Road and Sergeant Ellis Avenue, Nairobi.

Assessor : E. D. Hill, F.R.I.B.A.

Premiums : Design placed first, £100 ; design placed second, £50 ; design placed third, £25.

Last day for submitting designs will be 10th May, 1954.

Conditions may be obtained on application to the Secretary, City of Nairobi King George VI Memorial Fund Appeal Committee, P.O. Box 651, Nairobi, on deposit of the sum of 30/-, which will be returned to competitors on receipt of their designs.

OBITUARY

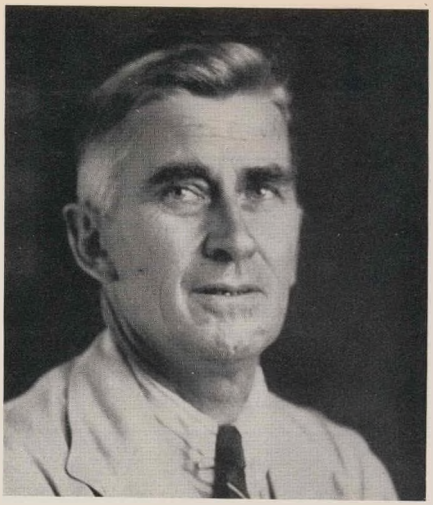
GEORGE UTTING FRIPP was born in Beaufort West on the 6th March, 1884. As a young man he was one of South Africa's foremost cyclists and won no fewer than 57 Cape Colony and Western Province Championships, including many first prizes. His greatest finish was in the South African 5-mile Championship of 1904 which he lost by inches.

George Fripp commenced his architectural career with Messrs. Reid and East, Architects, of Cape Town, in 1902, and he remained with that firm for seven years. He entered the P.W.D. in May, 1909, and resigned in July, 1910, to take up a more senior appointment with the Rhodesian Government. This appointment was held until 1914 and during that period he was responsible for the new Salisbury Hospital. George Fripp was placed second with Mr. F. W. Macey in the competition for the Salisbury Municipal Offices, and was placed in the competition for the Ramblers' Club, Bloemfontein.

He rejoined the P.W.D. in September, 1918, and resigned in November, 1921.

In August, 1924, he joined the City Council, Pretoria, and was responsible for the design of the Fountains Kiosk. He later rejoined the P.W.D. in December, 1928.

George Fripp was one of the inaugural members of the Institute of South African Architects.



During the depression of the early '30's George Fripp, among other architects in the Department, was retrenched in April, 1932, but re-entered the P.W.D. in November, 1932, and remained until his death on the 18th November, 1953.

He was one of the most colourful personalities ever to work in the P.W.D., a great sportsman who will be missed by all who knew him.

NOTES AND NEWS

TRANSVAAL PROVINCIAL INSTITUTE : MEMBERSHIP

REGISTRATIONS

Mr. P. R. G de Beer and Mr. M. Glukman, both of Johannesburg, and Mrs. M. M. Bader, of Benoni, as Practising Members ; Mr. G. Meyers as Salaried Member.

TRANSFERS

Mr. J. W. Biggar from C.P.I. and from Salaried to Practising ; Mr. J. Innes, Mr. J. Shaw, Mr. W. H. A. Place and Mr. R. A. Todd from Salaried to Practising ; Mr. W. B. T. Newham (Provincial Architect) from Salaried to Retired, and Mr. R. H. Graham from Practising to Retired.

PARTNERSHIPS

Mr. S. A. Abramowitch and Mr. David Pinshow have entered into partnership as Abramowitch and David Pinshow, at 305/7, Alris Buildings, Rissik Street, Johannesburg.

Mr. J. Innes has entered the partnership of Messrs. Corrigall, Crickmay and Partners, Pretoria ; Mr. R. A. Todd has entered the partnership of Messrs. Nurcombe, Summerley and Lange, of Johannesburg ; Mr. M. D. Lennard has entered the partnership of Messrs. Haddon and Allen, of Johannesburg.

1953/54 YEAR BOOK CORRIGENDA

C. M. Gamley, Esq., Quantity Surveyor, is incorrectly described as being in partnership with Springthorpe and Crosthwaite, whereas he is actually practising on his own account.

A. J. B. Firth's address is incorrectly shown as " c/o Margate Timber Yard "; the address should have been 105/6 Margate Court, Marine Drive, Margate, Natal.