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OF SOUTH AFRICAN ARCHITECTS AND THE CHAPTER OF SOUTH AFRICAN QUANTITY SURVEYORS

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E D I T O R VOLUME 36

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SOLAR HOUSE AT WESTVILLE, NATAL, FOR MR. & MRS. GREENBERG

CHICK, BARTHOLOMEW AND POOLE, Architects, Durban

The site $1\frac{1}{4}$ acres in extent is approached via a feeder road on the south boundary with a steep slope of one in five to, and bounded on the north by, the Durban-Johannesburg National Road. The site has uninterrupted views to the north across the Westville valley with views of Durban and the coast to the east and Kloof uplands to the west.

PLAN REQUIREMENTS

At the time of building in 1946 the restrictions imposed by building control of 2,000 sq. ft. total area for the house and limitations to the outbuildings affected the plan requirements which were as follows:—

Living Room; Dining Recess; Entrance Hall; Kitchen

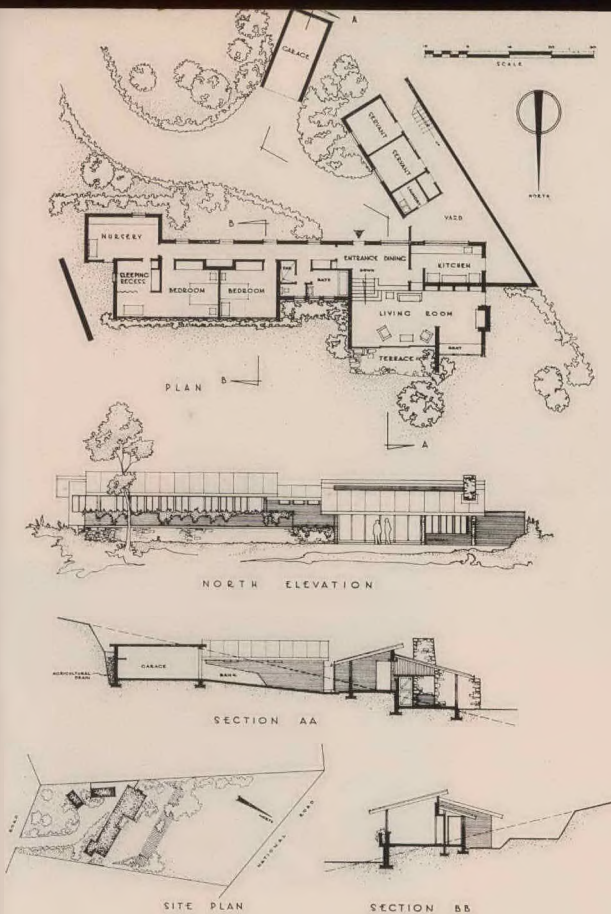
and Servery; two Bedrooms; Nursery; Bathroom; W.C.; Shower; Outbuilding with Laundry, Garage, two Rooms, W.C. and Shower.

Ample cupboards and shelves were required for a large collection of books, records, *objets d'art*, etc

GENERAL

The accommodation was to be provided in a single storey bungalow with an open and informal living area, but with security and privacy to the Bedrooms from outside observation.

The house was to exclude the sun throughout the whole day during the summer months and during the mid-day hours only of the winter months.



The owners' living characteristics were carefully considered; site conditions, prevailing winds and sun traverses were studied.

SOLUTION

The plan was grouped into three zones;

The *Living Zone* with the Living Room in two sections, excavated into the site and level with the North Terrace. The two sections provide for alternative living for summer and winter conditions. The summer section is paved with quarry tiles extending and opening on to the North Terrace with sliding glass doors, and is designed to give the amenities of the more conventional Verandah or Stoep without the waste in space of the usual conventional Lounge.

The winter section has a dropped boarded ceiling to give a cosy intimate atmosphere with a bay window seat to trap the winter afternoon sun.

Bookshelves and cupboards extend along the back wall between the two sections and accommodate books, records, cocktail cabinet, etc. with a serving hatch through to the Kitchen Servery.

The Dining Recess-cum-Entrance Hall is on a higher level and divided from the Living Room by a low wall and cutlery fitting with steps leading down to the Living Room.

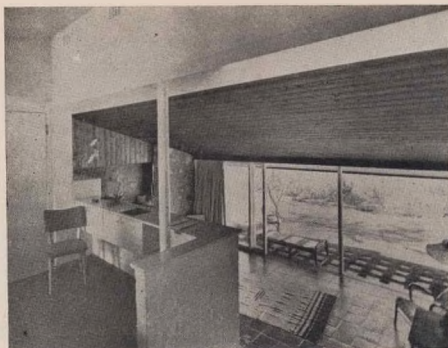
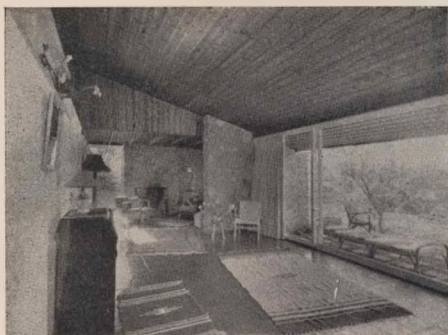
OPPOSITE: View of North Elevation and the North Terrace. BELOW: View of the South Elevation from the feeder road down the driveway.

Photography: Balance Studios.





ABOVE: The Living room looking towards the steps to Dining Recess, seen from the Winter Section. **RIGHT, ABOVE:** The Living Room, looking towards the Winter Section, from the steps to the Dining Recess. **RIGHT, BELOW:** General view across the Living Room, with terrace beyond, seen from the upper level of the Dining Recess. **BELOW:** The sleeping recess off the Main Bedroom with the interleading door to the Nursery





View of the North front of the Bedroom Wing, showing the raised floor level arranged for privacy of the bedroom wing.

The Sleeping Zone is elevated 3'6" above, and set back from, the living zone, thereby providing privacy to the windows from the North Terrace outside; the window sills being 7'0" above the ground level. A Sleeping Recess with cupboards has been arranged in Bedroom 1, with direct access to the Nursery.

The Nursery is at the eastern end of the sleeping zone and remote from activities of the living zone.

Clerestory windows are provided on the south elevation above the Passage for cross-ventilation to the Bedrooms during hot summer nights.

A battery of cupboards occurs between the Passage and Bedrooms for soundproofing and planning economy, with an electric conduit duct over.

The Ablutions are planned between, and accessible to both the living and sleeping zones, and include Bathroom, Shower with basin and W.C. linen cupboard etc.

The Service Zone facing south is complete with fittings etc. and opens on to the Kitchen yard with Laundry, and Servants' Rooms and Tradesman's entrance. The Servants' Quarters are excavated into the site to be unobtrusive and they serve as a screen and wind break to the Entrance against the prevailing South-West wind.

All rooms excluding the service zone face north. The

mono-pitch roof is pitched to the north to prevent penetration of the hot mid-day sun of the winter months, a solar condition which is common only to the coastal belt.

CONSTRUCTION AND FINISH

Sand stone excavated from the site has been used in the fireplace, chimney stack and screen wall in the Living Room, and to the foundation wall under the flower box to the Bedrooms.

The walls are of brickwork bagged and whitewashed inside and outside; the mono-pitch roof is constructed with rafters, Malthoid and shingles with stained boarded ceilings to the Living Room and Rhino board to the sleeping zone. The slatted eaves soffit ventilates the roof.

The concrete floors on solid have *Muhuhu* wood blocks to Bedrooms, Nursery and the winter section of Living Room, with 12" quarry tile floors elsewhere, for coolness and durability.

Wall plates are bolted to the heads of wood window frames over all external openings, and reinforcing Exmet in the brick courses over internal openings have been substituted to obviate cracking where concrete beams and lintels are used.

This twin level single storey house thereby embodies the advantages of both single and double storey designs.



THE INSTITUTE OF SOUTH AFRICAN ARCHITECTS THE CHAPTER OF SOUTH AFRICAN QUANTITY SURVEYORS FIFTH CONGRESS

HELD IN THE GREAT HALL, UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG, ON TUESDAY AND WEDNESDAY, MAY 1st AND 2nd, 1951

CONGRESS OPENING CEREMONY

THE PRESIDENT-IN-CHIEF: Your Honour the Administrator, Mr. Mayor, Ladies and Gentlemen: On behalf of the Architects and Quantity Surveyors of South Africa, I wish to say how grateful we are that we have with us, at this Opening Ceremony, His Honour the Administrator of the Transvaal, Dr. Nicol; His Worship the Mayor of Johannesburg, Councillor Claude Bekkett; Mr. H. S. van der Walt, Secretary for Education, who has come all the way from Cape Town to represent the Honourable Mr. J. H. Viljoen, Minister of Education, Arts and Science; and Dr. H. R. Raikes, Principal of the University of the Witwatersrand, who has so kindly allowed us the use of the University premises for this Congress and for the Annual Meetings of our Central Council and Board of Education.

Equally grateful are we to have with us this morning the representatives of Science, of Commerce and Industry, and especially the representatives of the Building Industry, in which we literally live and move and have our being.

We are also gratified that so many of our professional colleagues are here, from all parts of South Africa. And, finally, I would express our appreciation of the presence here of a representative contingent of the Architects and Quantity Surveyors of the future — the students of to-day.

Ladies and Gentlemen, I now have pleasure in calling upon His Worship the Mayor of Johannesburg to declare this, the Fifth Congress of South African Architects and Quantity Surveyors, formally open.

ADDRESS BY HIS WORSHIP THE MAYOR OF JOHANNESBURG

Mr. President-in-Chief, Your Honour Dr. Nicol, Mr. van der Walt, Dr. Raikes, Ladies and Gentlemen: First of all I want to express my very decided pleasure at being allowed to come here this morning and to associate myself with the Architects and Quantity Surveyors of South Africa.

We are very glad indeed that you as a Profession have decided to hold your Fifth Congress in Johannesburg. We say that in no insular fashion; we appreciate the enormous development that is taking place all over Africa, but nevertheless we feel that Johannesburg does rather constitute the essence of that development. Most of the things that develop over our country are begun in Johannesburg; and, while we say that there are some things which are delightful in our City, we also realise that there are some things which are decidedly otherwise. On behalf of the people I represent, I have come here this morning to say that I hope you as a Profession will be able to eliminate some of those disabilities from which we have suffered in the past, because of our youth, so that in the course of time we will be able to look upon Johannesburg as a place consisting of beautiful things only.

Sir, Architecture is the outward and visible sign of a country's progress; educationally, religiously, culturally and industrially. It tells



His Worship The Mayor of Johannesburg, Councillor C. F. Bekkett, M.P.C.

undue guiding restrictions on our part, especially in regard to such matters as style and conception.

But I hope the Transvaal Architects, at any rate, will forgive me if I turn for a moment to the other, the mundane and more practical side of the picture, where the Provincial Administration, as the High Priest of Economy and guardian of the best and proper expenditure of Public Funds, demands primarily a rigid standard of simplicity in planning, the highest quality of durability in the choice of materials and the absolute minimum of expenditure in the matter of maintenance, added to these, perhaps the miracle of harmonious functioning of all the parts with the whole.

I know that many of you have suffered from the demands of these requirements, but I am sure you will agree that, in the main, the results obtained have justified our being difficult at times, or, should I claim, our endeavouring to be helpful and co-operative.

Still, on the mundane and practical side I would like to say: experience has taught us that once a plan for any particular type of building has been found to meet all the required conditions of suitability, health, appearance and cost, then no very great departures from the accepted plan, except those which may be made necessary due to particular site problems, should be made for other buildings required for a similar purpose, be it a school, a hospital, a clinic, or any other utility building.

The Administration is well aware of the limitations of Type Plans, and I would not like you to imagine that we are desirous of erecting chains of schools, or hospitals, throughout the Province, all similar in appearance and design. Such is not the case, but where there is a shortage of funds and we find that for many reasons we cannot be saved by using a Type Plan, then our hands are tied, and we are forced to do so. Nevertheless, the Administration is deeply conscious of the benefits which have been conferred on the area it controls by the use of private Architects to design most of its public buildings, and I can assure you that we intend to go on giving out as much of our architectural work to private practitioners in the future, as we possibly can, that is, where funds and time permit.

I must utilise this opportunity to appeal to the architectural and allied professions to give the Province some measure of preference in the allocation of their time when once they have been commissioned for a service.

After all the Province has been the largest employer of architectural brain for many years. I doubt whether any other concern in the Union has consistently during a quarter of a century, and longer, commissioned private Architects to do work for more than a million pounds annually.

At this moment we have a very long building programme on hand. On the 31st of March, 1951, we were actually employed on 184 separate building services, involving an expenditure of £1,500,000. To these have just been added 191 new services for which the Provincial Council will be requested during this month to find the necessary money.

As in the past, most of this work will have to be handed out, or, rather, is being handed out, to private Architects. There is, however, an impression gaining ground in the Administration that sketch plans do not materialise and working drawings are not submitted to us as expeditiously as to private employers. And if you read the newspapers you will notice that the blows are often falling on innocent shoulders. I maintain that the work of the Province should not only receive equal treatment with that of the private employer, but that it should receive preferential treatment as being for the use of the nation as a whole.

I have made reference to the beauty of your creations and, on the other hand, to the necessity resting upon us to stress the factors of cost and time when once those of suitability and health have been satisfied.

These two factors of cost and time are going to exert an increasing pressure upon us in the immediate future. I am glad to notice that you are to study the question of building costs during your assembly. Many of us have a suspicion that you can save the nation millions, and we shall eagerly await the results of your deliberations.

These two factors, cost and time, have even been driving us into the hands of the engineers with his pre-fabricated buildings. I know the public does not like pre-fabs. Or rather, to be strictly correct, everybody claims the pre-fab, as an excellent idea for the next town. The Administration does not like it because we, too, would wish the children to be educated, and the patients to be treated, in fine, solid buildings. The Architects and Quantity Surveyors do not like pre-fabs, and for very evident reasons. And yet, nevertheless and notwithstanding, I do not see how we can avoid erecting an increasing number of pre-fabricated buildings during the next few years. They will have to come as emergency measures to meet the needs of Native hospitalisation and as

additional rooms to existing schools. Let me add that the reports about some of these pre-fabricated buildings already in use are dangerously encouraging.

I have mentioned these points, Mr. Chairman, to indicate the urgency of the position, and not to praise pre-fabs. Anything your Profession can do to expedite the provision of buildings and to reduce costs will be to the advantage of your Profession and of the nation as a whole.

Somehow the words "architect" and "builder" strike a responsive chord in our breasts. It is magnificent to see an inspired dream reproduced on paper as an intelligible plan, and it is equally moving to see the two-dimension drawing taking form as a three-dimension structure. It arouses the urge also to create something beautiful that can be of use to others. In a very real sense we are all architects and builders, shaping the generations to come. Perhaps that is, in part, the reason for the great esteem in which we hold the Architect: we see and adore ourselves in him. The only difference is that his work is more visible and tangible than that of the teacher, the preacher and the mother; more visible but not necessarily more lasting. And so the duty devolves upon each of us to see to it how we build.

"Whoever he is, let him be careful how he builds." Thus Moffet translates St. Paul's words to the Corinthians, who were themselves surrounded by masterpieces of architecture. And he continues: "Anyone may build gold, silver, precious stones, wood, hay or straw, but in every case the nature of his work will come out; the Day will show what it is, for the Day will test the work of each, no matter what that work may be."

Let each of us, therefore, in our respective spheres, make sure that our contribution towards the building of our nation is in accordance with the everlastingly plan and carried out faithfully in every detail.

Finally, Mr. Chairman, I assure you of our very best wishes for your gathering. I trust that it will be both pleasant and fruitful. (Applause.)

ADDRESS BY THE SECRETARY FOR EDUCATION

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen, the Minister of Education, Arts and Science, Mr. J. H. Viljoen, could not absent himself from Cape Town to attend this Congress. But in his place he has very kindly sent Mr. van der Walt, Secretary for Education.

By statutory provision the Minister of Education is in charge of us; he may be regarded as the step-father, or the father-in-law, or, as we prefer to look upon him, as the guide, philosopher and friend, of the Institute. We have received much help, in a very kindly way, from the Department of Education, and I think it fitting to mention that now Mr. van der Walt, will you please address the Congress.

MR. H. S. VAN DER WALT: Mr. President, Your Honour the Administrator, Mr. Mayor, Mr. Principal, Ladies and Gentlemen: In the first place the Hon. the Minister of Education, Arts and Science, Mr. Viljoen, has asked me to apologise for his not being able to attend this Opening Ceremony. He would very much have liked to have done so, but he could not, because of his parliamentary duties.

MNR. H. S. VAN DER WALT: Meneer die Voorsitter, Dames en Here: Vir een van twee redes het u my blykbaar gevra om hierdie Kongres te kom toespraak: eerste, omrede die verhouding wat daar bestaan tussen my amptelike posisie en die universiteite wat vir die opleiding van Argitekte voorsiening maak. Tweedens, omdat u gretig is om te verneem wat die mening van nog 'n leek oor Argitekture is, want op deskundige kennis kan ek nie aanspraak maak nie.

Die volgende Universiteite lei Argitekte op: Witwatersrand, Kaapstad, Pretoria en Natal. In 1941 is daar 17 Argitekte in hierdie universiteite opgelei, in 1945, 19, en in 1949, 78. In 1946 was daar 826 blanke Argitekte in Suid-Afrika, een Kleurling Argitek een Indier. Die getal Argitekte wat opgelei word, is sekerlik onvoldoende as ons in Suid-Afrika geen dot Argitekte "n groter rol moet speel by die beplanning van ons geboue.

Daar is verskillende soorte geboue: woonhuise, regerings- en munisipale geboue, museums, kunstgeboue, Biblioteke, skole, kerke, fabriek, spoorwagstasies, winkels, hospitale, hotels, georganiseerde universiteite, ens.

Elke gebou wat opgerig word, het nie argitektoniese waarde nie; daar is sekere vereistes nodig voordat ons kan praat van 'n gebou wat argitektonies maal is. "n Huis wat soos 'n kantoor lyk, sal ons seker nie as 'n mooi woonhuis beskou nie, en dit sal heel moontlik ook 'n gerieflike woonhuis wees nie, 'n kerk wat soos 'n bioskoop lyk, sal ons ook nie as 'n mooi kerk beskou nie. Daar moet dan twee vereistes wees voordat ons van argitekture kan praat. 'n Gebou moet mooi wees en dit moet beantwoord aan die doel waarvoor dit opgerig is.

Die begeerte by die mens om mooi en doeltreffende geboue op te rig, is baie oud. Met die bou van huise het die eerste tekens van beskawing by die mense ontstaan, sodat argitektuur een van die moelstuwende gewaarde het, waarvolgens die standaard van beskawing van 'n gemeenskap gemeet word.

As ons die geskiedenis lees dan sien ons hoe dit uitstaande argitektuur met die hoogtepunte van die beskawing saamval. Ek dink bv. aan die hoogtepunte van die argitektuur in die doe van die Grieke en die Romeine en later die van die Renaissance-periode toe in Italië veral 'n ernstige pasing aangewend is om die vergete vorms van klassieke argitektuur te laat herlewe. Ons het groot meesters in die typeryk gekry wat hulle ingeleef het in die gees van argitektuur soos dit in Rome en Athene bestaan het, en met nuwe skeppinge voor die dag gekom, wat die besondere karakter van die Renaissance-periode gekenmerk het. Om spesiale redes dink ek hier bv. aan Michael Angelo wat bekend gestaan het vir sy grotteske konstruksie en beplanning en wat alle "detail" daarvan ondergeskik gemaak het. Ek van die groot argitekture van hierdie typeryk in Italië en later die in ander lande het op sy eie manier uiting aan sy kunstgevoel gegee en is geboue in ooreenslemming daarmee gemaak. Ons praat van die argitektuur van die Renaissance-periode omdat ten sytle van die verskille in die moeiheid van die geboue daar min of meer 'n sentrale gedagte is, waarvolgens die geboue opperig is. Om praat van 'n argitektuur van 'n sekere periode wanneer daar kenmerkende eienskappe deurloep gedurende daardie periode. Ander lande het die mooi boustyl van Italië nageboots, sommige getrou, ander minder getrou. Hierdie boustyl van die Renaissance-periode is natuurlik later verdring deur ander boustyle en argitektuur. Sa het oor die jaare heen argitektuur verskillende vorms in verskillende lande aangeneem. Eienaardig genoeg soedert die Middeleeue het argitektuur ners in die wereld weer die hoogte bereik wat dit in Italië gedurende die Renaissance-periode bereik het nie. En vandag nog is Italië die Meke van die argitekture. Hulle volk natuurlik nie klakkeloos wat hulle daar sien nie, maar dit bly vir hulle 'n bron van inspirasie en nuwe gedagtes.

'n Kenmerk van die geboue van hierdie typeryk is o.a. die sirkelrheid daarvan. Dit was nie doe van gebrek aan materiaal en vakmanne nie. Tyd was nie so skaars as wat dit vandag is nie en die kleem het meer geval op skoonheid as op bruikbaarheid. Geboue was meer opperig vir die individu, as vir die massa.

In South Africa we have not succeeded in developing a particular type of architecture. Our early Dutch and Huguenot ancestors succeeded admirably in adapting the Old Dutch art of building to South African conditions and hence developed a form of architecture which was characteristic of South Africa. Our early settlers built stately homes and outbuildings, surrounded by orchards and vineyards, with beautiful avenues leading to the homestead. The architecture of these homesteads was noted for its simplicity. In the Western Province we still find these old homes, with their white-gabled walls, solid teak shutters on windows and doors and soft unreflecting thatched roofs, high steep, large entrance halls, with their polished red-tile floors. Unfortunately, the succeeding generations did not develop sufficient appreciation for this type of architecture and did not build a national architecture on the foundations laid by our forefathers.

Apart from this, we can only refer to some of our churches as having a particular South African type of architecture. When we think of the wide steps, with shady verandahs, in the Korroo and the rondavel type of houses in the lowveld, we must recognise some attempt at developing a South African style in certain parts of our country.

On the other hand, again, if I think of Sea Point, where I am staying during the Parliamentary Session, I can hardly recognise any particular type of architecture. Looking at Sea Point from the sea one is struck by the incoherent mass of buildings with no proper re-ordination and no particular order. There is very little sympathy about the buildings and one gets the impression that Sea Point and the surrounding areas have been built up in a haphazard way without proper planning. As far as the actual architecture is concerned it is in no way different from that existing anywhere else in the world. It can be described as international. And this no doubt applies to all the towns in the thickly populated areas of South Africa. I also notice that a large number of homesteads are being built in the Constantia Valley. Some of the old farms are being cut up into plots and it is to be hoped that the residential areas will be so planned as to form an harmonious whole of an high architectural significance.

Planning is the key word for the modern Architect, and it is very necessary that the Architects and other people in South Africa, responsible for the erection of buildings to provide decent living conditions for our citizens, see to it that the planning is carried out properly.

In planning its new homes, new townships, its new cities, South Africa must bear in mind its ever-increasing population — Europeans and Natives. Not only must the well-being and happiness of our present and future citizens be provided for, but our towns and cities of the future must be characterised for their architectural simplicity, dignity and beauty. There should be spaciousness and restfulness about our parks and playing fields. In planning we must bear in mind that a building or scheme need not necessarily be costly to be beautiful. Wonders can be achieved through simplicity, balance and the beauty of design.

Whether we shall succeed in developing a particular South African Architecture or merely remain "Europeans in South Africa" so far as Architecture is concerned is of course impossible to say.

As you are members of a Profession which affects the daily lives of every man, woman and child in this country, your immediate concern is no doubt to provide the homes which the nation needs urgently of as low a cost as possible.

I am sure I am speaking on behalf of everybody in the country when I wish you every success in your deliberations. (Applause.)

ADDRESS BY DR. R. H. RAIKES

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen: An Opening Ceremony such as this would not be complete without a few words from our esteemed friend, Dr. Raikes. He has from time to time attended meetings of our Board of Education; on occasions, to advise; at times to criticise; and very rarely, but it has happened, just to listen. We are grateful for the interest he has continuously taken in our two Professions. I have pleasure in asking Dr. Raikes to address you.

DR. R. H. RAIKES: Mr. President-in-Chief, Your Honour, Mr. Mayor, Mr. van der Walt, Ladies and Gentlemen: On behalf of the Council and Senate of the University of the Witwatersrand, it gives me very great pleasure to welcome here to-day all the delegates to this Fifth Congress of Architects and Quantity Surveyors. I trust that you will find the arrangements made for your reception to your liking, and that your Congress will prove in every way a success.

I have heard it stated that the University has conferred an honour upon your Institute and Chapter by allowing this Congress to be held this year at the University. I wish to assure you, however, that we were very pleased that you should have sought a temporary lodgement within our walls. The University considers that, while of course its principal and primary duty is to its own students, it also owes a duty to the community as a whole to provide the venue of conferences, of a type which will promote the advancement of knowledge, whether pure or applied.

This means that at times of the year when the University is not in teaching session, it will welcome very warmly conferences such as yours which bring together, from the four corners of the Union, practitioners of a common Art or Science. Conferences of Political Parties the University does not wish to house because their various policies divide the Nation and therefore also the University, which is a microcosm of the Nation. But at a conference such as yours, while you may, and I hope you will, find points of disagreement, you can crush them out to the benefit of the whole Union because you represent all shades of opinion which exist within your profession, and not only those of one group as would be the case at a Political Congress.

I hope therefore that, if you enjoy your stay within our walls, you will not hesitate to come back again, and I trust also that other bodies of a nature similar to yours will not hesitate to seek accommodation also, bearing in mind that the University can only make such accommodation available during vacation periods.

My first contact with Architecture, or rather, Architects, was with Sir Christopher Wren. Of course I knew about him beforehand from Hillaire Ballou's well-known biography. Sir Christopher died at the age of 91 in 1723, and in 1922, in making arrangements for the commemoration of the second centenary of his death, the Architect to the University of Oxford made a study of Sir Christopher's advice to the Vice-Chancellor of his day. One of the subjects to which Sir Christopher devoted special attention was the safety of the fabric of the Bodleian Library where even at that date the load of books was causing the walls to bulge outwards. Sir Christopher proposed two remedies. One above ground consisted of a complicated system of iron stays which hold the north and south walls together. With these I am not concerned here, but it is interesting to note that, although the ends of the stays and the plates are visible outside, they are so disposed inside the book stacks as to be invisible within the building — a 250 year old lesson to those of you who mark the position of every hand basin, sink

and lavatory pan with a maze of outside pipes. [Laughter and applause.]

The recommendation which did specially interest me was Sir Christopher's plan for strengthening the buttresses. He pointed out that the only way to do this was greatly to increase their weight by adding fresh stone work. He was, however, careful to point out that it would be extremely dangerous to remove the soil at the toe of the existing buttress so as to build a foundation for the new one. He therefore designed an underground arch with its springing several feet out from the toe of the old buttress, and on this he supported the new one which just rested against the old — Sir Christopher laying down that it must on no account be bonded into the old work, so as to allow for movement.

The University Architect suggested to the University Archaeological Society that it might investigate whether the underground work, which, if it existed, must be in the Fellows Garden of my College, had been carried out to Sir Christopher's design. The Oxford undergraduate of 1922, was no less wily than his 1951 successor, so that the Club proceeded to elect me president and then to invite me to seek permission from the College to dig. Permission was granted, and it was found that the work had been carried out exactly to Sir Christopher's specification. The work was published, but in the time of my disposal I have been unable to trace it. It showed, I think, Sir Christopher's great skill as an engineer, his knowledge of soil mechanics, and the skill of Oxford's stone masons at the end of the Seventeenth Century.

My next contact with Architecture was when I found myself as Principal of this University in touch with the training of Architects and responsible to the Council for the erection and maintenance of buildings.

The supervision of the training of Architects has never been a difficult job owing to the devoted service rendered to the University, first by Professor Pearse, and more recently by Professor Fassler. (Hear, hear.) For some reason with which I am not acquainted, Architecture as a discipline within the University, started life in the Faculty of Engineering. It was never happy there, Engineering, though it requires imagination for the execution of its finest projects, is too scientific and full of mathematics for the Architect. (Laughter.) The Architect, it is true, cannot in a modern structure do without the Engineer, but he demands to be free to plan the inside to the needs of his client. The Engineer must design a skeleton to fit the plan and the Architect will then cover the whole with a graceful skin.

Incidentally, I am of opinion that closer co-operation between the Architect and the Structural Engineer than at present exists, may on occasion be desirable. I have known cases where the Architect has set the Engineer extremely difficult tasks, which might possibly have been rendered less difficult if the two had planned side by side. I realise, however, that the Architect and the Engineer might get together at the expense of the client, and that would never do. (Laughter.) The client must have, in reason, what he wants, but it is not impossible that if the Engineer were called in at a slightly earlier stage, he might be able to make suggestions which, while giving the client what he wants, might make his own task easier.

This speech has taken nearly as long to read as the Architects remained in thrall to the Faculty of Engineering — 20 years ago. But in 1940 Professor Pearse persuaded the Senate and Council that Architecture could only achieve complete development by a divorce. Since that date the junior faculty of the University has gone on from strength to strength.

Now we are told that the students cannot reach the peak required by international standards in the five years allotted to their training, and Professor Fassler demands another six months. The Senate has agreed that this is academically desirable, but whether the increased staff and accommodation required are financially possible, is a matter for my Council to decide, after, as I believe to be the case, you have thrashed the matter out here.

I had intended, Mr. President-in-Chief, to go on to suggest that the present set up in constructing a big building is not entirely stable. It is true, it is a three legged stool, Architect, Structural Engineer and Quantity Surveyor, and any mathematician will tell you that a three legged stool is always stable, while the addition of a fourth, unless done with great skill, leads to instability. If I put in a fourth — a resident Architect — I might upset the balance. The University's experience of clerks of works has not been altogether happy, and it may be that, had it been happier, we should be satisfied with such a scheme. But I do feel that something more in this direction is required.

If, however, I develop the point, Mr. President-in-Chief, I shall outstay my welcome. So I will close by saying once more how much I hope you will have a successful and enjoyable Congress. (Applause.)

REPLY TO INTRODUCTORY ADDRESSES

THE PRESIDENT-IN-CHIEF, Ladies and Gentlemen: I know I speak on behalf of all of you when I express our gratitude and appreciation to His Worship the Mayor, to His Honour the Administrator, to the Hon. the Minister of Education and his chief lieutenant, Mr. van der Walt, and to Dr Raikes, for their addresses to us this morning.

We, the Architects and Quantity Surveyors present, have listened with attention, with respect, and with deep interest to all that has been said. I feel I can say, by way of additional appreciation, that in the deliberations which are to follow, we will endeavour to be worthy of the high hopes and good wishes expressed in the addresses to which we have just listened.

I would add that these addresses will reach every Architect, Quantity Surveyor and student in South Africa, through the medium of our official journal.

I would now ask you all to join with me, in time honoured manner, in expressing our grateful appreciation to these distinguished gentlemen who, in addition to the many other calls on their time, have nevertheless so kindly come here to address us at this Opening Ceremony. (Prolonged applause.)

(Note: At this stage His Honour the Administrator left the Congress Hall.)

PRESIDENT-IN-CHIEF'S ADDRESS TO CONGRESS

Mr. Mayor, Mr. van der Walt, Dr Raikes, Ladies and Gentlemen: After the intellectual feast — a four-course feast, if I may so describe it — to which we have been treated this morning, I wish duty did not require me to attempt a fifth contribution. But I feel that the Institute and the Chapter, which I have the honour to represent — bodies which have been given statutory status by the Union Parliament — do play, and are destined to play, a really important part in the economic and cultural life of South Africa.

That, then, is my justification for rounding off this Opening Ceremony by telling you a few things about our Institute and Chapter.

We were created by Statute in 1927. We were, I believe, the first body of Architects and Quantity Surveyors in the British Empire to achieve statutory recognition. But the Union Parliament of 1927 — a generation ago — was not as sympathetic as we believe the present Parliament would be. In the statutory sphere we sought recognition in two major respects, firstly, protection of the use of the title "Architect" and "Quantity Surveyor", and secondly, protection of the work of both Professions.

The Parliament of 1927 did not grant our second request. It was in effect suggested to us that if, during the course of the years, we concentrated upon the development of Professional Education, we could approach Parliament again.

May I say, with no disrespect whatever, that we would have proceeded with the development of Professional Education even without any such suggestion. We had in fact, long before approving Parliament, begun this difficult but all important work.

Today there are four recognised Schools of Architecture and Quantity Surveying in the Union, that is, in the Universities of the Witwatersrand, Cape Town, Pretoria and Natal; and it is possible that, within the next year or two, the University of South Africa may be able to render a very necessary service by catering for students not domiciled at a University centre.

I think the Institute and Chapter may feel justly proud of their share in the establishment of these Recognised Schools.

When Parliament granted us registration in 1927, there were, in round figures, 500 Architects and 150 Quantity Surveyors in South Africa. Today, 24 years later, those numbers have more than doubled. In addition, the Faculties of Architecture and Quantity Surveying in their respective Universities attract a considerable number of students every year; so much so that it has become, for the larger Universities, a physical impossibility to admit to their courses anything like all the students applying for enrolment.

The Institute, with the four Universities, is ever mindful of the standard of professional education required; and through the instrumentality of the Institute's Board of Education, on which the four Universities and the Union Department of Education have been granted permanent representation, this important matter is constantly considered.

With regard, then, to what I may call the immediate future of our students, after they have qualified, is it unreasonable of us to hope that the Union Parliament will — as has been done, for example, in Southern Rhodesia — also statutorily protect the work of the Architect and the Quantity Surveyor? (Hear, hear, and applause.)

Dealing just briefly with a matter that is very dear to the heart of the Institute, we feel that Architecture is, and should be regarded as, a national asset. I think I can say, without any fear of contradiction, that the standard of Architecture and of architectural practice is as high in South Africa as anywhere in the world.

On the Quantity Surveying side, we are ahead of most countries. South Africa was the first, and may still be the only, country in the world to provide University courses of training in Quantity Surveying. The day has long since passed when the question could be asked in, say, a cross-country quiz: "What is a Quantity Surveyor?" (Laughter.) I feel I can round off this aspect of my address by referring you to the extremely important item, "Building Costs", on which there will be two papers and, I hope, much discussion at this afternoon's session of this Congress.

We all know that South Africa has unique opportunities for economic and industrial development, for which a well organised Building Industry is an absolute essentiality. We, as the professional side of the Building Industry, are glad to be able to pay tribute to our friends the Master Builders, and to say that professional ideals and good, sound practice are of as much concern to their body, the National Federation of Building Trade Employers in South Africa, as to the Institute and the Chapter.

I do not for a moment wish to suggest that the organisation of the Building Industry in South Africa has reached its zenith or optimum development; or, in other words, that we are not conscious of its shortcomings.

On this point I would say that I look forward, keenly and earnestly, to the resuscitation of the efforts started by the Institute, with the Federation and the Trade Unions in South Africa, for the formation of a National Joint Council within the Building Industry. May I here interpolate a strong personal conviction, that is, that a system of incentive pay in the Building Industry is essential, and is long overdue.

Finally, on this aspect, I feel that, with the co-operation and goodwill of these three component parts of our great Building Industry, we can do even more than we have done for the economic and industrial development of South Africa.

Ladies and Gentlemen, our Congress Agenda speaks for itself. I trust we will all enjoy and benefit by the deliberations of this Congress; and, in conclusion, I wish to thank you sincerely for the great interest shown in this Opening Ceremony. (Applause.)

MESSAGES FROM OVERSEAS

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen, two messages have been received, from the Royal Institute of British Architects, and from the Royal Institution of Chartered Surveyors. I will ask the Vice-President-in-Chief, Mr. Erik Todd, to read them to you.

MR. C. ERIK TODD: This is the letter from the President of the R.I.B.A.:

"Dear Mr. President,

"I am very glad to convey to you, your Council and the members of the Institute of South African Architects the cordial greetings of the Royal Institute on the occasion of the Fifth Congress of South African Architects and Quantity Surveyors.

"We hope that you will have a most successful meeting which will prove of benefit to both Professions.

"At the Royal Institute we follow with very considerable interest the activities of our colleagues in South Africa and we wish them every health and prosperity in the years to come.

"With kindest regards,

"Yours sincerely,

(Signed) A. GRAHAM HENDERSON (President)".

The next letter is from the President of the Royal Institution of Chartered Surveyors, which reads:

"Dear Mr President-in-Chief,

"It gives me the greatest pleasure to send you, on the occasion of the Fifth Congress of South African Architects and Quantity Surveyors fraternal greetings from the 2,500 members of the Royal Institution of Chartered Surveyors throughout the world who are qualified as quantity surveyors. They join with me in wishing every success to the Congress as an occasion for learned deliberation and pleasant social intercourse; and though but few of us are so fortunate as to have seen and enjoyed the many wonders of your great country we can see well that a Congress which draws its members together from such great distances assumes an exceptional importance.

"Nor must I let the occasion pass without sending special greetings to the members of our own affiliated body, the Chapter of South



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The President-in-Chief, Mr. Leo C. Austin, A.R.I.C.S., M.C.Q.S.

"African Quantity Surveyors, and to our own children, the 117 chartered quantity surveyors in the Union. These greetings come all the more from the heart when we remember the friendly hospitality and the personal kindnesses which have recently been extended to chartered surveyors and to our Secretary when visiting South Africa.

"The record of your Institute's and its Chapter's efforts in the field of professional education and the official recognition which they have deservedly received from the Union Government is impressive and is bearing rich fruit. No investment is more worth while than the expenditure of effort, or money, or both, in spreading knowledge of the arts and sciences required for the practice of our professions. Your Institute and its Chapter deserve the gratitude of the public and of posterity for their achievements in this field.

"I conclude by asking you, Mr. President-in-Chief, and the members of the great professions over which you preside, to accept the sincere wishes of the Royal Institution for your continued success and prosperity.

"Yours sincerely,

(Signed) H. P. HOBBS (President)."

Then there is also a telegram from the Cape Town Local Committee of the Chapter, sending its greetings and best wishes for a successful Congress.

MR. ROBERT HOWDEN

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen, I very much regret that, because of illness, Mr. Robert Howden is unable to be with us today. He is now 81. With the Registrar, I saw him this morning, and he sends his greetings and best wishes to Congress.

I think it can be said that Mr Howden has done more than any other person in South Africa for the furtherance and welfare of our Professions. He was our first President-in-Chief and the first Chairman of our Board of Education. He has in fact for many years been regarded as the Father of the Architectural Profession in South Africa.

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen, I am very glad to say that we have with us this morning Mr. and Mrs. W. S. Payne, of Durban, Mr. Payne is a Baker Scholarship Trustee and a former President-in-Chief. I think that he and the Registrar are the only two present this morning of the personnel of the first Central Council. Perhaps Mr. Payne would like to say a few words to us.

MR. WILFRED S. PAYNE: Mr. President-in-Chief, I am very glad to have this opportunity of saying a few words at this Congress. I would first of all like to thank you for your Presidential Address, and to congratulate you upon the position which you now hold. You succeed a number of men, both Architects and Quantity Surveyors, who in the past have done their utmost, in the position that you now hold, to further the interests of the Profession, and I think all who have any

knowledge of the position will realise that their efforts have not been in vain.

Mr. President-in-Chief, I had the opportunity yesterday of visiting our old friend Mr. Howden. If anyone interested will look up the minutes of the Central Council, so meticulously kept by our Registrar, you will find that the first resolution at the first meeting of the Central Council was one which I had the pleasure of proposing; that was, the election of Mr. Howden as President-in-Chief. Mr. Howden, as many of us know, took a very prominent part in the formation of our Institute. He was Chairman of the Committee which did the preliminary work before the Act was put through Parliament in 1927; and subsequently he sat for many years on the Central Council. When I went to see Mr. Howden I noticed, in a very prominent position on the wall of his house, a photo of the badge of office which you now wear, Sir, which indicates the interest he still takes in the Institute.

Finally, Mr. President-in-Chief, I would like, on behalf of all present, to thank you for your Address and for presiding so ably at this Conference. (Applause.)

(Conclusion of Opening Ceremony.)

CONGRESS FIRST DAY, AFTERNOON SESSION

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen, we are now about to listen to two Papers on the subject of "Building Costs" by two of our colleagues, who are very well qualified to read Papers of this nature. I will ask the Vice-President-in-Chief, Mr. Erik Todd, to read his Paper.

BUILDING COSTS

MR. C. ERIC TODD: Mr. President-in-Chief, Ladies and Gentlemen: Members of the lay public, when commenting without thought on present building costs, tend to state emphatically that they are exorbitant and caused almost entirely by the high profits made by building contractors. Nothing in my mind could be further from the truth. But this, however, does not mean that I think nothing should or can be done to reduce present costs. I would, in fact, like to make it quite clear at this stage that I consider it imperative that the gap between building costs and the earning capacity of the average man must be narrowed.

In pressing this paper, I will endeavour, within the limited time available, to deal with the broader issues concerning building costs, explaining briefly why they are at their present level, and offering some suggestions for cost reduction. My colleague, Mr. Louw, in the second paper on this subject, will deal with the more detailed considerations such as cost analysis, efficiency of labour, etc. I am therefore avoiding as far as possible any overlapping in this direction.

NATIONAL ASPECTS. Dealing firstly with the problem from the broadest possible viewpoint, there is no doubt whatever that building costs can be influenced considerably by pre-planning on a national basis. By pre-planning for the Building Industry, I mean an intelligent anticipation of the building needs of the public well ahead of actual requirements, bearing in mind the impact on these requirements of population increases and decreases which are likely to occur over a period in a given centre, consequent upon immigration, migration, births and deaths, and planned industrial and other development, together with planning to meet these requirements.

To be most effective as a means of reducing building costs, pre-planning would, in my mind, have to be initiated by the Government. It is not enough just to restrict Governmental building during boom times, and for the Government to build during depressions, as has been advocated so frequently before. Although this first principle of pre-planning is an elementary factor in stabilizing the Building Industry, and therefore to some extent national economy, as yet we have not had a Government with sufficient courage to commit themselves to a heavy building programme during a depression period. If building costs are to be levelled out, it is essential that the Government should initiate pre-planning for the country's building requirements and the Building Industry, with vigour.

To maintain the industry and thereby provide the building requirements of the people, this industry has an urgent need of:

- (1) A larger, well trained artisan force, with big output.
- (2) A free supply of essential building materials in which healthy competition is possible.

- (3) Readily available plant, tools and equipment of all descriptions, at low prices.
- (4) A free supply of vehicles and fuel to operate them at a reasonable cost.
- (5) A greater number of skilled executive and professional men supported by adequate Research Departments.

All these requirements for the efficient maintenance of the industry, with the object of reducing or stabilizing building costs, can be achieved by careful pre-planning. While shortages exist, however, there is no doubt that the industry as a whole must operate with some inefficiency.

At the very moment, the industry is being crippled by a shortage of artisans, of steel, of corrugated and other galvanized iron, and other commodities, particularly cement. I would like here to state emphatically that a solution cannot be found through the purely negative approach of establishing Controls.

There is a very serious backlog in the country's building requirements. Dwelling units are required to house the people, schools for the children, hospitals and clinics for the sick, offices and factories for the people to work in, and Government buildings to keep up with official requirements — each being as important as the other, and all being urgently required.

Under the present circumstances, therefore, it would be far preferable and of far greater use to the country for the Government to accept the principle of subsidising to eliminate shortages in preference to controlling, thereby securing the greatest possible output from the Building Industry. A central organisation costs a considerable sum to operate, and that money would be far better spent in subsidising a short supply requirement.

THE INDIVIDUAL PROJECT (EARLY STAGES). Getting away from the national aspect of the subject, I propose to deal with the problem of the individual building project. After careful study and long consideration, I am convinced that the greatest opportunities for lowering building costs exist in the very earliest stages of any project. Yet, strangely enough, I have found that the average building owner tends to neglect this stage to a very large extent.

This does not mean that I consider costs need not be watched in the later stages. On the contrary, I consider that costs should be watched throughout any project. A building owner should, however, be careful not to seek cost reductions where such savings will be detrimental to the scheme as a whole. I am referring particularly to the period of documentation.

If the building cost of any project is to be kept low it is, in my opinion, essential for the building owner, during his earliest considerations and well before consultation with his Architect, to anticipate intelligently the time necessary for the production of a well considered design and adequate documents. He should realise that, for a large project, this time may be anything from one to three years, or more, depending on the nature of the building. Even design and documentation for a simple cottage, if done inadequately, takes a considerable time. There is far too great a tendency on the part of almost all building owners to leave

the appointment of their Architect and their Quantity Surveyor until the last minute, thereby embarrassing themselves and the professional men they engage, preventing them from giving of their best, due to rush and hurry.

It is not unusual for a building owner to talk about and consider a scheme for five or ten years before even the most elementary professional advice is sought in regard to the time necessary for design and documentation. I feel sure that it must be quite clear to any discerning person that rush design, documentation and construction, cannot be economic and effective, and that the quality of any building must be impaired under such conditions.

PROGRAMMING AND STANDARDS OF ACCOMMODATION. The programming stage in any building project offers opportunities for limiting the cost of a building. "Programming," in regard to building, is understood to mean the preparation of a statement of the requirements in broad outline for a particular building. This statement in reality sets forth the building owner's requirements or demands.

It may come as a shock to many of my listeners when I state that it is my considered opinion that the increased demands of the public since 1938 in regard to amenities and improved living conditions in the average domestic house, account for an increase in building costs of approximately 20 per cent. To some extent, however, this increase has been reduced by a greater economy in planning consequent upon the disparity between present over-all building costs and the earning capacity of the average house building owner.

This increase in amenities is probably most noticeable in the domestic field, but is by no means non-existent in other types of building.

There is no doubt that the skilled consideration of a "programme" for a building of any type, with the object of eliminating all unnecessary functions and accommodation, and ultimately producing a design which will be truly functional, will produce high dividends in the form of avoiding unnecessary expenditure. At this stage, it is perhaps necessary for me to issue a warning against the present tendency on the part of the lay public to compare building costs on a square foot rate without regard to the fitness of purpose or quality of the building. These comparisons are most unscientific and misleading.

A house, for example, with a lot of waste space and consequent low density, will obviously cost less per square foot than the compact, waste-free house; yet the compact house will have a lesser over-all cost and fulfill the same function more efficiently.

To achieve the full economic advantages during the programming stage of a project, the building owner should take his Architect into full consultation early enough to allow for a proper study to be made of the requirements and standards of accommodation; and, if the building is of a complex nature, early enough to arrange for special study and research to be conducted.

Here I would like to draw attention to the valuable work being done by the Building Research Section of the C.S.I.R. in regard to standards of accommodation, etc.

ECONOMY IN DESIGN AND CONSTRUCTION. When giving consideration to economy in design and construction, the quality of the completed building cannot be disregarded. Undoubtedly building costs can be reduced by utilizing cheaper materials than at present; but the question is whether the building will or will not fulfill its purpose for the desired period without becoming an uneconomic proposition due to heavy maintenance costs and other difficulties arising out of the original economies.

I would like to take this opportunity of pointing out that well designed contemporary buildings derive their aesthetic value from simple form and the application of the principle of fitness for purpose. If the public desires lower building costs, then the public as a whole should support and demand contemporary architecture. I regret to say that, despite present building costs, it is still quite usual for a building owner to demand that his building should be designed to conform to patterns which are uneconomic and outmoded. This fault I think is most prevalent with owners requiring domestic work, but is by no means uncommon amongst owners requiring large buildings.

The necessity for the Architect to have a thorough knowledge of the building site prior to the preparation of the initial sketches — in fact even before any serious thought is given to the problem — is not generally appreciated outside the profession. I feel sure that almost every Architect present, has, on numerous occasions, been approached to prepare sketch designs and even working drawings without an intimate knowledge of the site and its surroundings. Some may in fact have been prevailed upon to complete documents without that very necessary knowledge.

Designs cannot be economic or entirely satisfactory unless there is a complete and adequate knowledge of the site, therefore, in all cases, except in the most exceptional circumstances, the building owner should arrange for his Architect to visit the site prior to sketch-planning. This has particular reference to works for affield.

Duplication of elements of plan and design within individual buildings, particularly in large buildings, provides a considerable potential for reducing building costs. This is merely a matter of skill in design; and today, due to the greater need for economy, we see many more examples of duplication of elements in our buildings than we did 15 years ago, to great economic advantage.

For a further reduction in building costs, the industry as a whole should be supported by factories producing a greater quantity of fabricated articles and units than at present. A huge variety of types is quite unnecessary, and, in fact, only a hindrance. It is, however, important that the types produced should be well designed, standardised, and satisfy fully the requirements. The use of standardised types can materially affect the cost of a buildings. For example, the use of purpose-made windows in lieu of standard stock windows will probably increase the cost of the windows by more than 50 per cent.

The elimination of waste space, as has been mentioned when dealing with the programming stage, always offers the possibility of saving; but, once more, it must be realised that its elimination will probably increase the density of the plan. You can therefore expect the cost expressed in a rate per square foot to go up as a result of the elimination of waste space. It becomes obvious, after thought, that skilled economic design costing more per square foot may well be the cheapest. The public generally, however, persists in making this unscientific comparison of the square foot rate, to the detriment and discouragement of the skilled designer.

By-laws, unless they are kept flexible by means of discretionary clauses, can and do keep building costs higher than necessary. It is regrettable that the by-laws and regulations in most of our towns and cities, while performing the essential function of protecting the public to a reasonable degree against shoddy building work, serve as a distinct deterrent to attempts which are made to introduce new ideas and methods of construction in the interests of economy.

COMPETITION, DOCUMENTATION AND FORMS OF CONTRACT. keen competition within the building industry, and between manufacturers and merchants supplying the industry, is in my view a first essential for producing low building costs. This condition cannot be induced without a greater artisan force and a free supply of building materials, plant, tools and equipment as mentioned earlier in this paper.

The second factor for keen competition is clear and concise documentation for construction and tender purposes. I have already touched on the necessity for providing adequate time for design and documentation, but there can be no doubt that a well considered design and adequate documentation for construction and tender purposes will produce the most economic building. I would, in fact, go so far as to say that the cost of a building is related directly to these factors and that, without adequate documentation, much of the advantage of the competitive tender system falls away.

Despite the number of forms of contract that are in operation, and the various forms that have been tried from time to time, and the many arguments that have been expressed for and against the various forms, I am firmly convinced that the "fixed price contract" based on an agreement, drawings and specification for smaller work, and for larger work, on the same documents with the addition of a bill of quantities, is the most satisfactory form to use in the interests of levelling or lowering building costs.

The application of the "fixed price contract" system lends itself admirably to effective competitive tendering, as it requires complete documentation of the building owner's requirements before the builder can fix the contract price. These documents can be utilised just before entering into a contract as a sound and common basis for competitive tendering. In addition, variations excepted, the fixed price contract provides the only basis by which the building owner can know his commitments with reasonable accuracy before embarking on actual construction. Variations can also be dealt with effectively as the fixed price basis applies, *mutatis mutandis*, to such variations. Lastly, under this type of contract, it is the contractor, not the building owner, who pays directly for his own mistakes and poor workmanship. This is undoubtedly a great incentive for efficiency and sound work during construction.

Many prospective building owners and Architects will no doubt meet the suggestion that contemplated work should be carried out under some form of "cost plus" or "cost reimbursement" contract.

The term "cost plus" is in a sense self-explanatory, but it is essential that the prospective building owner should be quite certain that he knows exactly what this type of contract is and what it involves.

Under such contracts, the price to be paid by the building owner to the contractor is left at the time of entering into the contract, to be determined after completion, on the basis of the actual prime cost determined after completion, on the basis of the actual prime cost incurred by the contractor in carrying out the work plus an agreed percentage or amount to cover contractors' overheads and profits. There are three or four different varieties of this form of contract, but the underlying principle is always the same, namely, that the amount which will eventually be paid by the building owner to the contractor is based in some way on a computation of the contractor's ultimate cost plus an allowance for profits, etc.

There is a tendency, under this type of contract, not to have complete documentation of the building owner's wants and requirements before embarking on actual building. Designing is frequently done concurrently with the construction, to the detriment of design, constructional efficiency and economy.

In addition, as can be seen readily, the system eliminates competitive tendering and guarantees the contractor's profits irrespective of the efficiency of the contractor's organization. Furthermore, the building owner will have to bear the cost of rectifying any mistakes or bad workmanship that may arise during the execution of the works, or alternatively the building owner must perform accept such mistakes or bad workmanship in order not to incur extra expense.

I am firmly convinced that building owners and Architects, in the interests of economy and low cost, should, except in the most exceptional circumstances, avoid like the plague the use of any form of cost reimbursement or "cost plus" contract. I am convinced further that these forms of contract, will, if allowed to develop, be detrimental to the Building Industry as they tend to force the industry into huge monopolistic construction units.

* * *

In conclusion, Mr. President-in-Chief, Ladies and Gentlemen, I have no doubt that building costs will be reduced relative to the average man's earning capacity when conditions are such that competition in the building and supporting industries, and with suppliers, is present to a greater extent than today. To my mind efficiency and economy and low cost go hand in hand with healthy competition, and we must see to it, and the Government must see to it, that the industry gets its larger, well-trained artisan force, its free supply of essential building materials, its plant, tools and equipment. (Applause.)

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THE PRESIDENT-IN-CHIEF: Thank you, Mr. Todd, for the Paper you have just read. Ladies and Gentlemen, I understand that Mr. Louw's Paper leads on naturally from the point left by Mr. Todd; and I will ask Mr. Louw, Immediate Past-President of the Chapter, to continue straight away.

MR. T. H. LOUW: Mr. President-in-Chief, Mr. Todd, Ladies and Gentlemen: We hear and see these days much of high building costs, almost as much as high costs of living, high cost of cars, excessive taxation, in fact high costs in every walk of life. The only difference is that in building a scapegoat is usually sought other than the Government of the day. If the high cost of building is not the builder's fault, then it must be the Architect or Quantity Surveyor who is responsible. While not attempting to defend these parties for a moment, who, you will be surprised to hear, are often responsible for an appreciable share of high costs, as I will show later, without attempting to defend them, I think a short survey of general trends since the outbreak of the Second World War, compared with a similar period during and after the First World War, will go some way towards clearing the air.

After the outbreak of war in 1914, building costs in keeping with the costs of most other commodities started to rise and kept doing so steadily after the war to a peak just before the recession of about 1922-24. Thereafter, the building activity developed again, with a more gradual rise in cost which, however, never reached the peak of the 1921-22 period. Then came the severe depression of the early thirties, with prices tumbling down, but never quite reaching pre-war levels. A case in point is the BASIC wage of skilled labour, which climbed from 2/6d. per hour before the war to about 4/6d. at the peak and receded during the great depression to 3/-.

If a graph were drawn of building costs against time for that period, you would find that a similar graph since 1939, over the same number of years up to the development of the Korean war in the second half of last year, would closely follow the first graph, although naturally at a higher level. Relatively speaking, the second graph would not quite

reach the peaks of the first, probably as a result of stricter control measures and a greater use of locally manufactured materials; but otherwise it is very much a case of history repeating itself.

Expressed in figures, since 1939, assuming a basis of 100 for that year, the index for building costs climbed steadily during the following years to about 175 in 1945, 185 in 1946, and from 205 to 210 in 1948. During 1949 the first signs of a decline became apparent while last year the index dropped to as low as 170 in some major centres. By comparison with 1914-1933 period, it would almost appear to be possible to predict fluctuations in building costs for some years hence, culminating in a depression in about 1957-58. But the Korean war intervened, bringing with it new world-wide war preparations on a large scale. This, coupled with an almost feverish demand for buildings, resulted in a sharp rise in the building cost index to about 200 in the post few months.

I am only too well aware that the correctness of the figures quoted by me will be questioned by many. To them I must point out, however, that these figures refer to basic costs, and not costs inflated by other factors such as greater elaboration of buildings and non-competitive tenders, which I am coming to.

The reasons for these general fluctuations must be quite obvious to the keen observer, but, not being an expert economist, I will not attempt to express them. Let it suffice to say that it has a lot to do with the law of supply and demand, the availability of funds and the intrinsic value of money. The world cannot expect to spend millions unproductively on wars without feeling the repercussions.

Now all this does not mean that building costs cannot be reduced, in spite of the overwhelming forces from outside, or that no attempts should be made to reduce them. In fact, compared with the cost-living index it would appear that building costs are somewhat loaded in this country at present. In dealing with this problem in a paper of this nature, I can naturally only touch on the major issues involved. Details, however necessary and important, would take up far too much of your time.

As I see it, there are three main aspects which deserve attention: firstly the building owner's requirements, secondly the circumstances surrounding the building contract, and thirdly the prime cost of building itself.

Taking the building owner's requirements first, there can be no doubt that the building public's demands have grown extensively. Please note that I am not necessarily criticising this aspect; I am merely pointing to a tendency which in no small way is responsible for higher building costs. Take the house of today, for instance, with all its built-in fittings, electric equipment and other amenities, and compare it with the house of fifteen to twenty years ago, with its coal stove and scarcely an electric plug. It is true that high prime costs have necessitated better planning and a greater concentration, made possible by the introduction of more amenities. This greater concentration has obviously increased the cost per square foot, although not necessarily the total cost, as Mr. Todd pointed out so well.

The fault that I have to find with this development is that so many house-owners want it both ways: spaciousness, as well as all the amenities. It must cost more money. In the same way as there is a vast difference in the cost of different cars brought about by both size and quality. And I am not referring to the luxury residences and cars that only the few can afford.

The same tendency is becoming evident in commercial buildings, and, to a smaller degree, public buildings. The quest for greater comforts such as air-conditioning, elaborate sun protection devices, movable internal walls, better artificial lighting, and many other services, has contributed in no small way to higher costs. Taller buildings cost more constructionally and require faster, better and more expensive lifts, while special provisions need more often than not to be made in respect of water supply and fire services.

The modern tendency to plan freely and openly to obtain freer use and sub-division of internal spaces has, perhaps more than any other single design factor, contributed towards higher costs — although it is not always appreciated. It brings about constructional problems such as large spans, cantilevers and excessive point loads which, although possible with modern methods, cost money. In addition the need in such designs for many more service points, such as electrical and communication, quite often requires double structural elements to house mains in an accessible manner.

Hand in hand with freer planning goes the larger window space or opening: the aim to couple the indoor with the outdoor. To the uninitiated it might sound erroneous to mention larger openings as a cause for higher costs, but the fact remains that openings need

protection against sun and weather, which invariably costs more than the simple wall, quite apart from the greater widths which require spanning.

I repeat, I am not finding fault with these developments. I merely mention them, as their contribution towards higher costs must not be overlooked. The general public is inclined to compare present with pre-war costs without taking such factors into consideration. The complex building of today has changed almost beyond recognition from the simple structure of yesterday, with its simple, often inadequate, lighting and ventilation, its wall upon wall, and its lack of amenities.

It has been asked why building is lagging behind in the general trend for modernisation, for streamlining, as it were, but I make bold to state that the period since 1939 has seen unprecedented development in this respect.

The major drawback to modernisation has been, and still is to a large extent the inability or unwillingness of a major portion of the building industry in this country to cope with the demand. Structural design by engineers is lagging behind this development, the tendency being to err on the safe side, which is partly excusable, due to inefficient construction methods. Manufacturers are slow and often unwilling to modernise their products, which leads to excessive costs when compliance with Architects' designs results in so called purpose-made articles. Building contractors are more often than not the worst offenders by quoting excessive prices as soon as they are faced with unorthodox items.

There is certainly room for greater ingenuity and specialisation in construction methods. And, last but not least, Health and Building By-laws are mostly outmoded and inflexible, colling, on the one hand, for standards of construction which are unnecessarily high, and, on the other hand, preventing modern development. All this has been more fully dealt with by Mr. Todd. These criticisms are made here merely to show why modern construction more often than not tends to higher costs.

Now I must not leave you under the impression that modern design is necessarily more expensive than the orthodox. With better planning and the elimination of unnecessary elements, modern building to show why modern construction more often than not tends to higher standards of requirements.

Coming to the second main aspect of building costs, namely, the circumstances surrounding the building contract, I need not say much, as my colleague, Mr. Todd, has dealt so fully and ably with all the implications of proper documentation, competition, types of contract, etc. In addition, this aspect of building has been the subject of extensive enquiries, *inter alia*, in the United Kingdom and the Union of South Africa, resulting in excellent and reliable reports, which are well known to most of you, and the results of which support the views expressed by Mr. Todd.

I can only stress again the need for true competitive prices to keep building costs down, or at least to bring them into line with prime costs of labour and materials. I am sorry to say that, even with proper documentation and competitive tendering, true competitive prices are not always obtained in times of building booms as at present. Not that the builders are to blame, because it is expecting too much from a contractor to tender keenly when he has more work on hand than he can comfortably handle. A building boom is a nightmare when it comes to building costs, particularly in a time of shortage as at present. It leads to unhealthy bidding for labour and materials, stock-piling by all and sundry, thus aggravating shortages, costly delays on works under construction, and inefficiency all round. It is during such times that building costs usually fluctuate wildly, sometimes resulting in prices well in excess of true prime costs.

What then is the solution? Not to build, of course!

In all seriousness, though, one inevitably thinks of controlling the volume of building to within the capacity and resources of the Building Industry. Control, however, is a negative manner of overcoming the difficulty, quite apart from all the other implications which go with Building Control in a country like ours, as you will all probably remember only too well.

A more positive and constructive way to deal with the problem is to increase the potential of the Building Industry. This is, however, a matter for the Government, as Mr. Todd so rightly points out. The Government, as probably the biggest building owner in the country, should either retard its own building programme drastically, or make every effort to increase the capacity of the industry. It is interesting to note that, as a result merely of a slackening off in the Building Industry, building costs dropped about 15% last year in some centres, while prime costs on the whole remained the same.

It is to be hoped that high costs alone will prevent many from building. In any case, I think it is wrong to proceed with a building when the price is obviously out of all proportion to its true value. I am pleased to say, however, that this does not often happen, not even in the worst boom times. Also, do not let me leave you under the impression that the builder is necessarily responsible for non-competitive prices. In times of shortages the initiative is largely taken out of his hands by manufacturers and merchants, as well as by building labour.

In connection with documentation I wish to refer briefly to a scapegoat of the building contract, namely, the final account. There appears to be a general belief that quantity surveyors are keen on large final accounts, which I can assure you, is quite incorrect. (Laughter). The building owner could very easily prevent large and costly final accounts by formulating his requirements clearly in the first instance, insisting on proper documentation, and limiting subsequent variations to the minimum. This would lead to all-round economies, and, not least of all, enabling the builder to get on with the job.

Before stepping off the building contract I must touch on another vexed question: qualification of tenders in respect of fluctuation of prices. We have had it in different forms at various stages and I do not think anybody really wants it. But circumstances some times are such that in the best interests of the building owner we are obliged to accept it. There can be no doubt that when a tenderer cannot obtain firm quotations for materials in short supply, which are subject to sudden price changes, it is cheaper for the building owner to carry the risk of fluctuation himself.

I now come to the last main aspect of building costs, namely, the prime cost of building itself, that is, after the elimination of all other causes of high costs already dealt with. I realise only too well that I am now treading on dangerous ground, but I have no alternative. I will therefore come out with the worst, immediately. I am satisfied that the Building Industry is the most inefficient of all large industries. (Hear, hear).

Of course, this comparison is most unfair, as the Building Industry cannot be housed permanently in one place, producing an article at a time on a large scale. Buildings do not roll off belts, as cars do. The high standard of efficiency of the factory is not feasible with the erection of a building. Although something in the nature of the factory-produced article might still be possible to some extent with large-scale housing schemes, general building could never be produced in that manner.

Yet I feel there is still room for much improvement in building organisation. With a few exceptions, builders do not plan ahead systematically. They make very little effort to study methods and procedure with the intention of eliminating waste in time, labour and materials. Carefully planned progress schedules on building contracts are the exception rather than the rule. I think that, if builders were to consult efficiency experts, they would be surprised at the results and possibilities. Perhaps the complete lack of proper facilities to train building contractors in this country has a lot to do with it. I suggest, for the serious consideration of the Government, the creation of such training facilities.

I might be taken to task this afternoon for expressing these views. But I said there were a few exceptions, and, more likely than not, only those exceptions would be interested enough to be here. I can expand on this subject, I think with some authority, at much greater length, but time does not allow of it. Let it suffice to say that in most aspects of contracting there is room for improvement, such as finance, tender procedure and pricing, sub-letting, administration and site organisation, supervision, equipment and plant, buying, handling and stacking of materials, handling of labour, continuity of work, etc.

There now remain only the two major elements of prime costs, namely, labour and materials, which, strangely enough, are the only two items blamed by many for high building costs. Certainly these two items make up the bulk of building costs, but they are just the means to an end, decided on and handled by the building owner, the architect, the specialist consultant, the quantity surveyor and the contractor. But I am not going over all that again. Let us rather consider these two elements on their own merits.

There can be no doubt that our building labour as a whole, skilled as well as unskilled, is not as efficient as it could be. This is recognised in the highest circles. It is general knowledge that the responsible Minister is at present grappling with the problem of improving it. Higher wages do not necessarily mean higher costs, if the step-up in efficiency is relatively greater. I regret to say, however, that past experience has shown that any improvements resulting from higher wages were short-lived. Also, I do not believe that the permanent solution

lies in bonus schemes based on piece-work, as it is quite impracticable and far too costly to measure every man's work every day, quite apart from the onerous task of setting standards to cover all possibilities. Group bonus schemes might, however, be successfully applied by individual contractors, provided they do not become merely new grounds for bidding for labour, or, alternatively, be looked upon eventually by labour as the normal standard.

One sure way of obtaining greater efficiency from labour is to have more labour than work available, but as nobody would agree to the principle of unemployment, this solution would not do. I personally think that the position might be improved by classification of labour, that is to divide labour into classes and to grade wages accordingly. The newly-trained artisan, for instance, will be allowed automatically into the bottom class of skilled labour, and his graduation into the higher classes will be subject to Government-controlled trade-testing in respect of quality as well as output. There is no time now to go into further details, but the basic principle behind it all is to create an incentive for the worker to improve his own position by his own efforts.

As regards materials, Mr. Todd has already touched on one aspect, that of a smaller but more appropriate range of stock or standard articles, which, by means of mass-production resulting from a greater demand, would reduce costs, ease the burden on merchants of carrying a large variety of stocks, and assure more ready delivery.

Greater local manufacture versus importation of building materials might improve costs, though not necessarily. Great strides have been made in this direction: for instance, 69.5 per cent. of building materials were produced locally in 1949, compared with only 49 per cent. in 1939. I think where local manufacture has proved itself, it deserves greater support than it is generally getting.

Substitution of materials in short supply or of materials of excessive cost certainly offers a field for investigation. I understand, for instance, that Icor is embarking on the production of high-tension steel reinforcement, by which it is hoped to bring about an appreciable saving in steel and costs. Again, the general introduction of pre-stressed reinforced concrete promises to reduce the use of cement and timber, amongst other things, as well as to speed up construction. So, other possibilities offer themselves — but I have already exceeded my time.

That, Ladies and Gentlemen, sums up the position very briefly, as I see it. There may be several aspects I have omitted to refer to, such as sub-contractors and specialists, although much I have said applies equally to them. The subject is really too vast for a paper of this

nature. You must not, therefore, leave with the impression that building costs could be drastically reduced overnight. I think they can be improved, but to obtain anything like substantial reductions, savings should and could be effected all round, however small in any one respect. To achieve this, the effective co-operation of all concerned is necessary.

Mr. President-in-Chief, if I have succeeded in stimulating positive discussion on the all-important problem of high building costs, and not merely evoking the displeasure of those vitally concerned, which will only result in negative defensive argument, then I am more than satisfied. Thank you. (Applause.)

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen, I am sure you have all listened with deep interest to the papers that you have just heard. As you don't often get the opportunity of discussing this subject in public, I hope you will use it now. I notice several prominent members of the Building Industry here, and I must particularly request them, if they feel constrained to throw anything in this direction, as a result of Mr. Louw's remarks, that their aim will be true. (Laughter.) Ladies and Gentlemen, the subject is now open for discussion.

(No response.)
THE PRESIDENT-IN-CHIEF: Do I take it then, Ladies and Gentlemen, that everybody is in full agreement with all the remarks that have been made this afternoon?

MR. J. O. QUAIL: Mr. President-in-Chief, both Mr. Todd and Mr. Louw dealt with one aspect of Building Costs which I think should be repeated: that is, the costs occasioned by Bye-Laws. I think the Central Council should appoint a Sub-Committee to go into these Bye-Laws which I personally feel are adding so much on to the cost of building.

Let me just mention, for instance, fire-fighting equipment, fire-escape stairs, sprinkler installations, and, worst of all, lifts. Ladies and Gentlemen, I would just like to tell you one experience which will, I hope, support my argument. I refer to a 50 x 50 flat building in town here. The owner is an Indian. It is occupied by Indians. And yet the Municipality has insisted on a European and a non-European lift. With the high cost of lifts, that position is simply fantastic.

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen, I just don't know why there is no discussion on this subject. Perhaps if we invite discussion after tea, we may then get somewhere. Meanwhile I will ask Professor Fassler to read his paper.

THE FUTURE OF ARCHITECTURE IN SOUTH AFRICA

PROFESSOR J. FASSLER: Mr. President-in-Chief, Ladies and Gentlemen: Early this year, when Mr. Lewis invited me to read a paper on "The Future of Architecture in South Africa," I accepted but with mixed feelings about the scope of the subject. My misgivings arose because I have not had the opportunity to travel extensively in South Africa in recent years, and have therefore not seen as much work elsewhere as I should like. However, after some thought it seemed to me that the subject could be approached from several points of view which would be within the terms of reference. For example, it could take the form of an investigation directed towards ascertaining whether there will be sufficient work forthcoming for the profession in the interval between this Congress and the next. . . .

I intend to pursue quite another theme. I want to examine the present trend of design, and to ascertain whether all is well with the standard of our work; whether Architecture, considered as an art, is progressing, or if not, what can be done about it. Whilst my subject concerns South Africa principally, I shall have to spend some time discussing developments elsewhere.

Reference to what is happening elsewhere is inevitable, because South Africa is a youthful country from the cultural point of view, and has not developed intellectually sufficiently to initiate movements in Art or Architecture, which will be of consequence overseas. We are still in the stage of absorbing influences, and the position is unlikely to change during our lives unless something unforeseen happens in world affairs.

I must add that, whilst we absorb influences from many quarters, our geography, social background, and material resources, automatically come into play, and modify their expression in architectural terms. Further, I believe that movements in the Fine Arts which develop overseas, from time to time, are of profound interest to us, and must be kept in close touch with. The urge to travel presently manifesting itself amongst students and architects, is a healthy one, for there is no better way of

learning what other architects have to teach us than by making personal contact with them and their work.

I propose to proceed by making a broad assessment of the stage Architecture has reached at the present time, following this with specific reference to South Africa, and some recommendations for future development.

I want to commence by saying that the architectural revolution of the early 1930's, represented as profound a change as that which occurred in the fourteenth century, when the Renaissance superseded the Mediaeval Period. There were many at the time who believed that this was another passing phase, to be supplanted, very likely, by a return to another historical revival. This reactionary view still remains abroad today, and I feel I must deal with it.

In making up one's mind about this matter, it must be remembered that Architecture cannot be considered in vacuo unrelated to external circumstances. In my opinion, such a return is unthinkable, because the social changes that have taken place, and which are still occurring on all sides, are so profound that conditions can never be quite the same again.

Mediaevalism reflected the aims and aspirations of mediaeval society. Classicism, the motive force of the Renaissance, was an appropriate background for a civilization which modelled itself on Greece and Rome. Whilst it is stimulating and pleasant for us to draw strength from the architectural essences which can be distilled from these periods, and other past experience, ranging over 6,000 years, we cannot overlook the fact that we live in a troubled, but stimulating period, when humanity is reviewing the functioning of governments, legal procedures, and the preservation of peace, making life in great cities possible and convenient, and generally improving the common lot of all men.

The architectural emphasis of such an age, particularly where democracy prevails, cannot be placed on the creation of impressive monuments and costly buildings, but rather on speed, efficiency, good organisation,

and economy in design and construction. These are not exactly objectives which are suitable for the traditional way of building, which is no longer in harmony with the tenor of our times.

Taking a broad view, it is interesting to note that the general feeling of simplicity which is such a salient characteristic of the Architecture of the past two decades, is part of a process that began with the Regency period early in the nineteenth century.

From what I have just said it follows that my standpoint is one from which I shall advocate the continued growth of a contemporary Architecture, expressive of the world today, nevertheless drawing life and strength from roots deep in the rich loam of historical experience.

Previously I mentioned that the modern movement may be traced back to the early nineteenth century. Nikolaus Pevsner and Siegfried Giedion have skillfully fitted together a fascinating mosaic of personalities and events, which now form a tissue of connecting links. What is of special importance for us is the synthesis which took place between 1910 and 1930, when an architectural philosophy, and language of form, were resolved, which opened a highroad into the future that was sufficiently well defined for others to follow. Principally through the genius of Frank Lloyd Wright, Walter Gropius, Mies van der Rohe and Le Corbusier, all great masters of our age, and all hopefully still with us, the foundations of a style expressive of our times were securely laid.

Apart from the profound spiritual differences which separate the philosophies of these masters, the one thing they all held in common was a need for a rational approach to building problems. Analysis before planning, or the doctrine of functionalism as it was vigorously expounded by Le Corbusier, became the cornerstone of the new approach. This principle was one that all could readily understand.

As few architects were sufficiently gifted to match his amazing plastic inventiveness of Frank Lloyd Wright, or Le Corbusier, it became convenient to accept their language of form. It is certainly true to say of Johannesburg and Pretoria, after 1930, that whenever Le Corbusier employed new forms or reused old ones, such as buildings raised on columns, knuckle shaped columns, mono-pitched roofs, or rubble walls, these materials and forms would be adopted immediately and applied widely without enquiring too deeply into their appropriateness. It is now true to say that the kind of functionalism that was practised was thus limited, and in general, buildings frequently looked very much like those of the masters who inspired them. It is also true to say, of the Transvaal, at any rate, that the period 1930 to 1939 saw the peak of Le Corbusier's influence on the Architecture of this region. I am not as familiar as I should like to be with work done at the same time in Natal, and at the Cape. In the absence of any evidence to the contrary, I am going to hazard the statement that tradition very likely exercised a stronger brake in the older communities of these two Provinces, and that the outburst of new work was not as strong or as radical as that on the High Veld.

Changing political circumstances in Germany, after 1930, heralded by the rise of Hitler to power, forced Walter Gropius, Mies van der Rohe, and others, to emigrate to the United States, and the distinguished leadership in Architecture which Germany enjoyed passed out of her hands. The subsequent occupation of Europe after the outbreak of war saw the virtual disappearance of Le Corbusier. All non-essential building ceased everywhere, and further development was halted. When hostilities ceased, and architects, returning to their practices, began to pick up the threads again, the marked abstract quality which infused the work of the pre-war era seemed somehow to be insufficient, and a feeling spread abroad that Architecture required to be humanized, to render it more generally acceptable to themselves and the public. The functional approach still served for the analysis of problems, and the establishment of the main lines of solution. The desire to enrich the fabric of buildings was met by using the old familiar motifs, particularly frames round windows, and frames round facades, in endless permutations and combinations. This procedure was accompanied by the use of a variety of materials, frequently applied rather indiscriminately in order, somehow, to achieve the visual richness architects were seeking.

It now seems clear that many architects are in danger of losing their sense of values in the absence of a clearly defined post-war philosophy. The initial stream of enthusiasm which flowed so strongly has now lost its force in a morass of uncertainty.

The feeling of uncertainty to which I have just referred is not confined to South Africa; it exists everywhere. Only last year Mr. J. M. Richards wrote an excellent paper for the "Architectural Review" entitled "The Next Step?", in which he examined the ground covered by the modern movement so far, and enquired into possibilities for future development. This same uneasiness is reflected by Nils Arlbom in a recent essay on New Swedish Architecture. In it he said: "Swedish architecture today is without a programme to the extent that it does

not purposefully follow a conscious line, as did the previously mentioned trends. There is nothing intrinsically wrong in this — but it is to be regretted that at the moment it lacks any clearly formed ideal. To those who are able to see it close at hand, it seems often unstable and faltering."

That we have reached the crossroads not only in South Africa but also in Europe and America is clear enough. An architectural revolution has been accomplished. The first flush of victory is over. Where do we go from here? There is no escaping the fact that we cannot stand still. We must move forward or stagnate. I must admit that I find it extraordinary difficult to grope for the next step, in that impenetrable darkness which obscures further progress, and which is illuminated, now and then, by men of genius whom the Muses occasionally grant us. The next step? Like Hamlet, I can say, with feelings: "That is the question".

As the first step towards the formulation of a set of recommendations, I feel I must express some views about Architecture in this country. So, before I become critical, let me glance at the credit side of our balance-sheet. I think the general impression made by our cities, in spite of almost universal poor town-planning, which always negates the achievement of a really satisfactory urbane character, in that an indifferent setting is provided for buildings generally, is very creditable indeed.

Firstly, our cities are well kept. The civil engineering of pavements, curbs, roads, and distribution of overhead services, is always neatly executed. These comments may sound platitudinous, but I make them because I cannot help making a mental comparison with the country towns of the United States of comparable size, bearing in mind the fact that as far as national maturity goes, these two countries are roughly the same age. In the United States, many city services are provided by private enterprise. Electric power and telephones form two examples. Thus, when they came to be distributed, they pay very little attention to one another or to anything else. Advertising has free reign. The average visual scene is thus one of great untidiness. The general picture I have in mind may be seen in the "Architectural Review" of December, 1950.

In passing, I must add that, whilst I do not entirely agree with the "Reviews" attitude towards America, and its potential contribution to the future of society, the picture of the average city which is presented is a fair one.

Suburban developments in South African towns, more especially Pretoria, Durban, Cape Town and Johannesburg are very fine in my opinion. I know that land has been used extravagantly, and I have a sneaking sympathy for the longing of the average family to own a house and garden of its own. The picture of houses of good average standard — a fair proportion, really excellent — set in well-kept gardens, is one of which we can well be proud. It must be remembered that our present social set-up makes gardening on the extensive scale it is practised here, feasible, because it is still possible to hire Native labour on a part-time or a full-time basis. If such labour was not forthcoming, the picture would be a very different one indeed. Another point in our favour is that we can still afford to purchase manure. Recently, when Mr Colderwood addressed the Town Planning Institute, he mentioned that it was virtually impossible to purchase manure in American towns, because the cost was prohibitive. This simple homey fact explains the notable absence of flowers in their suburban scene. The rich atmosphere of South African suburbs is hardly equalled anywhere, at the present time. Their general aspect could be materially improved, however, from the civic design point of view, by the generous provision of grouped flat sites — not the flat-over-shop variety, which I think is an iniquitous arrangement and should be prohibited. Groups of taller buildings would relieve the feeling of flatness and the present spreading character of residential areas.

Now, turning to the debit side, let me preface my remarks by saying that any criticisms which I offer are made with the sincere object of attempting to improve the standard of Architecture, and I hope the Profession will not take it amiss if I use buildings executed by members to illustrate my remarks, when they are published in the S.A. Architectural Record. In return, I certainly expect, and will welcome, criticism. Let me also add that the speculatively-minded building public of Johannesburg does not give Architects sufficient time, in the preliminary stages, to prepare and think out their schemes thoroughly. I am all for speed once the contract has been let. More thought early, will also assist later speed of building. I do think that for more serious study is needed to design buildings which will be sufficiently distinguished to be called works of Architecture. Such buildings are rare nowadays. This whole question is one our Public Relations Committee can well deal with.

FRANK LLOYD WRIGHT. UNITY CHURCH, OAK PARK, ILLINOIS: 1906.

The work of Frank Lloyd Wright is notable for the strong sense of unity with which it is imbued.

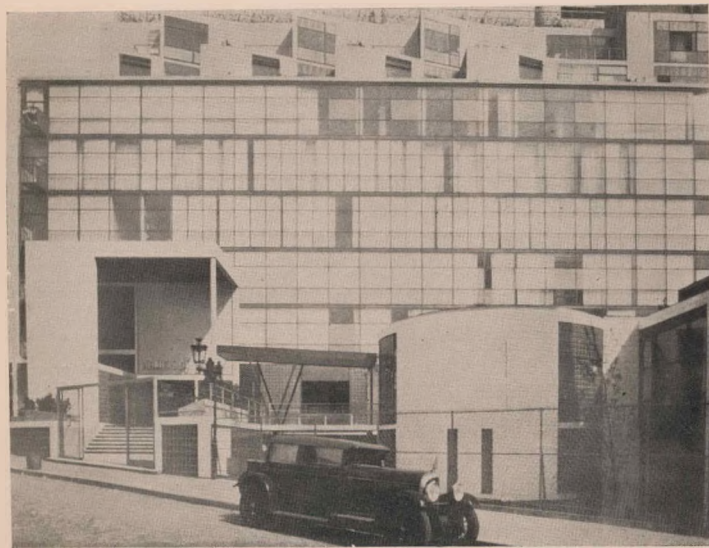
Unity Church, an early experiment in poured concrete in situ, built in 1906, displays this quality admirably. The building contains two principal elements, the Church proper and facilities for social functions immediately opposite. Both are joined by an entrance vestibule.

A cubic form is the basis of the composition. The plan comprises a series of square compartments. The volume of the auditorium has a strong cubic character. The same form repeats in deep coffers to the roof lights above. It also appears in the lighting fittings — remarkably advanced for the period — which embody an appropriate contrasting form — the sphere — in their design.

The beautiful pattern made by the lead glazing to windows is notable. They embody a subtle play on variations in the thickness of the lead comes. A similar feeling pervades the organ grille.

Externally, the principal forms of the building reflect the plan arrangement. The same cubic feeling pervades the whole, restrained use of materials internally and externally. In practice, it displays Lloyd Wright's deep understanding of the language of architecture. It is a notable work of art.

As time did not permit of our obtaining the necessary authority to reproduce illustrations of this work the reader is referred to those appearing in Henry-Russell Hitchcock's book or Frank Lloyd Wright, "IN THE NATURE OF MATERIALS." — Editor.



2. LE CORBUSIER, LA CITE DE REFUGE, PARIS: 1932-1933.

Most architects will recall Corbusier's handling of the entrance to La Cité de Refuge, an historic building in the evolution of contemporary architecture, which has suffered severe damage during the last war. His amazing plastic inventiveness produced a propylatium, linked by a covered bridge with a circular entrance hall beyond. Behind, rose the sheer glass facade of the main building.

It is interesting to note how the main building and the forms spread out in front of it are faced with similar materials. Although they present a lively play of form, they are knitted into the composition as a whole by this means. Note that white glazed tiles and glass bricks have been used to face the plinth in the foreground. White glazed tiles also face the circular entrance hall. These materials recur in the treatment of the large windows of ground floor level. The design of the entrance gate also repeats the protective balustrade to be seen in the background.

Illustration from "Le Corbusier et Pierre Jeanneret" Oeuvre Complete de 1929-1934. H. Girsberger, Zurich.

3. MIES VAN DER ROHE, GERMAN PAVILION, INTERNATIONAL EXPOSITION, BARCELONA, SPAIN: 1929.

It is regrettable that so many of Mies van der Rohe's buildings — and he has not built a great many — have suffered destruction. This is particularly so in the case of the German Pavilion designed for the Barcelona Exposition. From photographs, now the only record of this remarkable building, it is clear that it possessed an aura which lifted it into the highest flights of architectural achievement. Attention is drawn to the strong sense of unity which pervades the composition. Mies used Roman travertine for floors and walling generally, some walls of green Tintin marble, an internal partition of onyx, and glass of different colours. All changes of materials took place between the spacious travertine floor and base, and the broad cantilevered slab, and were consequently disciplined by them. It is probably that the present day tendency to apply a variety of materials to buildings rather freely, has a possible origin in the technique Mies employed. His use of materials must, however, be studied in relation to his particular system of punctuating a free flowing space. Materials here form an integral part of a system of space definition.



Illustration from "Mies van der Rohe," by Philip C. Johnson, Museum of Modern Art, New York.

The criticisms I have to offer have been reduced to six main points:

Firstly: I have a feeling that Architects show a lack of appreciation of some of the fundamental qualities required of a work of Architecture. The one attribute I particularly have in mind is Unity. A sense of unity is basic to works of art generally. Any building, painting, or piece of sculpture which does not possess it, suffers a severe handicap. It is important to remember that to master how likely the modulating of a building may be in the arrangement of its component parts, and minutiae, every part of it must eventually form an indivisible whole. Frank Lloyd Wright, Mies van der Rohe, Gropius and Le Corbusier understand this need very well, and seldom fail in this regard. It is rewarding to study their work to see how they achieve it. (Figs. 2, 3).

Another familiar quality which tends to be misunderstood is "Contrast". The necessity for "Contrast", in the three-dimensional and detailed aspects of the architectural treatment of buildings, is often construed too liberally today. Contrasting forms are frequently employed — emphasised further by the use of totally different materials to pick out the main structure, and the elements which contrast with it. If we examine "Contrast", as employed in the traditional sense, we will see that the forms providing it project or recede, including a greater or lesser degree of light and shade, or that a surface is more or less perforated than an adjoining one.

To take a local example, contrast in the composition of the Union Buildings, Pretoria, is provided by the projecting colonnaded pavilions of each end of the long wings flanking the semi-circular amphitheatre. The flatness of the wings is further relieved by projecting entrance porches. It is important to note that the same sense of scale, treatment of masonry, eaves and roof, is shared by the wings, and the projecting pavilions contrasting with them. Contrast in the way Frank Lloyd Wright uses it, has much in common with the orthodox treatment mentioned previously. There is, of course, an inter-relationship between "Unity" and "Contrast." I would say "Contrast" is satisfactory as long as it does not disrupt the unity of the whole. The moment it does interfere, then the result is most likely to be two or more buildings, instead of one.

Secondly: Our structural repertoire is unimaginative. With few exceptions, the average city office or flat block, is supported by a conventional reinforced concrete frame, with floors either solid or of the hollow tile variety. It is interesting to note that the block of flats the English firm Tecton has just completed in Rosebery Avenue utilises quite a different method. The important point is that structural systems largely determine the ultimate character of buildings. It can be shown that the one factor which tends to imprint a sameness on new flat buildings erected in Johannesburg during the past few years, is the fact that the same kind of structural system has been used practically without variation. The concrete frame, as we know it, may well be the best solution. What usually happens is that its employment is largely automatic. The fact that the design of structures is not handled by the Profession, renders the creation of first-rate buildings very difficult,

unless it is possible for architects to collaborate with a reinforced concrete designer like Ole Arup who has done excellent work in collaboration with Tecton for many years, and who has helped to maintain the standard which distinguishes their buildings.

The other day Mr. Haddon showed me an example of post-stressed concrete in Johannesburg. The construction involved a series of seventy-five foot clear span concrete beams over a newspaper press room. The procedure was so interesting, and the results so remarkable, that I have hopes that the introduction of post-stressed and pre-stressed concrete will expand our structural repertoire, and enrich Architecture in the process.

Thirdly: There appears to be a tendency abroad for architects to be rather unconcerned about the truthful expression of plans when developing elevational treatments. Such a tendency can only lead to eventual anarchy in design. It requires one kind of skill to want to make a building look a certain way, and make it look that way, irrespective and quite another order of skill to correlate plans and elevations so that they are properly expressive of each other and yet produce a successful result.

Fourthly: I have already referred to the cliché-ridden state of Contemporary Architecture. Favourites are the frame round facade or round windows. (Fig. 4) The particular plastic problems which produced the frame in the early days, have now been forgotten, and they are used indiscriminately in endless combinations. It would be a very good thing for South African Architecture if, by general agreement, these motifs were to be abandoned for at least twelve months, so that architects would be thrown back to a consideration of fundamentals. Kidder Smith's photographs of South American architecture, which surprised and delighted the architectural world in 1943, have also added the "brise soleil" to our repertoire of overworked motifs.

It is interesting to note that what I have just said about the cliché-ridden state of Architecture in South Africa, applies with equal force to South America, where the "brise soleil" is sometimes applied to facades with southern exposures simply for the sake of the rich patterns they make. I think that the elaborate construction necessitated by the introduction of these elements can mostly be avoided by the simple expedient of using modern types of glass which have been developed to eliminate sunlight, and heat, or heat alone.

Fifthly: Mention has been made previously of the post-war tendency to use an excessive number of materials in the external treatment of buildings. The consequences of doing so can lead to the disruption of the overall unity. It just will not do to make one wall brick, another adjoining of stone, another of timber, and so on. As I have already said, it is interesting to examine the work of Frank Lloyd Wright or Mies van der Rohe from this point of view. (Fig. 5) Lloyd Wright uses a comparatively small range of materials in combination. Those he employs are used in such a way that they are carefully interwoven into the



4. CRANBROOKE — a private residential hotel in Johannesburg, completed in 1949 by H. Le Roith and Partners, Architects, has facades of great virtuosity. On closer examination of the plans it will be found that the architects enjoyed a license in their treatment not far removed from that associated with the Renaissance. In Cranbrooke, the frame forms an important motif. A large frame surrounds the facade to the north, a smaller one portion of the facade to the west, and still smaller ones, the windows within it. There is little evidence of any structural system.

The character of the building derives from a lively play of forms. These forms have a strong aesthetic basis, and have been developed on the north facade without too much regard for the bedrooms behind. Although these rooms are similar, the allocation of balcony space and window areas varies.

Cranbrooke displays a trend in design which places a stronger emphasis on aesthetic considerations. In this it departs from contemporary design philosophy in which the strongest possible emphasis is placed on practical considerations.

building as a whole. The staccato type of usage, each material existing in its own right, which appears to be so popular in this country, may arrest attention; but from the aesthetic point of view, such treatments remain completely unresolved. (Fig. 6.)

Well—you have heard my criticisms, and I am sure some of you will be wanting to come back at me. Before you do, permit me to present my recommendations concerning what can be done, to ensure the healthy continued development of Architecture in this country.

Firstly: There is need for the active discussion of Architecture in the Profession. The type of discussion I have in mind is best achieved by the informal formation of small groups drawn together by mutual regard or friendship. I happen to be a member of such a group which includes the staff of the Witwatersrand School of Architecture, plus a few practising architects who are interested. My colleagues may not agree with all I have said; nevertheless, I want to add that the discussions we have had, in each other's houses, over quantities of beer, at least one evening per month, for the past eighteen months, have been quite a tonic for everyone concerned. There is no better way of coming to grips with Architecture, if one feels keenly, than by talking about it, criticising other people's views, or presenting one's own and defending them. To be quite realistic, I have to accept the fact that the Profession may be broadly divided into two classes of practitioners. There are those for whom Architecture is primarily a business concern, and nothing much else, and then there are others who feel and think about it. There is nothing much that can be done about the first category; it must depend upon the second category for the advancement of Architecture.

I believe I am right in saying that not enough of the second category indulge in serious discussion frequently enough. Whenever I can manage to travel in Europe, which isn't often, I am always struck by the well-formed ideas which architects of note, and artists, have about the objectives they are pursuing in their work. For example, I have a delightful recollection of Florence, of a dimly lit farmhouse in the spring of 1949, set in the shimmering olive groves of Settignano, where, after a simple peasant meal of cheese, coarse bread and rough wine, a young contemporary Florentine architect and painter, Leonardo Ricci, pacing up and down his unheated studio, poured out his aims, aspirations and passion for architecture and painting. It was an exposition characterised by a fervour, quite volcanic in its intensity. It left me wandering at his strength of feeling.

I believe that, to produce a significant Architecture, one must have strong, well founded, convictions, forged by the heat and hammering of frequent debate. It is a sad reflection that lectures and discussions organised by the Profession have been abandoned because of lack of support. By comparison, the journal of the Royal Institute shows that that body attempts to lead an active intellectual and social life at Portland Place. The Council of Architectural Students at this University is one of the only bodies that organises a steady programme of lectures and discussions in the Transvaal. At one time the Pretoria Architectural Society was active. It now appears to be moribund.

Secondly: Before shaping a philosophy which will serve to provide Architecture with an ideal towards which we can strive, in the near future, I feel it advisable as a first step to review the publications of Frank Lloyd Wright, Walter Gropius, Mies van der Rohe and Le Corbusier.

As a matter of interest, I have been doing so myself. There are many aspects about the philosophies of these masters that time has blurred. Reading through "Towards a New Architecture" again, I found that Le Corbusier, the arch-apostle of functionalism, who coined that dreadful phrase "a house is a machine for living in," did not believe that functionalism itself was the "Open sesame" to Architecture. For example, on page 110 we find that "Architecture has another meaning and other ends to pursue than showing construction and responding to needs (and by 'needs' I mean utility, comfort and practical arrangement). Architecture is the art above all others which achieves a state of platonic grandeur, mathematical order, speculation, the perception of harmony which lies in emotional relationships. This is the aim of Architecture."

Compared with Le Corbusier, Mies van der Rohe is a man of few words. He has not written very much. The inaugural address he delivered as Director of the Armour Institute of Technology, Chicago, sums up his philosophy pretty well. It is suffused with a humanism that is unexpected in a man whose work on paper is so emphatically formal and abstract in quality. There is a Rabindranath Tagore-like feeling about many of his statements. For example, his dictum that "less is more," joins hands with Tagore's, "Beauty knows to say enough, barbarism clamours for still more." I have some pleasant recollections of his quiet modesty, and kindness to me, when I visited him in Chicago. Published photographs of his Illinois Institute of Technology do not impress. In reality, these buildings are distinguished by a serenely, quiet monumentality, and perfection of proportion and detail that is totally unexpected and very moving.

Without needlessly pursuing this logic further, I want to say that at this stage we are too inclined to rely on our memories of the contemporary masters I mentioned. I feel that, before we attempt to move forward, we must go back a little to make quite sure that we have absorbed everything of value in the philosophies they propounded, and which have so far guided the course of Contemporary Architecture.

Thirdly: My previous recommendation drew attention to the need to review the sources of Contemporary Architecture, and I am going to add to this: the desirability of making a careful study of contemporary Architecture in Scandinavia and Switzerland. This procedure appears to me to be necessary, for two reasons. One is, that the contemporary masters demonstrated their philosophies in the design and erection of buildings, which were mostly conceived on a very abstract plane indeed. Their language of form and expression could be appreciated by architects, who could understand, but they were very much out of the reach of the average person. In blazing the trail, no departure could be countenanced by them which would be detrimental to the purity of the demonstration emerging from the principles and ideals which gave it birth. This is especially true of Mies van der Rohe and Le Corbusier.

As mentioned previously, a somewhat literal translation of Le Corbusier was attempted in the Transval of one time. I need hardly add that the buildings belonging to this phase were not at all popular.

5. RESIDENCE — DONEN : 1950, by Cowin & Ellis, Architects, shows, what is very likely, a local interpretation of Mies van der Rohe's use of plane surfaces, and the varied materials he employed. The wing on the right should be compared with the Barcelona Pavilion. In the latter example, the varied materials were firmly disciplined between slab and base as parts of a greater whole. Here the separate materials, Slasto for the end walls of the bedroom wing, the face brick plinth, whitewashed brick walls above, and roof, exist as separate entities. Whilst the effect has a visual richness that is quite deceptive, the strength of the overall form is weakened because the simple envelope which creates it has suffered excessive disruption. From the aesthetic point of view, a house built of stone should have a character which derives from the quality of the material itself. Similarly a house built of brick will be expressive of brick as a material, and will therefore be of different character. Where these two materials are used together in more or less equal quantities, it becomes extremely difficult to weld them together as parts of a greater whole.

Photography: E. Rehninow

I am not suggesting that all new developments must be popular. I do suggest that, when Switzerland and Sweden adapted contemporary architecture in the early 'thirties, the interpretation of these influences was carefully considered, and was not nearly so literal. A new way of building was developed which did arouse criticism, but it was far more compatible. To quote Kidder Smith, he says, "Switzerland found its own feet architecturally, and ever since has demonstrated increasing self-reliance upon its considerable native abilities. This maturity and self-development were undoubtedly hastened by the traditional independence of the Swiss themselves". He considers that "Switzerland today is one of the most progressive countries architecturally to be found in the world. Whereas Brazil or the United States occasionally produces buildings of exceptional merit, these are comparative rarities in a field of eclectic mediocrity. Switzerland on the other hand, is one of the few countries outside Scandinavia where the reverse obtains. Instead of finding a few fine buildings amidst a welter of architectural nothingness, first-rate modern examples are everywhere, and the traditional almost non-existent."

To the study of Switzerland must be added Scandinavia where contemporary architecture has similarly developed very sensitively. One thing which such a study will reveal is, how architects in these countries get along without recourse to the cliché which are so endemic here. Study will also reveal the taste and feeling with which buildings are detailed, and the restrained use of materials.

Fourthly: Architects must make a practice of recording their work and experience in this country. Movements in the arts develop rapidly nowadays, because methods of communication are so much better than they were in previous centuries. If Picasso paints a picture which suggests the beginning of a new phase in his work, this fact is known to people who are interested, within a few weeks, in many parts of the world. Ideas are transplanted rapidly in this way. Without conscientious recording of work and experience in South Africa, this very necessary communication between architects is absent, and what is likely to happen is that, instead of building up our own approach, based on South African experience, we are likely to depend on the stimulus of Europe and America. It is true to say that architects derive most of their inspiration from overseas periodicals at the present time. We must know what is happening elsewhere in South Africa, and I therefore welcome the introduction of the new journal, "Architect and Builder," because it is assisting in doing precisely this.

Fifthly: The need for discussion which I have pressed for can be satisfied on a more formal basis than that mentioned, by the organisation of Spring or Summer Schools at those Universities offering courses in Architecture. Summer schools have been organised in England for many years, and are quite a feature of the Town Planning Institute in that country. There is also the possibility of Provincial Institutes exchanging small teams of lecturers who could expand on the aims and objects of the Profession in their own parts of South Africa.





6. S. K. F. BALL BEARING COMPANY BUILDING: 1950, by Chris Niell, Architect. This is one of the better well-finished recent additions to Johannesburg's office buildings. The two principal forms in the superstructure are treated with terrazzo facing slabs and face brickwork. This strong differentiation is typical of a good deal of post-war work, and in this case virtually separates the building into two component parts which thereafter remain unreconciled. The building thus does not achieve an overall sense of unity.

I now wish to make reference to a matter which falls partly within the scope of this subject, and is nevertheless relevant and highly important. It concerns furniture and furnishings. There are two aspects I want to mention. The first is that having designed houses, let us say, which are works of Architecture, clients duly take possession with furniture so poorly designed and executed, as to set the architects' efforts at naught. We cannot blame clients entirely because the standard of taste exhibited by our manufacturers, excluding a few rare exceptions, is so poor that the market is flooded with bad reproductions of period pieces. It is difficult for people to buy anything else. What I am driving at is this: in the past, the Profession has been able to influence the trend of furniture design. The popularisation of steel furniture forms a case in point. In due course, instead of moving on when steel was abandoned, as designers did in Europe and America, to explore the possibilities of using timber simply and with taste, a full-scale retreat took place. The result is everywhere to be seen in this town and any other. In the interests of our work, I feel our Public Relations Committees must exert every effort to stimulate a demand for mass-produced furniture which is economical, simple and elegant. The importation of furniture from Sweden, which has achieved great popularity, shows what can be achieved. Import duties and cost of transport make this furniture more expensive than it is really worth; nevertheless, it shows a trend which can be followed up here with success.

The second aspect I want to mention follows from the first but has particular relevance in the case of housing schemes, either economic or

sub-economic. Furniture manufacturers must be made to realise that, owing to rising building costs, houses are becoming smaller. Living-room and bedroom sizes have contracted, and it is really necessary to produce furniture which is as compact as it can be, so that no excessive demands will be made upon the space available. I wonder how far the furniture architects draw on their plans to ascertain whether rooms can be satisfactorily arranged, bears any relation to the hulking pieces which are later duly moved in. To the need for mass-produced furniture which is simple and elegant, must, therefore, be added the need for compactness.

In conclusion, I want to point out that the character of South African cities is largely determined by our Profession. In my opinion, quite a number of post-war buildings designed by architects are poor, from the design point of view, and this represents lost ground. I feel we must adopt the principle that only the best is good enough to form the background of our daily lives. The search for the best must be pursued constantly. I think we have been complacent in recent years, consequently Architecture is in the doldrums. Every effort must be made to set the ship sailing briskly again before a clean fresh wind.

Before I close, I want to acknowledge the assistance I have received from discussions I have enjoyed with my colleagues. These have helped me to clarify my own ideas. I have included many useful points that emerged. Others have been added to which they may or may not subscribe. [Applause].

THE PRESIDENT-IN-CHIEF: Professor Fassler, I must thank you for a most interesting paper and one so clear that even I was able to follow you, [laughter.] Ladies and Gentlemen, I propose deferring discussion on Professor Fassler's paper until after tea. I am sure that what he has had to say will stimulate discussion on the subject he dealt with.

[Tea adjournment.]

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen, before I call for discussion, I wish to make an announcement about to-morrow afternoon's discussion "in Committee." "in Committee" merely means the exclusion of the Press and the general public; the Congress will be open to all Members of the Institute, the Chapter, and the Master Builders' Association.

Now, Ladies and Gentlemen, I think you will agree that the three papers you have heard before tea are very closely linked. I now invite discussion on these three papers, either collectively or singly.

MR. N. L. HANSON: Mr. President-in-Chief, I should like, in the first place, to congratulate the speakers this afternoon on the excellence of their papers. ["Hear, hear."] That excellence I think is shared by all three contributions. May I here say that regrettably some of the "targets" have disappeared from the main table, but I suppose they may still be found in the audience. These "targets" I think are open to attack by others, if not by myself — although may I say I do not intend to attack.

What struck me as between the two sets of papers this afternoon — that of Professor Fassler, on the one hand, and those of Mr. Todd and Mr. Low, on the other — is that the scope for comment and criticism, although almost infinite in the one case, is more restricted in the other two.

As far as Building Costs are concerned, it seemed to me that no positive arguments appear to emerge. Perhaps that was to be expected and it was not, in the view of the authors, necessary to deal with the arguments direct. I am not thinking so much of arguments in principle as of active steps which could be taken, shall we say, to reduce building costs. As a matter of fact, my conclusion is that nothing active can be done except by building owners who operate on a big scale. If anything is to be done, it should and can only be started from the highest levels, that is, from the Government, the Provinces and the Municipalities. As far as I can judge, these are the only bodies from whom active steps can emanate.

I cannot see much direct influence on the individual building owner. His reactions are based on economic conditions and pressures which come from without. In other words, I cannot for the moment see much in the way of help from within the body of private building owners; but it may be that the speakers this afternoon can suggest something rather more positive than I have been able to discern.

As far as Professor Fassler's paper is concerned, I do not want to deal with any particular aspect of it. But it does seem to me that one of the most notable remarks which he made was to the effect that Architects in one part of the Union are practically foreigners to another part — or at least shall we say their work is foreign. That I think is a very true statement. I feel it is undoubtedly true that Architects in one centre know more of the work of Architects overseas than they know of the work of Architects in other centres of the Union. That surely is something which requires investigation and action on the part of the Central Council. I would suggest that the Central Council looks into this aspect and devises ways and means of bringing about closer contact.

Mr. President-in-Chief, my main function in rising was to start the ball rolling. I do not intend to say anything further at this stage, but I should like to hear other contributions.

MR. F. HESTER: Mr. President-in-Chief, further to what Mr. Hanson has said, there is one aspect I would like to refer to in regard to Building Costs. Mr. Todd referred to the matter of Government subsidies. I have in mind raw material lying around in factories, or more especially in the wharves in Durban, and the shortage of railway trucks to handle that raw material.

I feel that a better system can be started there to improve our rail facilities in getting our materials up from the Coast quickly. A better system of distributing cement, for instance, will make a very big difference, because buildings are now being held up for the lack of cement. I therefore feel that it would be a big improvement if some of the subsidy on cement were used in providing more trucks, more tarpaulins, so that the material could be moved more quickly.

MR. D. S. HADDON: Mr. President-in-Chief, I feel I would like to introduce a little bit of aggravation into the discussion. I feel Mr. Todd and Mr. Low did not aggravate the audience at all, whereas Professor Fassler did. If you will permit this little bit of aggravation, it seems to me you will arrive at something rather astonishing, because the professions of Architecture and Quantity Surveying were mentioned, but not at all seriously, by Messrs. Todd and Low.

However, not fifty per cent. of the building work in South Africa passes through the hands of Architects and Quantity Surveyors; probably not forty per cent. taking it on an average. The conclusion I reach from that is that the costs of building are determined by the work — the majority of the work — which is not being done through the Professions. As a consequence the attitude of the Professions, which Professor Fassler touched upon, in regard to Design — that is, an attitude of stalemate at the moment — is also evident in the handling of buildings; and one can only ask the question — Have the Professions done enough in trying to reduce the costs of building either in Design, or by new methods, or by more careful specifications, or by more careful supervision, or by more insistence in their work on more efficient organisation from the Builder's end?

Certain Committees that I serve on, and that other Members of the Profession serve on, reveal an astonishing state of affairs with regard to the costs of buildings. It is sometimes suggested that a big building, probably costing a quarter of a million pounds — done without the assistance of either Profession — can be done at a cost lower than if done by the Professions. I will not go tediously into the question of the square-foot rate as a method of calculating building costs, but I would like to stress efficiency in Design as an important factor.

Where a building owner desires to reduce costs, it may not be done in an efficient way. The resulting building may be not ornamental, but will it be good Architecture? It may not even be a safe building, in terms of the Bye-Laws.

Here, then, are opportunities open to the Professions, but I feel that we have not, on our side, made a sufficiently serious attempt about reducing the high cost of building.

My friend Mr. Quail blamed the Bye-Laws. Well, I admit that, generally speaking, the Bye-Laws are inflexible. I feel, however, that a reasonable approach in a difficult problem will always produce results. Professor Fassler was kind enough to mention something I have recently done with a pre-stressed beam which is not covered for by the structural bye-law in Johannesburg; but with the consent of the City Engineer and the Works Committee of the Council, we were permitted to do it.

MR. J. T. B. VILJOEN: Mr. President-in-Chief, one aspect of Building Costs has struck me lately. We all appreciate that the backbone of our industry rests on competition, yet we find we have no competition as far as labour is concerned.

When you invest money in gold shares you expect a return of about three per cent; if you are not quite sure of your investment, you expect a higher rate of interest. I feel you cannot blame the contractor if he expects a ten per cent. return on his investment. On the other hand, it may be possible to reduce the interest of the contractor, and also encourage some form of better output among artisans, if you were to pass the competition in regard to labour to the actual artisans.

What I mean is that the artisans, instead of doing work at a fixed rate per hour, should form themselves into groups and, say under a Chairman, tender to the contractor to execute a certain part of the job at a certain figure. In that way they would be bound to the contractor to do that work for that figure, to the satisfaction of the Architect. If the Architect is not satisfied with that work, the artisans must then re-do that work, at their own expense, and not at the expense of the contractor. In that way, again, the lesser risk to the contractor may mean that he would be prepared to reduce the interest on his capital. I do not mean that the interest realised by the contractor affects building costs so much; I have been told by several contractors that their actual profits are not very high. But the main thing that will accrue from this is a greater output on the part of the artisans.

MR. E. F. ALLEN: Mr. President-in-Chief, several challenges have been thrown out to the Builders this afternoon. I feel I must respond. I would like to start off by associating myself with the remarks made by Mr. Hanson regarding the excellence of the papers read. ["Hear, hear."] I think possibly the delay in starting the discussion on Building Costs was due to the excellence of the papers.

To my mind they covered the matter of Building Costs very thoroughly; and whilst some points could possibly be elaborated, I think every major point was touched upon. Mr. Louw made reference to the inefficiency of the Building Industry — I think those were his words; and I submit, Mr. President-in-Chief, that the Building Industry comprises not only the Builders and not only the Artisans, but the Architects and the Quantity Surveyors as well. [Laughter.] I think that is in reply to Mr. Haddon. I certainly did not take this point up with Mr. Louw because, to my mind, that was quite clear, that if the Building Industry is inefficient, that inefficiency must lie at the door of the Professions as well as the Builders.

Now let me be quite frank. I am the last one to say that the Builder is efficient. We have in our ranks many Builders who are very inefficient. We have others who try very hard to be efficient. But, Gentlemen, the efficiency starts with the man on the job, the man who lays the bricks. He is the one to be efficient. And the last speaker is quite correct, when he says that labour is one of the roots of the matter of Building Costs.

The question of labour has exercised the Federation of Building Trade Employers for some time, and we did explore the possibilities of incentive pay. Mr. Louw mentioned that, to his mind, that was no solution. We ourselves still have an open mind on the matter, and we are awaiting the final outcome of the experiment in Britain.

However, there is another approach, and that is piece-work. In terms of our Agreement, our Industrial Agreement, piece-work is prohibited, but I submit that if a man is able to earn more than the minimum rate of pay through his own efforts, there should be no bar laid down to his doing so. He should be encouraged to do so. The only proviso I would make is that a minimum rate of pay must be maintained. With that in view, there is no reason why piece-work rates should not be laid down, and the effort of the individual encouraged.

If we do not introduce some system of this sort, the only alternative means of obtaining increased output is unemployment. Mr. Louw tended to discourage the principle of unemployment. I say that it is really the only efficient way of getting labour to work, and unless we have a measure of unemployment or another means of inducing labour to give us of their best, we will continue to have high building costs.

Another means of stepping up production, but not quite a satisfactory means, is inducing an interest on the part of the individual in his output. And here, Ladies and Gentlemen, the Professions come into the matter. There are many Builders in this town, in this country, who try to be efficient, who study overseas methods, who use the latest machinery, the best equipment. How far they are able to be efficient depends on the point that Mr. Todd raised: the question of pre-planning. It is the experience of many Builders that they are discouraged from pre-planning because of the Variation Clause. Now the Variation Clause is a very necessary one in the contract; very necessary indeed, but it may be a big handicap to efficiency. The Variation Clause does provide a loophole to the Architect and to the owner to start the job before the planning is completed. He has the opportunity of introducing variations and of coming to decisions later on, all of which tends to deter the contractor from his planning.

Contractors do make out progress schedules; they do try to order their materials to time-schedules; but when variations are introduced which upset these schedules, it produces disorganisation and discouragement and leads to the inefficiency which is apparent in the Industry to-day.

The Variation Clause is also responsible to some degree for the factor Mr. Louw mentioned — the final accounts. Mr. Louw mentioned this matter with a half apology, Mr. President-in-Chief. I submit he should not have done so. The matter of final accounts is a very serious one in the Building Industry and it does have a very serious repercussion on Building Costs. From the point of view of the Professions alone, Mr. Louw said that the Quantity Surveyors wished to deny an allegation that they were keen on running up big final accounts. I am quite aware that they do not wish to run them up, but if they do not wish to run them up, why do we have these big final accounts? Why do we have the long delay in the settlement of jobs?

The reason is that the planning is not done at the early stages. The owner is allowed to make these variations. The Architect is allowed to defer decisions. The Quantity Surveyor is therefore forced to devote his time and his energies to preparing the final account. The Builder, the Sub-Contractors, and in some cases the merchants, are kept waiting for their final settlement. There is the question of disruption of the interest on the money outstanding. All of these things do have a serious repercussion on Building Costs.

Mr. Haddon said that the Architects had not accepted any responsibility — that is the point I inferred from him. I submit that is not so. From Mr. Todd's remarks about the necessity for pre-planning, I say that the Architects have accepted responsibility. The Architects do say that unless there is this pre-planning at an early stage, unless the job is completed, as far as it possibly can be, before it reaches the Builder, there is bound to be a certain amount of disruption; there is bound to be a certain amount of increased costs. And, which is more important to the Builder, the efficient organisation which he is trying to build up, is broken down and is discouraged.

I submit, therefore, that the inefficiency in the Building Industry, which is there, is a fault of all parties to the Building Industry: the Artisans, the Builders, the Quantity Surveyors, the Architects, and, not the least — not the least — the Building Owners.

Here is a point where I think the Architects could do something to help. The building owner very frequently is a man with no experience in the Building Industry. He regards his Architect, quite rightly, as his professional adviser; and it is here that the Architect should impress on him that a month saved in putting the first spade into the ground is probably two months lost in the final completion of the job. It is a very, very serious point, Mr. President-in-Chief, and I submit that the Architects should propagate this idea among their members, that the building owner must be impressed with the imperative urgency of having the planning done comprehensively before the job starts.

I think, Mr. President-in-Chief, I have now put to you some aspects of the attitude of the Builders towards this very important problem. I would like to say as well that the Federation of Building Trade Employers is vitally concerned with the high cost of building, has made several attempts to get the Government to institute a Commission of Inquiry into the high costs of building, and hopes to continue to press along these lines. [Applause].

MR. J. R. ASBURY, Mr. President, I would not like Mr. Haddon to think the silence on the part of the Builders is a guilty conscience. We just wanted to hear what the Professions were going to say about this matter before we really brought it up. Building Costs are high, and if anything is to be pointed at the Industry it can only be pointed either at the professional side or the Building Contractor's side.

One of our own Profession, Mr. Haddon, has made the point that, to his knowledge, large buildings built without the Profession have proved in the long run to be cheaper than buildings that have been built under the Profession. Mr. President, there must be some reason for that. The prospective building owner comes along to see his Architect with a view to putting up a building in the centre of the city; he has seen other buildings; he has seen endless concrete fins and all the various multicoloured plasters; he has seen the Neon signs, the fluorescent lighting, the central heating. He has watched other buildings, and he comes to his Architect. I wonder how many Architects tell him that to incorporate air-conditioning and all the other things he has seen, and would actually like, would probably put about twenty per cent. on to a large city building as compared with a building that would have been built in pre-war days?

There I think, Mr. President, is one of the main things which contribute to the present high cost of buildings, especially city buildings.

Then there is the price of timber and labour composition. When you come to the Building Contractor there is only one aspect you can point at him. If he was efficient, if competition was free, he would be forced in the long run to bring down building costs, because competition would force him to do so and he would therefore be forced to organise. But can we organise without an adequate supply of labour? Can we organise when the work may be rushed by the owner, when the drawings and the documentation, that we have heard so much about this afternoon, are also rushed?

A Building Contractor finds that he is the lowest tenderer, and the same afternoon he is given a set of drawings and a bill of quantities, and he is asked to start "to-morrow morning"; and when he goes on the site he usually finds the Reinforced Engineer hasn't even put the paper on his board yet to make the final design.

Mr. President, can you organise an Industry like that? How long does the Builder get from the time he is accepted before he has come on the site; how much time does he get to pre-plan? Is he ever called together with all the nominated sub-contractors? Is he ever asked in conjunction with the Architect and the owner to form a time-schedule, a progress schedule?

And then in regard to the supply of material, the Builder is in a cleft stick. Unless he has a pool of labour to draw on, unless there is a sufficiency of material, where he can go to the merchant and bid competitively, he is absolutely helpless. I support Mr. Allen: I feel

that we will be the first to say we are all inefficient because of the circumstances we find ourselves in; but if that could be eliminated from the Building Contractor's life, I am sure that normal competitive circumstances would reduce the cost of buildings tremendously.

MR. H. N. JOUBERT: Mr. President-in-Chief, there are a few points I would like to raise. I do not wish to make any statements and draw conclusions from them, or to state a particular point of view. Mine is rather a quest for knowledge. Nevertheless I have some figures here, which may or may not be correct; however, they are at least a basis for discussion.

I have been told in this country in the Building Industry generally there are two-and-three-quarter unskilled labourers to every skilled labourer on a normal domestic site; that is to say, houses or flats or maisonettes or similar work. In France, Italy, Switzerland, on roughly the same work, there are one-and-a-quarter unskilled labourers to every two skilled labourers on the site. You have to trust my mathematics here, but the proportion then is twenty-two unskilled labourers on a South African site to five unskilled labourers on a site in Europe; a ratio of four-and-two-fifths to one. That is to say, taking the average non-European wage here of £2 10s. a week the basis of comparison would be £11 per week for an unskilled labourer here as against the wage of one unskilled labourer overseas who earns about £4. So that our unskilled labour here is costing us approximately three times that of unskilled labour in any European country.

On the other hand, the unskilled labourer overseas is a semi-skilled labourer, and he is both permitted by law and is capable of doing more tasks than our unskilled labourer here.

It would be interesting to find out really what our so-called cheap labour is costing the Building Industry in this country. There is a Bill before the House at the moment for the training of non-European building artisans. Does anyone know if there is any provision in this Bill for training semi-skilled non-European artisans to work say in the contractors' yards? That is to say, would there be a pool of semi-trained or trained sufficiently for the purpose for which they should be employed — a pool of non-European labour which contractors can draw on, instead of waiting for someone to show up out of the streets?

That is one point I make with regard to Building Costs. The next is the profits of merchants and manufacturers in this country. My personal observation — I may very well be wrong — is that the manufacturer of building merchandise in this country appears to base his prices on the cost of the imported article. He makes the cost of his product just sufficiently cheaper to make it perhaps worth while to purchase it. He doesn't seem to scale his prices on his cost of production plus a fair and reasonable profit. If the cost of an imported article goes up through circumstances such as devaluation, or increased cost of insurance or shipping, his price goes up because he says the cost of raw materials goes up. It seems to me, therefore, that the profits of manufacturers of lines which tend to compete with imported lines, could bear investigation.

Another point which I would like to mention is the peculiar situation in which certain sub-contractors find themselves in the Building Industry. I have had occasion to come across the workings of a firm which is, in the normal course of its business, a sub-contractor to a main contractor. It consists of two partners and four men. The two partners enjoy an income which would be the envy I think of all Architects, and even of some Building Contractors. [Laughter.] It seems extraordinary that once the four men have drawn their own salaries, they can extract from the Building Industry such an enormous income for the two principals.

I would like to tell here a little anecdote that all my friends have heard — I am afraid it will bore them; but there are a lot of people here to whom it may be new. This is authentic: it occurred to me about a year ago. I had occasion to call up an electrician to investigate the failure of a borehole pump on my property. I suspected that in digging I had put a fork through the cable leading from the house to the pump. I explained what my fears were to the electrician, and he came with a resistance meter. He put the meter across the cable. He said the cable was alright. I remarked that perhaps the fuse had blown. He took some ten-amp. wire, put it in, and the pump ran perfectly. He sent me a bill, which I will come to in a moment.

That was on Thursday. On the Saturday one of my children fell ill. I rang up the doctor and asked him to come round. He came round at seven o'clock and stayed with my child for about half an hour. He duly sent in his bill, and they both arrived in the same post. The electrician's bill was £1 8s. 6d., and the doctor's bill was 15s. The electrician was there for twelve minutes and the doctor was

there for thirty. I don't know how long the electrician had to spend qualifying as an electrician; but this particular doctor I know spent some ten years of his life in very extensive study, in this country and overseas. I think there is a pointer to one reason for the inflation of building costs.

There is another question which has been dealt with by certain members of the Master Builders' Association, that is, the disorganisation which results on the site once the clients begin to see what form the building is going to take. Most clients do not admit that they cannot read a drawing at all. They would rather see the house on the ground before they start making any comments, and then you have the usual alterations.

Most of the Members here may have read the report of the British productivity team that I think studied building costs in the Building Industry in general in America. One point there which appealed to me personally, and I am sure it would appeal to most practitioners here, was the ruthless way in which the Architect would appear to discipline his clients. I wonder if something on those lines could possibly be done in this country — possibly by forging a big stick with which to beat the client — by making it obligatory on the members of the Professions to charge a very, very much inflated fee on any alterations, measured on value, whether they are omissions or additions. I would suggest something in the neighbourhood of thirty per cent. [Laughter.]

I think the Professions should spend very, very much more time — both Professions, and perhaps the M.B.A. as well — in discussing with the client exactly what he wants; recording everything and being quite sure; and then in a very, very sombre tone of voice warning the client against the slightest departure from the initial design during the progress of the house, or whatever building it is — more often than not, a house; I feel that may discourage this whimsical and absolutely — what can I say; we all know it [laughter] — tendency of clients to go on the site and, with complete *sang froid*, order the demolition and removal. . . [laughter].

As I said, Mr. President-in-Chief, those are the points I wish to make, but I do not wish to draw any conclusions from them. [Applause.]

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen, I do not wish to stifle discussion on these subjects, but time is limited. As you know, we have the Banquet this evening. But I must give the gentleman who read the papers an opportunity to reply to the various points that have been raised. I do so now in the order in which they read the papers. If Mr. Todd would like to say anything now, I will ask him to do so.

MR. C. ERIK TODD: Mr. President-in-Chief, Ladies and Gentlemen, I will attempt to cover some of the points that have been referred to by the speakers from the floor; but I may not be able to do so in their correct order.

Firstly, I would agree entirely with Mr. Hester in regard to our transport system. That is probably one of the most important factors which faces this country today, and, I might add, it extends far beyond the borders of South Africa. It affects the whole of Southern Africa: that is, our railway system and its efficiency in moving the commodities we require. That is probably an omission from my paper.

With regard to Mr. Haddon's reference to the Professions and Building Costs, I do feel that the Professions are, even if only to a limited extent, trying to do something. At any rate, the germ has been sown. I realise that a lot more can be done, and I intended my paper to indicate certain directions in which we should move.

Then, with regard to Mr. Allen, I definitely agree with all he says. He has elaborated on certain points I tried to make in my paper.

Next is Mr. Joubert's observation in regard to unskilled labour. I think we all appreciate that the use of the semi-skilled artisan in the Building Industry overseas is a very important factor in regard to building costs. Our strict division between skilled and unskilled work in this country is one of the handicaps we face when considering Building Costs.

Again, I am in full sympathy with Mr. Joubert's reference to a thirty per cent. fee for alterations. I support that very warmly, but I must point out certain difficulties. The Professions of Architecture and Quantity Surveying are not protected in this country; their work is in no way protected at all. I am afraid a thirty per cent. fee might have the effect of liquidating the two Professions altogether.

Mr. President-in-Chief, rather hurriedly, those are just a few remarks in reply to the points raised by the different speakers from the floor. I feel sure my colleagues will be able to fill in the many gaps that, I am afraid, I have left.

THE PRESIDENT-IN-CHIEF: Thank you, Mr. Todd. Mr. Louw, would you like to reply to any of the points raised?

MR. T. H. LOUW: Mr. President-in-Chief, I feel there is very little to add. I think we have never been so agreed as we are this afternoon. As we say in Afrikaans, "Oms is roerend eens."

In regard to Mr. Maddon's remarks about the Professions, I can only say I spent a great deal of time and study on that part of my paper; but of course, as a Quantity Surveyor to an Architect, I had to be very tactful. (Laughter). I noticed there was no disagreement whatever about trying to correct some of the methods referred to — especially in preparing documents.

Finally, Mr. President-in-Chief, I feel we can take a lesson from our discussions here this afternoon; we can all set-to and really do something about building costs, starting by putting our own house in order.

THE PRESIDENT-IN-CHIEF: Thank you, Mr. Louw. Professor Fassler, in spite of the fact that you have been let down so lightly, would you like to add anything?

PROFESSOR J. FASSLER: Mr. President-in-Chief, Ladies and Gentlemen, all I would like to say is this: clearly one of the component parts of this ideal which I feel to be so necessary for the future development of Architecture must obviously be the attempt to obtain more far less. In other words, as costs rise, and as Architects are reduced more to basic essentials, so the tax on their imagination becomes greater and greater. I think our role in the future, despite the difficulties that surround us, and despite conditions in the industry, is that we must really succeed in producing good Architecture.

I would just like to add one thing; that is, it seems to me that, in whatever work we do, we must question everything. I have in mind Domestic Architecture in particular, where we have been accustomed to certain standards; we must not hesitate to abandon certain standards, let us say, of planning convenience in order to gain a greater measure of space and usefulness.

Let me point out, for example, that the contemporary American house, that is, the house of the average American — in a country which enjoys the highest standard of living in the world — is a house without circulations. In other words, if you look at a cross-section through American Domestic Architecture at the present time, you will see there are no circulations in their houses at all. No expensive passages, in other words. That is the sort of direction I think we must explore in order to make the most of what is possible in these very difficult times.

THE PRESIDENT-IN-CHIEF: Ladies and Gentlemen, once more, on your behalf and my own, I thank Mr. Todd, Mr. Louw and Professor Fassler, for the very interesting papers they read this afternoon. I would also like to thank you for the interest you have shown, and the discussion that has taken place; and once more I apologise for having to cut the discussion short.

Finally, I look forward to seeing as many of you as possible at the Banquet tonight; and I now declare this session of the Congress closed.

(Adjournment — 5.20 p.m.)
(End of First Day of Congress.)

BOOK REVIEW

SWEDEN BUILDS by G. E. Kidder Smith, A.I.A.

Published by *The Architectural Press*, London, *Albert Banner*, New York and Stockholm, in co-operation with the *Swedish Institute*, Stockholm, 1951. 280 pages, 683 photographs and drawings and 7 colour plates, 45/-.

For the third time in a comparatively short period, Mr. Kidder Smith presents a feast of architectural photography, and as in the case of *Switzerland Builds* he is also responsible for background review. Those who enjoyed the impact of his first exposition of South American building in *Brazil Builds* were not disappointed by his masterly handling of the companion volume *Switzerland Builds*. A feature of both these publications is the clarity with which the story is told both in word and photograph, enabling those who have not visited these different lands to understand the social, economic and historical factors which have produced the present-day buildings, and what is equally important, to see through the discerning eye of an architect, the merits of the contemporary scene.

Those who would understand the full significance of modern architecture will find the three publications now available an essential library. Like its predecessors *Sweden Builds* surveys in a generously illustrated form the architecture of Sweden — a land in which this great movement has found general application and many of its ablest practitioners. Like *Switzerland*, Sweden has adapted the contemporary idiom in a natural and unselfconscious manner, and in a way that reflects the innate good taste of its people.

Svan Markelius, City Planner of Stockholm and authority on Swedish land policy and planning contributes an introductory chapter on land usage. The main part of the book begins with the traditional building types.

Then follows the review of contemporary Swedish architecture. Every aspect of the work is examined, from housing to hangars, from site planning for new suburbs to bus shelters. Churches, hospitals, concert halls, public buildings, sports centres, museums and factories are all included, together with Asplund's Crematorium and the Stockholm park system.

The book closes on the elegant note of a number of audacious and exciting bridges — almost unbelievably delicate of structure, and which give one the same stimulus as those masterpieces of Robert Maillart.

W. D. H.

HOW TO ESTIMATE, by John T. Reo. (Batsford, 25/-).

This book has been well-known for many years to builders and quantity surveyors. The 1951 edition, now available, is even more comprehensive than its predecessors. Containing 716 pages and over 600 illustrations, almost every trade and speciality met with in modern building practice is exhaustively dealt with. Each trade is given a chapter to

itself and is divided into sub-divisions of (a) data or memoranda, (b) prices of the items as they appear in the Bill of Quantities, (c) prices of materials and wages and (d) the complete analysis of each Bill of Quantity item.

Although based on conditions in Great Britain, the information can readily be adapted to local procedure. For use in Great Britain the author has overcome the problem of fluctuating costs by allowing the prices in the text to remain at 1937 rates and providing a set of cost-adaptation tables to bring the prices up to the 1950 level. Builders' estimators to-day must be resigned to recalculating prices for each new contract owing to the rapid fluctuations in labour and material costs and it is only to be expected that prices given in any textbook, however recent, become obsolete in a very short time. The estimator or quantity surveyor is therefore obliged to obtain, by enquiry, the current prices required for each new project.

There is no South African counterpart to this comprehensive treatise and if the reader takes care to replace the prices in the volume with current local prices the information given in the book will provide a sound framework on which to build up rates.

J.W.S.C.

DRAINAGE AND SANITATION by E. H. Blake and W. R. Jenkins. 10th Edition, revised by Leonard B. Gumbrell, 558 pages, 732 illustrations, 15/-, B. T. Batsford, Ltd., London.

First published in 1913 this well-known book will require little introduction to those Architects, Surveyors, Health Officers and others whose professional activities impinge on this subject. As the subtitle indicates, it is a practical exposition of the conditions vital to healthy buildings, their surroundings and construction, their ventilation, heating, lighting, water and waste services. As such it is a standard work covering this wide field in a compact and concise manner, in which general principles are stated and supported by explanatory diagrams. Materials, methods and the various types of apparatus are suitably dealt with and this new edition brings the contents into line with current developments.

W.D.H.

WALLS AND WALL FACINGS, by Denzil Nield, A.R.I.B.A., 268 pages, 18 illustrative figures, 18/-, E. and F.N. Spon, Ltd., London.

This is a further publication in the Architectural Series, edited by M. M. Chitty, and published by this firm which deals in a comprehensive and detailed manner with the theoretical and practical factors relating to specific aspects of architecture. The present volume concentrating on Walls and facing materials is supported by recent research information on the subject, and in its detailed investigations it greatly supplements the information normally included in the average text book. This specialised study is of great value in bringing before architects the most up-to-date study of the many problems relating to walls and their construction and finishings. The manner of handling this subject is to be commended; the first portion of the volume is devoted to the exposition of the theories

regarding strength, durability, heat and sound transmission, etc.) and the second to the practical means whereby, using the different materials and structural methods available to-day, the optimum requirements of the particular problem may be satisfied. This is the most comprehensive study of the many problems and characteristics of wall construction and finish that has come to my notice since the publication in 1939 of "Principles of Modern Building Vol. 1," by R. Fitzmaurice (H.M. Co.) and is to be strongly commended to practitioners and students alike.

W.D.H.

SOUTH AFRICAN CEMENT AND CONCRETE HANDBOOK

This extremely useful Handbook has been produced by the Concrete Association of South Africa to bring to all those concerned with cement and concrete, in a convenient form, the principles of design and construction. It has been written for engineers, architects, quantity surveyors, contractors and their foremen to aid them in a better understanding of the functions and applications of cement in construction work.

This Handbook is based largely on research and experimental work in the Union, and attempts to cover all the important factors connected with the making of good concrete and their inter relation, and to mention briefly most of the recent developments.

It is intended to be neither highly technical nor elementary, but to hold a midway course, extending the knowledge of some readers and indicating where greater refinements can be made by those who have

the technical knowledge. Above all, it is intended to be a brief summary of the available knowledge on the use of cement in this country, presented in a form for quick reference.

Chapters are included, concerning general construction, special concretes, waterproofing and hardening, floor finishes, special aggrs, coloured concretes, mortars, renderings, bricks and blocks as well as self-cement construction.

It is the intention of the Association to distribute this Handbook, free of charge, to any enquirer whose work requires a knowledge of the finer points and techniques involved in the use of cement and concrete.

W.D.H.

Also received are two small publications. The first is *A Guide to Designing Windows* by Neville Woodbury, A.R.I.B.A., published by Neville Woodbury Ltd. of London. In it the author demonstrates his method of reducing window design to its basic essentials, and as such factors figure in the early training of students of architecture, this book should prove useful to students and laymen who are approaching design for the first time. The second is *Roof Carpentry* by George Collins, second edition revised by T. H. Rawlinson, published by The Technical Press, Ltd., London, 1948. First published in 1893 this book deals with the practical matters of roofing and trusses. Intended as a practical guide the book avoids design theory and much useful information is contained in cross joining and arrangement.

W.D.H.

NOTES AND NEWS

CHAPTER OF S.A. QUANTITY SURVEYORS

REGISTRATIONS

The following members have been enrolled as Salaried Members with effect from 9th May, 1951: Messrs. W. W. Culbert (Pretoria), C. R. Senior (Johannesburg), J. R. G. Ury (Pretoria) and A. G. Wallace (Cape Town). The following members have been enrolled as Salaried Members with effect from 19th June, 1951: Messrs. F. P. Caietta (Cape Town), E. S. Griffen (Pretoria) and R. E. Wheelan (Cape Town).

TRANSVAAL PROVINCIAL INSTITUTE

REGISTRATIONS

Mr. A. A. Pitt has been registered as a Practising Member. Messrs. J. Bannerman (Pretoria), C. H. Basson, J. Bronkhorst, R. J. Nicholas and J. R. Snodgrass (all in Johannesburg) and B. E. E. Wiehahn (presently of 16, Manchester Sq. London, W.1) have been registered as Salaried Members.

TRANSFERS

Mr. G. H. Crickmay has transferred to the Natal Provincial Institute. Mr. A. E. Jones has transferred to the Cape Provincial Institute.

Mr. K. Knulzen has transferred from Practising to Absentee Practising membership. Mr. W. J. P. Moortens has transferred from Salaried to Practising membership.

PARTNERSHIP

Mr. W. J. P. Moortens has joined the firm of H. W. E. Stauch and Partners, and is practising at 3, Lex Buildings, c/r Schoeman and Vorster Sts., Pietersburg.

ROYAL INSTITUTE OF BRITISH ARCHITECTS

Following the success of the informal reception for architects and students from the British Commonwealth and the U.S.A. held in October, 1950, the Council has decided to hold a further reception on the 9th October, 1951. The Secretary (R.I.B.A.), therefore, requires the names and addresses of any members or students who are expected to be in England during October, and whether they are married or not. Any members or students who are able to, are asked to furnish such information, either direct to the Secretary, R.I.B.A., 66, Portland Place, London, W.1, or to the Secretaries of their respective Institutes.

INTERNATIONAL UNION OF ARCHITECTS

As previously mentioned, the Second Congress will take place at Rabat, Morocco, between 23rd and 30th September. Mr. Alexandre Courtais, President du Conseil Supérieur de l'Ordre des Architectes du Maroc, will preside. The theme of the Congress will be "How the Architect is lacking his new task." The Congress will be divided into two

parts: A, The Theory and Practice of Town Planning; B, Review of future prospect for reconstruction and redevelopment.

The five Sessional Papers are entitled, Urban Centres: Housing, Open Spaces, Building Techniques, and Outlook for the Future.

The Congress will be preceded by an Assembly at Casablanca from 20th to 23rd September. Seven tours in French West Africa have been arranged, ending between 4th and 11th October. Particulars are obtainable from the Organising Secretary, International Union of Architects Congress, 2 Rue Gaethe, Paris XVI.

BRITISH SCHOOL AT ROME

ROME SCHOLARSHIP IN ARCHITECTURE, 1952

The Rome Scholarships are intended to give a few students of distinction and exceptional promise the opportunity of devoting their whole time for a period of two years to the furtherance of their studies in Fine Arts. A scholarship in each of the following subjects will be offered in 1952: Architecture, Sculpture, Painting and Engraving, and unless modified by the Executive Committee, will be of the value of £400 per annum.

The competition in the Architectural Scholarship is open to British subjects of either sex who have passed the final examination of the R.I.B.A. or one of its recognised equivalents and who are less than 30 years of age on the 1st July, 1952. For this purpose a candidate may deduct from his age years spent in National service. The competition will be conducted by the Faculty of Architecture of the British School at Rome. Those wishing to enter should apply to Honorary General Secretary, British School at Rome, 1, Lower Gardens, Exhibition Road, London, S.W.7, for the conditions and necessary entrance form. This form must be returned to the Hon. General Secretary not later than the 12th October, 1951, accompanied by a personal letter setting out the candidates' interest in travel and study in Italy and any other consideration he would wish the faculty to be aware of when judging his claims to admission; birth certificate and a portfolio of work (Overseas students may submit photographs of their work). The first stage of the competition, limited to twelve competitors, will be held in February 1952, in London. The second stage, when selected candidates will be allowed not more than twelve weeks to complete the requirements, will follow the notification of the subject in April, 1952.

The Chairman of the Faculty has drawn attention to the mistaken impression that the British School at Rome demands in its competition some version of Classic or Italian Renaissance building, or perhaps a reflection of Beaux Arts training methods. The Faculty rules out no particular manner of architectural expression, old or new, and no competitor need fear defeat because of the manner in which he chooses to design.

SITUATION WANTED

"Architect, 30 years, married, stateless, 2½ years practice in Sweden including dwelling, commercial and industrial buildings, seeks position of architectural assistant as technical draughtsman. Good, quick draughtsman, artistic talents. Salary as per agreement. Jack Egon Kellmann, Stockholm-Viggen, Hagkintvägen 3, Sweden."

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