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Hon. Editors Professor G. E. Pearse
Rex Martienssen

Secretary A. S. Pearse

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THE 'BASILICA'
PAESTUM.

'n Skrywe oor 'n vyf-en-twintigjarige argitektoniese ontwikkeling in Europa, sou min betekenis hê, aangesien die vorm van 'n stad so langsaam verander dat honderde jare moet verloop voordat ons bewus word van die ontstaan van 'n nuwe boutrent. In Suid-Afrika het die vinnige groei van ny-werhede en die gebruikmaak van natuurlike hulpbronne 'n fenomenale boukundnige ontwikkeling as gevolg gehad.

Natuurlikerwys is die ontwikkeling in die groot streek wat die Unie beslaan. nie ewewigtig nie. En nog minder in sommige gevalle vry van die beperkings wat voortspruit uit die gebrek aan 'n versiende boubeleid. Die groei van ons dorpe was in sommige gevalle so snel, dat opeenhoping en verwarring elke bykomstige gerief vernietig.

Die ekonomiese aspek het 'n groot invloed op die mate van ontwikkeling van 'n stad. En indien ons een of twee voorbeelde ondersoek, sal ons bevind dat die grondslag van sy bestaan duidelik weerspieel word in sy argitektuur.

In Pretoria, wat bykans nie geraak word deur die skokke van spekulante en handel nie, word die kalme bestaan van sy inwoners weerkaats in die waardigheid van sy ruime wonings, sy pragtige lane met jakarandas en sy geskiedkundige Kerkplein.

Ook Kaapstad het 'n kleur van sy eie. Manjefieke natuuromgewings, met die beweging van skepe en die kom en gaan van vakansiegangers, gee hom 'n atmosfeer van sy eie.

Argitektonies het die snelste ontwikkeling te Johannesburg plaasgevind, veral tydens die afgelope paar jaar. In die tydperk het die hele aanskyn van die stad verander. In baie kleiner sentra het byvoeging tot geboue geleidelik gekom soos bv. nuwe stadsale, skole of banke. Maar die verbasende bevolkingsaanwas aan die Rand het akute behuisingsvraagstukke laat ontstaan. Van die oogpunt van hoeveelheid beskou, het die grootste ontwikkeling derhalwe betrekking op behuising (of eerder lewenswys) en waar jarelank een- of tweeverdiepinggeboue gestaan het, verrys nou groot veelvuldige verdiepinggeboue of woonapartemente om 'n nuwe gesigseinder te verskaf.

Die woonapartement wat voorheen die uitsondering in ons land was, word nou alhoemeer die normale woning van die massa. Ongelukkig, egter, word die middepunt van elke groot dorp, selfs met al die ruimte om ons heen, alhoemeer oorbewoon.

Hoe geboue langs nou straatjies neem die sonskyn weg en, sonder lane wat aan oud-Londen en Parys herinner, maak hulle verskyning. Dis 'n eienaardige teenstelling met die pragtige vryheid van lugtige wolkekrabbers.

Ons moet die stad laat asemhaal. Uitgestrekte ruimtes en grasperke moet die loodregte massa van enorme kantoor- en apartementgeboue puntueer, of anders sal ons slawe van die geraas en verwarring word.

Maar in vyf-en-twintig jaar het ons een ding geleer ! Die wurggreep van ongeskikte bouvorms van die negentiende eeu is afgewerp en vandag verrys ons geboue sonder tierlantyntjies, oorstroom deur lewegewende sonlig en word 'n Suid-Afrika uitgeroep wat die reg eis om in die huidige te lewe.

Toe sir Herbert Baker die Uniegebou ontwerp het, het hy 'n standaard, 'n simbool vir argitektuur van die toekoms gestel. Hy het getoon dat noodshulpmetodes nie blywend sou wees nie en dat die verantwoordelikheid van die boumeester groot was in 'n vinnig

ontwikkelende land. Ook in die woningboustyl was hy die eerste om waarde te heg aan die erflating van die ou Hollandse wonings van die Kaap.

Hy het ons getoon dat die onafgebroke wit muurvlak en ruime vertrekke tot stand gebring kan word en wenslik is in ons wonings. Vier jaar van oorlog het hierdie nuwe en gesonde rigting gestrem. Toe Suid-Afrika van die terugslag herstel was, het die ontwikkeling voortgegaan, dog met 'n altyd uitbreidende veld vir bedrywigheid. Die tegniese aspekte van die boustyl het meer aandag geniet. Nuwe geboue het ontstaan vir 'n verskeidenheid van doeleindes waaroor tot dusver nie gedroom is nie. Vandag het die bestek van die boumeester as skeppende organiseerder so verbasend uitgebrei dat dit 'n nuwe lig op sy verantwoordelikheid werp. Die optrek van geboue vir gespesialiseerde doeleindes maak nuwe vorms noodsaaklik wat uit die aard van die vraagstuk voortspruit en die hoogste mate van uitbeeldingsvermoe van die boumeester vereis. Vry van vooroordeel, neem die boukuns 'n liriese hoedanigheid aan ; dit dui die pols van ons bestaan aan en verhoog elke bedrywigheid.

Vyf-en-twintig jaar het groot vooruitgang aangedui, maar ons moet nie tevrede wees om in ou groewe voort te gaan en foute te herhaal nie. Ons behoort sowel die toekoms as die verlede te skat indien ons geboue 'n vrolike agtergrond moet verskaf wat voldoende en ten volle in harmonie sal wees met ons lewenswyse.

With Acknowledgments to "Die Volkstem."

Rex Martienssen

COMPETITION FOR THE PRIME MINISTER'S RESIDENCE AT PRETORIA

Extract from the Assessor's Report.

In his report on the designs submitted in this competition the Assessor Mr. J. S. Cleland, F.R.I.B.A. said :-

The scheme is one of importance and, although there is no outstanding design and the architectural treatment generally is disappointing, it is clear that many of the competitors have put a good deal of time and thought into their designs.

It should be emphasised that with all the schemes submitted many alterations and improvements in arrangement would be necessary, and that I look upon the schemes as sketch plan designs.

The First Design No. 21. Mr. G. Moerdyk.

I have placed this scheme first principally on account of this competitor having visualised the requirements and the architectural tradition considered desirable for a house of this description and for its simple economic lines and right shape to suit the site.

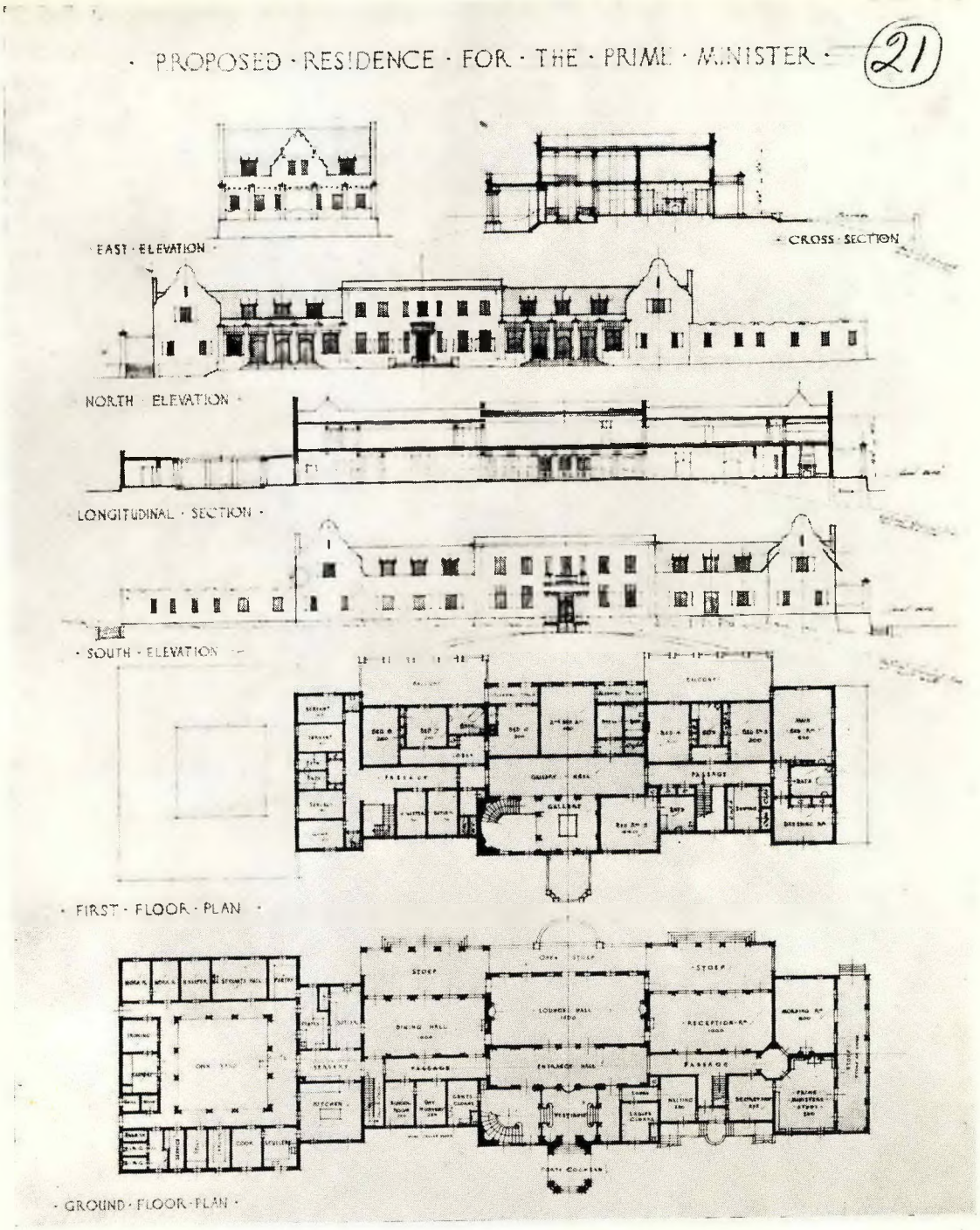
The entrance hall is spacious and suitable. Prime Minister's study, etc., and morning room are nicely arranged and good stoeps, verandahs are provided. The kitchen arrangements are good. The first floor is suitably arranged. The architectural treatment is simple and suitable. Lay out of grounds is fair. As previously mentioned there are many matters of detail in this scheme, as with all the schemes, that will require amendment.

The Second Design No. 43. Mr. J. Stekhoven.

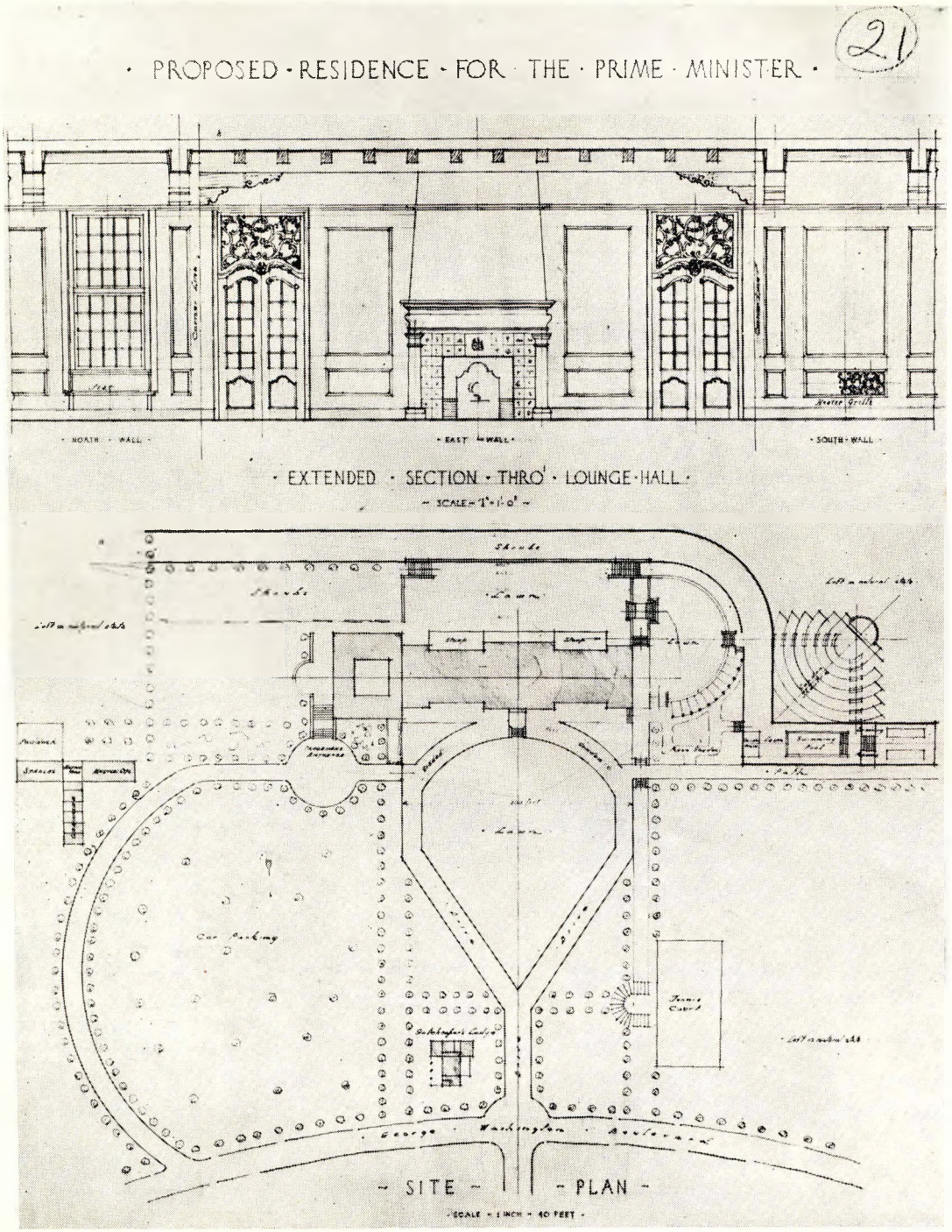
A very good plan on broad simple lines, cloaks good, entrance hall and gallery very suitable, nursery and school room not in best positions. Kitchen, etc., and bedroom arrangement good. Architectural treatment simple. Layout of grounds good. A scheme with faults but many possibilities.

The Third Design No. 22. Mr. G. Le Sueur.

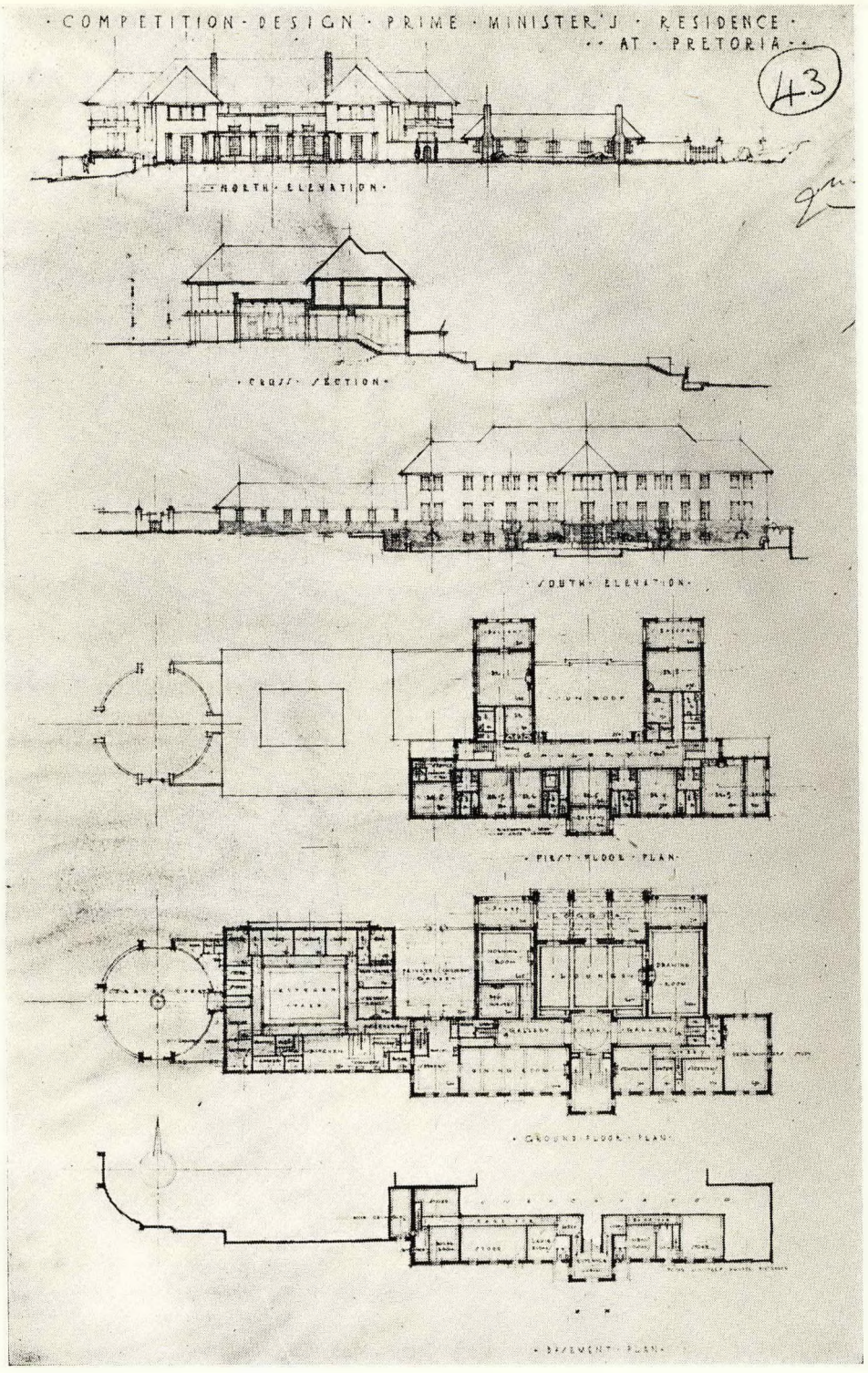
Scheme on good economical lines with good entrance hall arrangements. Study, etc., suitable. Loggia good. School room and nursery would have been better on North. Kitchen, etc., good. Architectural treatment good. Ordinary layout of grounds fair.



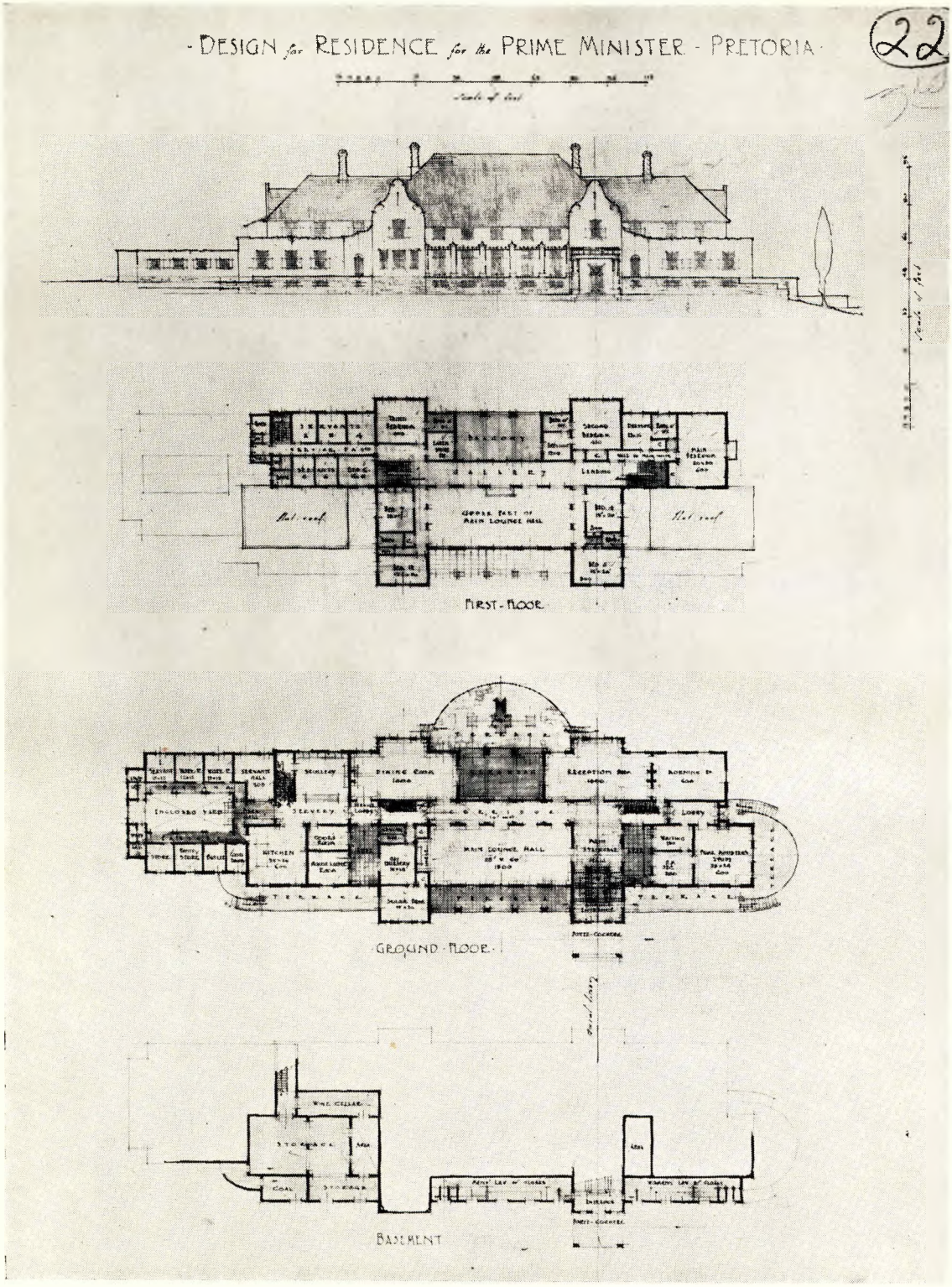
First Premiated Design • G. Moerdyk.



First Premiated Design. • G. Moerdyk



Second Premiated Design • J. Stekhoven.



Third Premiated Design • G. Le Sueur

I am asked to criticise the fifty schemes submitted for this competition. I find, however that there is nothing in them to criticise.

My mind full of the possibilities of an unrivalled kopje site and of the broad essentials that must be combined to form the contemporary dwelling that is to adorn it, I arrived at the exhibition to find, surrounding me, not fifty solutions to such a problem, but fifty fantasies, each conjuring up with varying, and, in most cases, questionable success a vision of what might have been the proud dwelling of a successful Cape Colonial butcher two hundred years ago. Huysing himself would have revelled in such display.

Thus my dilemma—my impotence to criticise unrealities and ability only to wonder at them.

Once again our narrow, apathetic, and yet dictatorial competitive system has produced sterile results, and the labour pains—and they are very real pains—of creative effort have been in vain. Architecture claims another fifty still-born babes.

To those unacquainted with contemporary architectural endeavour these observations may seem a trifle exaggerated, but to those of the profession who have been, one way and another, responsible for this abortive result, and who are, or should be, aware of the fundamentals guiding this endeavour, the folly of it all must be only too clear. Why then this persistence in such unanswerable obstructionism ? Can it be that they are tired of trying, tired of thinking, bewildered and perhaps a little afraid of the magnitude of the work still to be done before architecture can again take its natural and beneficent place in human society.

The competitors whose wasted labours have contributed to this further failure must forgive me if I appear to place overmuch responsibility with them. The great physical and mental energy and the distress of failure involved are well known to me. But while they continue to support the retrograde attitude of mind for which the promoters of this competition appear to stand, they must be prepared to accept a good measure of this responsibility.

It is noteworthy that among the designs there did not appear to be one single work by the younger and more contemporary-minded architects of this country, men whose energy and keenness is unquestioned and who would have thrown themselves with unrestrained zeal into this competition had not some obvious reason shown them the futility of doing so. This reason is to be found in the conditions of competition. Protestations in the text of this, stressing the absolute freedom given to competitors in their approach to and solution of the problem, ended with a contradictory and comic injunction to the effect that the designs must be "suitably based on the fine old traditional work of this country"—suitably mark you.

In a news comment of March last—republished in the March issue of this journal—Mr. George Findlay comments with insight on these conditions and anticipates the outcome of this injunction accurately. He says: "Here, there can be little doubt what is intended, and competing architects will accept these directions as inescapable demands" . . . "Had the department insisted on baroque gables and other features of Cape Dutch architecture with half ashamed adaptations to more modern purposes, the instructions could hardly have been clearer. It is an unhappy example of the meddling timidiy of our bureaucracy that dares not trust unfettered originality." In the light of this competition result the rest of Mr. Findlay's remarks would be worth looking up again.

Quite apart from the lifeless copyism which is the best we may expect from these misguided attempts to hark back to past styles for inspiration, the insensibility of mind which can associate "Cape Dutch" architecture of two hundred years ago—born as it is of the

valley stillnesses and soft green heat of its own particular geographical setting—with the wild, rugged, almost fierce infinitude of the Transvaal kopje, is inconceivable. One could almost wish that a settled prosperous community contemporary with that of the early Cape had flourished here and evolved their Transvaal house. Then at least the folly of this notion might have been revealed. The winning design has the advantage over the others of a simpler and more direct plan with perhaps the best of the fifty half-hearted attempts to make some use of the verily mighty Northern aspect the site presents.

The adjudicator said of this design that it had "visualised the requirements and the architectural tradition considered desirable for a house of this description" and he commended it for its "simple economic lines and right shape to site."

I deny that, in terms of enlightened contemporary work, it has "visualised the requirements" of this age of motorcars, aeroplanes, radios, refrigerators, artificial light and all the rest of our much prized mechanical and other amenities or of the ever growing desire for light, air, space and a general feeling of openness and freedom in planning. I deny that "architectural tradition" is, or can be, "desirable" for a "house of this description" or for any other kind of contemporary house, and it requires only a visit to the truly magnificent site which has been chosen for it to demolish absolutely the statement that it is the "right shape to suit the site." The farflung horizontal lines of the Magaliesburg and its parallel hills succeeding each other infinitely into the distance, mock the idea. But feel as we may this tragi-comedy must run its course. Powerless as an audience behind the footlights we must see it through. We cannot prevent these improper designs upon the unfortunate Cape Dutch maiden. She must perforce be wedded to the fierce, wild man of the North and suffer her distress forever in conspicuous silence. The most that we may hope for is that the elusive powers behind the scenes will at least spare us the further farce of inconsistency. That the house will be fully equipped throughout with all the familiar paraphernalia of the eighteenth century homes at the Cape ; that the Prime Minister and his suite will be obliged while in residence to garb themselves in the surtout, kneebreeches and feathered hat of the good old days ; drive with dignity in their gilded coaches and sleep with safety in their curtained beds, lulled to an even deeper coma by the soothing heat of warming pans. Then at least this atavistic plan will show some small excuse for its conception, and thus alone redeem its masquerade.

If competitive endeavour continues to be guided and cozened into sterile results of this sort, one can only hope that unsuccessful competitors will refuse to be drawn into the cul-de-sac a second time and will clamour for a form of competition and assessment which encourages genuine and original work.

Norman Eaton

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A considerable amount of discussion has taken place in connection with the award in this competition. A question that is being frequently asked is whether the winning design is similar in general conception to a model which was publicly exhibited prior to the holding of the competition. If this is the case then it is generally felt that the other competitors have been placed at a decided disadvantage.

We feel that no good can be gained by discussing in detail the merits or demerits of the winning design, but we are glad to know that the expression of opinion published in the Cape "Architect, Builder and Engineer" coincides to a large extent with the views held in the Transvaal. We quote from an article which appeared in our Cape contemporary with the hope that further discussion may take place. The writer after referring to the fact that he has obtained opinions from non-competitors who are architects of standing says :—

"We regret to say that those consulted were unanimous in their profound disagreement with the assessor's award, and to our way of thinking there are sound reasons behind this disagreement ; those reasons being, as we believe, immanent in the competition conditions themselves. These conditions were

not framed in the happiest manner, to say the least of it ; they appear to call for an amount of work, particularly in the lay-out, which would seem to be totally unnecessary even where a site is as difficult in grading as that chosen.

"The figure of cost laid down is obviously totally inadequate for such a project and such a site. The winner of the first prize receives an encomium from the assessor by reason of the shape of his house and of its somewhat obvious economies. Of the former, it need only be said that scant attention has been paid to the direction in the competition conditions that the building was to respect our traditional architecture.

"As for the economic side of this scheme, the less said about it the better, since the economies aimed at include the lighting of practically the whole of the upper or bedroom floor by dormer windows, the sills of which are at the roof eaves level, the roofs being of the lean-to variety.

"It is very vexing to us feel that a sense of duty compels us to make remarks of this nature, since the exercise is one foreign to our habit and the policy of this paper ; but we feel that it is essential to record the calm and deliberate views which we have gathered and hold upon the matter.

"It is true the assessor states that he regards competition designs as merely preliminary sketches, and from that point of view either of the authors of the selected designs are fully qualified to turn out a creditable Prime Minister's residence in Pretoria. We labour under a doubt, however, as to whether the single assessor idea has not again been found wanting. The jury method of assessment is undoubtedly better, and the method of the Greek vote by the competitors themselves is demonstrably the best of all."

JUBILEE HONOURS

The King's Silver Jubilee medal has been conferred upon the following distinguished South African architects and quantity surveyors : Lt.-Col. W. E. Puntis, President-in-Chief, Messrs. A. T. Babbs, G. S. Burt-Andrews, W. J. Cairns, J. S. Cleland, C. Deuchar, M. J. Harris, R. Howden, T. Moore, E. M. Powers, R. J. C. Prentice, V. S. Rees Poole, F. D. Strong, Wilfrid Tonkin, C. P. Walgate and E. H. Waugh.

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Lieutenant-Colonel W. E. Puntis was born at Portsmouth, England, and was educated at Portsmouth and London for the Imperial Civil Service, receiving appointment in London in 1896, after competitve examination.

He obtained his initial training in architecture as a pupil of Mr. E. A. Young, A.R.I.B.A., F.S.I., London, and subsequently studied privately and at the University of London for the profession of Quantity Surveying. He joined Messrs. Fowler and Hugman, A.A.R.I.B.A., F.F.S.I., of London and resigned in 1902 to take up an appointment in the architectural branch of the Public Works Department, Transvaal.

He was appointed assistant Quantity Surveyor in 1912, and is now Chief Quantity Surveyor, P.W.D., for the Union of South Africa.

Lt.-Col. Puntis was one of the original members of the Transvaal Society of Quantity Surveyors, and has been President of both the South African Institute of Quantity Surveyors and the Chapter of South African Quantity Surveyors.

He is a Fellow of the Chartered Surveyor's Institution of Great Britain, a registered architect of the Transvaal Provincial Institute of Architects, and one of those principally responsible for the passing of the Architects and Quantity Surveyors Private Act of 1927. He afterward became a member of the Inaugural Board which formulated the regulations under the Act.

He is a Licentiate of the Royal Institute of British Architects, and has been a member of the Central Council of the Institute of South African Architects since its inception. He was elected President-in-Chief in 1935.

Lt.-Col. Puntis has had a distinguished military career dating from 1895, when he joined the 1st Cadet Battalion (The Queen's)

Royal West Surrey Regiment. During the South African war be joined the forces and saw active service, being awarded the Queen's medal and four bars. On returning to South Africa in 1902, he continued his military service in the Transvaal volunteers and Union Defence Force. He holds the Colonial Auxiliary Forces Long Service medal and Colonial Auxiliary Forces Officers decoration.

During the Great War he held staff commands in Pretoria, Capetown, Durban and the East African campaign and was D.A.A.G., being mentioned three times in despatches for gallant and distinguished service in the field and decorated with the O.B.E. (Military). He is now a Lieutenant-Colonel on the reserve of officers and takes a keen and active interest in the British Empire Service League (S.A.), being for many years chairman of the Pretoria branch. He is a life Vice-President of the branch and also a member of the Dominion Executive, having been re-elected this year a trustee of the League.

He is one of the founders of the Pretoria branch of the Navy League of South Africa and was for several years its Chairman and a member of the Federal Executive. He is now President of the Northern Transvaal District Executive. He is also District Commissioner for Pretoria of the Boy Scouts.

Lt.-Col. Puntis is retiring from the public service in July this year to take up private practice in Johannesburg and Pretoria in partnership with Messrs. A. T. Babbs and Labdon, of Capetown.

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Mr. A. T. Babbs was born in London and received his professional training in the office of Messrs. Stoner & Sons, Quantity Surveyors, London, and whilst there was engaged mainly on works for Ernest George and Peto, Guy Dawber, Edwin Lutyens and others. Subsequently he was engaged as quantity surveyor on the Cadogan Estate, Chelsea, and in the office of Messrs. Pinks and Watson, of Westminster, who at that time were surveyors for E. Mountford, Brumwell Thomas, Leonard Stokes, Dunn and Watson and other leading architects of the period.

He came to South Africa at the instance of Mr., now Sir Herbert, Baker, in 1898, and in 1901 started in independent practice.

At that time and for some years afterwards he was the only solely practising quantity surveyor in Capetown, and thus pioneered the profession in that city. During this period Mr. Babbs has been engaged as quantity surveyor on many large undertakings, taking Mr. H. G. Labdon into partnership in 1911, and Mr. John Quail in 1918.

Previous to the partnership, he acted as quantity surveyor on many works erected by Mr. Rhodes including Groote Schuur and other houses, the explosive works at Somerset West, the Matoppo and Kimberley Memorials, the Rhodes Building, Capetown, and after his death, the Rhodes' Memorial, Capetown. His firm has been employed on works for the Universities of Capetown, Stellenbosch and Rhodes, Grahamstown, the Capetown City Council, the Cape School Board, the Public Works Departments of the Union and the Cape Province, and a number of large buildings erected in Capetown and other parts of the Union.

Mr. Babbs was elected a Fellow of the Surveyors' Institute in 1919 and a member of the South African Institute of Quantity Surveyors in 1908.

He contributed an important part in the work of passing the Registration Act of 1927 and has since been a member of the Board of the Chapter of Quantity Surveyors and of the Central Council of the Institute of Architects.

At present he is Chairman of the Capetown Council of the Building Industry under the Industrial Conciliation Act. He founded the Joint Committee of Architects and Builders which meets to discuss mutual problems in the industry as they arise. He is also the technical representative of the City of Capetown on the Provincial Valuation Appeal Court.

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Mr. G. S. Burt Andrews was born at Greenwich, England, and received his early training in the Town Surveyor's Office, Bournemouth Improvement Commissioners. He was engineering assistant to the Hornsey Local Board, London, for four years.

He came to South Africa in 1890 and was for some time associated with Mr. Arthur H. Reid in architectural work in Johannesburg.

Mr. Burt Andrews was appointed assistant Town Engineer, Johannesburg, in 1893, and Town Engineer in 1905. He retired from Municipal service in 1927. He is responsible for the design and erection of many important public buildings in Johannesburg. Mr. Burt Andrews was elected a member of the Society of Architects' in 1894, Fellow of the Royal Institute of British Architects 1925, President of the Association of Transvaal Architects 1925, President of the South African Branch, Society of Architects 1910, Associate member of the Institute of Civil Engineers 1894, and member in 1905, Fellow of the Royal Sanitary Institute, Member of the Main Reef Road and Durban Borough Boundaries Commission, Member of the National Road Board for the Union of South Africa.

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Mr. J. S. Cleland was born at Walsall, Staffordshire, and was educated at Queen Mary's Grammar School and at Bishop Vesey's School, near Birmingham. In 1897 he was articled to an architect at Walsall and subsequently worked at numerous places with other firms. At St. Albans he was engaged on the plans of the museum which was built to house the trophies of the late Captain Selous, the famous big game hunter.

Thirty-three years ago, Mr. Cleland came to South Africa to join an architect in Capetown, where he was stationed for seven years. The firm competed for the new Post Office at Pretoria, and he was engaged by the Government to see the work carried out, joining the Public Works Department. About ten years ago he was promoted to the position of Chief Architect and about three years ago to the Secretaryship of the whole department.

Mr. Cleland has had a great deal to do with the layout of the grounds of the Union Buildings, and, in addition to the Pretoria Hospital, he also planned the hospital at Bloemfontein, the new Museum at Pretoria, the University of Pretoria, the Law Courts at Johannesburg, the Delville Wood Memorial at Capetown, the new Hospital at Capetown, and many other important Government buildings. The department under his control has also taken considerable interest in the work of outside municipalities, while arts and crafts have received considerable help from the department. Many modellers, carvers, and sculptors can testify to the interest shown by Mr. Cleland and many of them have been employed on work for the Government.

Mr. Cleland was elected a Fellow of the Royal Institute of British Architects in 1926, and is a member of the Order of the British Empire. In 1934 he was elected President-in-Chief of the Institute of South African Architects.

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Mr. Robert Howden was born in Australia and came to this country in 1893, having previously qualified as an architect by passing the examination of the Royal Victorian Institute of Architects and incidentally tying for the gold medal of the Institute. He was subsequently elected a member of the Society of Architects, London, and a Fellow of the Royal Institute of British Architects.

After becoming established in Johannesburg he took into partnership Mr. A. J. Stewart, and, as the firm of Howden and Stewart, they were responsible for many of the important buildings of Johannesburg.

Amongst these outstanding buildings were the Technical College on Plein Square, Eloff Street ; Norman Anstey's, Kerk Street (in collaboration with the late Mr. Stucke) ; Central Hall, Von Brandis Square ; St. George's Church, Noord Street ; Mackay Bros., Pritchard Street ; Mappin and Webb, Plein Street ; and as S.A. collaborator with Sir Edwin Lutyens, for the Art Gallery, Joubert Park. Mr. Howden is now engaged in erecting several important buildings including new premises for Walter Wise and Co., and extensive additions to his old Technical College in conjunction with Mr. Gordon Leith.

Amongst the many competitions won by Messrs. Howden and Stewart must be mentioned the Technical College, St. George's Church, Central Hall, Pretoria Post Office, and others. While as to residences no suburb exists without a fair sprinkling of his work more particularly in the Northern Suburbs.

When the Provincial Administration decided to give their work out to private practitioners Mr. Howden was on the first panel and is responsible for several schools under the Provincial Administration.

It is, however, in connection with the professional activities of the Association that Mr. Howden is best known by the architects of Johannesburg.

No committee of any importance in connection with the profession lacked the name of Mr. Howden, and no member of the profession has sacrificed so much time in the interests of his brother professionals.

Amongst the many positions occupied by him may be mentioned the following: President of the Transvaal Institute of Architects and a member of each Council since its inception, President of the Society of Architects (London) S.A. Branch, Vice-Chairman of the Inaugural Board appointed by Government, Chairman of the Union Act Committee and first President-in-Chief of the Institute of S.A. Architects, President of the Chapter of Quantity Surveyors and a member of the Board since Quantity Surveyors obtained Statutory Qualifications, Member of the Council of the R.I.B.A. on which he sat on his recent visit to England.

Mr. Howden is now Chairman of the Executive of the Institute of S.A. Architects and Chairman of the Standing Committee on Architectural and Quantity Surveying Education of South Africa in addition to being Chairman of several sub-committees.

In consideration of the amount of work done and time devoted by Mr. Howden in the interests of the profession the members have founded a scholarship in his name for students of Architecture and Quantity Surveying which will be held in perpetuity.

Mr. Howden's recent accomplishment is some interesting research work while in England on behalf of the Johannesburg Art Gallery, who were somewhat concerned over the reflections from the glass on framed pictures. Finding that nothing satisfactory had been achieved by the experts in England and the Continent, he attempted the adaptation of an invention for eliminating reflections from shop windows, and in no time evolved a completely successful device for eliminating reflections from glazed pictures.

He delivered a lecture on this device at the Royal Society of Arts London before all the priests and acolytes of the art world demonstrating successfully the method.

Amongst those interested were Viscount Lee, in the Chair, Lord Crawford of the National Gallery, Sir Richard Allison, of the Office of Works, Sir Richard Unwin and others, each and all acknowledging that up to that point all other methods had failed.

In recognition of this research work Mr. Howden was forthwith elected a member of the Royal Society of Arts, and congratulated by all concerned in the success of his research.

Mr. Howden's military career has been confined to the German West campaign where he obtained a commission in the S.A.E.C., and did yeoman service for his corps in assisting in the quick termination of that campaign.

He is in possession of the 1914 Star as well as the Victory and General Service war medals.

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Mr. Thomas Moore was born in England and is of Irish descent. He was trained as a quantity surveyor in the office of Messrs. Fowler and Huginan. From 1891 to 1893 he was with Mr. Arthur Anderson, Melbourne, Australia, and from 1896 to 1902 he was practising in London.

In 1902 he was appointed by Lord Milner as chief quantity surveyor, Public Works Department, Transvaal Colony. From 1905 to the present time he has been in practice in Pretoria.

He held the position of president of the South African Institute of Quantity Surveyors on several occasions and was elected president of the chapter of South African Quantity Surveyors.

In 1930 he was Vice-president-in-Chief of the South African Institute of Architects and in 1931 was elected President-in-Chief of that body. He was a member of the Inaugural Board and was also Chairman of the Executive Council which framed the regulations under the Act.

Mr. Moore is a member of the five constituent bodies of the Institute and Chapter, Licentiate of the Royal Institute of British Architects, member of the Royal Institute of Public Health, Fellow of the Chartered Surveyor's Institution, Fellow of the Institute of Arbitrators, member of the Transvaal Town Planning Association and member of the Architectural Association, London.

He is permanent Vice-Chairman of the Institute's Standing Committee on Education and Examinations and External Examiner in Quantity Surveying in the University of Pretoria.

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Mr. E. M. Powers was born in Staffordshire and was educated at King Edward VI School, Birmingham. He commenced his architectural education as an articled pupil in the office of Mr. J. W. Allen, of West Bromwich, and was later junior assistant to Mr. F. W. Lloyd, of Birmingham. In 1903 he joined the staff of the late Mr. William Black, F.R.I.B.A., of Capetown and later spent two years in Melbourne, Australia in the Public Works Department and with private practitioners.

Mr. Powers joined the Public Works Department in Pretoria just before Union and started in private practice in Pretoria in 1912 in partnership with Mr. N. T. Cowin.

He qualified as Associate of the Royal Institute of British Architects in 1909, and was elected a Fellow in 1920. For some years he was Hon. Corresponding Secretary for the R.I.B.A. in South Africa.

Among the principal works carried out by Mr. Powers and his partners are : The Pretoria Central Fire Station, the Dutch Reformed Church, Greylingstad ; the Memorial Hospital for Children, Johannesburg ; the Huguenot Memorial Hall, Capetown ; the Witwatersrand University Buildings in collaboration with Messrs. Emley and Williamson, and also a number of commercial buildings and insurance offices at Johannesburg, Pretoria and Durban, including the new Broadcasting Studios, Durban.

Mr. R. J. C. Prentice was born in Edinburgh and joined the Public Works Department in 1909. He was on active service from 1914–1918. During 1921 and 1922 he studied in London and passed the examinations of the Surveyors' Institution. He was a prize-winner and silver medallist in the examinations in quantities of the City and Guilds of London Institute. In 1931 he was elected a member of the Board of the Chapter of Quantity Surveyors. In 1934 he was elected President and again in 1935. Mr. Prentice is a Colonial Fellow of the Surveyors' Institution, a member of the Royal Sanitary Institute and a member of the Chapter of South African Quantity Surveyors.

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Mr. V. S. Rees-Poole was born in Capetown and educated at "Bishops." He studied singing with Mr. Henry Clements intending to take up an operatic career and at the same time developed his talent for drawing and painting under the direction of the late James Ford.

Through the interest of Bishop Fogerty he met Mr. (now Sir Herbert) Baker and, deciding to study architecture, became a pupil in his office for three years. He won the "Baker" prizes for measured "Dutch Architecture," at the Cape, and was employed in Mr. Baker's office as an assistant for a further five years. He obtained a twelve months' appointment in the Public Works Department and thereupon left Capetown for Pretoria. He was successful in winning the Competition for the lay-out of Church Square, Pretoria, and carried out that work. On completion he visited Europe and studied in Paris and Rome for two years.

Upon his return he was successful in winning the Competitions for the lay-out of Bloemfontein Town Square and the Brakpan Town Hall and Gardens. He was appointed Diocesan Architect for the Pretoria Diocese by Bishop Talbot in 1922. He visited Mombasa in 1925 with Mr. Walton Jameson, M.I.C.E., to prepare a town scheme for replanning of the island for the Imperial Government. He was elected a Licentiate member of the R.I.B.A. in 1911 and a Fellow in 1933.

Mr. Rees-Poole is President of the Transvaal Provincial Institute for the year 1935-36.

Mr. F. D. Strong was born in London. In 1897 he entered the office of the late Sir Aston Webb where he received his training.

In 1902 he was selected by the Crown Agents for the Colonies and appointed to the Public Works Department, Transvaal, as an architectural assistant. In October, 1927, he was promoted from architectural assistant to specification writer.

In December, 1927, he was promoted to second grade assistant architect at Capetown, and in May, 1929, to senior assistant architect, P.W.D., Pretoria. In May, 1933, he was promoted to Government architect which posi tion he still holds.

Mr. Strong is a Licentiate of the Royal Institute of British Architects.

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Mr. Wilfrid Tonkin was born at Frome, Somerset and served his articles with Messrs. Silcock and Reay, architects of Bath, later becoming their chief architectural assistant. In 1898 he came to Durban and was chief architectural assistant in turn to Messrs. Arthur Fyfe, Kent and Price and Mr. William Lucas. He joined the Public Works Department in Pretoria in July, 1902, and became chief draughtsman, first under Mr. T. Tyrwhitt, A.R.I.B.A., and later under the late Mr. P. Eagle, chief architect.

At the end of 1907, Mr. Tonkin was transferred to the District Staffs organisation and was in charge of P.W.D. districts in several parts of the Union from January 1912, to January, 1933, when he retired from the service.

Mr. Tonkin is a Licentiate of the Royal Institute of British Architects and is President of the Orange Free State Provincial Institute of South African Architects this year.

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Mr. C. P. Walgate was born at Beverley (East Yorkshire) and was educated at Beverley Grammar School. He was articled to Sir Alfred Gelder, in Hull. He won the national scholarship in architecture and proceeded to the Royal College of Art (School of Architecture) and thence with a Royal College of Art Scholarship to the British School at Rome. On returning from Italy he entered the office of the late Professor Beresford Pite and later worked in London and Delhi, as chief assistant to Sir Herbert Baker. Mr. Walgate came to South Africa in 1920 to join the late Mr. J. M. Solomon and has been in partnership with Capt. L. A. Elsworth since 1921. His work includes the new buildings for the Diocesan College at Rondebosch, the South African College junior school and the Herschel Girls' School ; Churches at Langa and Fish Hoek ; residences for Sir Lionel Phillips and the late Sir David Graaff, also, in collaboration with Sir Herbert Baker, a house for the late Sir Drummond Chaplin, and, in collaboration with Messrs. Hawke and McKinlay, the new University of Capetown, at Groote Schuur. Mr. Walgate is an Associate of the Royal College of Art, an Associate of the Royal Institute of British Architects, and a Grissell Gold Medallist.

CO-OPERATION OR EXTINCTION? • By G. POWELL-JONES

In spite of the fact that this Sixteenth Annual Exhibition produced a slightly higher standard of work exhibited than in previous years, and was a well hung show (no light effort, considering the great difficulties to be overcome, in a room such as the Selborne Hall), there was, nevertheless, an unsatisfactory feeling prevalent that the Academy was not fulfilling the purpose for which it was created, and that it has never done so since its inception.

In view of the limited amount of space allotted to me, I have decided to devote nearly the whole of this to the consideration of the conditions prevailing, which, if allowed to continue, will undoubtedly bring this yearly effort to an ignominous conclusion.

The writer of last year's criticism in this journal prefaced his remarks with one or two pertinent questions which seem worthy of reconsideration. They also reveal a state of uneasiness as to the future welfare of this organisation, and the direction in which we are drifting.

The necessity is urgent to consider some of these and other questions, and, as far as is possible, to find a solution for the difficulties presenting themselves.

There is no reason why these should not be overcome ; they are not unsurmountable—but what did the Architects in their imagination set out to do ?—and, what has been done ?

The nucleus of a S.A. Academy was formed years ago but has not developed along the lines originally intended, i.e., a S.A. Academy representing the work of S.A. artists as a whole.

If there were indications that the exhibitions were becoming more representative year by year, there would be ample ground for hope, but unfortunately the facts are otherwise, and with certain rare exceptions many well known S.A. artists do not contribute with any regularity, and many not at all.

Let it be said at once that both the artists and public alike are deeply indebted to the Architects' Association for its unflagging energy in producing these yearly exhibitions, however far short of the ideal they may be, and when eventually an Academy of representative S.A. art is brought into being, it will owe a very great deal to this initial effort.

In the meantime the urgent necessity is for co-operation between the artists of S.A. and the Academy ; the lack of which at present is the outstanding cause of all our trouble.

I have recently returned from a visit to Australia and New Zealand and there I had an opportunity of meeting many of their leading artists and attending exhibitions. In marked contrast to the difficulties we experience here, I found the closest co-operation in existence, and successful exhibitions being held supported by a really representative backing of the artists themselves.

The result of this co-operation of course made itself felt in a keen support from the press, with the result that the public, realizing the truly representative nature of the exhibitions, made a point of attending in force.

It is undesirable to make invidious comparisons between the public taste of Australia and South Africa—the former as is well known, has enjoyed the reputation for many

years of being a keen supporter of the arts, and this no doubt fosters that spirit of co-operation amongst the artists.

I have no doubt that the S.A. public would lend its support to any S.A. Academy which was known to be truly representative of S.A. artists and the same thing applies to the press.

What are the obstacles in existence which prevent this co-operation.

(a) In support of the artists it is only fair to point out that the Selborne Hall is a most unsuitable place in which to hold an exhibition. Quite apart from a host of other objections the quality of the light is such as to reduce most of the paintings, for instance, to various degrees of muddy colour. It is, therefore, not unreasonable to sympathise with artists who do not wish that their work should be seen under such adverse conditions.

It does not reflect to the credit of a City so richly endowed with buildings of every kind, as is Johannesburg, that no effort has been made to provide suitable accommodation for its S.A. Academy exhibition.

I visited recently the winter exhibition at Capetown, which was delightfully arranged at their Art Gallery. It would seem that they are more fortunate than ourselves or is it that they have a keener sense of appreciation ?

(b) Judging from a large proportion of work sent to the Academy for exhibition, it is evident that there is a considerable misunderstanding as to the nature of work suitable for exhibition in this or any other Academy. Considerable disappointment and bitterness has often arisen in consequence, and it should be made perfectly clear to all concerned, that a very much higher standard (than is at present being allowed) will be required ; because a S.A. Academy it if is ever to take its place amongst the other young Academies of the world will have to aim at the very highest standard obtainable and not be satisfied with anything less. It would be better to exhibit ten works of art only, which really had merit, than to accept for exhibition on the present low basis.

(c) Then there are artists who do not co-operate because they have (seemingly) no sense of their duty in this respect : and these will be the most difficult to convince.

In summing up, under this heading, it is quite clear that for whatever reasons artists do not give us a representative exhibition, then the S.A. Academy fails, and if a solution cannot be found, the inevitable result will be the closing of the Academy for good, for as has already been shown, it cannot continue to exist unless it is representative.

But before so sweeping a decision is made I should like to be sure that all the facts have been put before every responsible member of our S.A. community of artists and if, after that, there is no representative response, then our course is clear.

But there is no doubt that such a state of things will be deeply regretted in the years to come, for as everyone knows it is easy to destroy a good thing (though imperfect), but not at all so easy to set in motion that which has once fallen into disuse.

Preparation of the Site

Since it is practically impossible to find a perfect site for an aerodrome, some preparation will be necessary. There are two main types of surface: (1) turf surfaces; (2) those on which turf is impossible or unsuitable. Turf surfaces are not practicable in South Africa. Up to the present the ordinary veld grass is found to be sufficient, and if and when it is insufficient runways will probably be used. Turf is commonly used in damp climates in many parts of Europe; and since it is one of the best, if not the best aerodrome surfaces obtainable it is worth some attention.

Natural turf suitable for landing surfaces must be able to stand up to the wear of traffic; it must be adequately drained, and in some cases be suitable for grazing; such turf is often found in damp climates in many parts of the world, and with little work can be made quite suitable. The danger to be guarded against is soft or boggy patches, either from choked drains or "built-up" patches. Not only is this dangerous at the high speed of modern aircraft, but such moist patches have the effect of cooling the air directly above them, forming "air-bumps."

A close contour map is made of the whole site to a large scale, giving the contours of one foot or eighteen inch intervals. This will be valuable in working out the grading required and the amount of soil from hummocks available for filling-in hollows. The contour map is also useful in laying out runways; and is essential in obtaining the best lines for drainage giving the minimum of trenching. Drainage is most important in a damp climate, and all drains should be planned out and their falls shown on the contour map. If runways are to be laid down later, the system of drainage should be as far as possible part of the runway scheme to prevent future expense. The runways themselves require ample drainage, as the paved surfaces throw off the water quickly. All this drainage should be planned out separately before proceeding.

The work required on the raw surfaces will, of course, very according to its condition; generally four processes will be necessary:—

(1) Clearing (trees, fences, old roads, etc.).
(2) Levelling.
(3) Surface and subsoil drainage.
(4) Final drainage.

Clearing

All obstructions are removed without exception; trees, hedges, etc., are cut down and the roots grubbed up, either by blasting, machinery, or hand labour. Fence poles must be dug right out, all concrete bases being removed bodily. The same applies to foundations and concrete floors of old buildings. In the case of concrete engine beds, an allowance must be made in the cost for blasting.

Levelling

Before levelling or grading is started any turf on the surface can be dug out and stacked in dumps for replacement. Road scrapers drawn by tractors are usually used in America for levelling. In some cases trains of scrapers are used. The amount of levelling required can be taken from the survey. When finished, no gradient should exceed one in forty, and generally one in fifty is the figure to aim at (Diagram 12). Surface ploughs, harrows, or rippers may be required to go before the grader to break up the surface. Disc ploughs are used on very hard surfaces; harrowing and rolling complete the operation. Where a turf surface is required the final operation is seeding, which can be done by machinery. A proper seed mixture that suits the soil should be used and advice can be obtained from an agricultural expert. The chief requirements are:—

(1) The grass must bind together well.
(2) The grass must grow rapidly and be able to resist drought.

Length of grass is important on account of the expense of mowing. A suitable grass will depend almost entirely on the climate.

The maintenance cost of turf is fairly high, requiring watering, rolling, and mowing regularly, and even replanting in patches ; all of which operations are likely to cause obstructions on a busy airport. To make all machinery used in this work easily visible from the air, it should be painted white or chrome yellow.

Surface and Subsoil Drainage

Where drainage of the site is considered necessary, a survey of the surface soil and subsoil must be prepared by means of trial holes. Over such a large area as will be required a few will not give enough information, and it will be necessary to place them at fairly regular intervals over the whole site. The formation of the strata can be plotted, and the sections of the holes will show the depth of the various strata. It is chiefly required to know what strata are impervious and what porous. Different formations are found such as an impervious stratum overlying a porous or vice versa, or all impervious or all pervious and require different treatment. No one type of drain has been found suitable for all classes of soil. The drainage system :—

(1) Removes storm water quickly.
(2) Keeps the surface dry.
(3) Disposes of excess water below the surface.

The safety and efficiency of the surface is largely dependent on adequate drainage. All water collected must be taken right off the field. No open ditches or culverts of any sort may be used. The amount of piping required and its position will be decided by the contour map and subsoil. Generally a system of main drains is laid with a number of subsidiary or feeder drains running into them. The number and spacing of these drains is entirely dependent upon the nature of the soil. Main collector drains crossing the field are of the french type. A trench is dug with sufficient fall to carry off the water and is filled in with coarse clinker or gravel. Agricultural drain pipes with open joints may be laid at the bottom of the trenches to assist the flow (Diagram 12). Ditches of any sort can be filled in but when they carry storm water or a small stream arrangements should be made to deal with that water, either by diverting or canalising in some way. The ditch bottoms should be scoured and the pipes laid to a reasonable fall at the bottom, the ditch being filled in with coarse material such as crushed angular stone. The filling should be carried up to within a few inches of the top, the remainder being filled in with light soil, or ashes, or with sand in non-cohesive soils (Diagram 13), old ponds or large holes should be similarly treated. In order to avoid any water lying beneath such a filling as would happen in impervious soils, french drains at the bottom of the hole will keep them adequately drained. Any old drains should be opened up, and either replaced or filled in as is deemed necessary. The filling should, if possible, be left to settle itself without any rolling or stamping as this will spoil the porosity required ; and the final dressing can be added later without much risk of a depression occurring.

The number of drains must be cut down to the minimum both on the score of expense and because they are a source of weakness to the surface. In a climate such as that of South Africa where the rainfall is concentrated over a few months of the year sub-soil drainage is not as important or as necessary as it is in countries with a steady rainfall throughout the greater part of the year.

Marshy ground of any sort can be easily drained if the expense is not prohibitive but where possible the site should be chosen to avoid such localities.

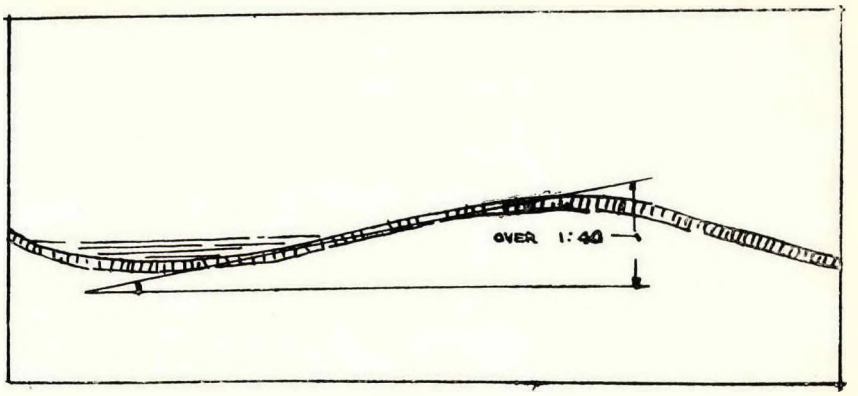
Final Surfaces

Some form of final surfacing will always be necessary. Turf is the best surface obtainable as has already been shown. However, where turf is inadequate or otherwise unsuitable, some form of artificial surface must be laid down ; and where it is proposed to use the runway system such surfacing is essential. The ideal runway surface has not yet been found, but many materials have been used in America which are given below. It is generally found that the most suitable materials,

Diagram 12

LEVELLING

Showing type of surface which requires levelling to reduce Grade-Breaks of over 1.40.



Surface levelled and graded

Method of placing drains

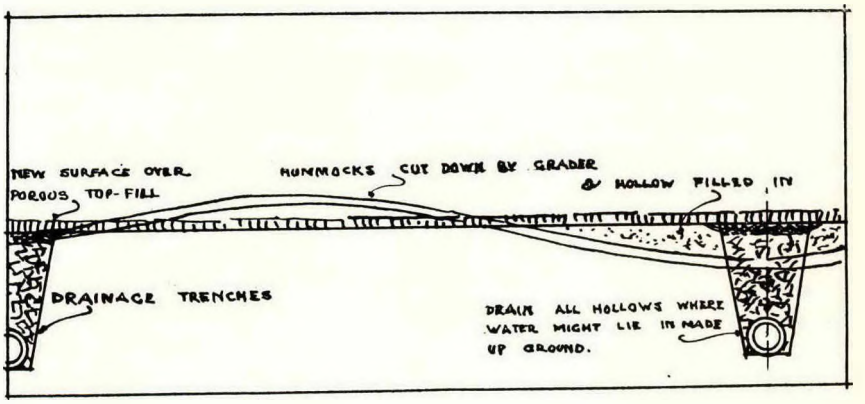
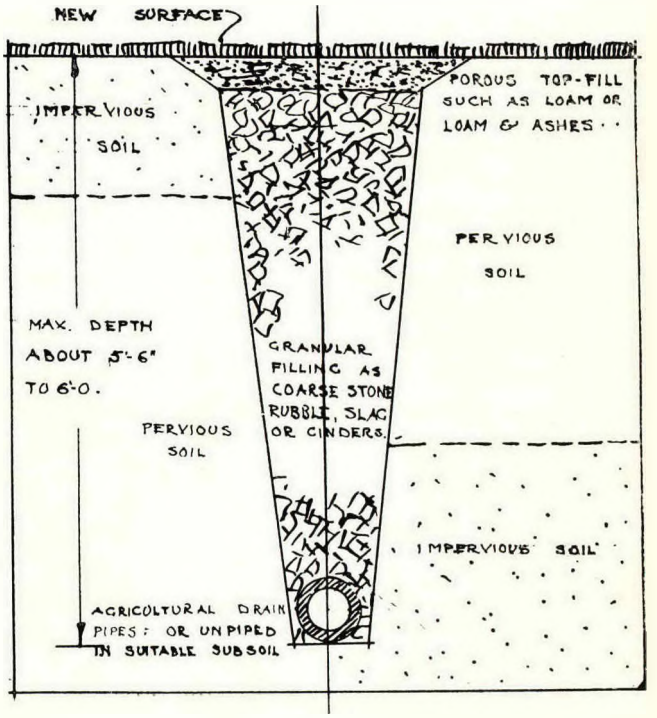


Diagram 13

DRAINAGE

1. Impervious Soil.
   Pervious below, in this case permeability of top filling is essential to good drainage.

2. Pervious Strata on top drain to remove water imprisoned by Impervious Substrata.



which are mostly of an asphaltic nature, are the most expensive ; but are the most durable and lowest in maintenance cost.

Earth

Earth alone is very unsatisfactory, as it is churned up by the landing gear ; it is dusty in hot weather and muddy in wet, and develops fissures in drought or severe frosts. Watering to relieve the dust is only a temporary measure, and in South Africa of little use. In the U.S.A. chemicals are used as a binder, such as sodium carbonate and calcium chloride, which are obtainable there in bulk. The latter is not recommended by the U.S.A. Department of Commerce, because it has an action on ferrous alloys. It is, however, much used on desert aerodromes in the U.S.A. when mixed with a neutralising agent.

Oiled Earth

Oils mixed with earth are a common road construction in the U.S.A. The oil consolidates and binds the surface. This method has been applied to aerodromes with some success, and has for example been used on the worn out surface adjoining the concrete apron at Croydon. For desert and tropical sites this method is especially suitable. A viscous crude oil is used, mixed into the surface with harrows or disc ploughs, and finished by grading or rolling. A road oil is obtainable, containing asphalt, and is suitable for lighter soil. The oil is applied at the rate of about half a gallon per super yard. Two applications are made : the first may only be lightly harrowed in, to about six inches deep. The second application is then made, and the whole again harrowed. Finishing is with a roller and scraper. The resulting surface is resilient and is easy to repair when damaged. Very sandy soil may require the addition of crushed stone to make it bind better.

Heavier bituminous oils applied hot to heavier earths give a more lasting treatment. Such oils are made by several companies, and different grades are obtainable for different earths. "Shelspra," "Tarvia," "Colas," "Stavely," are examples of these oils. The makers provide the correct grade for any surface.

Other oils are designed to be thinned out by the addition of water. After clearing off the grass the ground is dug to some four inches deep and harrowed. An emulsion of equal quantities of oil and water is made, in a machine, and applied fairly liberally, about one gallon to every square yard. Proper mixing is essential. After again harrowing the top soil is returned and mixed with a solution of fifty-five per cent. oil and forty-five per cent. water, about two gallons per square yard. A top dressing of fine stone will give a harder surface if required ; the whole should be sprayed with a one-third oil and two-thirds water mixture, about one gallon per square yard. Rolling will consolidate the surface, but such rolling must be done in stages, using a very light roller at first, and applying heavier rollers in successive stages.

This treatment may be applied by premixing the earth and emulsion in a rotary concrete mixer, then spreading and rolling as for tarmacadam paving.

Crushed stone pre-mixed with oil will give a better surface, and is deirable where possible. Graded stone, laid and top-dressed with oil, has been used at Tulsa airport, Oklahoma, with success ; for this an oil with an eighty per cent. asphalt base is preferable. A good, resilient, hard-wearing surface results. These pavings are fairly visible from the air, but do not hold or show markings very well. The suitability and success of oiled earth may be judged from the example of Croydon, where some 25,000 square yards have been treated next to the apron with "Colas." In appearance the actual surface may easily be mistaken for pre-mixed asphalt road surface of the standard type. The first trials were made at Croydon in 1929, with the co-operation of the Air Ministry. This proving successful, more was laid down as required. It has withstood severe conditions, some of it having taken all the traffic of the airport. Also most of the aircraft using this port have tail skids, and not rear wheels.

According to the makers, Colas Products, Ltd., London, maintenance costs are negligible, and the surface is more economical than any other available process. This surface is obtained without the aid of a foundation of graded stone.

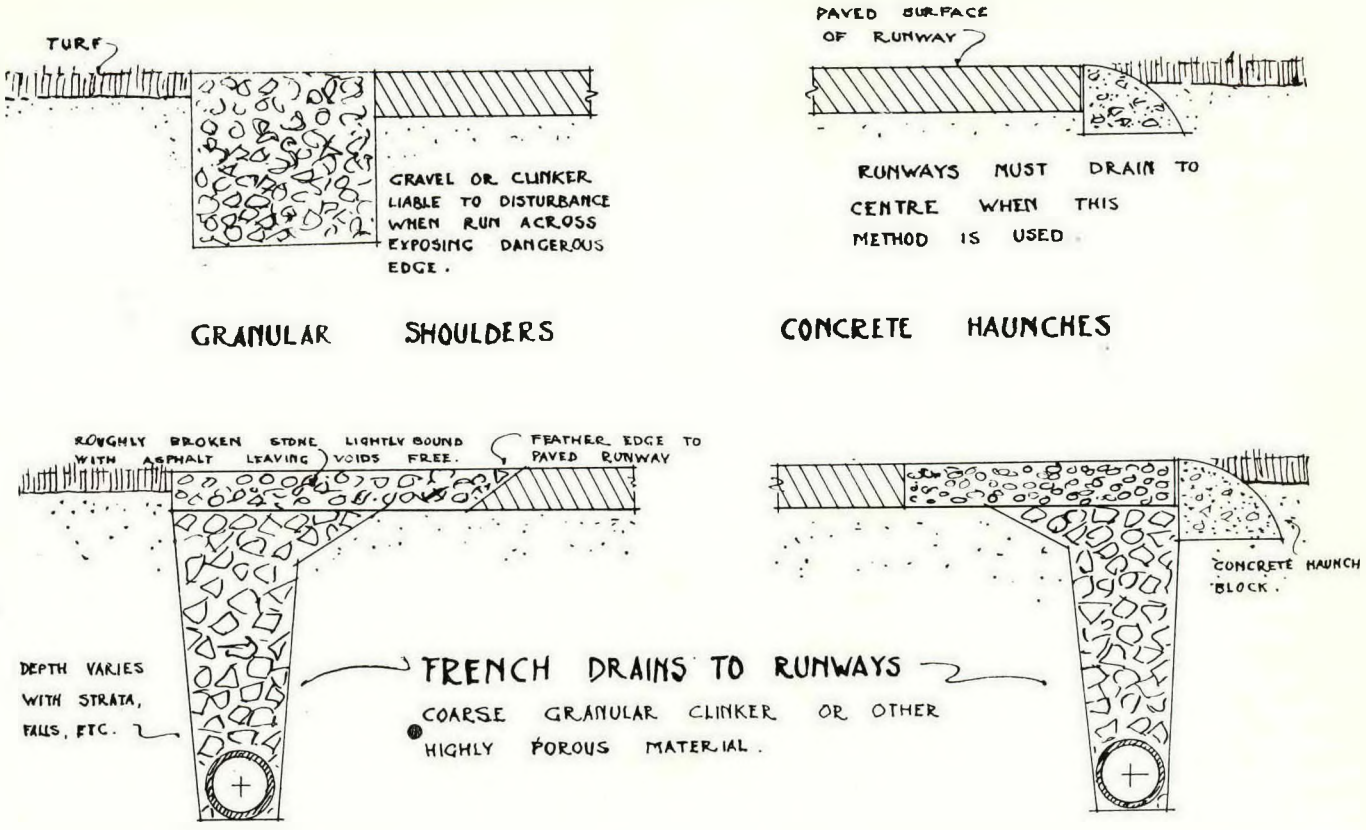


Diagram 14 ● Runway Drainage

Crushed Stone

Heavy crushed materials without binding have been used in the U.S.A. for some time ; an example is Oakland, California. It is quite practical if heavy enough to avoid being caught up in propeller slipstreams. The disadvantage is that constant attention is necessary to keep it in good condition, for unbound stone behaves in much the same way as unbound cinders. Stone is best used as a base on which to lay other types of surface.

Cinders

Several American airports, such as Chicago Municipal Airport and Buffalo Airport, N.Y., have cinder runways. Those at Chicago are no less than three feet thick. Unbound cinders are one of the worst materials for runways ; they are caught in the slipstreams of propellers in offensive clouds of particles and dust ; every wheel and skid leaves a deep rut ; in the course of time the cinders disintegrate, aggravating the nuisances. Where they have been used in America, upkeep costs are high, a tractor and blade grader being constantly required to smooth out the surfaces. Cinders are only useful as a foundation for other types of surfacing ; a tar spray over the surface improves matters to some extent.

Gravel is unsatisfactory because it scatters and is scored by skids too easily. When bound with clay and well rolled the surface is better maintained.

Tarmacadam

For resilient runways tarmacdam has been used in a number of cases, the surface being similar to that of highways. A firm foundation is essential, a crushed stone base being generally used. The tarmac is laid in two layers ; a coarse three-inch layer well rolled and consolidated, and a second layer of one and a half inches pre-mixed material rolled hot. A top layer of fine stone chips rolled in will give a better grip. Any necessary repairs are easily effected. This type

of runway is one of the most expensive, but gives a very good surface, is lasting, and requires very little maintenance.

Concrete

For permanence, low maintenance, and efficiency, concrete in some form or other is the most satisfactory material. It is both the highest in initial cost and the lowest in maintenance ; it is unequalled where there is very heavy traffic on busy aerodromes. Different concretes are used for runways and aprons ; these are :—

(1) Mass concrete in one layer.
(2) Mass concrete in two layers, with top layer rolled.
(3) Mass concrete as a base for tarmacadam or other resilient paving.
(4) Mass concrete as a base for brick or other rigid paving.

The important differences lie in the composition of the matrix. A resilient matrix is the most suitable, for an appreciable amount of the landing shock is thus absorbed. Rigid matrices have been used up to the present, but are declining in favour owing to their discomfort, and for this reason alone asphaltic concretes are preferable to Portland cement concrete ; and although the asphalt wears rather quicker it gives a much better wheel grip. Several examples are illustrated. In most cases these will be prohibitively expensive. Up to the present time no really satisfactory and at the same time cheap material has been discovered. Asphalt in one or another of its forms, or asphaltic concrete, have so far proved the best in practice.

Reinforced concrete has been used in America notably at Floyd Bennet Field, N.Y., an illustration of which is given in Diagram 16. These runways are one hundred feet wide and total seven thousand feet long. An eight inch slab of one-two-three and a half mix was used with fifty pounds of steel per hundred super feet. The width of one hundred feet is divided into ten bays each fifty feet long in the direction of the runway, and all bays are separated with expansion joints. The joints of runways to the adjacent turf is by the usual American method of gravel shoulders. This runway is crowned eight inches for drainage to the gravel pits.

The Apron

The apron is important in all aerodromes and in its construction several points must be considered. The apron is in the nature of the "working floor" of the airport and also the parking space for waiting aircraft ; it serves as the loading and off-loading point for everything, and it is there that the aircraft are filled with water, petrol, and oil from pipes below its surface. Resilience is of no importance, but a quick run-off for drainage is essential. It must be hard to resist the steel tracks of tractors, and impervious to petrol and oil. The surface must be non-dusting, as dust on the apron is a serious nuisance. Two types of paving have been found to be satisfactory ; tarmacadam and concrete. Tarmacadam was at first widely used, but lately concrete has been more popular. Both pre-cast slabs, or concrete cast in situ have been used, with or without expansion joints. Sizes of paving slabs vary. Those at Chicago are twenty feet by twelve feet ; at Heston the slabs are five feet square and only three inches thick. At Croydon, pre-cast paving slabs are used of the ordinary size. This is rather more expensive, but any repairs are easy and quick ; also small slabs allow of easy inspection of the pipes underneath. At Heston the slabs are cast in situ, and have been very satisfactory. The management claims that it has worked out cheaper than the current price of tarmac. Oiled earth has been used in America for the apron, but it is unsatisfactory in many ways. Aprons are drained by a series of drains laid underneath, connected to catch-pits covered with cast iron grids ; an example of one is illustrated in Diagram 15. The catch-pit is necessary to collect any silt, etc., that may choke the pipe. Traps must be provided in the system to deal with any oil or petrol that may be spilt on the apron.

Runway Drainage

Runways have a considerable catchment area owing to the nearly impervious nature of the surfaces, and a large volume of storm water has to be quickly drained away. The run-off efficiency of tarmac and concrete is forty per cent. and eighty per cent. respectively.

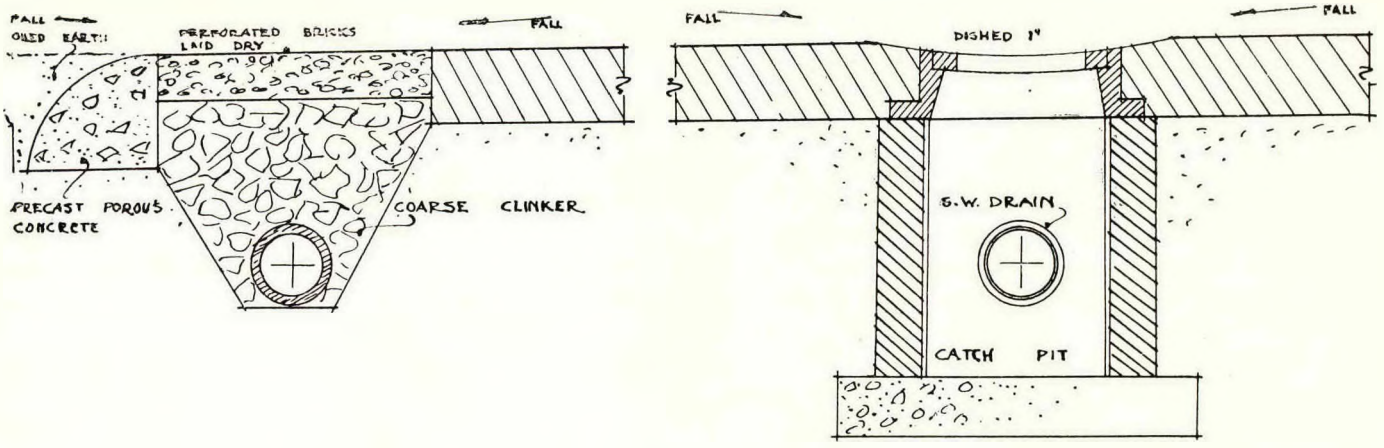


Diagram 15 ● Apron Drainage

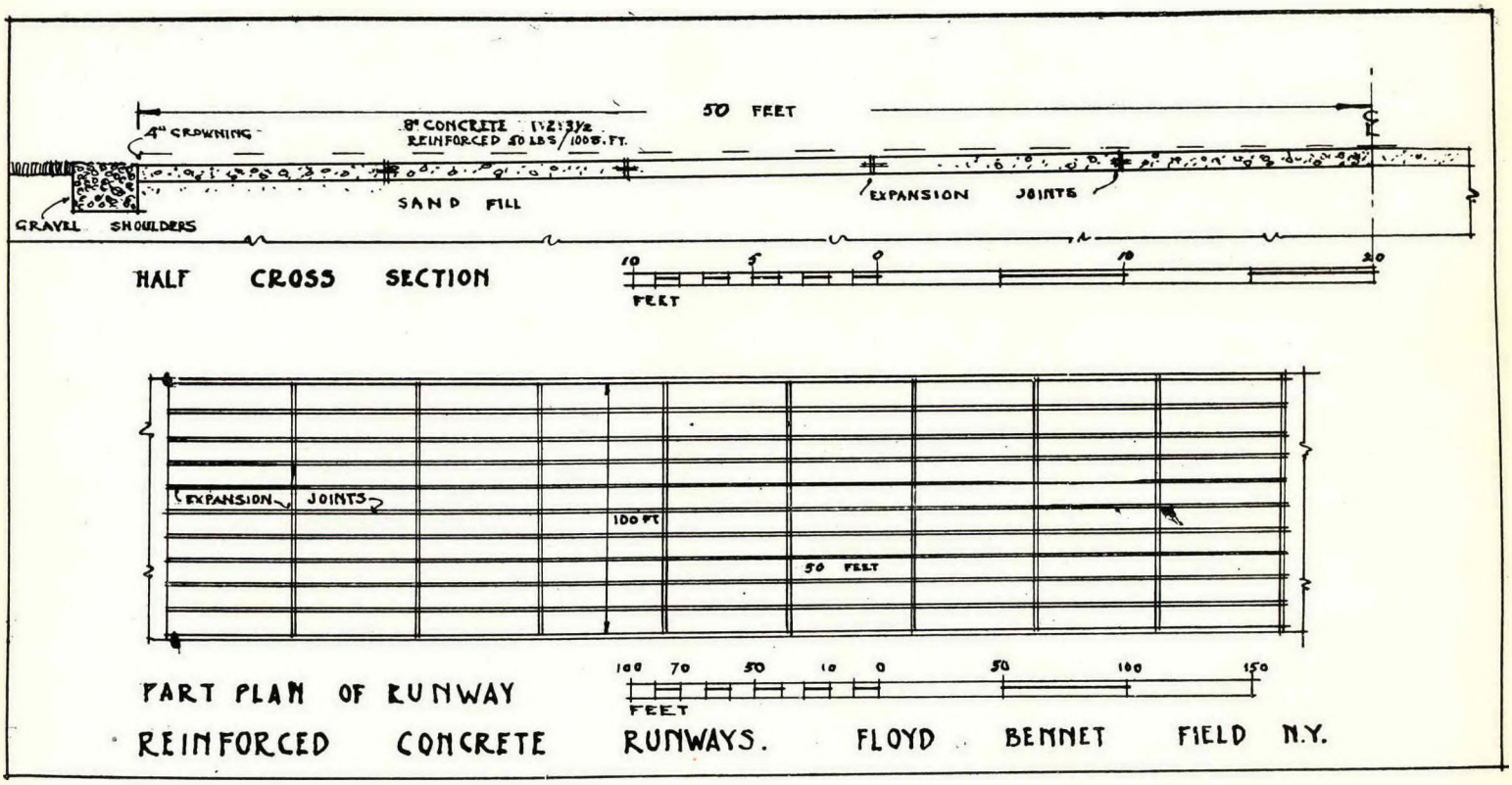


Diagram 16.

If this water is run off the paved surfaces and allowed to go on to the turf, a muddy strip is formed along the runway edge which is dangerous to traffic. Trouble of this sort has been experienced at Croydon. Water should be drained off before it accumulates, for aircraft alighting at speed on normally smooth pavements are difficult to handle, and when the pavings are running with water, dangerous skidding occurs. It is necessary that the surface of the runway and field should be flush to allow of taxi-ing on or off or across the runway. Where the paved surface adjoins turf or soft earth erosion will occur ; if this erosion exposes the edge of the pavement some four or eight inches thick, aeroplanes running into these curbs will damage their undercarriages and in some cases run the risk of overturning. Several methods of preventing this have been devised. The British method shown in Diagram 14, is to form the edge of the pavement as a feather edge with a convex slope. This prevents any sharp edge from being exposed ; the aeroplanes can manage this small slope quite easily. The American method is to have square trenches at the edges of the runways and fill these with loose granular material, such as gravel. Although permitting of drainage, the loose material is thrown about by every aeroplane that crosses.

There are two ways of draining runways :—

(a) By crowning, forming drains at the edges.

(b) Counter crowning ; the drains are placed beneath the centre, similar to apron drainage.

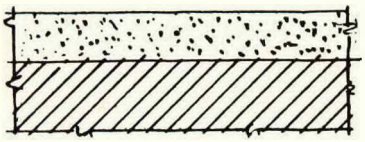
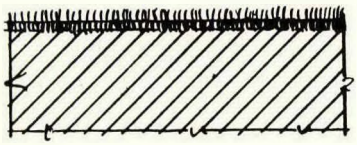
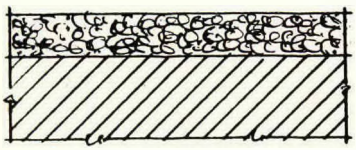
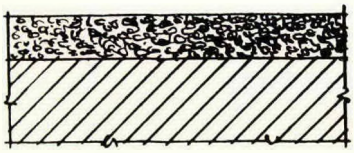
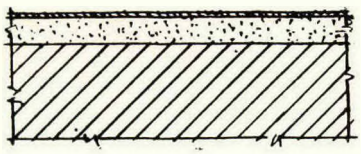
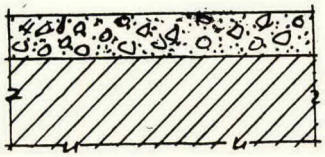
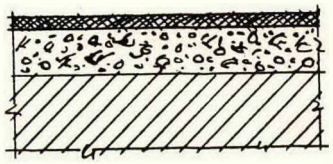
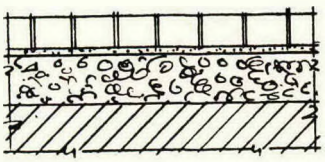
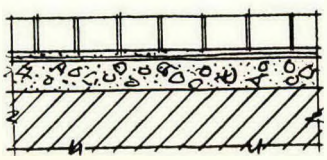
In case of (a) for runways, french drains are constructed at the edges of the paving ; these have a very porous back fill, and an open top fill. The disturbance of this loose fill is a very serious matter, and the U.S.A. Department of Commerce Aeronautics Bureau have suggested the treatment in Diagram 14. The runways are crowned four inches per one thousand foot span ; crowning is not to exceed six inches per one thousand foot span. The top fill of the drain is broken brick bound with a minimum of asphalt, the particles being lightly coated to give cohesion and yet allow the water to percolate through. Another method used with success consists of a similar drain at the edge of the runway with a feather edge on the outside, the drain being between the two areas of concrete, and allowing of a covering of perforated concrete slabs or bricks :

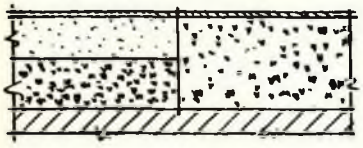
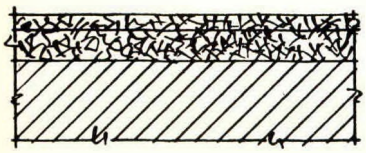
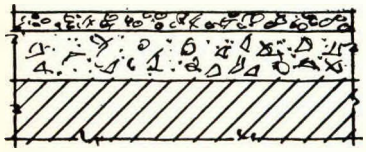
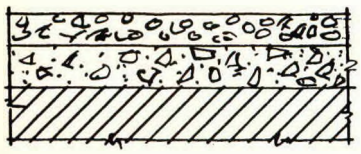
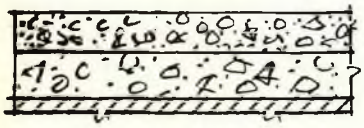
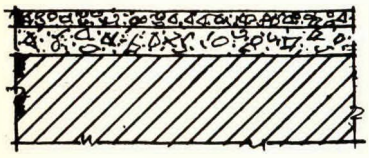
In (b) difficulty has arisen over the making of inlets safe for the passage of fast aircraft ; otherwise the drain-away system is similar to that on ordinary roads, gullies being provided to catch silt. So far no perfect system of runways has been evolved, chiefly because every field varies, and because every form of construction is in the experimental stage. The only definite and fixed basis for all this work is the needs of the aeroplane and pilot.

In summing up, the chief requirements in planning airport fields are :—

1. Good visibility from the air.
2. Even reliable surface, free from mud, dust, ruts, potholes, ditches, etc.
3. Good grip for wheels and for braking.
4. Non-skid surface in all weathers.
5. Resilience.
6. Clearness of background for markings.
7. Even non-glaring surface for floodlights.
8. Flush continuous surface to field, aprons, and runways.
9. Well drained at all times.
10. Low capital cost and maintenance.

DIAGRAM 17 • SECTIONS OF RUNWAYS

Section		Remarks
	1. EARTH OR SAND 3" to 6" Rolled	Low first cost but high in maintenance. Fairly good resilience, wears badly. Easily damaged. Muddy or dusty according to weather. Fair braking. Fair visibility from the air, but does not hold markings. Good under floodlights.
	2. TURF	Low first cost, high maintenance. Durable if maintained. Very good resilience for landing. Low resistance to damage, but partly self repairing. Fair braking. Poor visibility from the air. Good under floodlights, giving minimum glare.
	3. CINDERS 5" Rolled Cinders	Low first cost, high maintenance. Very poor durability. Fairly good resilience but easily damaged. Fair for braking if not too loose. Poor visibility from the air. Fair under floodlighting.
	4. GRAVEL 4" to 5" Rolled and watered	Low first cost, high maintenance. Not very good durability. Fairly good for landing. Easily damaged but easily repaired. Fair visibility from the air and fair under floodlights.
	5. OILED EARTH Scarified 3" Deep and Oiled	Low first cost, high maintenance. Fair durability and good resilience for landing. Low resistance to damage but easily repaired. Fair for braking, but not so good when wet. Fair visibility from the air. Poor background for markings. Fair visibility under floodlights.
	6. CEMENT CONCRETE 5" Concrete Wood Float Finish	Very high first cost. Maintenance fairly low. Fairly long life. Fair resilience. Has a very good mudless, dustless surface. Easily visible from the air, and fairly good for floodlighting, but is liable to glare.
	7. SHEET ASPHALT 1" Asphalt 5" Concrete	Very high first cost, but low maintenance. Fairly long life, and wears well. In other respects it is very similar to tarmacadam, except that it not so good for floodlighting.
	8. PAVING BRICK 1" Sand 6" Rolled Stone or Sand	Very high first cost, low maintenance. Has a long life, and is good in all other respects.
	9. BRICK OR CONCRETE Pry Cement Bed 4" Concrete	Very high first cost, low maintenance and long life. Poor resilience for landing. Good visibility from the air, and good for floodlighting.

Section		Remarks
	**10. HEAVIER OILED EARTH** Oil mixed in Situ or Oil Premixed	Similar to Number 5, but rather higher cost. Maintenance the same. Wears better and better braking in wet weather.
	**11. CRUSHED STONE or SLAG** 5" Graded and Rolled	Fairly low cost, maintenance high. Very good durability in wear. Poor resilience. Good visibility from the air and good under floodlights. An improved surface is obtained if oil is used as a binder.
	**12. TARMACADAM** 1½" Small Tarmacadam 3½" Large Tarmacadam	Moderate first cost and moderate maintenance. Fairly long life. Very good resilience for landing. Not easily damaged. Good braking. Good visibility from the air and good under floodlights.
	**13. TARVIA SURFACE** 3" Stone and Tarvia 6" Stone Base	Similar to tarmacadam. Moderate first cost and maintenance.
	**14. TARVIA PENETRATING OIL** 3" Stone and Tarvia 6" Stone Base	Similar to tarmacadam; high first cost but moderate maintenance. Hard wearing, giving long life. Good mudless and dustless surface.
	**15. ASPHALTIC CONCRETE** 1½" Stone 3½" Rock All in Asphalt	Fairly high first cost, moderate maintenance. Long life. Very poor resilience for landing. Other properties similar to tarmacadam.

In all cases "resilience" is used comparatively; some substances, such as tarmacadam, have the property of absorbing, to some extent, the shock of an aeroplane landing on them at a high speed; other substances, such as cement concrete, have no "give" in them, tending to cause an aeroplane to rebound when landing on them; this is not only uncomfortable to the occupants, but is wearing to the machine: and in cases where an error of judgment has led to a bad landing, a non-resilient surface is more likely to cause an accident.

• The next instalment will deal with the Marking and Lighting of Aerodromes

Mr. C. W. Brown, A.R.I.B.A., 162, Lunnon Road, Hillcrest, Pretoria, has been registered as a member of the Transvaal Provincial Institute of South African Architects.

●

The President and Council of the South African Institute of Electrical Engineers and the Principal of the University of the Witwatersrand, Mr. H. R. Raikes, extend a cordial invitation to the members of the Institute to be present at the Joint Meeting of the South African Institute of Electrical Engineers and the University of the Witwatersrand, to be held at the University, Milner Park, Johannesburg, on Thursday, 27th June, at 8 p.m., when a lecture entitled "Resonance" with demonstrations will be delivered by Prof. J. P. Dalton, M.A., D.Sc.

●

Mr. V. S. Rees-Poole, F.R.I.B.A., has been elected President of the Transvaal Provincial Institute, Mr. Gerard Moerdijk A.R.I.B.A., Senior Vice-President and Mr. W. Gordon McIntosh, A.R.I.B.A., Junior Vice-President, for the ensuing year.

Plan that was turned down. ● "Star" 13/5/35

City Councils Decision Overuled. Question of Amenities in Doornfontein

A decision of the City Council not to allow the erection of a garage and filling station in Beit Street, New Doornfontein, was overruled by Mr. Justice Greenberg lately, when he gave judgment in the action brought by Fotes Scottes and Eustace Callinicos against the City Council.

The applicants are the owners of certain leasehold stands No. 477 and 478, Beit Street, New Doornfontein, and in September, 1934, they submitted a plan to the City Council for the erection of a garage and filling station on these stands.

Amendments to the plan were required by the city engineer in order to bring the proposed building into conformity with respondents' building by-laws. These amendments were made, but on December 27 the City Council notified the applicants that it had been decided not to allow the erection of the building under Section 52 of the Townships and Town Planning Ordinance of 1931.

In February the applicants' attorneys wrote to the Council asking it to reconsider its decision, but at a meeting of the Town Planning Committee it was resolved

that the applicants be informed that the committee was not prepared to recommend that the Council depart from its previous decision.

"Apparently this was the last word in the matter," said Mr. Justice Greenberg, "and the applicants now ask for an order directing respondent to approve of the plan and permit applicants to proceed with the erection of the buildings, or alternatively, an order setting aside the above-mentioned resolution and directing respondent to give applicants an opportunity of dealing with respondents' objections to the erection of the proposed building."

The City Council, stated the judge, had been given three years to compile a town-planning scheme, and the Town Planning Committee had decided that pending the preparation and approval of such a scheme, the garage should not be erected. Later it was decided that the projected building would interfere with the amenities of the neighbourhood.

"On the papers themselves," said the judge, "I had some difficulty in seeing how the amenities of the neighbourhood could be adversely affected if applicants were allowed to erect their building, and this impression was strengthened by my inspection. Indeed, I cannot imagine in what respect this could be so. If it were not for the existing garage, it might possibly be said that as the rest of Quin Street was residential, it was desirable to fix the limit of the business portion and not to allow any more encroachments, but this is not the position and I cannot see how the amenities could be improved by sandwiching a residential instead of a business building on the piece of land.

"I am unable to see in what respect it can reasonably be contended that the building would interfere with the amenities and the only suggestion that respondent's counsel could offer in this connection was that as large crowds congregate in the street on occasions for sporting events at Ellis Park, the presence of petrol pumps might cause a block in the traffic."

The City Council has "offered no explanation, and as neither its counsel nor the Court can suggest any substantial ground, I think I am bound to hold that no reasonable person who had not misinterpreted the section, might or could properly have come to this decsion.

"As the decision was based solely on section 52 it cannot stand, and the applicants are entitled to relief. There will therefore be an order directing the respondent to approve of the plan and to permit applicants to proceed with the erection of the buildings. Applicants are entitled to costs."

Mr. N. E. Rosenberg, with him Mr. H. J. Hanson (instructed by Messrs. Jackson and Cowan), appeared for the applicant, and Mr. P. Millin, K.C., with him Mr. C. T. Blakeway (instructed by Messrs. Moodie and Robertson) appeared for the respondent.

With acknowledgments to "The Star."