

THIBETAN ARCHITECTURE.

A SKETCH.

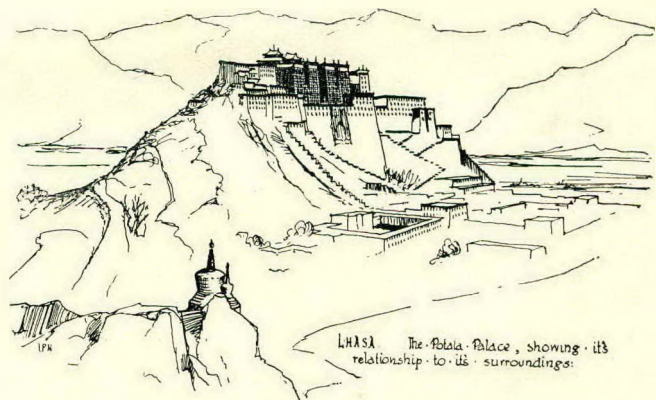
J. PEEL NELSON.

I should like to make it quite clear at the outset that this screed is not intended as a systematic description of the Architecture of Thibet. I have no qualifications whatsoever for writing such a treatise, never having been near the country in question, and having collected such scraps of information as I possess in a purely haphazard way.

It is inspired by a genuine desire to know more of a subject, which, from a purely superficial inspection, abounds with delightful possibilities.

The name of Thibet has always conjured up visions of a mysterious country up beyond the Himalayan snows, peopled by a race of beings who are extremely jealous of foreign interference. One has heard of it as the possible birth place of much of our knowledge, and the repository of still further wisdom. Magic is a very real thing to the Thibetan, and is extensively taught and practised in the many monasteries which are scattered over the country.

Is it not possible that in some monastic library is a record of some amazing fact or some stupendous truth, written in Sanskrit and sandwiched in with the intelligence that Brother Yougden burnt the "tsampa" cakes for supper last night?

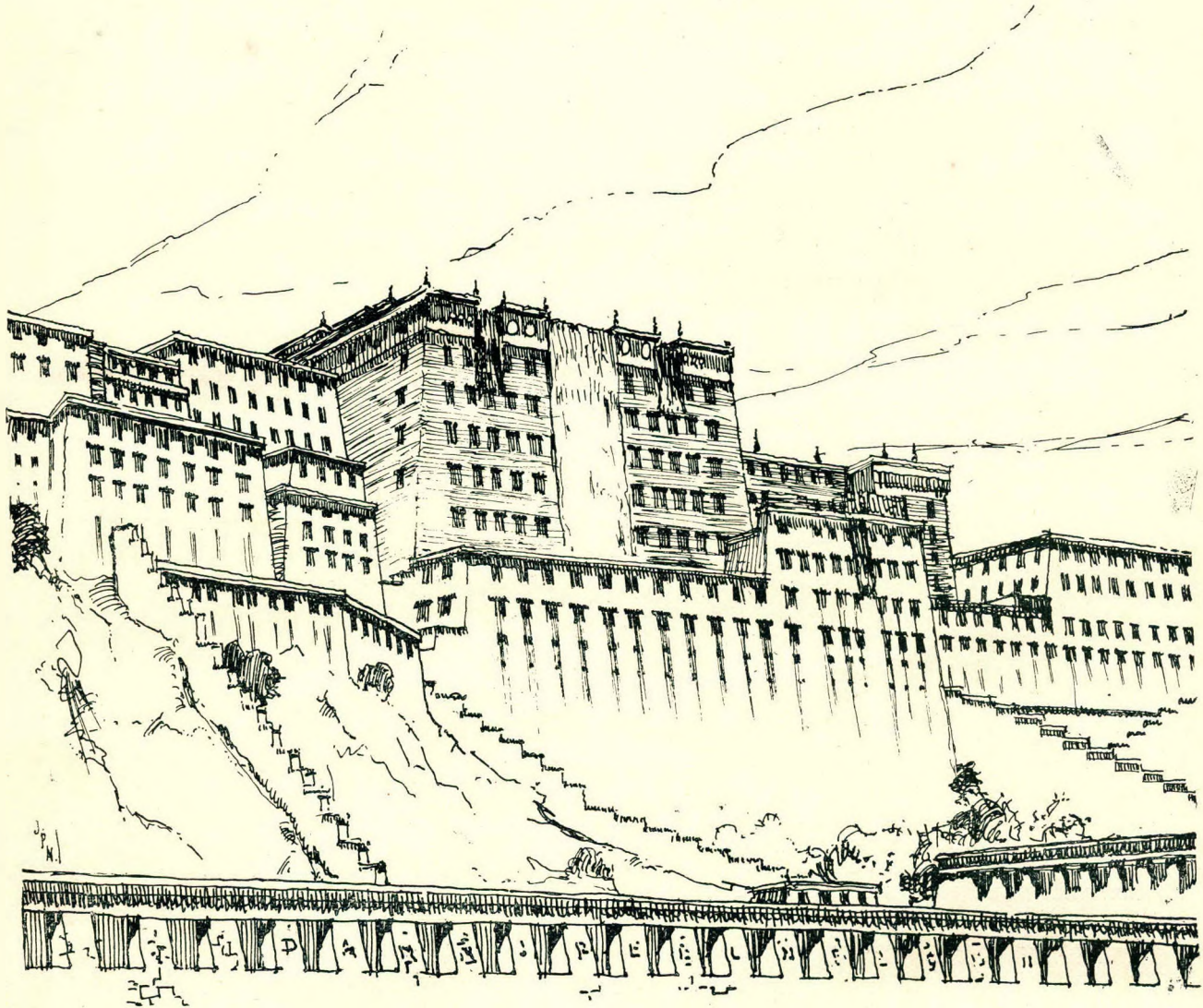


Vaguely I had heard of the Dalai-Lama as a sort of demi-God with tremendous religious sway: vaguely also I had heard of the fantastic monasteries which hung precariously on the edges of precipitous cliffs. But it was only within the last few months that, whilst on a holiday, did I actually come across an illustration of one of these buildings. This fired my curiosity and the present article (which at some future date I should like to augment on the acquisition of further data) is the outcome thereof.

Thibet is the stronghold of Buddhism. The Dalai-Lama is held to be the incarnation of Buddha himself and there are at least three other persons (of whom one is a woman) who are supposed to possess a share of the Divine Spirit. For years Thibet was under the domination of China, in fact until as recently as 1912, but it is now ruled by the Dalai-Lama, largely owing to the influence of Great Britain.

renness would be hard to equal. At least two of the larger monasteries house upwards of 8,000 monks.

Side by side with Buddhism, there exists a tremendous amount of superstition. One instance of the latter may be cited to show its hold on the people. Every year in Lhasa (which is the capital and contains the Potala Palace) is held the ceremony of "driving the scapegoat out of the city."



Politically the country is divided into two actively partizan groups. On the one hand is the Court, supported by a considerable portion of the lay nobility and gentry: on the other is the so-called National Assembly which is composed of the nominees of the priests of the three large monasteries in the vicinity of Lhasa.

The Court party is pro-British, but the Priestly party is strongly anti-British and pro-Chinese.

The tremendous power of the priests may be gauged from the fact that one man in four is a monk. I am inclined to ascribe this not so much to religious fervour as to the fact that a monastic life offers a comparatively assured livelihood in a country whose bar-

It is supposed by Thibetans that lamas (priests) expert in magic can divert to him the causes which would deliver others into the hands of the evil spirits, bringing upon them poverty, illness, death, and misfortunes of all kinds. So a voluntary victim, styled the "King of Impurity," charged with the iniquities of the ruler and his subjects, is ceremoniously expelled from the city.

Prior to his departure, the "Scapegoat" is allowed to collect a tax from the other inhabitants. He roams about the city, clad in a Sable Yak robe, carrying the tail in his hand. He enters the shops and stops the passers-by and exacts his toll from each. Should he fail



The most important monastery in Thibet is the Potala Palace, at Lhasa, the official residence of the Dalai-Lama. This pile, by reason of its site and the way in which the potentialities of the latter have been realised, cannot fail to impress even the layman with its architectural grandeur. Perched on the summit of a rock rising out of the plain, it soars on a steeply battered base some hundreds of feet above the city. It is constructed of square granite. The lower portion is whitewashed twice a year: the upper portion (shown in a darker tone in the two sketches) is referred to by writers as being crimson, and the roof as golden. Such a combination of mass and colour must indeed be impressive.

The palace is approached by huge flights of steps which zigzag across the naked rock which forms the pedestal of this remarkable structure. The first thing that strikes one about it is its simplicity. The long uninterrupted roof lines, the square headed window openings, sometimes surmounted by a simple cornice, and the huge expanses of blank battered walls, all are reminiscent of the earlier period of the Italian Renaissance rather than of the delicate and complicated architecture of the East.

All writers seem to be discreetly silent as to the date of its construction.

Almost as impressive, in another way is the Chongche Dzong, above the town of Tsetang, which forms the subject of another sketch. This building reminds me irresistibly of the fantastic castles inhabited by giants and ogres which illustrated the literature of our childhood.

In conclusion I should like to acknowledge the help I have obtained from books by Mme. Alexandra David-Neel, Dr. Sven-Hedin and Sir Francis Younghusband.

to obtain what he wants, he waves the Yak's tail above the head of the recalcitrant, a gesture of malediction productive of the most terrible consequences! It is an interesting and possibly instructive fact that the "Scapegoat" seldom lives more than a year after his departure.

One would expect from a country whose immediate neighbours are China and India an architecture possessing to a marked degree the characteristics of these nations. From the meagre illustrations at my disposal, I am unable to say that either of these nations have exercised any appreciable influence on Thibet in this direction. But here and there, in the smaller and secular buildings are traces of the undulating roofs and eaves lines which we associate with China: nowhere, however, am I able to find anything at all Saracenic. The Chinese influence is perhaps to be accounted for by the religious bond that exists between China and Thibet in Buddhism.

As I have said, the monasteries constitute by far the most numerous and important class of buildings in the country. They hold much the same relationship to the countryside as did the castles of the feudal barons, and exact from their adherents payment in kind and service in a like manner.



FESTIVAL AT LHASA

The Medical College in the background

STANLEY FURNER.

AN APPRECIATION BY A STUDENT.

Eheu, fugaces labuntur anni—and not only the time passes, but the people pass on. Mr. Furner has left us to enter upon private practice. According to the natural laws we shall start to appreciate him after he has gone. We have been walking cheerfully along a sun lit road, conscious of a companion at our elbow, but of a sudden he has turned off the road and we are left blinking our surprise at his absence. We take so much for granted in the daily round; things that matter are so often obscured by trivial events that it is difficult to disentangle the threads of a definite influence acting on a group of students. But there is no doubt about Mr. Furner's influence. It has always been strong, always vital, always tending to clarity of expression, not only in architectural design, but in the approach to the subject.

Let us consider what he has done. Let us attempt an investigation of his methods. First the approach to the question of design. From the beginning he has insisted on reasonableness. He has emphasised the importance of bringing a clear unprejudiced mind to the attack of every problem. To him preconceived ideas are anathema. And rightly, for a blend of sentiment and confused thinking will never produce anything but sterility. He has always maintained that every subject must be approached on its own merits. That is from the logical standpoint. We must start at the right end. Broad issues first, a reasonable organic development of plan, and lastly considerations of detail.

Most important to the student, Mr. Furner has eliminated his own personal prejudices to a degree almost super human. He has never taken the easy path. He has sought always to make the student do his own thinking. How many weary hours of weary pegging would have been saved had he taken his pencil and indicated the obvious solution. But this he has never done. Day after day he has faced with optimism and enthusiasm, dull, often uninspired drawings until they have taken a reasonable form. Halting

plans have straightened their backs, crooked corridors have unfolded, and cross circulations have vanished. But the scheme has always developed. At the end there is no sign of sickly youth. But what a labour! How much easier to have suggested the main lines and save a lot of tedious thinking. Fortunately for the student Mr. Furner has never done this. The schemes are always their own. This is the essence of a successful method of training.

Apart from design and its problems Mr. Furner has brought to his discussion a keen enthusiasm for everything connected with architecture. Painting, sculpture, poetry, the play—all are part of an Architect's life, and he has stressed their importance in broadening the outlook, in defining the subtle atmosphere in which it is necessary to raise embryo Architects. He has reverence for the past, appreciation of the present, and an unbounded delight in the future of architecture. For him it is not a dry-as-dust affair, it is something living, to be cherished and continually observed. Perhaps this is the most important part of his influence. For with him the end is always distinct from the means-to-the-end, and consequently he has brought a wide outlook to a question which has too often been hedged in with side issues.

Added to these qualities of clear thinking, and his ability to lay the foundations of a good taste in art, Mr. Furner has brought to his work endless energy, and an unflagging interest to every individual design that has been done under him. He has always been firm, but enthusiasts have never been wrenched unkindly from their preferences; classicists have reconciled classic forms to modern requirements until they have found their feet. Modernists and hyper-modernists have tried their hands with varying success, but always he has insisted only on the adherence to general principles in design. We are grateful to him. The freedom he has allowed us will surely produce healthy fruit. The students will miss him.

PROFESSIONAL NOTES AND NEWS.

IMPORTANT ANNOUNCEMENT.

It is hoped that a Special Issue of the "S.A. Architectural Record," will be published in June dealing with "Domestic Architecture in South Africa." The Editor will be glad to receive contributions in the shape of articles, plans and photographs, from all parts of the Union. Owing to the heavy cost of reproducing illustrations it may not be possible to include all the illustrations submitted. These, however, will be carefully considered by the Journal Committee and a representative selection made from them.

Members are urgently requested to notify immediately any changes of address to their Provincial Institute or the Central Council.

It is gratifying to be able to report that Sir Herbert Baker, A.R.A., F.R.I.B.A., and Mr. R. Howden, F.R.I.B.A., A.R.V.I.A., have been elected Members of the Council of the Royal Institute of British Architects.

The South African Institute of Architects is now one of the Affiliated Societies of the Royal Institute of British Architects.

A communication has been received from the R.I.B.A. that Messrs. J. B. Dey, W. Murray Jones and Harold Tompkins have passed the Special Final R.I.B.A. examinations.

The South African Academy is holding its Tenth Annual Exhibition of pictures and objects of art and the crafts in the Selborne Hall, Johannesburg, from Monday, the 29th April to Saturday, the 11th May, 1929, both dates inclusive.

Attention of members of the profession is again drawn to the fact that the "Epitome of the Municipal Building By-Laws of Johannesburg," price 5/-; and the "Professional Scale of Charges," price 1/-, can be obtained from the Secretary, Transvaal Provincial Institute of Architects, 67, Exploration Building, Johannesburg.

Mr. J. T. Lloyd has been appointed Senior Lecturer in Architecture at the University of the Witwatersrand, as successor to Mr. A. S. Furner, who is leaving the University to take up private practice. Mr. Lloyd was educated at Acton County School, Middlesex, and the University of London, where he obtained his Diploma in Architecture with first class honours in Architectural Design and Reinforced Concrete Construction.

He has had two years post-graduate experience in the Atelier of Architecture of the University of London, under Professor A. E. Richardson, where he distinguished himself in design. He was a Finalist in the Rome Scholarship in Architecture, in 1928, and in the Victory Scholarship in 1928-9. He also received Hon.

Mention in the Final Competition for the Soane Medalion in 1927-8. Mr. Lloyd will take up his duties at the University early in February.

We regret to have to record the death of Mr. Stanley Hudson, of Eshowe. The late Mr. Hudson was formerly associated with the firm of Messrs. Scott and Hudson, of Johannesburg, who were successful in winning the competition for the Town Hall, Durban.

Mr. Hudson left Johannesburg and commenced practice in Durban, where he also designed the Law Courts on the Esplanade. Later he took up sugar farming at Mtunzini, Zululand. There his health began to fail and he moved with his family to Eshowe, where he has lived for several years. The late Mr. Hudson was born at Hove, Sussex, the son of Edward William Hudson, F.R.I.B.A.

The Transvaal Provincial Institute has decided to hold the examinations for the Royal Institute of British Architects, in April of each year, and those for relegated candidates in September. All applications, including testimonies of study, must be forwarded to the Secretary, Box 2266, 67, Exploration Building, not later than January 31st.

The Minister of Education, after consultation with the Central Council of the South African Institute of Architects and the Board of the Chapter of South African Quantity Surveyors, has decided to approve of the University of Capetown and the University of the Witwatersrand, Johannesburg, jointly as the examining "authority" referred to in the Architects' and Quantity Surveyors (Private) Act, 1927.

The Minister desires that the two Universities should keep in touch with the professions concerned in the matter of examinations.

A letter has been received from the Receiver of Revenue drawing the attention of members to the requirement instituted in connection with Revenue Licences to be issued to persons engaged in professional pursuits, of proofs to be produced prior to the issue of a Licence of qualification to carry on the profession for which the Licence is applied for.

The proof required should be established by production of the Certificate of Registration. In any case in which the Certificate cannot be produced by reason of its loss, proof of such loss to be the subject of a declaration, the Receiver of Revenue would accept as the most convenient means of establishing the right to practice, a Certificate of registration, from the Secretary of the Provincial Institute.

The Licence application form to be completed is being prepared to give effect to the above stated requirement.

DRAFTSMEN OR ARCHITECTS.

Europeans Fined.

Two Europeans, L. J. Hudson and H. Johnson were before Mr. T. Moodie, A.M., yesterday, charged with illegally practising as Architects.

Both accused pleaded guilty, and Mr. C. Krog-scheepers appeared on their behalf. Mr. Brummer prosecuted.

The Hon. Secretary of the Local Committee of the Institute of S.A. Architects handed in a certificate, given by the Registrar in Johannesburg, stating that

the accused's names were not recorded as registered Architects.

Further evidence was given to the effect that the accused had signed their names to plans as Architects. These plans had been submitted to the Building Inspector and then on to the Council

Mr. Moodie warned both accused that it was a serious offence, and that on the next time they came before the Court the full penalty of £100 provided in the 1927 Act would be inflicted.

Accused were fined 10s. each.

(Extract from the *Port Elizabeth Advertiser*) Wed. Oct. 24th, 1928.

TOWN PLANNING.

E. H. WAUGH.

This science has now emerged in this province from the embryonic stage, and the marked advance made in the past ten years has been definitely fostered by the efforts of the Transvaal Town Planning Association and a small number of enthusiasts in various public walks of life, such as, the late Senator John Ware, the late Councillor Colin Wade and others who are fortunately still with us.

The Union Public Health Act of 1919, Section 132 (1) reads as follows:—

“Section 132 (1). The Minister may make regulations, and may confer powers and impose duties in connection with the carrying out and enforcement thereof on local authorities, magistrates, owners and others, as to—

- (h) The sub-division and general lay-out of land intended to be used as building sites, the width and number of streets and thoroughfares, the limitation of the number of dwellings or other buildings to be erected on such land, the proportion of any building site which may be built upon and the establishment of zones within which different limitations shall apply, and of zones within which may be prohibited the establishment or conduct of occupations or trades likely to cause nuisance or annoyance to persons residing in the neighbourhood.”

and in August, 1921, local authorities were invited by the Minister to submit draft regulations for—

- (a) Large Municipalities.
- (b) Municipalities of intermediate size.
- (c) Small Municipalities, village management boards, village councils and other small urban local authorities.
- (d) Divisional councils and rural areas.

The Johannesburg Town Council with the aid of the Medical Officer of Health and the Town Engineer produced a set of regulations which were forwarded to the Transvaal Town Planning Association for discussion, and after much deliberation, a complete and amended set of regulations was agreed upon by these two bodies and forwarded to the Minister early in 1924.

Since that date, so far as the Union Government is concerned in the matter, no further public action has been apparent or regulations published.

The Section 132 (1) (h) is inadequate to secure the attainment of many desirable objects which are not mentioned and, while useful as far as its terms permit, does not afford sufficient scope for the broader elements of town planning.

This province has so far therefore only reached the stage of development allowed under the terms of the Township Act, 1907, and subsequent small amendments. This Act is administered by the Townships Board under the Administrator. This Board has from time to time come under somewhat severe criticism from local authorities, more especially in regard to approval recommended by it to lay out suburban townships where it has been alleged that no necessity for such additional townships existed, and the burden of extra and unmade streets has been thrown on the local authority, sometimes to the extent of several miles at a time. In Johannesburg, the Council is not sufficiently recompensed for this additional burden of residential and unwanted suburbs by a small endowment of land or cash from sales nor by the modicum of extra rates brought in.

In addition to this aspect, it has also been argued that the Township Board is composed of Government Officials whose knowledge of Town Planning has been restricted to the particular duties with which they are associated. In a questionnaire put in Johannesburg

some years ago in connection with proposed town planning regulations and the type of administration desirable, one of the queries was "Should present Township Boards (i.e., all over the Union) be abolished," and from one highly placed and learned local Government officer, the terse answer came, "Yes; it is useless and ignorant of modern town planning principles."

Now as regards the first criticism as to the system, the Board's decision is subject finally to the Administrator's approval, but it appears that the solution of the difficulty as to unwanted townships or suburbs may lie along the more defined lines of the recent Cape Provincial Townships Ordinance of 1927 (reinforced by provisions similar to the New Zealand Town Planning Act, 1926), which includes also provision for approval of Town Planning Schemes. Under this, the Board has *definitely* to consider first and foremost the *need or desirability* of establishing a township on the proposed site. It would therefore lie with the applicant to produce proofs of the *need or desirability* for the township, and with an objecting local authority or other person to object and give evidence. The final decision rests, as in this Province, with the Administrator, but he shall not, without further reference to the Board, grant any application, the refusal of which has been recommended by the Board. In New Zealand, however, the procedure stops at the Board, and there the Board sits as a Court (but here as a Commission), and may hear evidence on oath, and parties may be represented by Counsel. In this Province, a curious provision ensures that any wilful insult to a member of the Board may

involve the perpetrator in a fine of £50 (FIFTY POUNDS), but in New Zealand there is no provision for misbehaviour, a somewhat amusing difference. The New Zealand method removes the final decision from a political or administrative officer, and invests it in the Board as a whole as a Court, and its findings have judicial effect. In the Orange Free State (1928), the Administrator may not grant an application except on the Board's recommendation, but he may refuse even if recommended by the Board and shall submit the application in case of refusal, to the Provincial Council at its first session after date of such refusal.

In New Zealand, the personnel of the Town Planning Board has a wider scope than in this country as the Chairman is the Minister of Internal Affairs and the Members are the Director of Town Planning, one person from each of the following, viz.:—the New Zealand Society of Civil Engineers, New Zealand Institute of Architects, the New Zealand Institute of Surveyors, the New Zealand Counties Association, two persons from the Municipal Association, two others appointed by the Minister of Internal Affairs and also the Surveyor General, the Engineer-in-Chief of the Public Works Department and the Government Architect. This is somewhat unwieldy in numbers, and deals with Town Planning without the function of a Township Board.

At the Cape, the personnel is the Surveyor General (Chairman), the Registrar of Deeds, Assistant Union

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Health Officer, an Officer of the Provincial Administration and two others selected by the Administrator for special knowledge of town planning, one of whom shall be a Civil Engineer. This provides for all professions concerned, except an Architect and a Lawyer.

In the Transvaal, since 1925, the Local Authority concerned has been empowered to select a person to sit on the Board in reference to an application within its jurisdiction. In Johannesburg, the person selected is the City Engineer.

As regards the second criticism levelled at the Transvaal Townships Board, the charge of ignorance cannot be upheld, as in regard to applications, not only do the actual questions of plan arise, but complicated points of administration and law covering the conditions and registration of titles. These are inseparable from the applications for approval of townships, and some of the officers concerned have special knowledge of these points, and it has also been the practice to seek special advice on the lay-outs from the Town Planning Association.

The Board has greatly advanced its knowledge from experience, as it has to deal with dozens of applications every year.

The Surveyor-General is the Chairman, and on the Board are the Registrar of Deeds, the Rand Townships Registrar, the Provincial Secretary, a senior assistant technical officer of the Surveyor-General's Department and the Under Secretary for Lands.

The practice of putting a member or officer of a local authority on the Board may be criticized from the point of view that he is biased in favour of certain resolutions already passed by his Council, and it seems that the composition of the Board adopted at the Cape is preferable, leaving the local authority freedom to lead or give evidence, and argue the case from its own standpoint, as in effect, the representative is occasionally left in a minority of one. The attitude of the Board and of the Administrator, as displayed in the Johannesburg Area, is evidently that a township may be laid out, provided that reasonable lay-outs, conditions and endowments are provided.

In the Cape, as the law is worded, the onus of showing the *need* or *desirability* of a township should distinctly lie on the applicant, and this is as it should be. In Johannesburg Municipal Area, the Council was powerless to obtain a refusal of a large township, although a census showed that approximately 20,000 lots were available for sales in the region concerned.

The Transvaal Ordinance makes no definite provision for Town Planning Schemes as apart from the applications of private persons. In many countries, local authorities are forced to consider their areas and submit schemes for the present or the future. In the Cape Ordinance of 1927, there is a chapter for Townships (i.e. as submitted by private owners) and another for Town Planning wherein the local authority may submit schemes both within or adjacent to its area—there is no compulsion. The scheme may affect the

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land of private owners, but they are not compelled to subdivide, but the local authority may expropriate for arterial roads.

This is a distinct encouragement to Councils to pre-plan their areas so as to provide proper arterial and link roads beforehand on a general scheme, and avoid the loose method hitherto followed in many districts. Nevertheless, it does not achieve the national control to the full extent possible in a Town Planning Act under which Councils are obliged to pre-plan their areas to meet future needs as far as arteries both within and without their boundaries. It is therefore possible for a supine Council to still allow matters to drift to the general detriment not only of their own people but of all who pass through from town to town. It is with the object of avoiding this that plenary Town Planning powers are given in many countries as well as to escape from the horrors arising from bad and narrow streets in slums. In the Transvaal, fortunately, narrow streets hardly ever exist, as not only has the good sense of the people led them to adopt streets of reasonable widths, but the powers given to make By-laws has led to a minimum width of street of 40 feet with a greater width where the street is of the nature of a main highway.

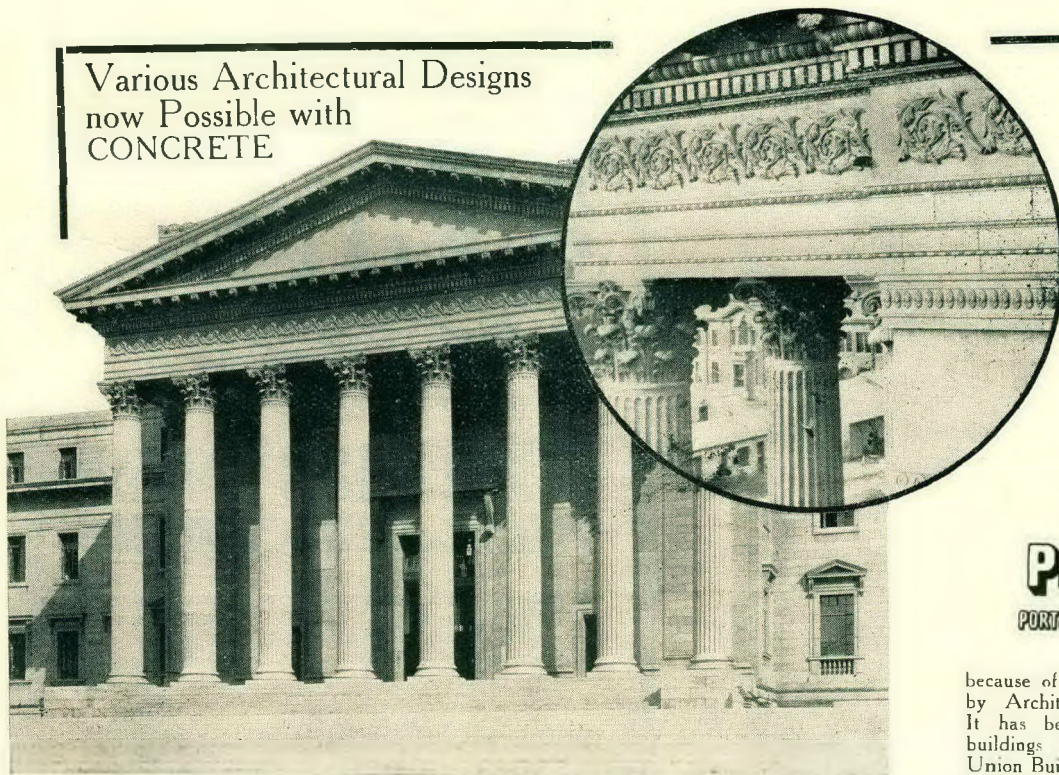
There is no doubt whatever that only obligatory plenary Town Planning powers will result in achieving the effects we all so much desire, viz. :—the lay-out of our towns in a comprehensive, orderly, convenient and sanitary manner with a due regard to beauty and

amenity, making full use of natural scenic features, keeping business and manufacturing districts in zones where they will be most useful without depreciation of housing districts. South Africa has been very slow to realise the necessity for this regional planning or planning by regions rather than by townships or districts; in other words, planning as a whole, comprehensively and with large foresight instead of piecemeal and without regard to the requirements of adjacent districts. The want of this prevision has cost Johannesburg alone with interest well over one and a half millions in dealing with the old so-called insanitary area, and, subsequently, by painful and costly process, acquiring other land to improve streets in other districts.

The mistakes of the past are only remediable by immense expense, and there are no present powers for replanning districts except by an extremely troublesome method of expropriation without the powerful assistance affordable by an expert court board such as is supplied in New Zealand and other countries under a Town Planning Act. There is in South Africa as yet no national thought in town planning, and such as has arisen has been too sporadic and local in its character.

Town Planning in its true sense is national, and affects not only the town dweller but the country dweller, as town planning also embraces cross communications not only through towns but through country districts.

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The Union Ministry of Health showed this in its full extent when in 1921 it invited draft suggestions embracing all kinds of districts, whether rural or urban. It is only to be regretted that such a good start born out of the new and very fine Union Health Act should have, after all these years, brought no visible fruit.

As that source of guidance and inspiration has so far led to nothing, it seems that the way the Cape has lately taken is open to the Transvaal. It is a way, however, that is less satisfactory than a Union or national way, and is limited to the powers of the Provincial Council, and it is possibly open to some doubt if the Provincial Council could confer full compulsory powers on a Town Planning Board (in which should be incorporated the Townships Board), or whether it could be limited, as has been the case in the Cape, to power for optional local initiative only.

It has been foreshadowed in certain quarters that a revision of the Townships Act is imminent. If this be so, the time has certainly arrived when full town planning powers should be sanctioned, not only for pre-planning or fore-planning new districts, but for re-planning existing parts which are unsatisfactory for any reason. The Townships Board has been in many ways a most useful body in preventing many serious mistakes, and it is difficult to conceive a satisfactory future Town Planning Board unless it be framed up to a large extent on the present basis as the knowledge embodied therein is not in many respects procurable in a different personnel, but an addition of elements, not at present represented, in the field of public health, and the professions of the civic architect and engineer and law would form a board fully equipped to give the essential directive and regulating force.

Our towns are growing and new villages are arising, some of which one day may become cities.

The main design of this paper is to focus attention on the present position and to take stock as it were, and to see what direction further advancement should take. There are, however, some points large in themselves but details to the general outline already discussed. Prominent amongst these is the intrusive right of the Railway Administration to invade the territories of local authorities with new lines and even with existing lines to retain a dividing or separative action within a Municipal area. A local authority should be regarded by the Central Government and its Administrations or Boards as part and parcel of the general Government, and should be accorded the same rights and privileges extended to such Administrations. The right to obtain statutory acts for building railways should be carried out only after notification to the local authority concerned, so that arbitrary division or internal separation of towns such as exists so badly in Johannesburg and Durban can be minimised to the fullest extent. With this object in view the following statutory provision should be made for such Administrations or authorities, viz. :—

"To require promoters of railways and tramways to notify local authorities of their proposals in regard to the construction of new lines or other works within the area of such local authorities and to provide for appeal to the Governor General in Council by a local authority who may consider the interests of the people of its area would be prejudiced by the execution of such lines or works."

CITY OF JOHANNESBURG.

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Applications are invited for the part time position of Curator of the Municipal Art Gallery at a salary of £28 per month.

The successful applicant will not be entitled to any pension rights, but will receive leave on the ordinary scale allowance of leave for officials of the Council.

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Applications addressed to the undersigned and endorsed "CURATOR" must be received on or before NOON on WEDNESDAY, 20TH FEBRUARY, 1929.

D. B. PATTISON,
Town Clerk.

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PROPERTIES AND FEATURES OF SLATE.

In view of the fact that slate for roofing and structural purposes is now being quarried and manufactured in South Africa, the following extracts from a thesis by Mr. Oliver Bowles, Supervising Engineer, Building Materials Section of the United States Department of Commerce, will be of interest.

The term "slate" is applied to fine-grade rock that has a more or less perfect cleavage, permitting it to be readily split into thin, smooth sheets. The term includes materials differing widely in colour and having a considerable range in chemical and mineralogical composition.

Slates consist essentially of stable silicate minerals that are very resistant to weathering, and consequently high-grade mica slate is one of the most durable of building materials. Mr. E. G. W. Ferguson says that slates mined near Delta, in 1734, were, at the time of writing (1910), still in use covering the seventh building on which they had been placed, showing no indication of change in colour or deterioration in quality. In European countries slates have been used for centuries, and consequently better evidence of their durability is obtainable from that side of the Atlantic. Reference may be made to a slate-roofed Saxon chapel which stands in Bradford-on-Avon, Wiltshire, England. It was built in the eighth century, and after 1,200 years of constant exposure to climatic changes, it is moss covered but still in good condition.

The fact is significant that during the latter part of the World War the British Government expressed a much greater preference for slate than for the cheaper and more temporary forms of roofing. This attitude was due partly to coal shortage, for composition roofing manufacture required larger coal supplies than did slate manufacture, but the chief reason was recognition of the durability of slate and its ultimate economy as compared with temporary roofing materials that had soon to be repaired or replaced. Consequently, slates were used widely for both temporary and per-

manent structures, such as engineering works, grain warehouses, airdromes, shell factories, and offices. Many composition roofs were stripped from buildings and replaced with slate.

Slates differ in colour, and some colours are much more in demand than others, the preference being based more on tradition than on artistic taste or actual qualities of the slates. A wider market for colours not now in demand depends, therefore, on the cultivation of public taste. Architects and builders can widen the field of utilization of roofing slate by judicious efforts to popularise new colours or combinations of colours.

Clay slates are not as durable as mica slates. They are more porous and disintegrate more readily. If a high-grade mica slate is placed on edge in water, the moisture will not rise perceptibly above the water line: whereas if a poor-grade of clay slate is used, the moisture may rise as much as two inches in ten minutes because of the capillarity of the porous clay.

Slate makes such durable and attractive roofing that its use should be greatly encouraged. Furthermore, its non-inflammability as compared with wood adds to its value, for the most frequent cause of dwelling-house fires in the United States is said to be sparks from a chimney alighting on a wood-shingle roof.

The essentials of slate for roofing are straight, uniform and smooth cleavage, a uniform and attractive colour, unfading or fading uniformly, and absence of mineral constituents that dissolve with relative ease. Roofing is a very important use and formerly it was, with minor exceptions, the only use made of slates.

In the United States slates are sold by the "square"—enough slate to cover 100 square feet with a three inch lap. In France and England the unit is a "mile," 1,200 slates of any given size and sixty

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additional to cover loss by breakage. Slates range in size from seven by nine to sixteen by twenty-four inches, and the number of slates required for a square range from eighty-five to six hundred and eighty six, according to size. Ordinary slates are from one-eighth to one-fourth inch thick, and although the cost of transportation and the weight on the roof supports is less for the thinner slates, the liability of breakage is greater. The weight of a square of average roofing slates is about six hundred and fifty pounds.

A slate roofed castle at Angers, in France, a famous modern slate-mining centre, dates to about the twelfth century. As in Wales, the rapid development of the slate industry in France began about 1850. According to Mr. N. Witrin, mining and transportation methods were greatly improved subsequent to 1842, chiefly by the substitution of mechanical equipment for hand methods.

Large and heavy roofing slates, with a maximum thickness of two inches and weighing seventy-five to two hundred pounds each, have recently been much in demand. Such slates are used for roofing large residences. Popular demand calls for rough, uneven surfaces, and great variation in size and colour. The red and mottled slates of Vermont and New York are used extensively, the highly coloured ones for the weathered zone being most popular. Special heavy types of trimming machines are used in the manufac-

ture of heavy slates. In one respect their manufacture is an advantage to the quarryman in that it permits the utilization of material that would not split readily into thin slates and would otherwise be wasted.

Every householder knows that a leaky roof not only is a source of continual annoyance, but that it seriously impairs the walls and ceiling and probably the contents of the structure that it is designed to protect. Properly manufactured slates laid according to established practice on uniform and strong supports of moderately steep pitch will provide a roof that will not leak. Furthermore, a roof so constructed will maintain its quality for very many years without any repairs or treatment other than the occasional replacement of a broken slate. A more general recognition of the inherent quality of slate would no doubt lead to its wider use, for although the first cost is greater than that of many types of roofing, the low maintenance and replacement costs under long service render it inexpensive.

With the many available convincing records of the durability of slate roofs, the fact is somewhat surprising that so many permanent homes and other structures have less enduring roofing materials. This is no doubt due in part to the lower cost of the more temporary types, and in part to the aggressive advertising of competitors.

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The modern tendency toward speculative building has a similar influence, for structures built to sell are commonly covered with the cheaper and less durable types of roofing. A wider knowledge of the excellence of slate on the part of the purchasing public, and a growing demand for roofs of standard quality would tend to discourage the use of roofing that from time to time must be repaired or even completely renewed.

Although roofing is ordinarily regarded as structural material, a distinction is made in speaking of slate, the term "structural slate" being employed for slate products used for interior structural and sanitary purposes. The chief structural slate products are mantels, floor tiles, steps, risers, flagging, skirting boards, window sills, lavatory slabs, billiard and other table tops, wainscoting, hearths, well caps, vats, sinks, laundry tubs, grave vaults, sanitary ware, refrigerator shelves, flour bins, and dough troughs. A soft, even-grained slate, preferably not highly fissile, is required for such purposes.

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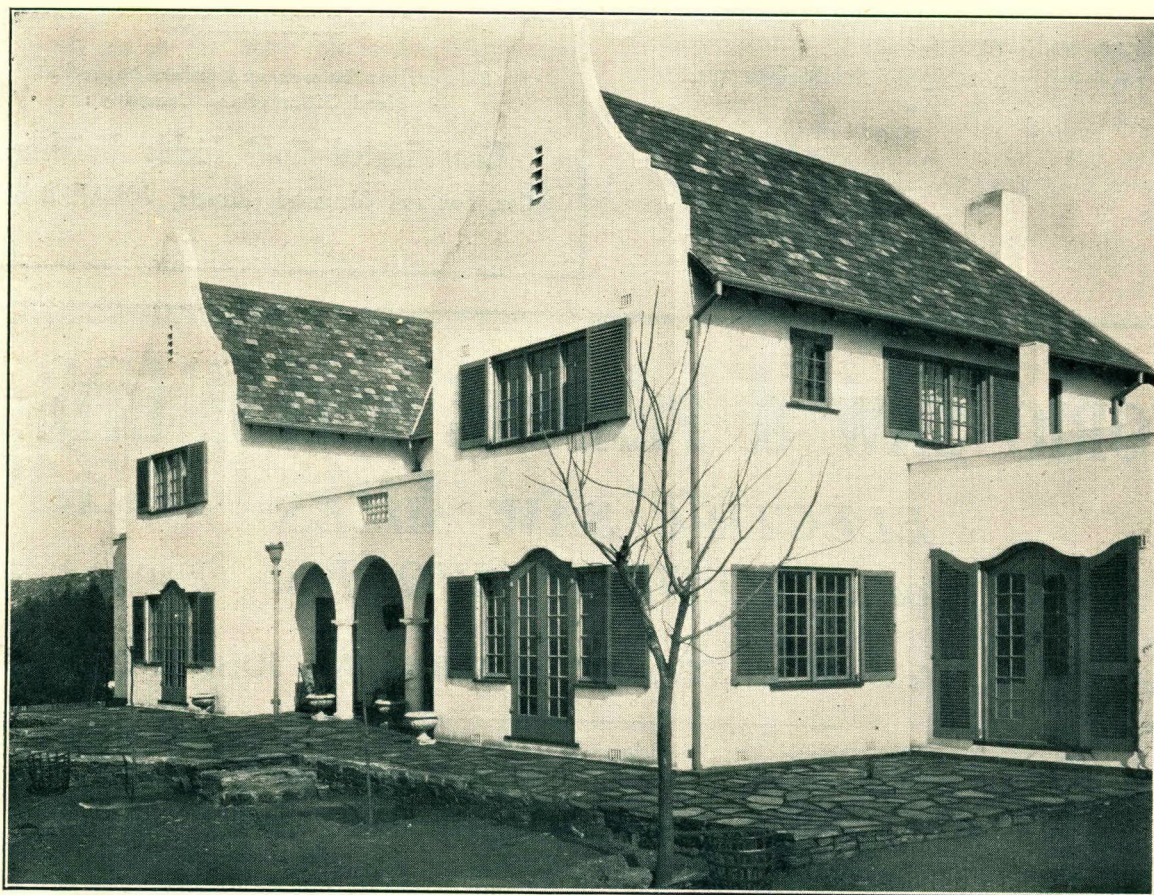
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