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1924

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EDITORIAL NOTE.

The Editor will be glad to consider any MSS., Photographs or Sketches submitted to him, but they should be accompanied by stamped addressed envelopes for return if unsuitable. In case of loss or injury he cannot hold himself responsible for MSS., Photographs or Sketches, and publication in the Journal can alone be taken as evidence of acceptance. The name and address of the owner should be placed on the back of all Pictures and MSS.

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R.I.B.A.

In connection with membership of the Royal Institute of British Architects, intending candidates are advised that the Board of Examiners of the Association of Transvaal Architects, acting for the Royal Institute, will, if sufficient candidates present themselves, conduct a special examination to qualify for associate membership of the Royal Institute, which examination is open to chief architectural assistants over 30 years of age. It is also proposed to conduct an intermediate examination for probationers of the Royal Institute who desire to qualify for student membership. These examinations will be held in the month of July, 1925, and intending candidates are requested to communicate immediately with Mr. Ernest M. Powers, Honorary Corresponding Secretary for the R.I.B.A. in the Union of South Africa, 52, Standard Bank Chambers, Commissioner Street, Johannesburg, so that all available information may be issued to them as soon as the necessary arrangements have been completed.

RECENT PRACTICE IN COLD STORAGE CONSTRUCTION.

By EDWARD H. WAUGH. A.R.I.B.A.

In this country the use of anhydrous ammonia compressors is practically universal. To those not conversant with the process it may be first briefly explained that the ammonia is circulated by means of a cylinder or compressor. The ammonia vapour is compressed, the heat rising to about 90° F., and is cooled by a condenser, and the compressed vapour then becoming liquefied is "expanded" or released into long pipes, at which stage it vapourises and its temperature is suddenly lowered to any point from 35° F. to 0° F. or zero or even less as required. It is at this stage used for refrigerating the cold stores and by its evaporation it absorbs the heat from the meat or goods stored therein and, then returning to the compressor by the sucking action of the piston, is again compressed, and is thus used over and over again. The pipes in which this releasing of pressure takes place are generally called "expansion pipes."

Other gases, such as air, carbonic acid gas and ether, are or have been used, but for shore or land practice ammonia is the most favoured to-day, the reasons for which are physical and lie outside the scope of this paper, which is intended to draw attention to a few phases in recent practice in the arrangement of cold store chambers themselves.

To grasp the treatment of the subject the reader should remember that cold air seeks the lower levels, and the warmer air rises or is pushed up by the colder air. The terms "warm" and "cold" are merely relative to one's own sense of feeling. All air has some warmth in it, and "absolute" zero has been calculated to lie somewhere about minus 461° F., though recent investigation by scientists has given light on this point, that absolute zero is still lower than this. There is no known absence of heat—or absolute zero—in any matter with which we have to deal. The term cold is relative to our senses and does not imply an absence of all heat. The zero of the thermometer is, of course, far from being the absence of heat, being an arbitrary point for measuring based on the freezing point of 25 per cent. common salt brine, just as the boiling point of fresh water at sea level is a higher point, viz., 212° F.

In cold storage practice it is usual to call bringing down temperatures to almost the freezing point of fresh water, viz., 32° F.; "chilling" and temperatures below that point are called "freezing." All products are, therefore, first chilled and, if required, are then frozen.

Some products may not be frozen without serious damage. Such, generally speaking, are fruits of all kinds. Meat may be frozen and frequently is so treated for long storage. Fruit stores are fitted up for "chilling." "Chilling" requires less refrigeration capacity or power than "freezing." A very large and excessive amount of energy has to be expended to bring chilled matter below the ice point or, in other words, to turn water at 32° F. to ice 32 F.

In freezing chambers the piping and plant is often capable of bringing down temperatures to 5° F. Below 0° F. it is not considered that lower temperatures are of any practical use. It is not usual to keep frozen meat at very low temperatures unless possibly for transit in trucks, when the stored cold in the meat will keep the temperatures well below the melting point in safety.

It is not wise to bring down temperatures too quickly, as slower reduction draws the heat out of the article from the centre more efficiently. Quick freezing may ruin meat, as the outer parts on becoming frozen case in the inner parts which still retain heat, which leads to putrefaction within, known as "bone-taint."

In cold stores there are usually four classes of apartments receiving refrigeration.: 1, chilling; 2, freezing; 3, frozen storage; 4, tanks for ice-making. No. 3, frozen storage, is a chamber which need not be very high for storing already frozen meat, about 8 to 9 feet.

Both Nos. 1 and 2, for chilling and freezing, require to be high for meat, fully 12 ft. or more. This is because it is essential that the meat hangs free and not touching anything, so that reduction of heat will take place evenly all round the article. When the freezing is accomplished, the hanging article is taken down and removed to the freezer store, No. 3, where the articles may be stacked on one another, as

on board ship, thereby taking far less space than in the hanging rooms. The sides are quartered or cut in halves for eventual storage. The reason for the chillers and freezers being high is to accommodate the length of a side of beef and the rails above, from which the beef is suspended on hooks attached to rollers or wheels running on the rails. The arrangement of these "hanging" rails, which look like the ordinary butchers' rails, is extremely complicated on account of the "switches" and the bars which hold the rails from the joists above. The rolling hooks must always be on the one hand of the rail, as the bars are on the other and block the passage. The planning of these rails will cause the designer a lot of head scratching, and indeed it is a subject which would require a long chapter to itself, and needs as much care as laying out a railway system. In the writer's opinion it is a job for the architect more than the engineer dealing with the engines and the piping, as the doors to these chambers have to be higher than the top of these rails; they are of unusual height, and it is needful to arrange a flap to allow the passage of the hook-hanger in and out on the rail. It is also needful to arange joists to carry these rails, and these joists should be separate and independent from those carrying the ceiling above, and the fasteners and bolts of these rails should be kept below the insulation above, so that they may receive attention if required. If the hangers are run through the insulation to joists above, they will cause a great loss of temperature, as there are few materials better conductors of heat or cold than steel or iron. The same remark applies to all the structural steel work and bolting, which should be insulated either from the heat outside or the cold within, as is most convenient. Any temperature loss of this nature is a loss of money, as energy has to be expended continually to make good the escape. It is like having a system of water piping in which loss from leakage is carefully prevented as far as possible. No conscientious designer will overlook these points, which, in their ramification with other considerations, make the design of cold storage one of the most complicated—if not the most—which an architect has to deal, for, as in other practice one may adapt his design to meet the errors which sometimes arise in work, in this sphere physical laws admit of no excuse, and one has to be sure before you start in.

Chilling and freezing, and also frozen storage, may, of course, take place consecutively in the one chamber, but it is often desirable to keep certain rooms for chilling only, which is enough for short storage of meat up to three weeks or for fruit for longer periods. In the same way, in very large concerns for shipping, the meat may be frozen hard in the freezers, and afterwards stored in much less space in the frozen storage awaiting shipment, thus making way for new stuff to be frozen and in its turn put in storage, till enough is obtained for a decent sized cargo. It is therefore necessary to learn from the cold storage proprietor what he requires in the way of different classes of storage.

Food products which require cold storage contain moisture, which, indeed, in the most of them constitutes, in the form of water, the greater part of their substance. The drying of such products is often used to preserve them, from the drying of milk to the drying of fruit or meat, which will show the great amount of water they contain. It is this water percentage which in meat and other matters causes the hardening on freezing. The presence of moisture in these products allows of putrefaction, which in the dried article is absent. The object of all cold storage is to retain the products in their natural state as long as possible. It should be realised, therefore, that all this stuff is dead and tending to return to "dust" or its elemental constituents. The apple on the tree dies when pulled, just as the ox dies before the slaughterman, but the process and speed of decay is different. Milk, it has been said, was "never meant to be seen." It soon becomes sour and rotten on exposure.

Air also contains moitsure, which varies with its temperature. As air is the vehicle by which the heat passes from the freezing article to the ammonia vapour in the expansion pipe, its behaviour is of the first importance. We are all acquainted with the natural phenomenon of dew, which is moisture deposited from the air at certain temperatures. The colder air becomes the less moisture it will hold, and in passing over a still colder surface will leave its moisture behind. This is an element in cold storage construction which has to be allowed for—it is of prime importance, and the behaviour of air has led to adaptations of construction with which this paper deals. Another consideration with air is that it carries impurities. Exhalations from meat, fruit and gases, and organic matter from the breath of the workmen, and infinitesimal particles of fat and other matter from the meat, are all picked up by the air, and it is necessary to remove these, if possible, from the room.

(To be continued.)

MEMORANDUM OF SUGGESTED REGULATIONS AND TOWN PLANNING AIMS FOR THE UNION OF SOUTH AFRICA.

Submitted by GORDON LEITH, M.C., A.R.I.B.A.

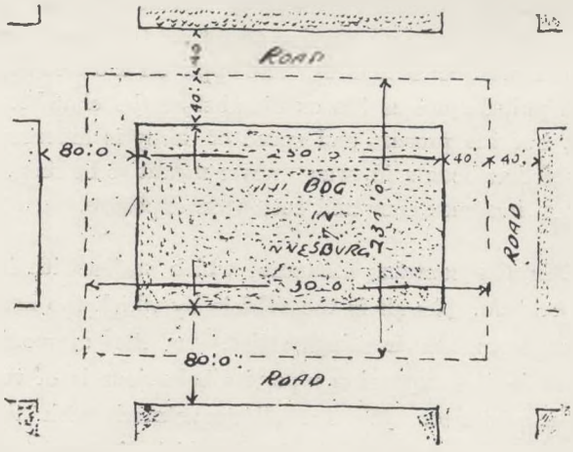
In response to the resolution passed by the Executive of the Town Planning Association on the 28th October, 1921, I venture to submit the following suggestions, with all humility, for the consideration of the special committee appointed to deal with this subject.

In making these suggestions I have been guided to a certain degree by what has been done on the Continent of Europe and America, but more especially by observations made during several years study abroad, with a special view to ascertaining the requirements of South Africa.

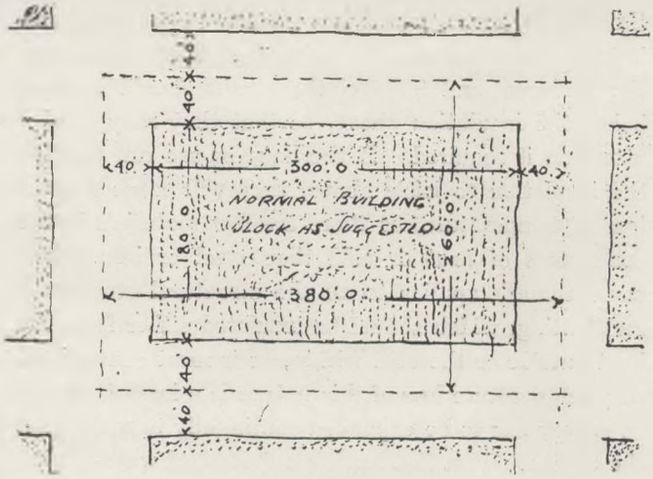
The foremost conclusion I have come to is, that it would be a mistake to fetter a young and growing country, and especially a country so sparsely populated as ours, with the limitations imposed on Town Planning Experts in the more populous parts of the world. The opportunity we have for laying the foundation of our future cities is unique in every possible respect. We are at liberty to lay out our towns on far more generous lines than any country in existence.

The increasing importance of motor and aerial traffic render distances of less importance, and street crossings correspondingly less desirable.

For this and other reasons it is suggested that building blocks in primary towns should be increased to 180′ × 300′ (English feet). By this means the relative amount of road area required will be reduced and an increased courtyard of light area would be given to the building blocks. For the purpose of comparison let us take the present day building blocks of Johannesburg:—



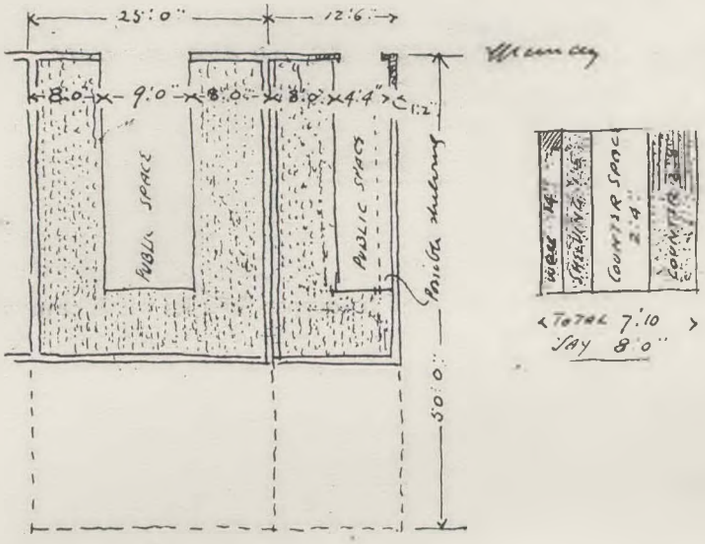
Total area of building block = 250′ × 150′ =	37,500 sup. ft.
Total area of ditto, including relative proportion of road = 330′ × 230′ =	75,900 ,, ,,
Road area to each block = 75,900′ – 37,500′ =	38,400 ,, ,,
Increase of road area over building area = 38,400′ – 37,500′ =	900 sup. ft.



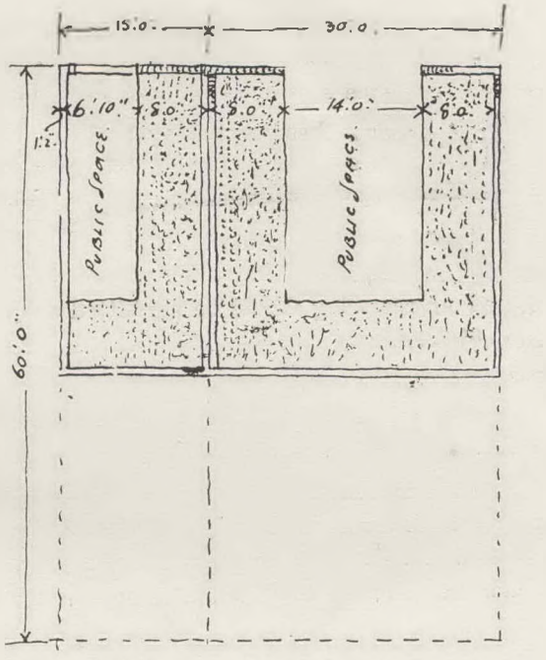
Total area of building block = 300′ × 180′ =	54,000 sup. ft.
Total area of ditto, including relative proportion of road = 380′ × 260′ =	98,800 ,, ,,
Road area to each block = 98,800′ – 5,400′ =	44,800 ,, ,,
Decrease of road area under building area = 54,000′ – 44,800′ =	9,200 sup. ft.

It may be argued that the relative widths of roads shown are not proportionate to the sizes of the building blocks. My contention is, that by the increase the blocks are capable not only of accommodating a great number of people, but that the possibilities of area ventilation and lighting are vastly improved. The average size Johannesburg plot of 50′ × 50′, 25′ × 50′, or 50′ × 100″ is an awkward one to plan

satisfactorily. A shop front on the 100′ basis would have to be 100′, 50′, 25′ or 12′ 6″ frontage. Of the two latter, 25′ shop represents one with two counters and the other a single counter shop; the amount of space available for the public is reduced to 9′ 0″ and 4′ 4″ respectively, which amount is considered insufficient from an hygienic as well as from the lessee's viewpoint of comfort and efficiency.

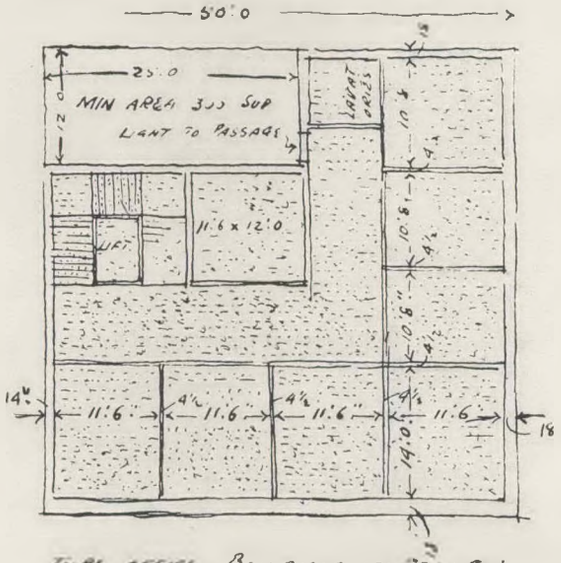


TYPE OF JOHANNESBURG SHOP SHOWING PUBLIC CONGESTION DUE TO THE 100 FOOT RATIO

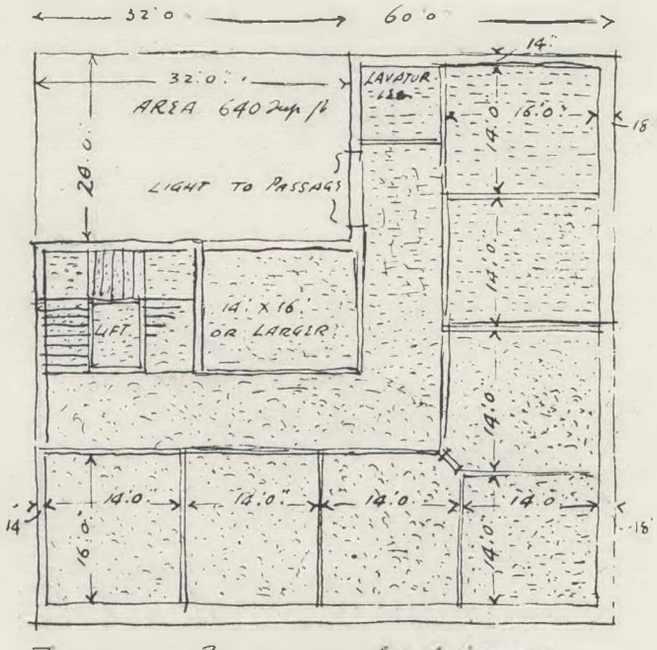


TYPE OF SHOP SUGGESTED ON THE 120 RATIO

The case of office buildings on 50′ × 50′ stands is even more deserving. After making allowances for staircase and lift a width is left which is insufficient to accommodate four rooms abreast and is too much for three rooms, besides the fact that the cost of running and supplying a lift makes the three-roomed proposition (per front) untenable.

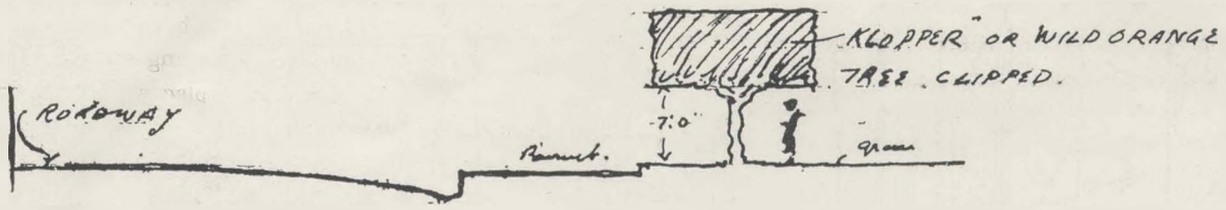


TYPE OFFICE BUILDING ON 50' x 50' STAND IN JOHANNESBURG.
AV SIZE OF OFFICES = 145 1/4 sup FEET.
LIGHT AREA = 300 sup

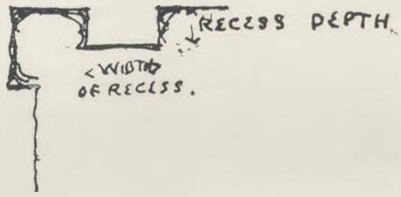


TYPE OFFICE BUILDING ON 60' x 60' STAND.
AV SIZE OF OFFICE = 220 1/2 sup FEET
LIGHT AREA 640 sup ft

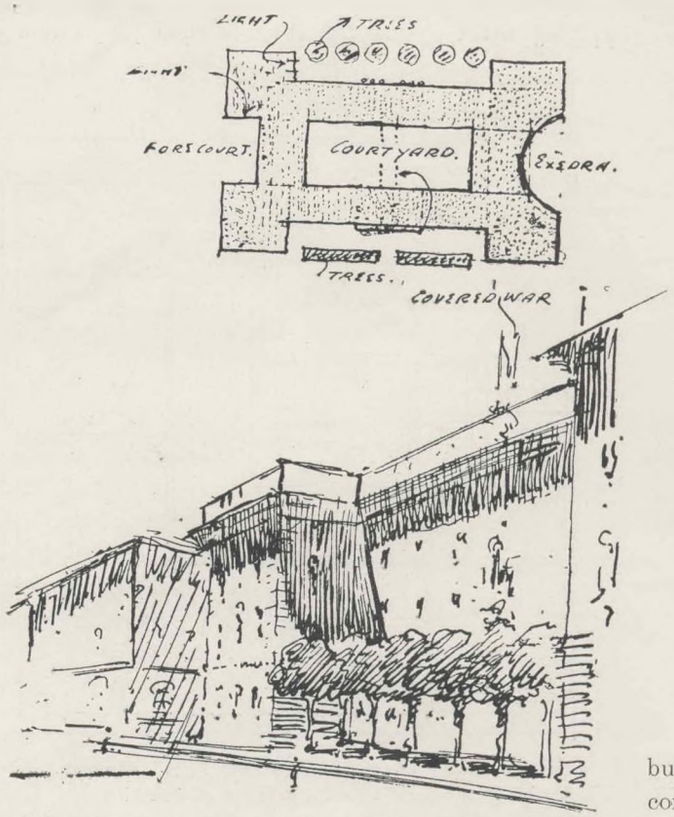
By the increase in size of building blocks, new and refreshing possibilities of street architecture are opened up, such as the creation of spacious inner courts or areas, or of recessing central portions of buildings from the street front, and thereby permitting the introduction of rows of trees as protection from the heat of the mid-day sun.

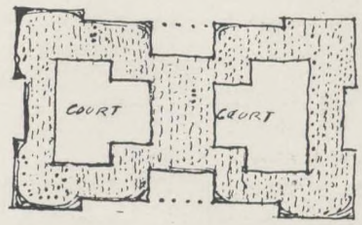


Plan recessing should be permitted subject to the rule that no recess shall be deeper than its width or more than 60′ deep.



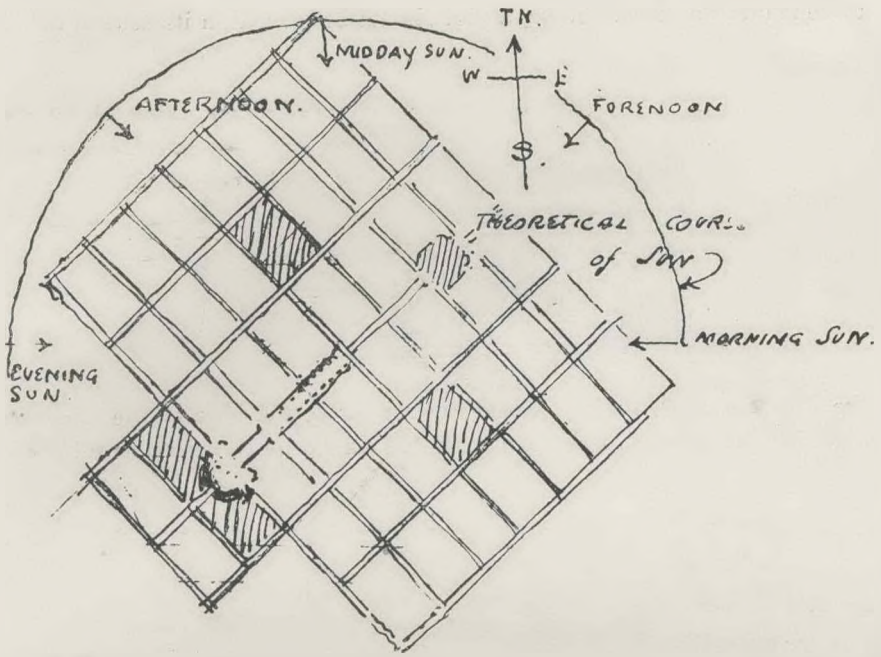
Plan recessing for building blocks such as we have under consideration could be carried out in various effective ways:







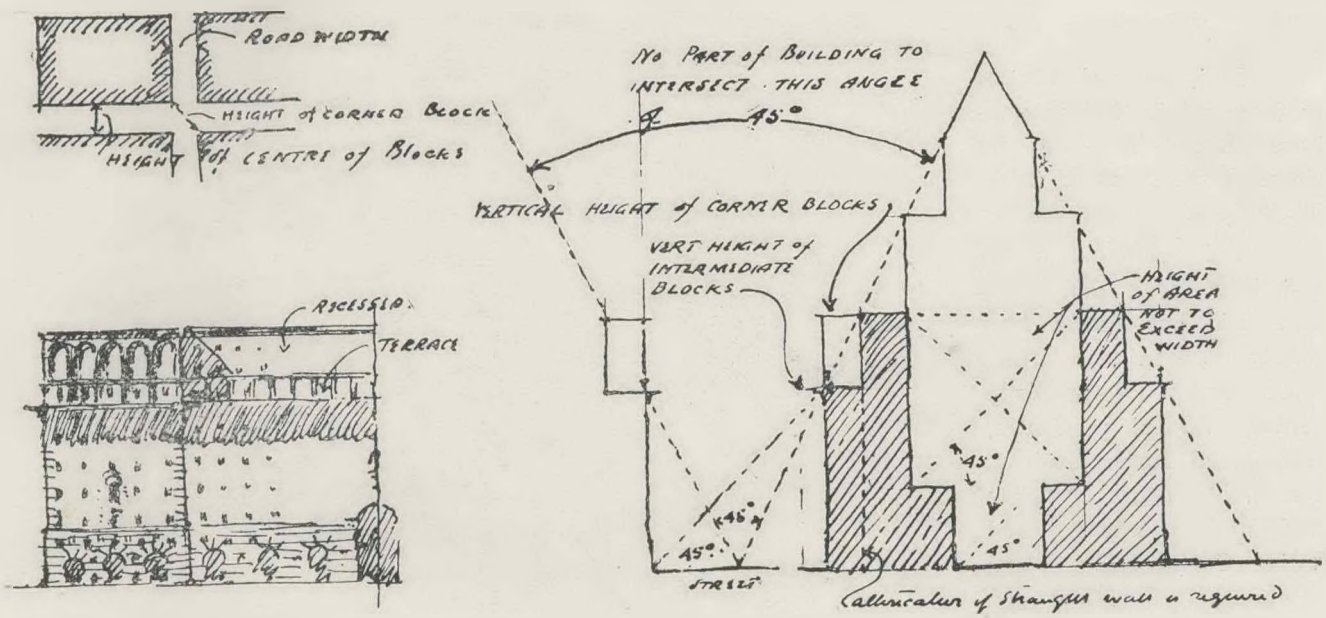
The admission of sunlight into every part of a building and street at some time of the day is of considerable importance, and for this reason it is suggested that as far as possible townships should be orientated towards the N.E.



The "lungs" or open spaces of every new town in the Union should be equal to 1-10th the total area of the layout. (See hatched portion of adjoining plan for relative proportion.) Such space may be distributed by widening streets, creation of gardens, places of assembly, recreation, etc., etc., and are to remain the ratepayers' heritage.

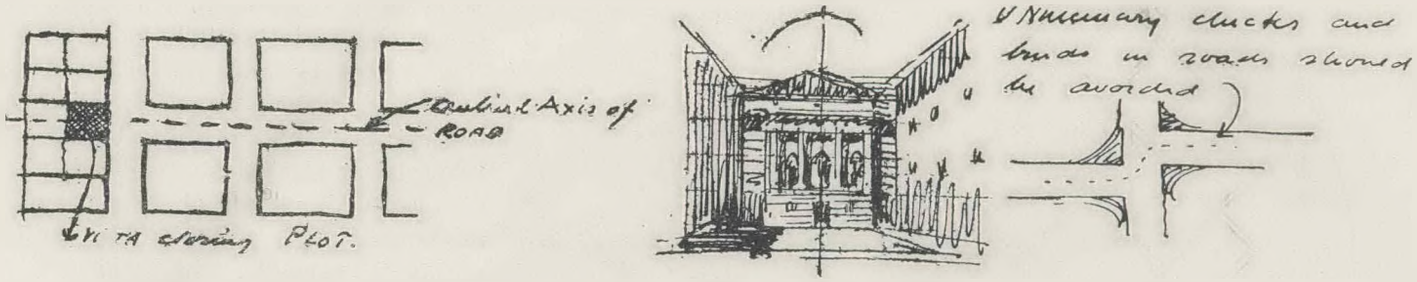
Widths of streets should average 50′ 0″ plus 2-5ths of that amount for pavements, a total of 70′ 0″. Main thoroughfares and streets embodying tram routes should be considerably wider.

Heights of buildings should not be more than the width of streets on which they front, except in the case of corner blocks, the height of which will be equal to the diagonal of the corner. A further concession is permissible provided the building is stepped back after the maximum vertical height has been reached; in

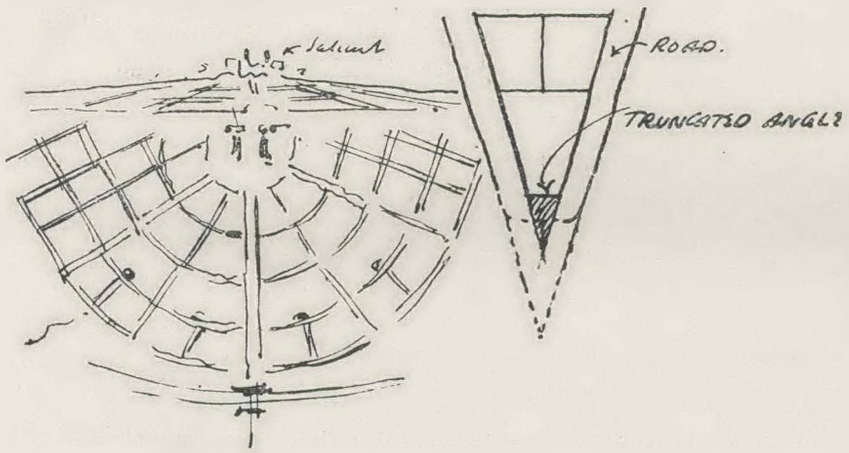


so doing they should be made to recede behind a line drawn from the centre of the road to the highest point of the vertical intermediate walls.

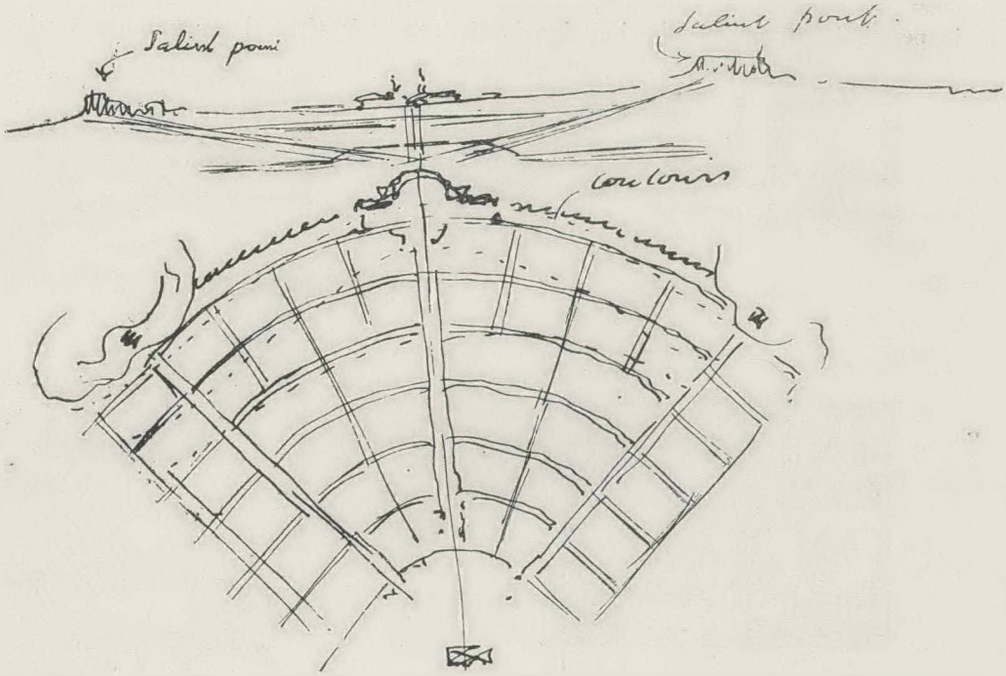
Where it is necessary for a road to conclude its direct course, a plot should be placed on its central axis in order to provide a climax to the vista.



Angles less than 90° formed by the junction of two roads should be truncated, the base of the truncated angle being equal to the width of the adjoining pavement; angles less than 45° should be truncated in ratio with the angl's diminution.

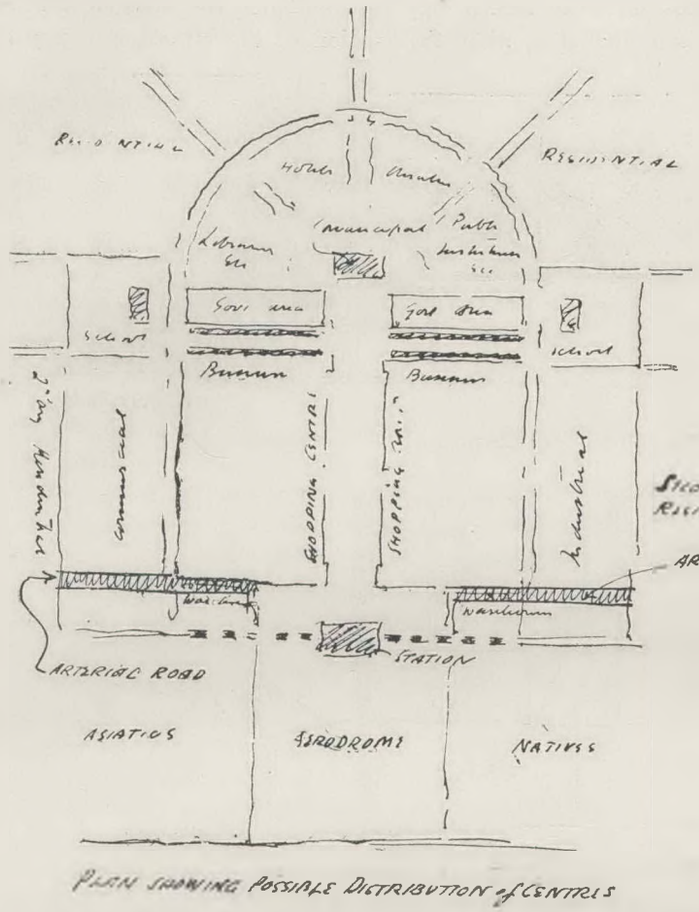


It is further suggested that in so far as it is possible a layout should conform with the natural lie and disposition of the ground. Salient points and peculiarities of the site should be co-ordinated and, together with the contour levels, form the basis of a layout scheme.



It is on such centres or focal points that reservations should be made for either Government or public institutions.

It is considered of the first importance that every town laid out should have clearly defined areas allocated as follows:—Civic Centre, Shopping Centre, Commercial Centre, Business Centre, Industrial Centre, Residental Centres, and Native Centre. The plans should be conceived on generous lines in order to avert later congestion and changes. In addition, sites should be allotted in appropriate sections for Government Schools, Post Office, Magistrate's Offices, Police Headquarters, Municipal Buildings, Hospitals, Railway Station, Library, Swimming Baths, Recreation Grounds, Aerodrome, etc., etc.



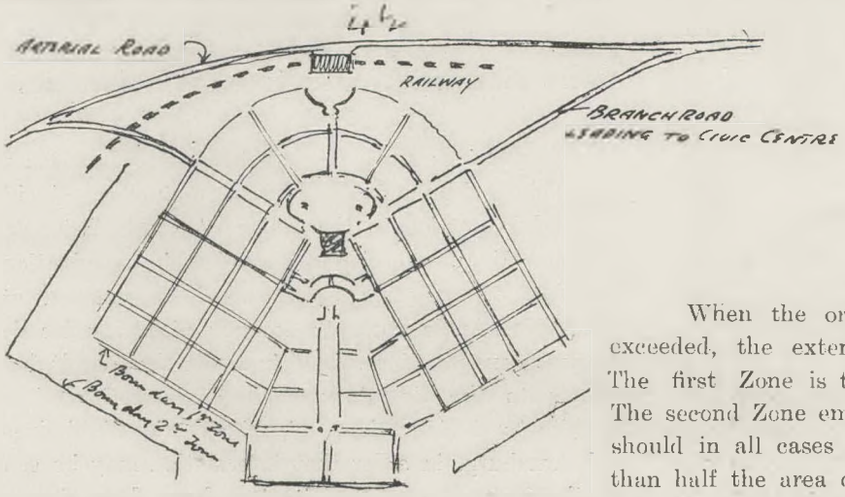
PLAN SHOWING POSSIBLE DISTRIBUTION of CENTRES

The tendency to lay out townships on the gridiron principle, wherein the largest number of small plots are squeezed into the smallest possible space and given the largest possible amount of road way to be paid for indirectly by the ratepayers, appears to be the outcome of an endeavour of land surveyors to simplify their work as much as possible and, at the same time, give the landowner what appears on the face of it to be a money producing scheme.

It has been definitely proved that such schemes are *not* economical, and that in every possible way they are detrimental and have a monotonous and lowering effect on their inhabitants.

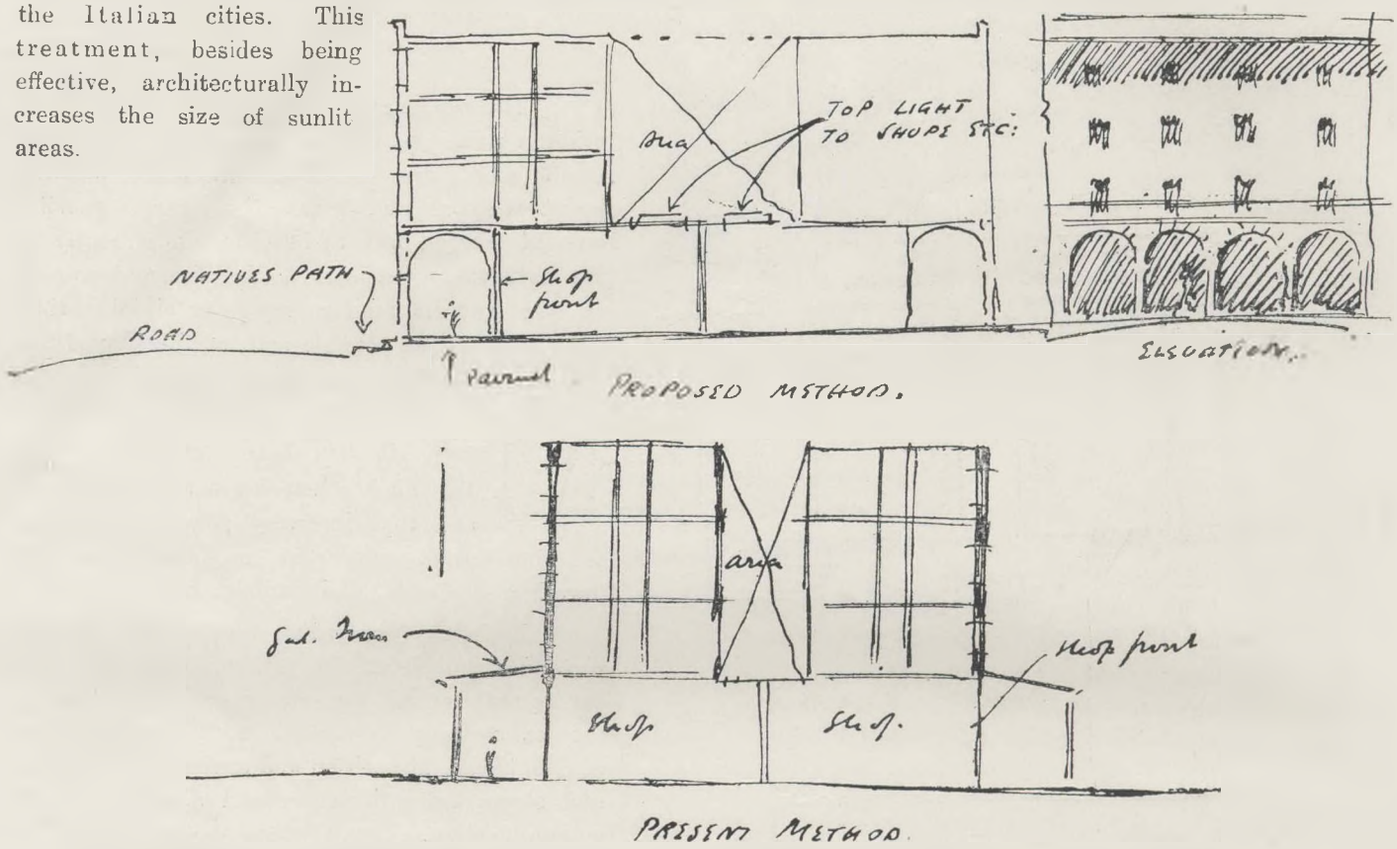
It is my contention that equally divided plots distributed on the gridiron principle, and consequent facility for setting out and mapping, are as nothing compared with considerations of orientation, disposition and environment, sewage and storm water drainage, and arterial lines of communication.

It is suggested that arterial roads should be allowed to pass on the outskirts of the inner or primary zone, and that branch roads from it should communicate with the civic centre. This will permit a continuous stream of fast traffic traversing the town thoroughfares, yet allowing those who intend entering the town to do so without inconvenience.



When the original limits of a layout require to be exceeded, the extension should be carried out in Zones. The first Zone is that with which we have hitherto dealt, The second Zone embodies its immediate environments, and should in all cases be separated by a commonage not less than half the area of the first Zone, and should encircle it on all sides. This area is to be reserved for recreation purposes and should, in years to come, serve as a Grand Boulevard and promenade.

Among the features of town planning applicable to South Africa may be mentioned the arcaded streets. Provision should be made for the arcading of main thoroughfares, after the fashion of the streets in many of the Italian cities. This treatment, besides being effective, architecturally increases the size of sunlit areas.



Aesthetically the arcaded street has much to commend itself, as it permits the superimposed walls to rest on visible supports, rather than on what optically appears to be a mass of plate glass.

The Architects' Act for the Union.

The Registration Executive Committee are busily engaged upon the final draft of the proposed Bill, and it is confidently hoped that the document will reach its final form at an early date and be ready for lodgment with the Clerk of the House of Assembly on the prescribed date in November, so that it can come before the House early next year.

A deputation from the Executive recently met members of the Institute of the Municipal and County Engineers and explained to them the aims and objects of the proposed Bill, and in so doing dispelled any impression there might have been regarding the curtailment of the functions of engineers. A similar course has been adopted in respect of the S.A. Society of Civil Engineers, and both these professional bodies are satisfied that the provisions made in the Act will in no way interfere with the engineering profession.

It may be considered advisable by the Executive to issue, to interested persons, a revised copy of the Bill in the form it is proposed to submit it to Parliament.

In case the expenditure for this proposal is greater than the Executive desire to go to, then a number of copies of the amendments to the proposed Act, issued in October, 1922, will be available at the Headquarters of the various Architectural Bodies throughout the Union.

The Baker Architectural Scholarship.

Negotiations are pending between the Trustees of this Scholarship and the Federal Council on Architectural Education in the Union of South Africa for the immediate promotion of a scholarship examination. In view of an early agreement being arrived at, intending eligible students desirous of sitting for the proposed examination should immediately submit their names to the Secretary of the Federal Council on Architectural Education, 67, Exploration Buildings, Johannesburg, in order that information may be sent to them as soon as the Trustees have decided on a course of action.

THE ORIENT.

(Sketch No. 2.)

By G. W. NICOLAY, F.S.Arc.

Long before Lucas Tudrill, the traveller from afar, resumed his journey at half-an-hour before sunrise, notice had been sent to Fu-san-su and to all stations that he would pass on the way there, as well as to Wi-hi, the principal merchant of the place and district.

He had the introductions which assured him all he could need on the way, which relieved him from the vexations common to travellers, and he found those he met seemed to be aware of his approach and always spoke to him, offering him any assistance they could give.

Most pleasantly he journeyed on and climbed the pass on the morning of the second day, from which now and then he saw with delight the great river as, now confined within its rock-bound course, it plunged through the gorges and, turning sharply to the north, was lost among the hills.

Five days' travelling brought him to within six miles of his destination, where he stayed the night with the factor of the merchant he wished to meet, and, learning from him that Wi-hi wished to see him privately before he went on to the town, stayed the night with his factor.

While travelling he had seen no houses of any consequence. Those he had stayed in were mean enough, but preparation had been made for him, so that he had been comfortably lodged.

Here all was different, for he found more ceremony and even more luxury with the merchant's factor than he had before with the country proprietor.

On arrival he noticed a great dissimilarity in the building; there was no bamboo to be seen about these premises, and the buildings were arranged quite differently and of another type.

Some remarks as to this seemed rather to amuse the factor. Certainly there were great differences; those people away in the country he thought very uncivilised, and in the morning he would show his guest something more worth his attention, and, leading him into the house, ordered some light refreshments. Wi-hi would not arrive until noon next day, so there would be plenty of time in the morning to show him over the place.

Accordingly after breakfast he redeemed his promise, and the notes made by his guest serve again the present editor's convenience.

Here was a considerable silk industry, but the house stood apart from it in the midst of a little forest of noble trees. Unlike that which pleased him so much a few days before, the buildings stood apart from each other and were not fenced in, but were disposed so as to take full advantage of their surroundings.

The factor's place or principal section of his somewhat dispersed establishment stood with its offices and servants' quarters in the midst of a beautiful garden, so skilfully planned that the offices and servants' quarters, very close to the house though they were, took their share in the general composition. Even the path used by the servants was cunningly masked by making a double bridge over an artificial stream of water, the lower path for the servants, the upper path for the factor and his friends.

The general disposition of the buildings was about an oblong square, the principal lines of them keeping this form exactly, but the trees were placed irregularly, as if they had grown naturally. From the town, the high road passing by the estate formed its boundary and was fenced off by a thick drystone wall with a wrought stone coping.

The private road that led to the works was made to take an easy turn as it approached the house, not to hug the gardens and yet be close to the factor's house. This was placed with the centre line on the longer axis of the enclosure which was at right angles to it. At the other end of the enclosure a small temple was placed, with on either side a small house for the accommodation of the priests. The flanks were occupied by four other houses, two on either hand, and the offices and servants' quarters, though not in line with the other buildings, served to complete the enclosure.

Occupying the central axis, and stretching from the front of the factor's garden to the steps of the temple, a broad path was laid with porcelain slabs of different colours, yellow and blue predominating. This length was divided into three; at each of the points of division a screen wall twenty-one feet wide and twelve feet high, pierced with a complete circle, nine feet in diameter, just clear of the pavement, which was raised at the sides and made hollow with specially moulded slabs, so that three persons could at once pass through conveniently. These walls were covered with roofs of glazed porcelain tiles and of the same shape as the roofs of the houses, which will presently be described.

A stream of clear water was led on to the ground from the watercourse which supplied the irrigation furrows and entered the enclosure between the factor's house and his servants' quarters, and passed under the bridge already mentioned and commenced its serpentine course through the grounds.

Noting that the central path and archway suggest a six-pointed division of the ground, the serpentine course of this stream may easily be imagined.

Passing away from the bridge and swinging gently to the left, it passed through half the distance between the garden gate and the pierced wall and, after turning more than a full half circle towards the porcelain path, with another and quicker turn passed beneath it and, going in a reversal of the same figure in the next sec-

tion, flowed on in the same method through the other four. Where the stream passed under it the path was raised in a slightly arched form and carried on a porcelain arch.

If the bends in the course of this little stream had been repeated with anything like precision, the effect of the whole would have appeared much too formal to satisfy a lover of nature, and the man who arranged all this was devout in that. So the course was designed so as to give room to allow the large trees to be placed accidentally. Care was taken to prepare for variety in the flow also of the water by alteration of the stream bed, assuring a quicker flow here and there, and where the porcelain bridge passed over it was made wider and deeper, forming pools, where the water lillies moved gently to and fro and brilliant fish slept in the shade or darted across in the sunbeams. By a skilful arrangement of live-wood screens a comprehensive view of the garden was prohibited, but occasion afforded for shaded seats made of ebony, inlaid—some with ivory and some with mother-of-pearl.

Paths leading to these places of serene repose were planned with straight or nearly straight lines, and, where led up to the water, were bent towards it, so as to make the crossing at right angles, the crossing being made by a broad and thick plank of ebony, and the path turned easily away from it again in the same manner.

Along the porcelain path a deep flower bed was planned, straight in front, and at the back shut in with live-wood screens in two rows in section with spaces between. In the front row a section was placed against each of the cross walls with the round openings, the others being arranged in line with these, leaving spaces between, and the next row similarly in sections but higher and covering the ends of the walls and the openings of the front row.

A wealth of beautiful flowers occupied these beds from end to end, and some trailers planted in front were allowed to stray over the porcelain curb and tone its severity.

Grass was laid down over the remainder of the ground, not flat, but with an undulating surface, having beds of choice flowers arranged with good judgment by the rest places and the water, this treatment being right up to the houses on each side.

The factor's house was raised upon a terrace about two feet above the general level, the retaining wall faced with porcelain and had a coping of the same material, and the temple with its attendant lodges similarly treated, the temple being further raised upon seven steps. These terraces and the bridges were guarded by bronze rails of simple pattern. The terrace of the temple was paved with porcelain, but that of the factor's house laid out as a garden.

The stranger looked upon all this with astonishment and delight. He had never seen anything like it. He followed his equally delighted host to inspect the temple, on the steps of which one of the priests met them and, after a few minutes' conversation, engaged their attention with the outside, pointing out the various significances of the enrichments.

The temple was small and simple but the workmanship displayed in the building was fine. In form it was circular, about twenty-one feet in diameter, and stood on a podium of seven steps. These were of pale yellow porcelain, and the top step stood just clear of the overhang of the roof. The posts, ten in number, which carried the roof, were so placed that an opening came at the front and formed the entrance. They stood on a base course of blue porcelain, which in the intervals between the posts was only six inches thick; the posts were twelve inches each way and a plate fourteen inches wide and six deep. The rafters were six inches by four in section, fixed with the larger dimension upon the plate; they were curved because the roof was made concave and in three lengths, with carefully designed scarfed joints, and projected three feet from the plate by triangular blocks tenoned to both rafter and plate; these projected on the inside beyond the plate and those over the posts considerably further, from the plate by triangular blocks tenoned to both rafter and plate; these projected on the inside beyond the plate and those over the posts considerably beyond, and were all carved. Notched down upon the rafters boards about two inches thick, diminished towards the outer edges, cut circular and laid together like the inverted voussoirs of an arch, formed a solid covering about three inches thick, upon which the tiles were laid. About one-third from the top a large block carried by a centre post received the ends of struts to the rafters, and the under side of the boss was carved. All was of ebony, externally left plain but on the inside inlaid with ivory and mother of pearl, and gilded. Between the posts the spaces were filled in with reticulated tracery, the boss being round in section, to a height of about four feet from the floor, and the work about three inches thick, finished with a rail seven inches wide and of a round section. Between this and the plate was filled with delicate bronze screens of honeycomb pattern, with at the angles of the hexagons, little buttons wrought into many little fanciful varieties all over the work. Bronze gates, matching these screens, closed the entrance when required. The roof covering of blue porcelain tiles was particularly remarkable. These tiles were about twelve inches wide at the eaves and diminished course by course to about four inches at the top, and diminished also in depth the same way, with radiating joints vertically, and circular edges top and bottom, and concave in section. The roof covering presented a difficult piece of work. The cicerone directed Lucas Tudrill's attention to this, and modestly said he regarded this tiling as a great triumph of craftsman-

ship, adding that he thought their visitor would be interested to know that he had records of its building.

First the woodwork was brought to the perfect form required and careful measurements taken, and the roof covered while the tiles were being made with blue oiled silk. The tiles were made with rounded edges to prevent chipping, and were laid in position as soon as they came from the kilns, row by row. If, when a row had been tested, the last tile left a joint on one side of more than the width of two fingers, a special tile was made to take its place. Vertical joints also had presented a difficulty, for if they had been kept one above the other in alternate courses, the tiles in the upper rows would have become mere strips. The joints were moved a little to the right and left alternately, as the work proceeded, and this removed the difficulty as well as avoiding making spirals with the joints. An eaves gutter of bronze carried the rainwater to a tank below the terrace behind the temple.

Beyond all this the colour of the tiles had been most carefully studied. No plain wash of colour, as it were, had been considered sufficient, but the tiles were coloured with many tints of blue and allied greens, producing a rich effect full of beauty.

Passing within, their guide drew attention to the superb floor of red marble, which he said had been obtained at great expense, as well as the great block of pale green marble, from a quarry far away.

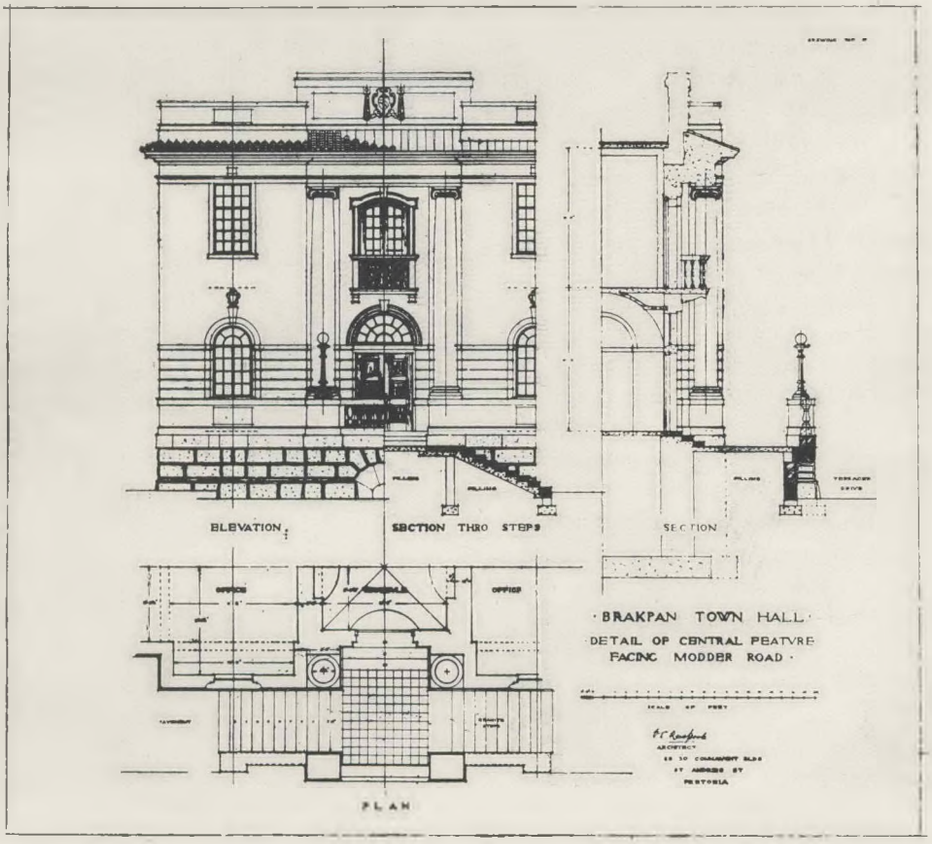
The centre of the floor was a square of thirteen feet in one piece of dark red; a margin of white a foot wide ran all round by the porcelain base, then a strip of black, then four pieces of red, somewhat lighter than the centre, the joints between which radiated from the corners of the square centre; and the inner edges parallel to it, and between these and the centre a strip of pale green.

Opposite the entrance and just behind the green strip, stood a large block of pale green thirteen feet wide, four high and three deep, upon which were placed the figures of the three Buddhas. Behind this the space between the posts was completely filled in with ebony, and the part visible above the green marble block richly inlaid with ivory and mother of pearl.

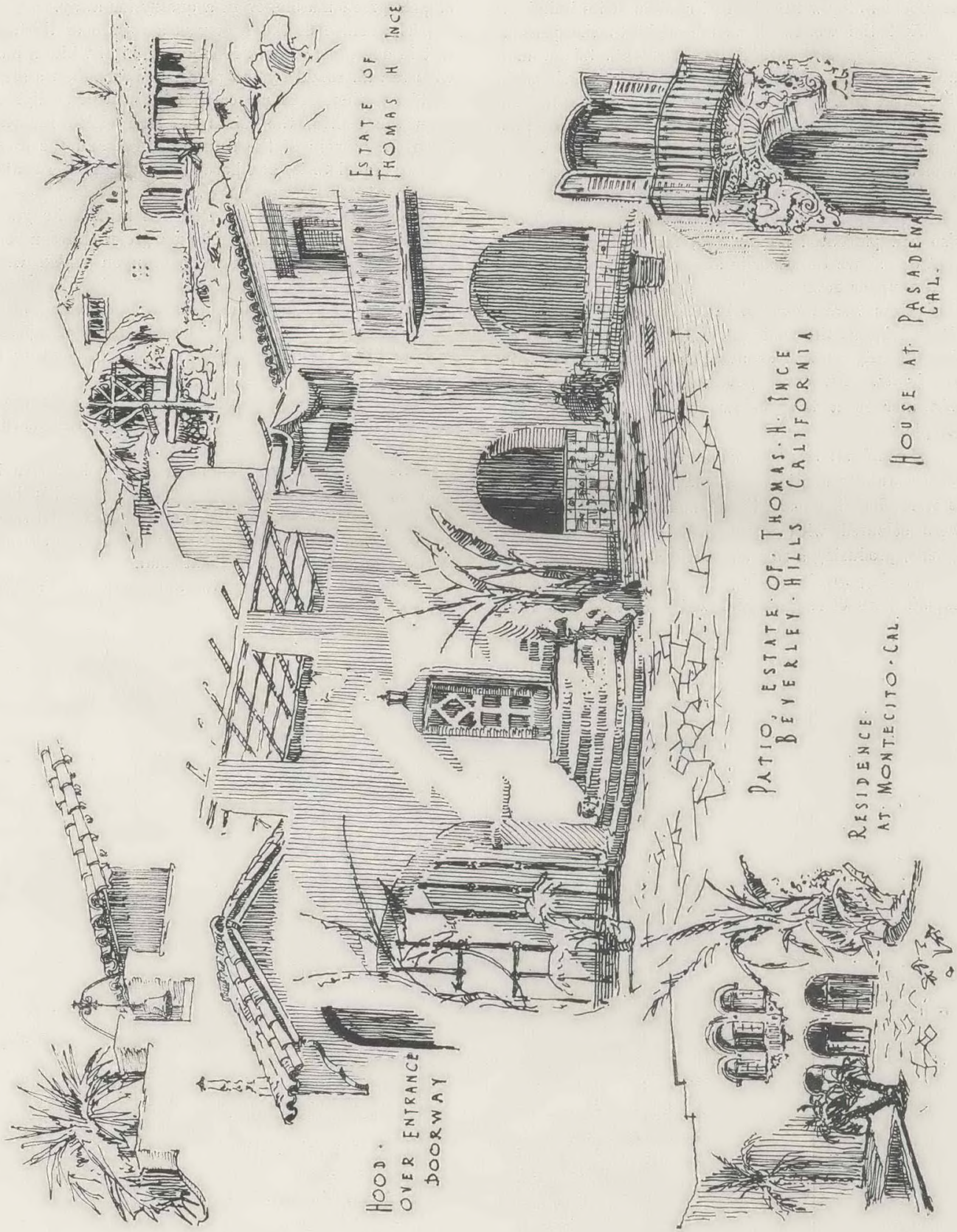
The Buddhas were of bronze, inlaid with other metals, and before them upon the deep red marble slab stood a finely wrought bronze table.

Wi Li was announced by a runner to arrive in half an hour, and so Lucas Tudrill and his host thanked the priest for his courtesy, the traveller expressing admiration of what he had seen, returned to the house to meet the great man.

The notes referring to this part of Tudrill's journey here end.



Brakpan Town Hall—Detail of Central Feature.
V. S. Rees-Pode, Architect


ESTATE OF THOMAS H INCE
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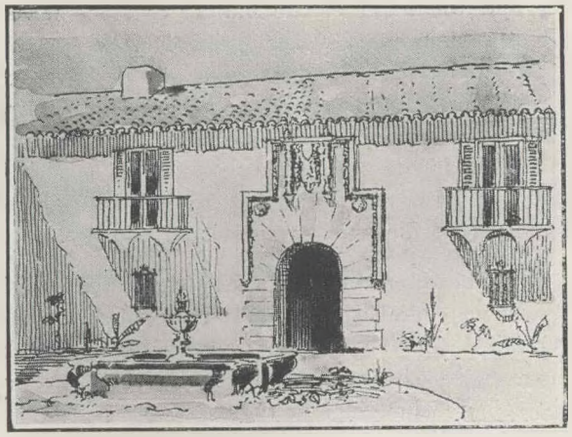
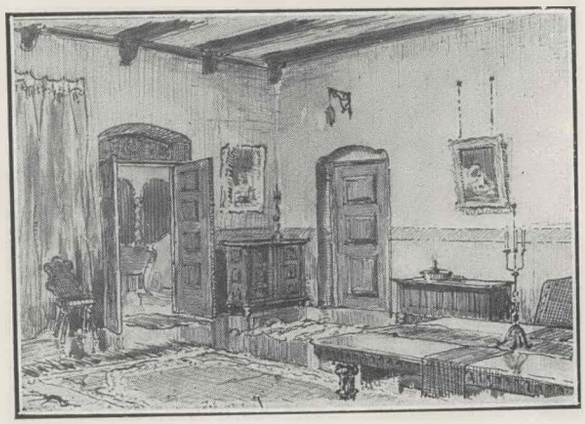
RESIDENCE AT MONTECITO CAL
HOOD OVER ENTRANCE DOORWAY





SPANISH MISSION ARCHITECTURE.

There is a threadbare saying that the manners and customs of a people are mirrored in their architecture.

This is singularly true of Johannesburg. Its rapid growth from a mining camp to the largest city in South Africa is reflected in the juxtaposition of large and pretentious buildings to mean corrugated iron shanties of the most primitive kind.

It was inevitable that a population drawn from almost every country under the sun should bring with it a distinctly cosmopolitan mixture of architectural styles, but one is hopeful that out of chaos order may come: in other words, that those foreign styles which are applicable should help to mould a style or styles suited to our own needs in our own country.

We are a country unhampered by tradition, if we except the Dutch homesteads of the Cape; and it is unnecessary to point out that the Cape differs very largely from the Transvaal, both climatically and in general appearance and conditions. There are three questions which the designer of a building should ask himself, namely: "Does it fulfil and express its purpose?" "Is it soundly constructed?" and "Does it suit its setting?"

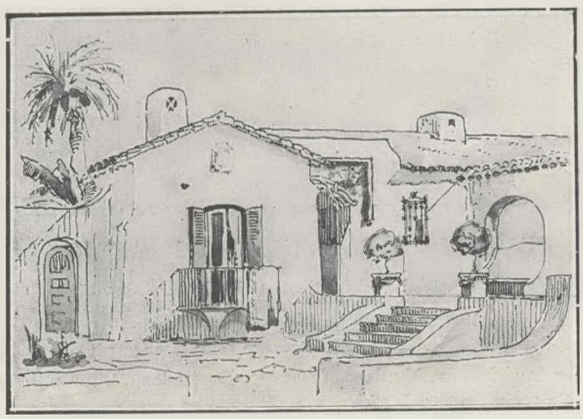
The answers to these will give a fairly correct estimate of the measure of success attained by the architect.

These Dutch colonial houses with their picturesque gables, thatched roofs and stoeps were a logical and successful attempt to adapt a European style to the needs of the South African colonist.

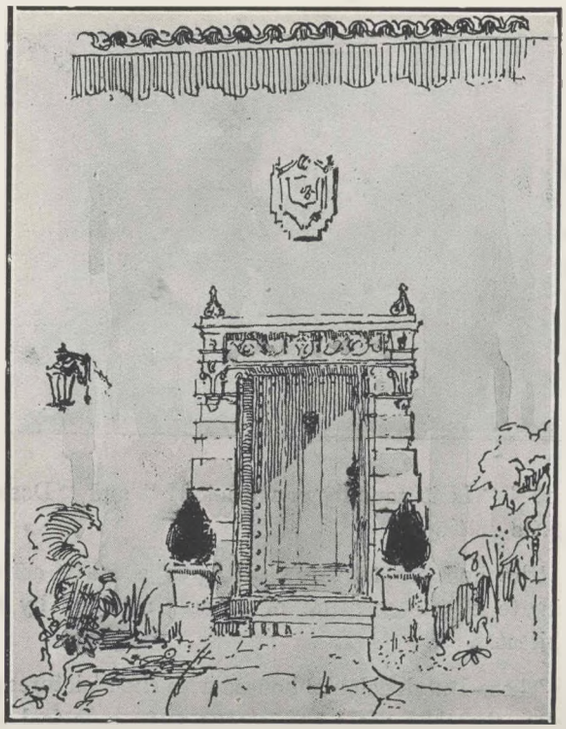
The style shown as "Spanish Mission," which has developed of late years in California is similar in many respects to Cape Dutch architecture. It is again a case of an European style transplanted overseas, shorn to a large extent of superfluous ornament, but possessing in general the characteristics of its prototype.

There are twenty-one of the missions which extend along the coast of California for a distance of roughly five hundred miles, being about a day's journey apart. They were founded by Padres of the Franciscan Order, the first one being built at San Diego in the year 1769.

The monks were their own architects, the natives supplying the labour. The necessity for protection







from hostile tribes gave rise to the characteristic "patio" or central court-yard, around which were grouped the mission buildings, and in the centre of which was the well or fountain. In addition to the patio, the following are characteristic of the style:

(*a*) Massive walls, piers and buttresses.
(*b*) Barrel vaulted corridors.
(*c*) Widely projecting eaves.
(*d*) Broad, undecorated and undulant wall surfaces.
(*e*) Low pitched tiled roofs.
(*f*) Fine metal work.
(*g*) Colour.

The influence of the native and Mexican artisans is apparent in the similarity in general external appearance to the Mexican "pueblo," a sketch of one of which with its flat roof and projecting roof timbers I append. Construction is definitely reflected in appearance, and the hand of the builder and the mark of his tool remain part of the finished work.



The style generally is simple almost to severity and relies for its effect on the contrast of concentrated ornament with plain wall surfaces. Ornament is mostly confined to the entrance doorway (which has generally a heavily sculptured or modelled hood) and a wrought iron grille over an occasional window.

The interior corresponds in feeling to the exterior. Lofty rooms, bare of ornament, save here and there an enriched fireplace or an ironwood lamp bracket, form a fitting background to heavy furniture and bright coloured hangings or rugs.

Coloured tiles are extensively used both externally and internally. The plan generally is rambling, its form in all cases dictated by the site, and, as a general rule, the picturesque has preference to the formal.

In conclusion, I should like to acknowledge my indebtedness to the following architects, from whose work the majority of my sketches were taken: Messrs. Marston & Van Pelt, Reginald D. Johnson and Roy Seldon Price. J. P. N.

Architecture of Southern Spain.

This work has lately been added to the collection of art books at the Johannesburg Municipal Library. It deals with minor ecclesiastical, domestic and garden subjects. The work is by Austin Whittlesey, with a preface by Bertram G. Goodhue, and has been published in New York. The scene of the author's labours was chosen early in the Great War, as other countries were then closed to travel. The work was carried out in order to compete for the Le Brun Scholarship, which requires "travel and study of architecture." It has been compiled after much difficulty of travel over months and consists largely of selected photographs and also some sketches. As the climates of Spain and the Transvaal have similarity, the work will be of interest to our architects, affording many examples for study and adapted to our sunshine.

E. H. WAUGH.

THE STANDARD SYSTEM OF MEASURING BUILDERS' WORK IN SOUTH AFRICA

Compiled and Issued by the S.A. Institute of Quantity Surveyors, and approved by the National Federation of Building Trade Employers in South Africa.

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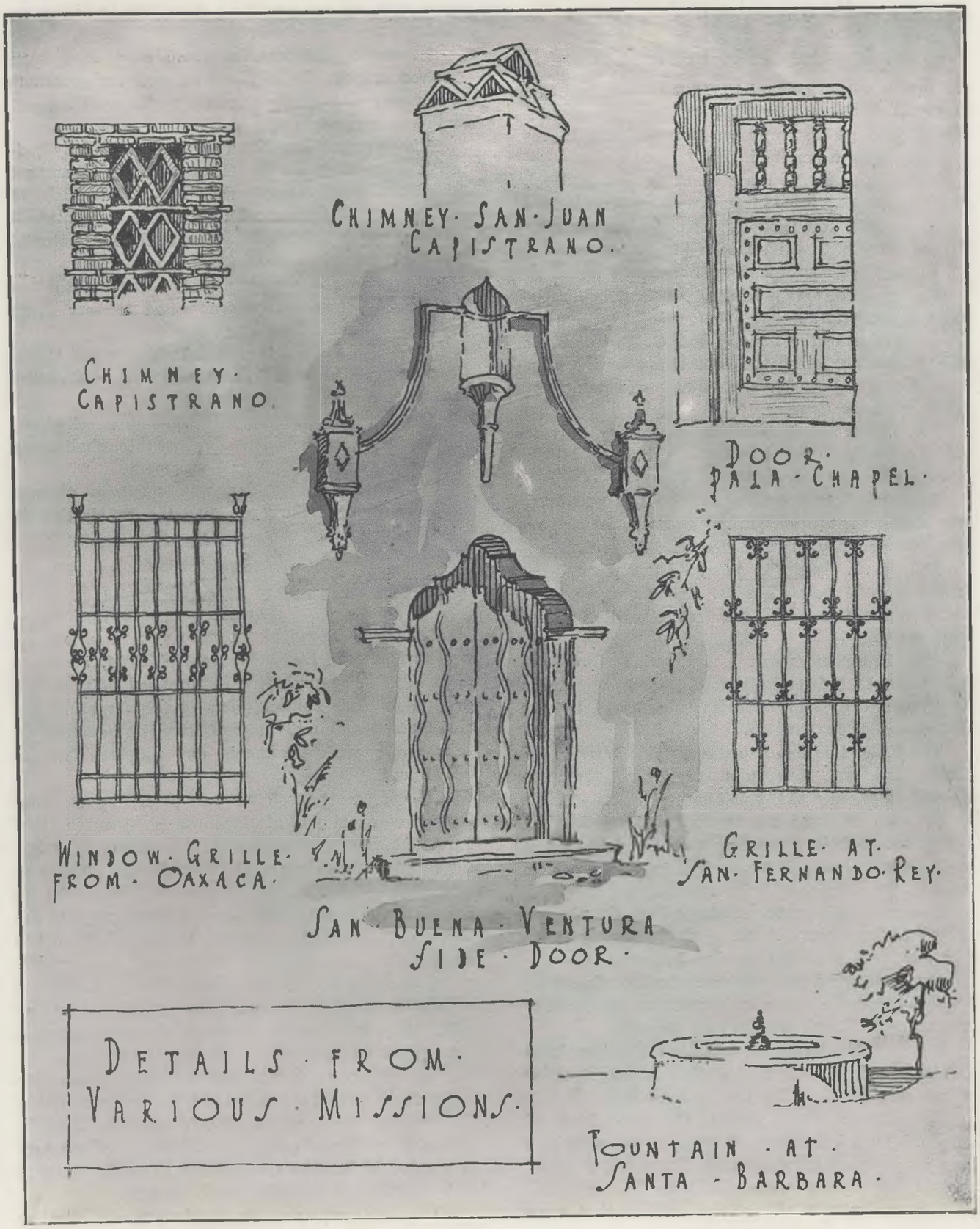
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DETAILS · FROM · VARIOUS · MISSIONS ·
FOUNTAIN · AT · SANTA · BARBARA ·

THE SOUTH AFRICAN INSTITUTE OF QUANTITY SURVEYORS.

Third Quarterly Report of the Council.

It is with deep regret that the Council has again to report the loss of an old member in Mr. J. F. Hooke, who passed away at New Malden, Surrey, England, after a painful illness.

Mr. Hooke joined the staff of the Public Works Department in 1912, and returned to England in 1921.

The Council, at their last meeting, passed a vote of condolence with Mrs. Hooke in her bereavement.

Since the second quarterly report was issued the Council has held two meetings, one in Johannesburg and one in Pertoria.

A member of the Council, Mr. G. E. Turner has resigned, having joined the contractors for the Capetown University which necessitates his taking up residence at the Cape.

Mr. Turner's resignation was accepted with regret and Mr. Springthorpe has been invited to fill the vacancy until the end of the year.

With regard to affiliation with the Surveyors Institute, London, an acknowledgment has been received from the Secretary and also from Mr. A. T. Babbs.

Mr. N. T. Cowin is now in England, and the Council has delegated Messrs. Babbs and Cowin to interview the Council of the Home Institute anent this matter.

The President received intimation from the Federation of Master Builders that certain items in the Standard System of measuring issued by the Institute called for revision.

The Federation has issued a circular letter to the Master Builders' Association requesting them to advise the Secretary of any points they wished to raise.

As soon as these are received and tabulated it is proposed to hold a meeting with the delegates of the Federation and, if necessary, to revise certain items in the Standard System.

In view of this matter having arisen, the Council decided to hold over the issue of the measurement of cast concrete work for the time being.

Arrangements have been made for the advertising of the Standard System of measuring in *Building* and in the *Architect, Builder and Engineer.*

A requst has been received from the Associated Scientific and Technical Societies for a donation towards new furniture for the Lecture Hall.

The Council felt in view of the scant funds of the Institute and further that many of our members being in provinces other than the Transvaal, it would be hardly fair to give a donation from the funds.

It was, however, the general opinion that some acknowledgment of the benefits which some members of the Institute derive from the Association with the Technical Societies should be made, and it was decided to send a small donation, the amount of same to be contributed by the practising Surveyors in Johannesburg.

Several applications for membership have been received but the Council has adopted the procedure in the past of carefully scrutinising the qualifications of the various applicants.

The President and Mr. T. Moore attended by invitation a meeting of the Council of the Transvaal Association of Architects, when Mr. Robert Blair, of the Institute of Accountants, gave some very interesting details in regard to the passing of the Accountants' Bill through a select committee of the House.

It appeared from his explanation that the Bill was considerably "watered down" and a very great expense incurred in the process.

It is to be hoped that the Architects and Quantity Surveyors' Act will not be subjected to a similar process at a corresponding cost.

On July 20th a pleasant little function took place, the President, on behalf of the Institute, challenging the Architects to a tennis tournament.

A most enjoyable day was spent in glorious weather, and the Surveyors had the satisfaction of winning by a small margin.

CONDITIONS of CONTRACT.

That the Standard Conditions of Contract be accepted on trial till December 31st, 1924, necessary alterations being permitted as arranged between the parties to each contract, but in the meantime the Union Registration Executive Committee be requested to consider all amendments and proposals for its betterment.

The foregoing resolution was passed by the Conference of Architects at Capetown on January 11th, 1923. At an early date it will be necessary to review the form of Conditions of Contract for the purpose of amending it in such directions as will provide for its acceptance as the standard form for use throughout the Union of South Africa. During the period which has elapsed since the foregoing resolution was passed, members have had many opportunities of noting its suitability or otherwise and have doubtless carefully noted the clauses which in operation have appeared to require amendment.

The Executive invites members to communicate their experiences of the usage of this document during the past two years, with a view to collating any difficulties or shortcomings thus presented, and so provide valuable data for the revising Executive charged with the work of amending the document.

You are requested to send any criticism or remarks you may wish to make to the Secretary, Union Architectural Practice Committee, 67, Exploration Building, Johannesburg.

The Benevolent Fund of the Architects of the Transvaal.

The Benevolent Fund of the Architects of the Transvaal has been in existence for many years, and has received support from a small number of interested persons whose donations have been sufficient to provide the trustees with the necessary amount to meet the demands which have arisen. Later, circumstances brought forward additional cases for consideration by the Trustees and it was found necessary, in order to carry out the ideas of the fund, to make a personal appeal to every member of the Association for immediate help. This was issued early in August and the response so far has resulted in the following amounts being donated:—Society of Architects, £50; D. M. Burton, £5; E. H. Waugh, £10; B. R. Avery, £2 2s.; E. J. Wellman, £2 2s.; Allen Wilson, £5; S. B. Cunningham, £1 1s.; Cowin, Powers & Ellis, £10; George Bromilow, £2 2s.; J. W. Gaisford, £2 2s.; H. W. Spicer, £3; Gordon Leith, £6 6s.; Mrs. Philip Treeby, £1 1s.; Anonymous, £3; Frank Emley and F. Williamson, £10 10s; G. E. Fitzgerald, £1 1s.; D. A. McCubbin, £1; F. L. H. Fleming (monthly), £1 1s.; Frank Hickman, £12.

In connection with the Trustees' appeal, the following two letters have been received:—

> In response to your appeal I shall have pleasure for the time being and so far as possible until your funds are in a better state, in contributing one guinea monthly, commencing with the 31st instant.
>
> I would suggest that if a number of our members would adopt a similar method of contribution the fund would very soon be placed upon a wide and solid basis without being felt as an undue burden.
>
> Yours faithfully,
>
> (sgd.) F. L. H. FLEMING.

> Judging from the amounts recorded in *Building*, the response to the appeal of so worthy an object seems to have been but small—the fees received by the profession out of all proportion to the amount donated. Those less fortunate appear to have been forgotten. Affluence is sometimes the cause.
>
> One would have thought that the effort on the part of the Association to raise the status of the profession from the slough of commercialism to which it had sunk before, to uphold the best traditions of an honourable calling as found in the older countries, would have made architects grateful.
>
> I beg to enclose a small contribution, with the hope that it may encourage the more fortunate ones who enjoy a comparatively lucrative practice to loosen their purse strings, show their gratitude in the best way by remembering those in need.
>
> I am, etc.,
>
> "ESPRIT DE CORPS."

The particular attention of members is drawn to the requirements of this fund in the hope that additional sums or monthly donations will be forthcoming. The trustees greatly appreciate the support so far obtained and trust that members who have not yet sent a donation will do so without delay.

In order to obtain funds for the Trustees the ladies, convened by Mrs. E. H. Waugh, have interested themselves, and are conducting a dance and bridge evening at the Scientific Club, 100, Fox Street, Johannesburg, on Friday, the 3rd October next. The Jazz Maniacs' full orchestra has been engaged; light refreshments will be provided, and special arrangements have been made for bridge to satisfy those members attending the function who do not desire to dance.

Tickets, which may be obtained from any of the ladies, or from the Registrar, are priced at the modest sum of 7s. 6d. each.

MATRICULATION EXAMINATION.

Proposed New Syllabus in Art.

FIRST PAPER: *Part I.*—General History of Art. Questions will be set on the following, but candidates will be expected to answer those in one section only: (*a*) Architecture. (*b*) Sculpture. (*c*) Painting. *Part II.*—Application of Art to Daily Life. The Home, its furnishing and decoration, the planning of the garden.

SECOND PAPER: *Part I.*—One of the following two sections must be taken by candidates:—(*a*) Drawing in light and shade, or Painting, from common objects, and from plant, animal, or figure, in one or other of the following media: (1) Black or white chalk on toned paper; (2) black chalk or lead pencil on white paper; (3) water colour or oil colour on white paper. (*b*) Illustration and Design (including memory drawing). (1) Imaginative illustrative work (such subjects as an incident in history or everyday life, or a quotation from a poem or story). (2) Design: Pattern or ornament having relation to a particular activity (such as wall paper, book cover, etc.). *Part II.*—Geometrical Drawing. (*a*) Plans and elevations of subjects and simple buildings. (*b*) Geometrical drawing, including pattern. (*c*) Perspective, the horizontal plane.

SANITARY NOTES.

The recent International Congress of Sanitary Engineers, held in London, is interesting to architects in the prominence given to house drainage and the strong contrast between English and American methods. Mr. J. S. Hodgson, Washington D.C., contributed a paper, entitled "Two House Drainage Systems—with the Atlantic between." Professor Whipple, Harvard Professor of Sanitary Engineering, sent a paper on "English and American House Drainage."

The purport of these two articles was to give comparison between the practice in the two countries. The Professor frankly accuses the English of being wedded to tradition a generation old and not being sufficiently scientific. The papers discussed the interceptor trap, and gave it as the most prominent distinction between the two countries. England clings lovingly to the interceptor; America sees no tutelary diety in this obstructive device.

Another marked difference is the so-called "air-break" system, or having waste pipes distinct from the soil pipe system, with an open air discharge between the waste and the soil pipes. The enormous expense entailed by the English practice almost beggars description. Think of the four lines of unsightly pipes running up parallel on the face of a fine elevation, the numerous distorted vent and branch connections! Then think of the benefit of omitting two of these lines and the consequent saving of expense, and one can realise the financial advantage and the aesthetic appearance of his buildings.

Another feature brought out was the frank way in which the Americans put all their pipes *inside* the building, and not outside. Our Transatlantic brethren are not scared by any undue regard for the fetish of sewer gas, and, as they have been doing this to the writer's knowledge for at least 35 years, it makes one think that there must be a "lot in it."

American practice can be summed up in its salient points as follows: (1) The single down pipe (i.e., waste and soil pipe in one). (2) No interceptor. (3) No outside pipes unless desired. In all these it is diametrically opposed to the traditional English practice, which one of the papers alleges took its rise from an outbreak of typhoid at Uppingham School before January, 1876, and gave rise to the uncompromising tenor of the dread model by-law. That procrustean code fastened its grip on the English conscience, and any suggestion to ease them was regarded as a heresy. Not even the adverse conclusions of the 1912 Departmental Report on Interceptors has succeeded in relaxing the official visage.

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In the following discussion, Dr. Coleman (Manchester) said that the carriage of disease germs from one house through the sewer into the next house was rarely possible. Professor Whipple pointed out that the sewer gas theory of disease transmission was largely false, and has led to the waste of huge sums on plumbing devices to protect against exaggerated dangers. To abandon all protection against sewer gas would be folly, but one must gather from his paper that he regards the interceptor as an expensive encumbrance, and that the general scientific American attitude is that the single trap at the fitting is able to give efficient protection. The Professor advises " going back, but stopping half way," *i.e.*, leave out the interceptor but keep the trap fitting.

The writer's opinion has for twenty years been on the lines of the papers referred to. The terrible cost of the multiple pipe system used in South Africa the general excellence of plumbing renders to-day quite unnecessary. Inside pipes, with modern workmanship and testing, no longer possess terrors, much of which seems to have been a visionary nightmare of largely imaginary fears. It is of vast importance to the world to obtain inexpensive sanitation, and also that a great country like America sticks to its generation-old practice of inside pipes, single down pipes and no interceptors. It is time this country insisted on a rigid examination of the present notions of work, which have become antiquated through the progress of science, which to a considerable extent only benefit an army of plumbers.

The partnership hitherto existing between Mr. M. J. Harris and Mr. W. J. Sloan has been dissolved by mutual consent.

Mr. D. P. Howells, Town Engineer of Benoni, a past President of the Town Planning Association (Transvaal), has been elected Chairman of the Municipal and County Engineers, African Section, for the current year.

The next annual general meeting of this body is to take place at Durban in July, 1925.

The War Memorials in teakwood to commemorate the names of those members of the staff of the South African Railways and Harbours who fell during the great war, erected at all the principal stations throughout the Union, have lately been completed by the addition of cast bronze moulded panels containing the names of all the Fallen. The names have been carried out in inscribed letters, cream vitreous enamel filled, and the craftsmanship is that of the Birmingham Guild, Ltd.

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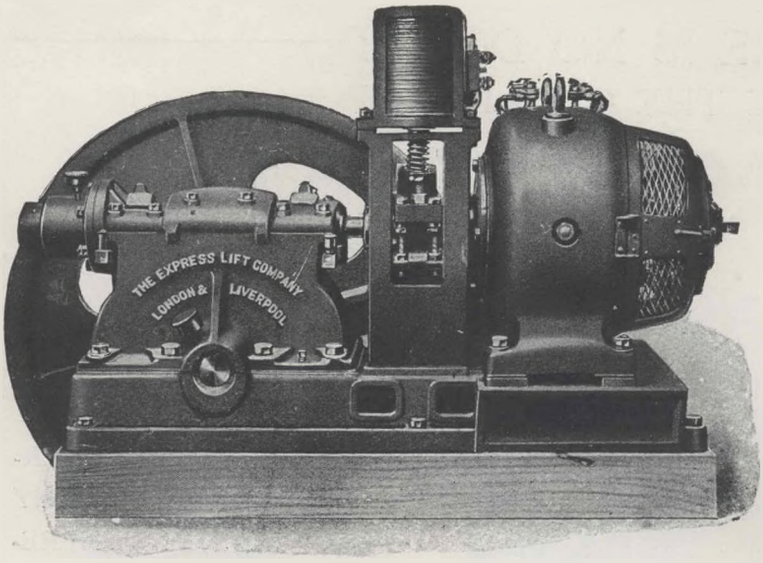

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