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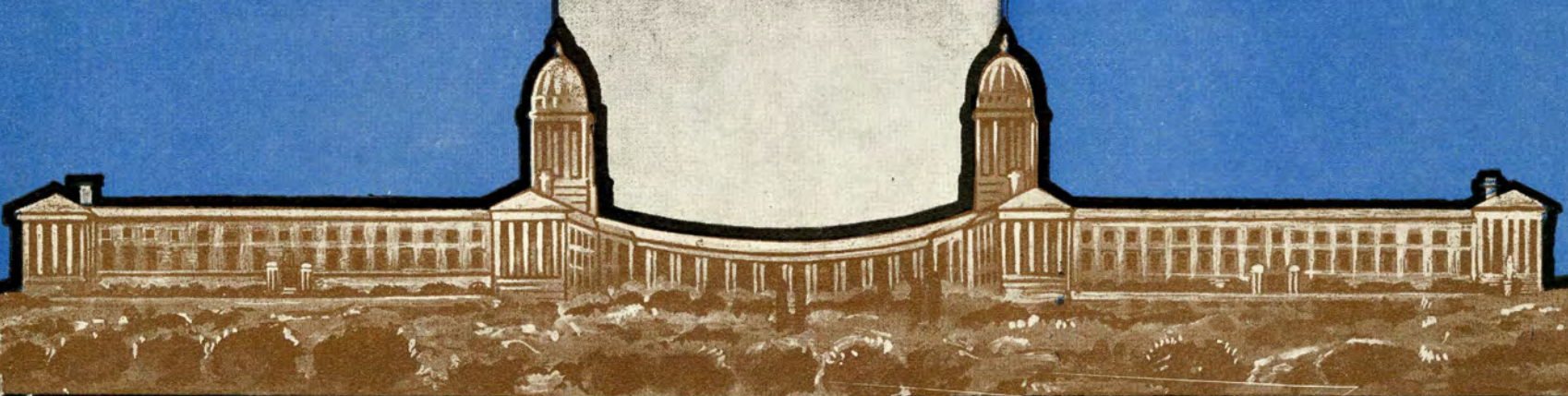
MEETINGS

UNIVERSITY OF PRETORIA

12-11-1977

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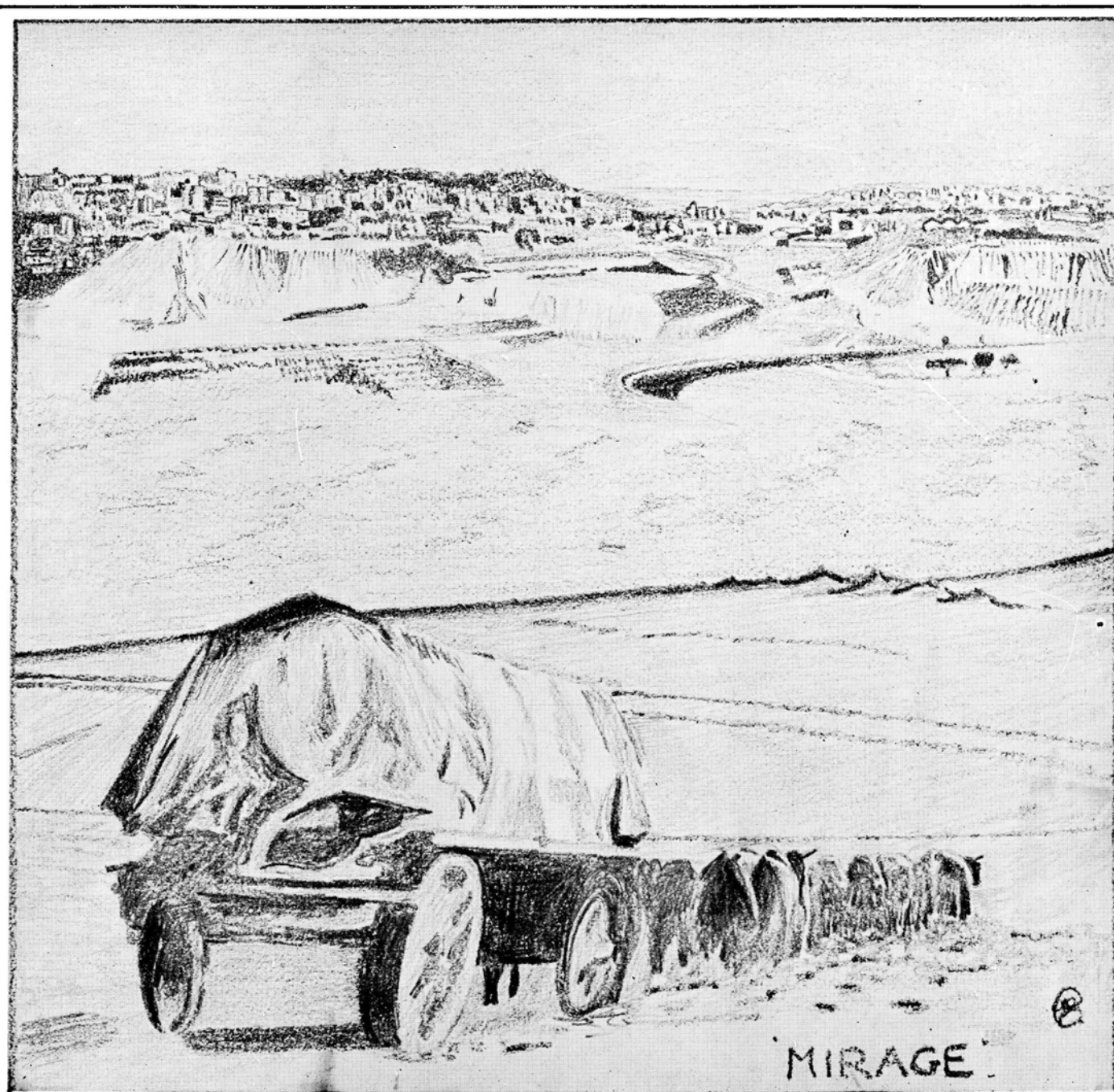
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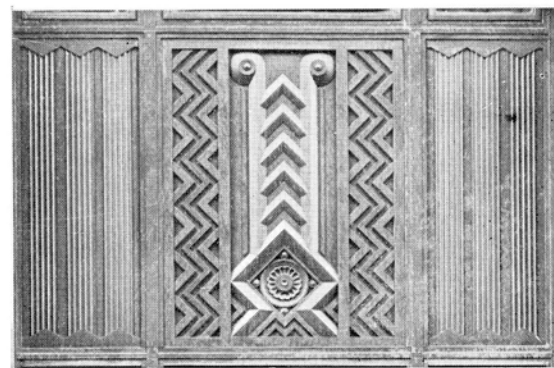


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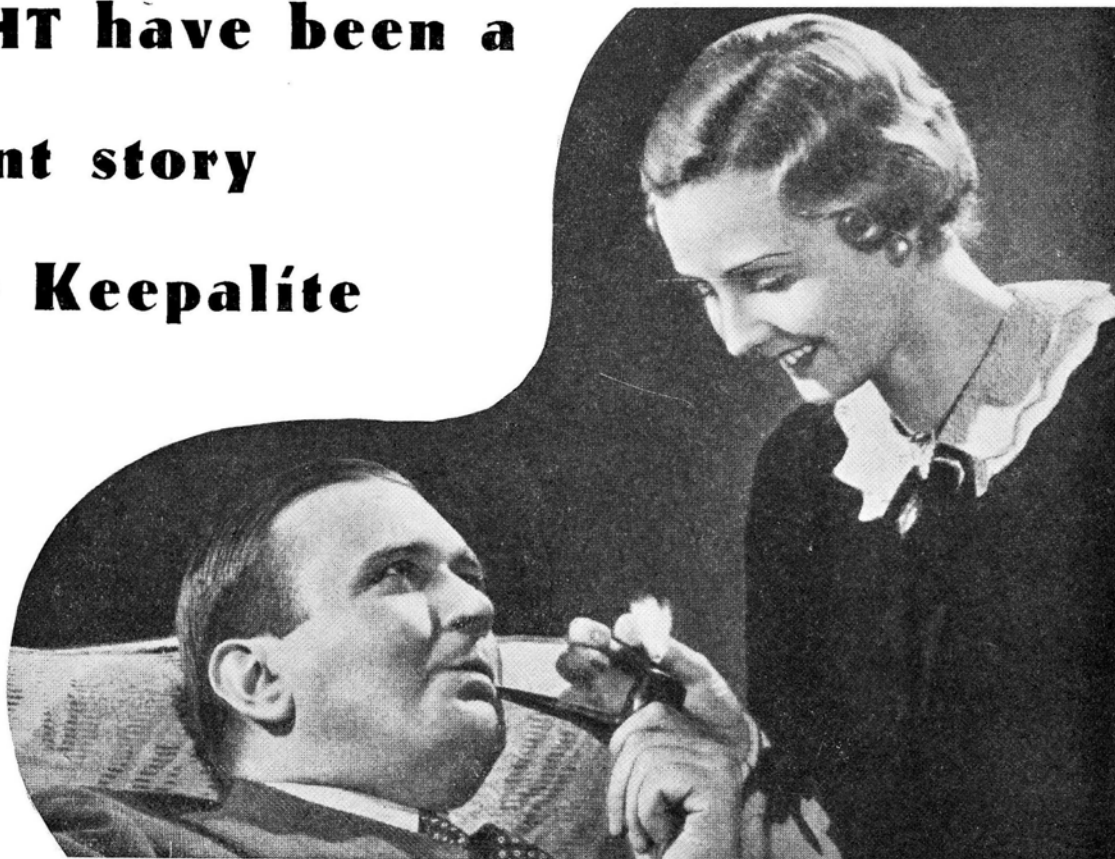


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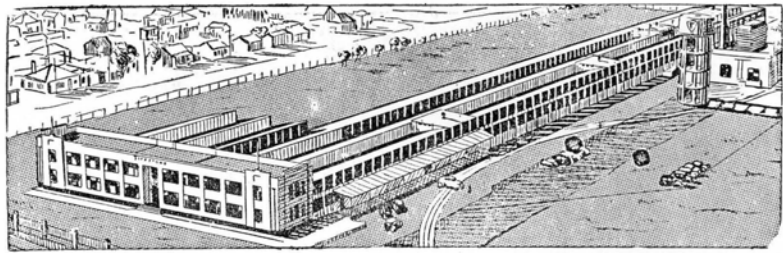
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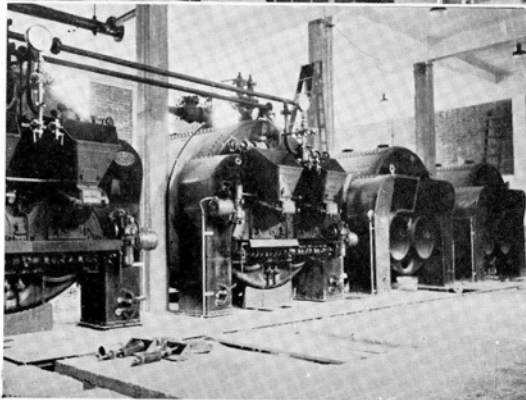
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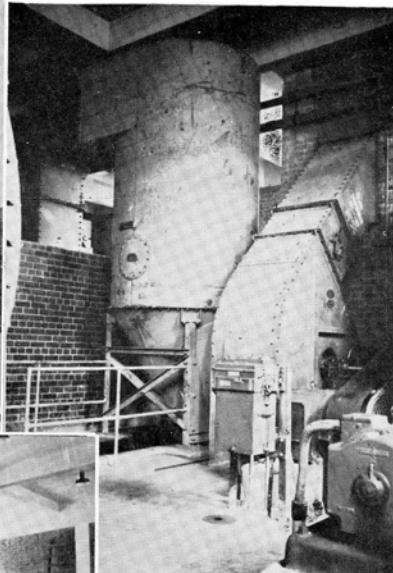
(Top) Construction of 125-foot steel self-supporting smoke stack supplied for General Hospital boiler house.



(Bottom) View of four Economic fire-tube boilers installed in the new Laundry boiler house.



(Right) Dust collecting plant and induced draught fan erected in Hospital Laundry boiler house.



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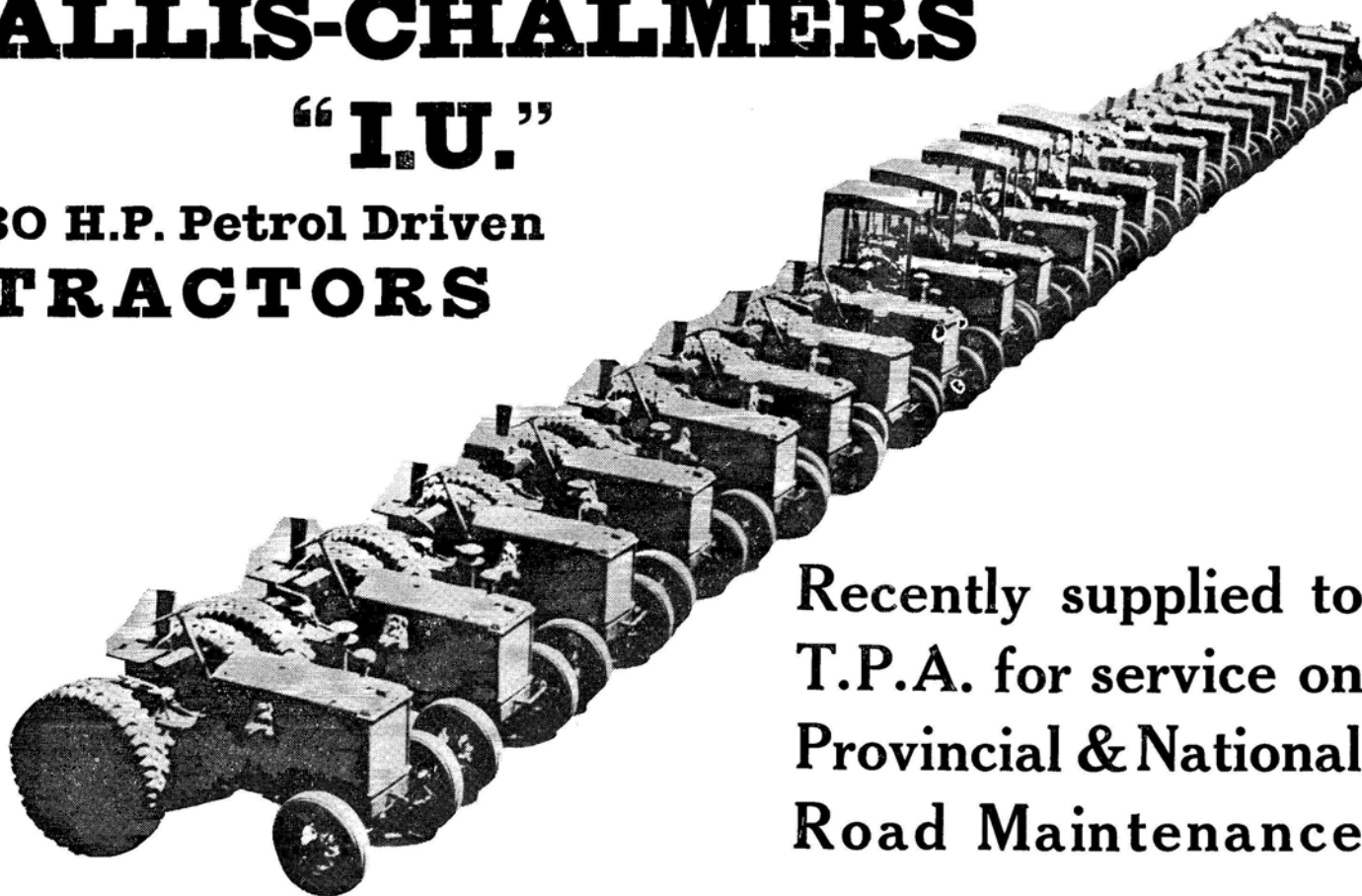
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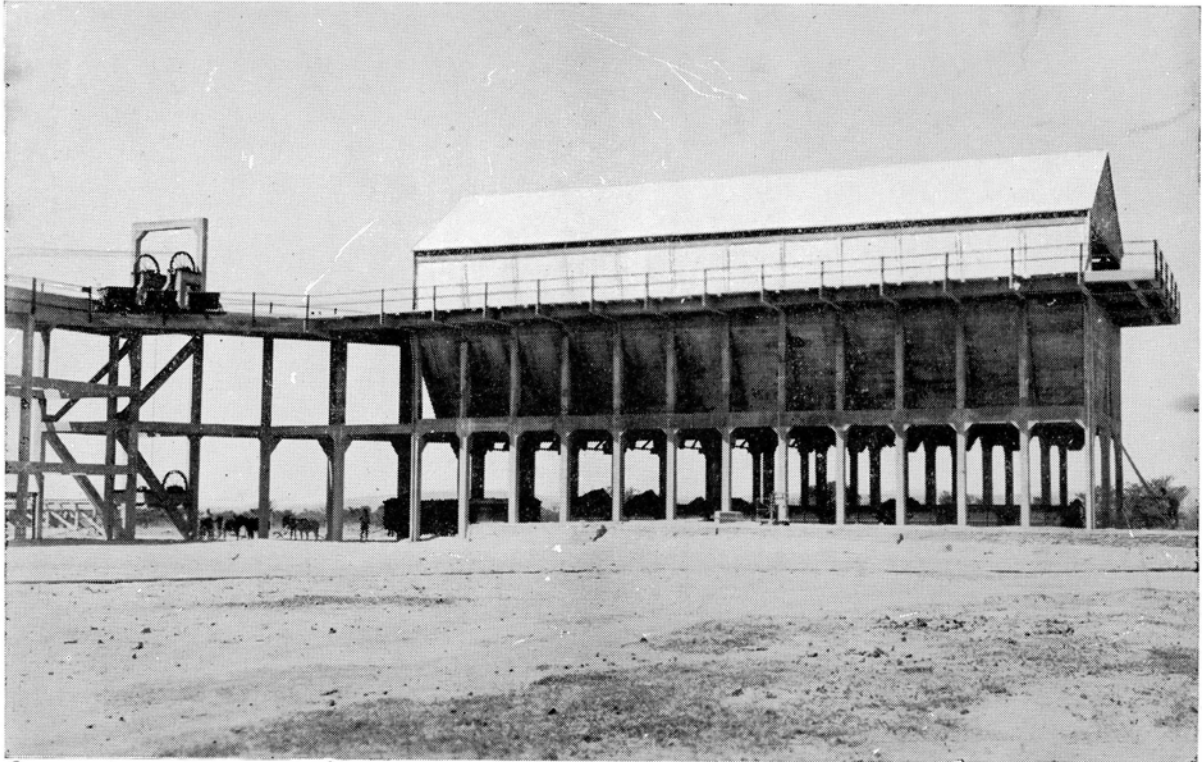
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AN OUTSTANDING ZOO

By

R. BIGALKE,

*M.A., Ph.D., C.M.Z.S., Director of
the National Zoological Gardens.*

The National Zoological Gardens,
Pretoria — History and Recent
Development: and the Public
Works Department's hand in the
New Extensions - - - -

PRETORIA has the distinction of being the seat of the oldest zoological garden in the Union of South Africa. As far back as 1895 the Government of the South African Republic acquired an area of about forty acres from the estate of the late J. F. Celliers, but the Zoo was not established at "Rus in Urbe" until the end of 1899. When the Anglo-Boer

In 1901 the Museum and Zoological Gardens were placed under the jurisdiction of the Civil Administration, and a committee was appointed to conduct the affairs of the combined institutions. Under the capable direction of Dr. Gunning the Zoo made such rapid progress that the Union Government in 1913 deemed it necessary to separate the two institutions, and to



VIEW OF THE NEW HILLSIDE CAMPS FROM THE ANTELOPE Paddock.

War broke out, in the latter year, an opportunity presented itself of which the alert director of the "Staatsmuseum," Dr. J. W. B. Gunning, did not fail to take advantage. He claimed "Rus in Urbe" for the purpose of establishing a zoo, and was permitted to transfer his few live animals "temporarily" from the museum on the Market Square of Pretoria to the new site.

It is clear, therefore, that the Union's national zoological garden was established in a most unconventional manner in difficult times.

appoint independent committees (now boards of trustees) and directors.

It is a matter of great importance to the Zoo that the necessity of reserving land for future expansion was realized at an early stage in its history. It was due largely to the efforts of Messrs. W. H. Gilfillan, A. Johnstone and Dr. J. W. B. Gunning that the area was increased by about thirty acres some years after the institution was established. This area stretches from the Aapies River to the top of the Daspoort hills.

The requirements of a modern zoological garden demand that the land shall not be uniform from the topographical point of view. Frequently it is difficult to satisfy the requirements, in view of the fact that suitable land is not available. The famous Tierpark at Stellingen in the neighbourhood of Hamburg, which has served as a model for many modern zoological gardens, is situated on a more or less level stretch of country without hills. In order to create an environment suitable for mountain animals, Carl Hagenbeck was obliged, therefore, to build artificial hills. This was done by constructing wooden frameworks in the desired form and covering them with concrete and other suitable materials.

In the case of the Pretoria Zoo artificial methods of this kind have fortunately not proved necessary. There are probably few zoological gardens in the world that are as fortunate as the National Zoological Gardens in Pretoria in so far as the available site is concerned. A large part of the new section consists of a more or less level portion, which is bounded on the north by hills, and on the south by part of the Aapies River flowing through the Zoo. Hence the new portion of the Zoo includes level ground, a hilly portion, and a sheet of water, all of which are indispensable in the lay-out of a modern zoological garden.

In the history of the National Zoological Gardens there has been no lack of efforts to develop the available ground on modern lines, but for a number of years all efforts were unavailing. An excellent opportunity presented itself, however, in the depression year 1932, when the Union Government announced its intention of making funds available for the relief of unemployment. The Zoo immediately submitted its case to the Department of Labour, with the result that it was possible to commence work. With the valuable aid of the Secretary for Public Works a lay-out plan was drawn up for the available thirty acres. This was planned on such a liberal basis that the institution will rank among the best of its kind on completion.

Operations were commenced with fifty men, and the number was subsequently increased until it amounted to 200 at one time. At present eighty men are engaged on the work.

That portion of the Daspoort hills lying within the new Zoo rises up to a height of about 300 feet above the level of the Aapies River, and is ideal for the purpose of exhibiting such animals as lions, tigers, baboons, bears, rhebuck, Barbary sheep and klip-springers under more or less natural conditions.

The work reached such a stage that the enclosures for lions, tigers and antelopes were occupied towards the end of 1938.

An idea of the huge scale of the scheme will be obtained by citing a few figures. The enclosures for

lions and tigers are surrounded by sunken walls mostly 20 feet high, with sloping ditches about 36 feet across. On the front side of each of the two enclosures the distance across the ditch is 35 feet. Each enclosure is about 160 feet wide and stretches up the slope of the hill to a distance of about 300 feet, so that the area exceeds an acre in each case.

During the Anglo-Boer War a camp for prisoners of war was established at the foot of the hill that is now being laid out for wild animals. The result of that occupation was that the vegetation on the hillside was cut down and used as firewood. But the area was fenced about thirty years ago, and during this time the hillside has become covered by a beautiful belt of the indigenous *Acacia caffra* trees. Visitors are able, therefore, to see the lions roaming about between the trees in an area on which they undoubtedly occurred when the Voortrekkers settled in the Transvaal a century ago.

Beneath the road from which the animals can be observed on the hillside there are suitable cages for isolating the lions and tigers when necessary. Drinking-pools have been built below the *A. caffra* trees, so that the animals may be seen from nearby when drinking.

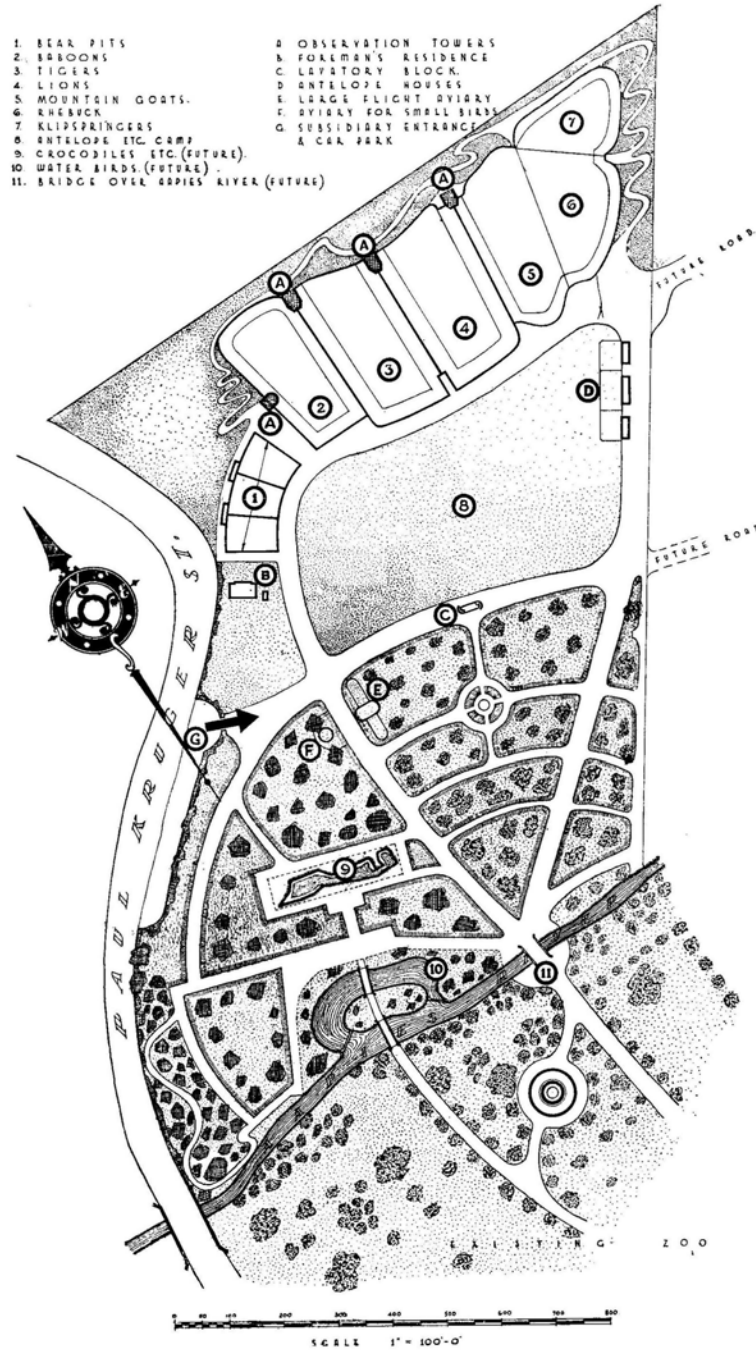
Those who are more energetic are able to climb to the top of the hill by means of a fairly easy path, and to study the large beasts of prey from three observation towers. In the course of time visitors may even become accustomed to observing the animals through field-glasses.

On the opposite side of the road at the foot of the hillside, there is an area of about six acres on which zebras and such antelopes as the eland, the blue wildebeest, the impala, the kudu, the waterbuck, the tsessebe and others roam at will. Ostriches, crowned cranes and guinea-fowls, all of which may be found associated with antelopes, are also represented. The idea has been to make this large paddock a sort of miniature Krüger Park. At one end of the paddock there are four small enclosures with houses, in which bulls and females with young may be isolated as occasion arises.

About thirty indigenous trees have already been planted in the antelope enclosure, and in the course of time it is intended to replace all exotic trees by indigenous species. Only indigenous plants, such as aloes and mesembryanthema, will be planted on the crest of the hill, so that a distinctly South African atmosphere will be maintained.

The three enclosures described above are, of course, only a portion of the whole scheme. As the total number of new enclosures will eventually number twenty-five, it is clear that the institution is still faced with years of development.

EXTENSION TO NATIONAL ZOO PRETORIA SITE - PLAN



In the article which follows, Mr. W. A. Macdonald, of the Union Department of Public Works, describes the share which this Department had in the planning of the Zoo Extension and the constructional work which is being done.

Our National Zoological Gardens ::

★ ★

*How the Union Public Works
Department has helped in the
New Extensions : : : : :*

By _____
W. A. MACDONALD

A PERUSAL of the first four numbers of this periodical shows that the architectural staff of the Union Department of Public Works is called upon to design a variety of schemes. Some of these are repeated from time to time and appear on the Department's Building Programme with a monotonous regularity, such as another Post Office or small Public Office. When the Department is called upon to help in the design of a new Zoological Gardens this becomes news: "The man has bitten the dog."

The extension to the National Zoological Gardens at Pretoria has proved most interesting in every sense — its origin having been described by Dr. Bigalke, the Director, in the foregoing article. Being what I would describe as a "Specialist Service," it follows that the Director's advice has been taken into consideration to a much greater extent than in the usual services. His views had to be sought on the habits and mode of living of the various animals to be housed.

The lay-out plan reproduced with this article shows clearly the magnitude of the scheme, which is actually an addition to the existing gardens south of the Aapies River. The two sections will be linked together eventually by means of a bridge (11 on plan), placed in a position suitable for the contours of the site. Meantime a small footbridge serves the purpose near the future water birds' enclosure. From the bridge the main avenue is taken up-hill through the lower portion, which is, as yet, undeveloped and skirts

round the bottom of the steep portion of the hill at the north end where the recently completed camps are located, as follows (see site plan) :—

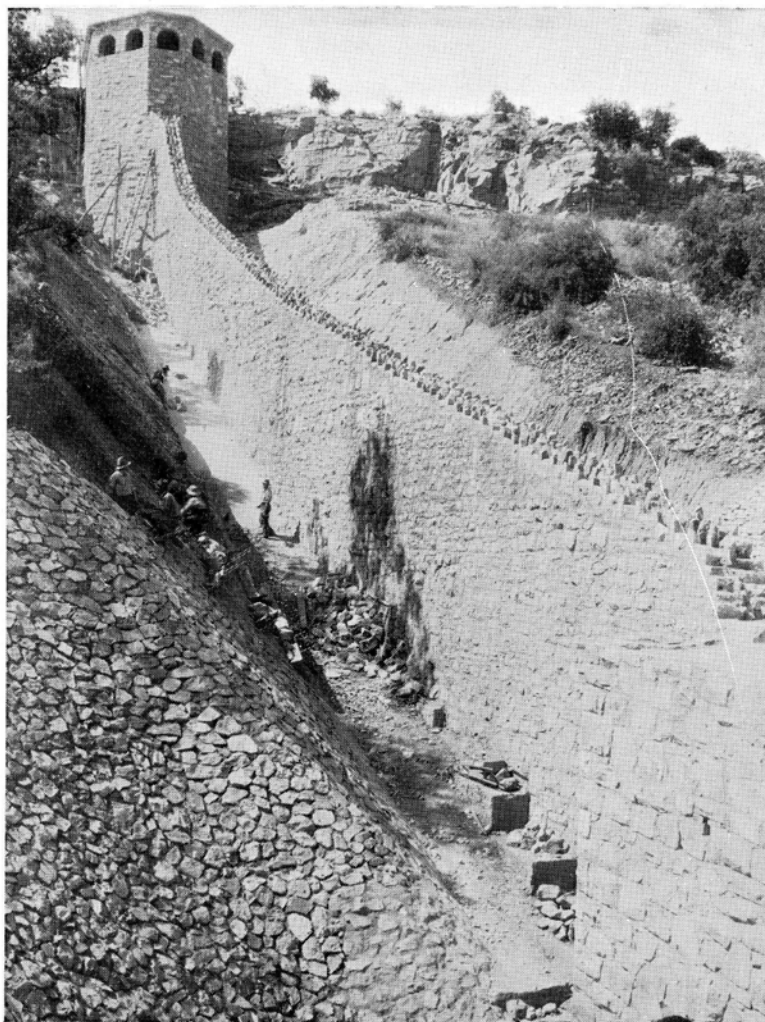
(1) The bear-pits have been excavated out of the hillside so that the public can view the animals from the road level. At the back the dens are erected

together with a feeding and service alley for the use of the keepers. Bathing pools have been sunk in each pit and the whole area covered with a concrete slab. Wherever practicable the dividing walls have been built of stone quarried on the site, but in some cases concrete has been used.

(2) The baboon enclosure is only partly completed, the back portion being still unfinished. The walls of this camp have been built of concrete, as a stone wall would have provided these agile animals with an excellent means of escape. This camp is served with dens in the observation platform (A) on the west wall, and it is the intention later to form grottoes for the baboons in the rear portion of the camp. A drinking pool will be provided in a conspicuous position.

(3) and (4) Adjacent to the baboon enclosure are located the tiger and

lion camps which are now complete. Here, I may state that both sets of dens have been placed under the main avenue with a ramp leading down to the service alley. The front walls of the dens are of stone with openings leading into the camps. The inner side is cut off from the service alley by means of wrought iron grilles, except in the case of the nursery dens,

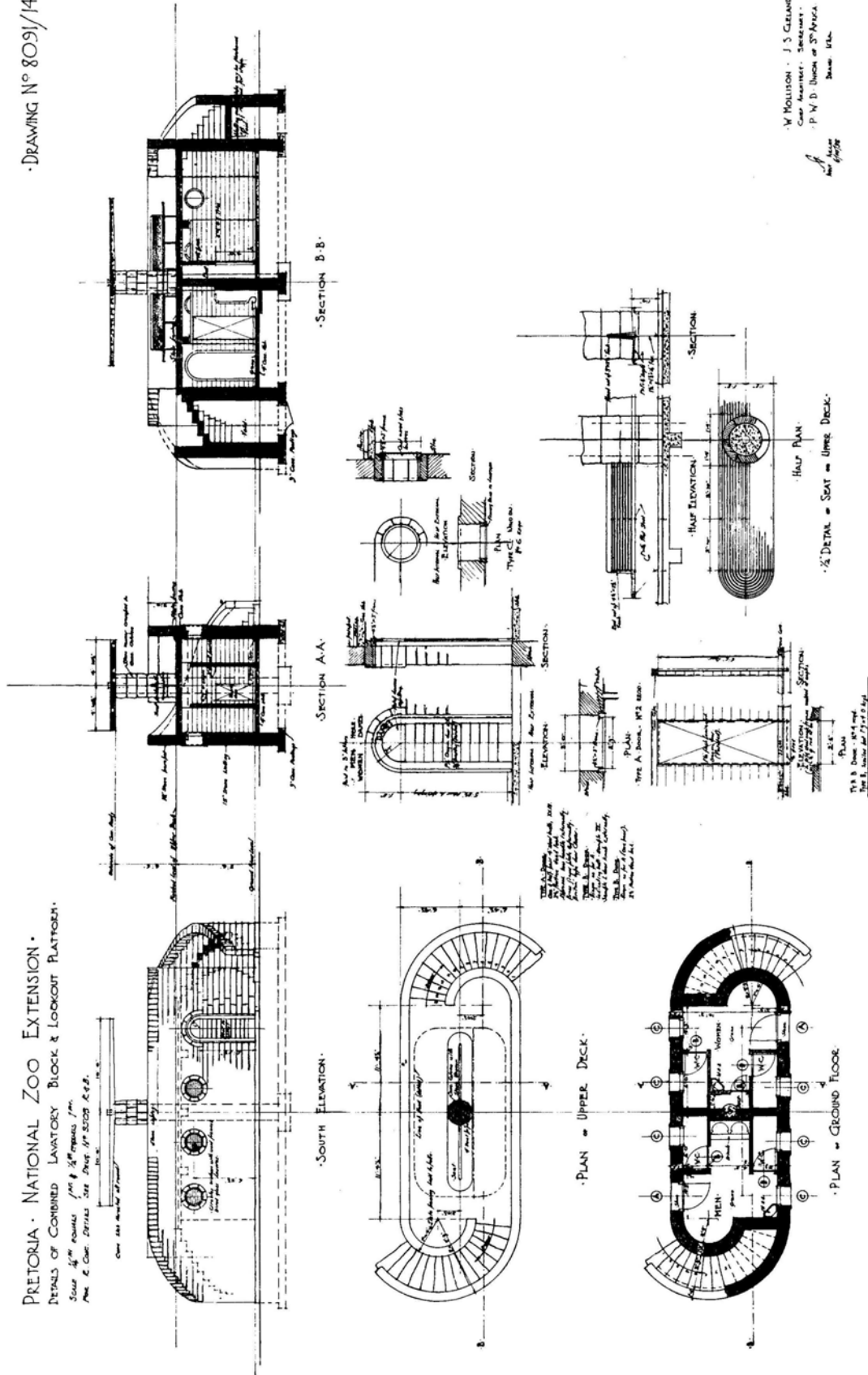


THE DIVISION WALL BETWEEN THE LIONS' AND TIGERS' CAMPS.

DRAWING N° 8091/14.

PRETORIA NATIONAL ZOO EXTENSION.
DETAILS OF COMBINED LAVATORY BLOCK & LOOKOUT PLATFORM.

Scale 1/4" = 1'-0" overall
Plan & Elev. Details see DWG. 17-8005 & 17-8006



W. MOLLISON · J. S. GLENDON ·
 CIVIL ENGINEERS · SHEPPARD ·
 P. W. D. (INCORPORATED IN SOUTH AFRICA)
 100, WATERLOO STREET, JOHANNESBURG.

which are of stone. The roof is a concrete slab, which has been cantilevered over the openings into the camp. The floors are formed with a concrete slab set over hollow blocks and finished in granolithic. Each den is provided with a bed composed of wood planks set in the concrete slab. The question of suitable flooring materials presented a real difficulty, as granolithic is too cold and wood is apt to smell after a time. When I was in England in 1937 I had the pleasure of discussing the question of suitable materials with Dr. Huxley and Mr. Fisher, of the Regents Park Zoological Gardens, and found that they were placed in a similar position. I was more than interested to learn that the much - advertised and attractive Penguin Pool had not proved a success owing to the concrete injuring the penguins' feet. From observations I felt that the best material for dens was undoubtedly an asphaltic tile, which is not as cold as granolithic and yet is fairly hard and easily cleaned. Unfortunately the dens at the Pretoria Zoo were completed before my return from overseas.

All openings to the dens have grilles over them, those in the front and back walls sliding vertically and operated from the service alley by means of counter weights, whilst those in the cross walls slide horizontally. In this manner it is quite easy for the keepers to segregate an animal from the others when the necessity arises.

The dividing walls between these camps have been sunk into the ground by excavating to a depth of 20 feet, 10 feet wide at the base and 50 feet wide at the surface level. The main walls were built in the middle of these excavations and the foundations "stepped" as they were carried up the hillside. The battered faces of the excavations have been pitched with mountain stone set in cement mortar, while the lower portion next to the walls has been paved in order to take away the large volume of storm-water collected in this area. The surface of the camps has not been disturbed except where water-holes for drinking pools have been formed.

The rock face at the rear of the camps was blasted

away to form a natural barrier for the animals — the stone being used for building walls, etc., — and is surmounted by a high fence as a further safeguard. The main dividing walls terminate in three stone-and-concrete observation towers (A on plan), from which the public may view the animals with safety.

(5), (6) and (7) These can be described as miniatures of the foregoing camps.

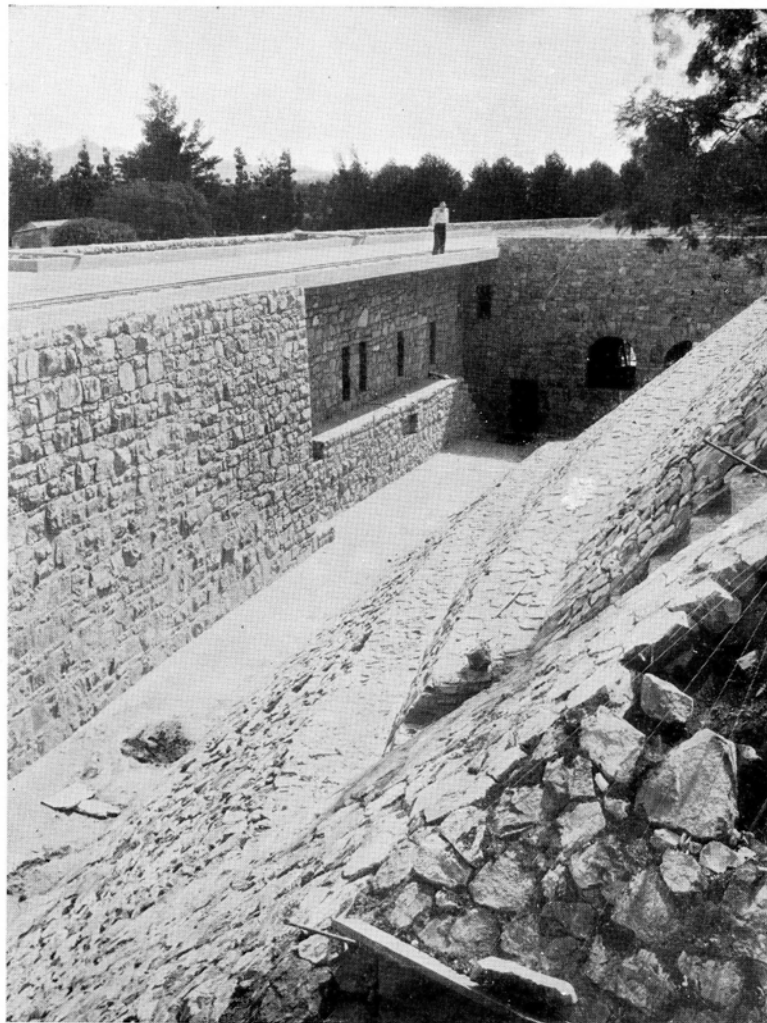
(8) To the south of the avenue there is a large paddock, already described by Dr. Bigalke. The structural work involved in this camp was very small, comprising waterholes, fencing, and a stone retaining wall under the roadway on the north and west. The

houses (D on plan) at the east side are built of stone and brick with a concrete roof. All internal angles in these houses have been splayed so that the animals will not injure themselves.

To the south side of this camp there is a building in course of construction (C on plan), the drawings of which have been reproduced. This is the lavatory block. Owing to its position, advantage has been taken to make use of its roof as an observation platform so that the public can view the animals in Camp No. 8 without having to look through the fence. The construction of this block will be of stone externally with a concrete slab at first-floor level. Rising up in the centre there will be a concrete column over which will be placed a concrete hood for shelter from rain and sun. The vent pipe from the ground floor will be carried up in this column

and no pipes will be visible. The portion of the column above the first floor will be encased with display cases containing photographs of the animals and birds in the paddock.

Another interesting structure already designed, but not erected, will be the aviary for small birds (F on plan), details of which are reproduced on the next page. It will be noted that wood has been eliminated entirely and concrete and steel used. The roof is a concrete cylinder surmounted by the frustrum of a cone, the top being open so that rain may enter. Carried round this concrete roof there is a cantilever slab which will



LIONS' DENS.

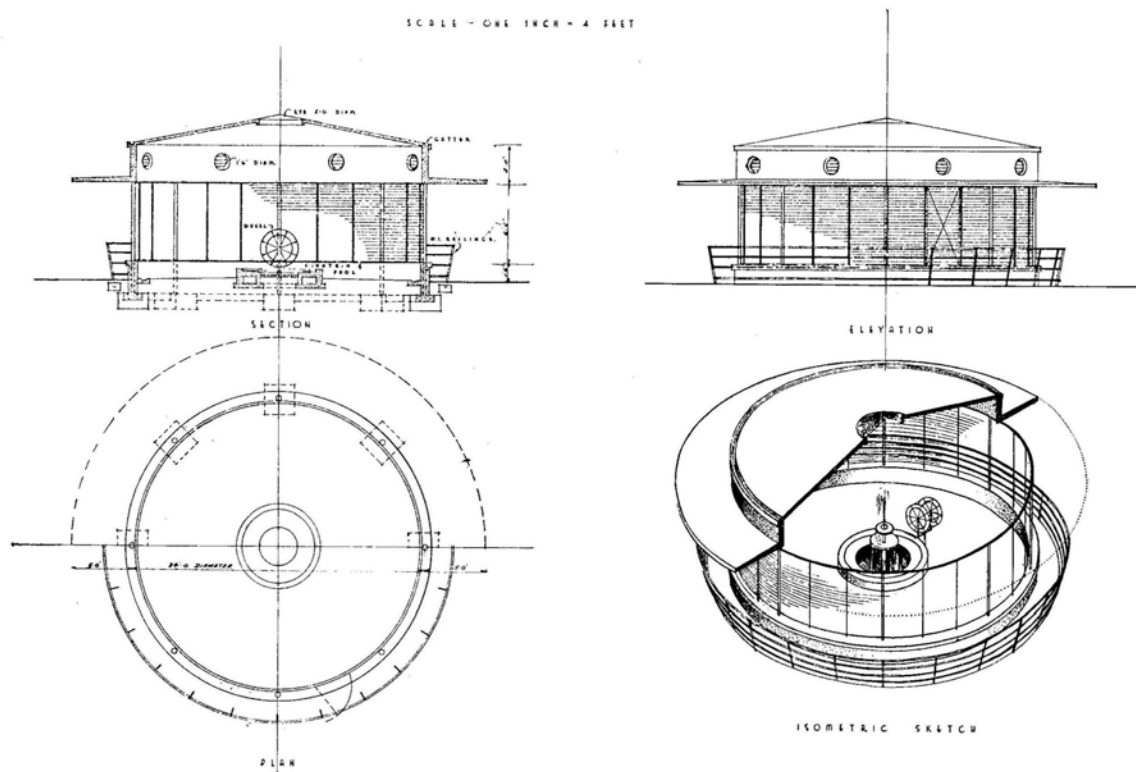
afford useful shelter for the public. The whole concrete structure is carried on eight metal tubes let into a low base wall. Between these tubes there will be two intermediate rods to which will be fixed specially woven wire mesh of rectangular pattern. In the centre of the aviary there will be a fountain and bird-bath, while sleeping and nesting boxes will be hung

from the roof. Owing to its design the structure should be easily kept free from bird lice, etc.

The large flight aviary (E on plan), crocodile pond (9), and the water birds' enclosure (10) have not yet been designed; in fact, the development of this lower portion is still very much "in the air" until financial aid is forthcoming.

EXTENSION TO NATIONAL ZOO
PRETORIA
PROPOSED AVIARY

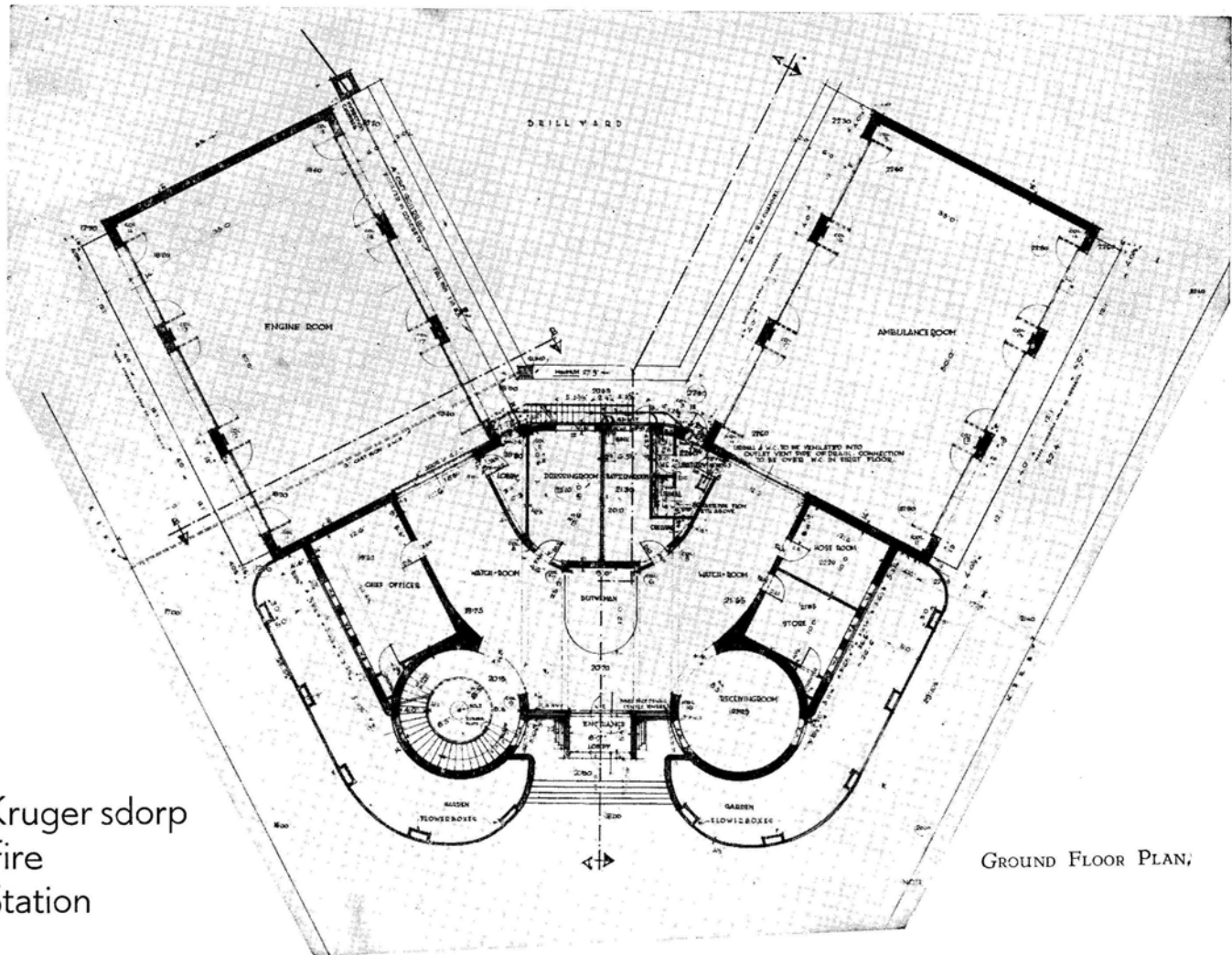
SCALE - ONE INCH = 4 FEET



DURBAN'S NEW FLYING-BOAT HANGARS : A CORRECTION.

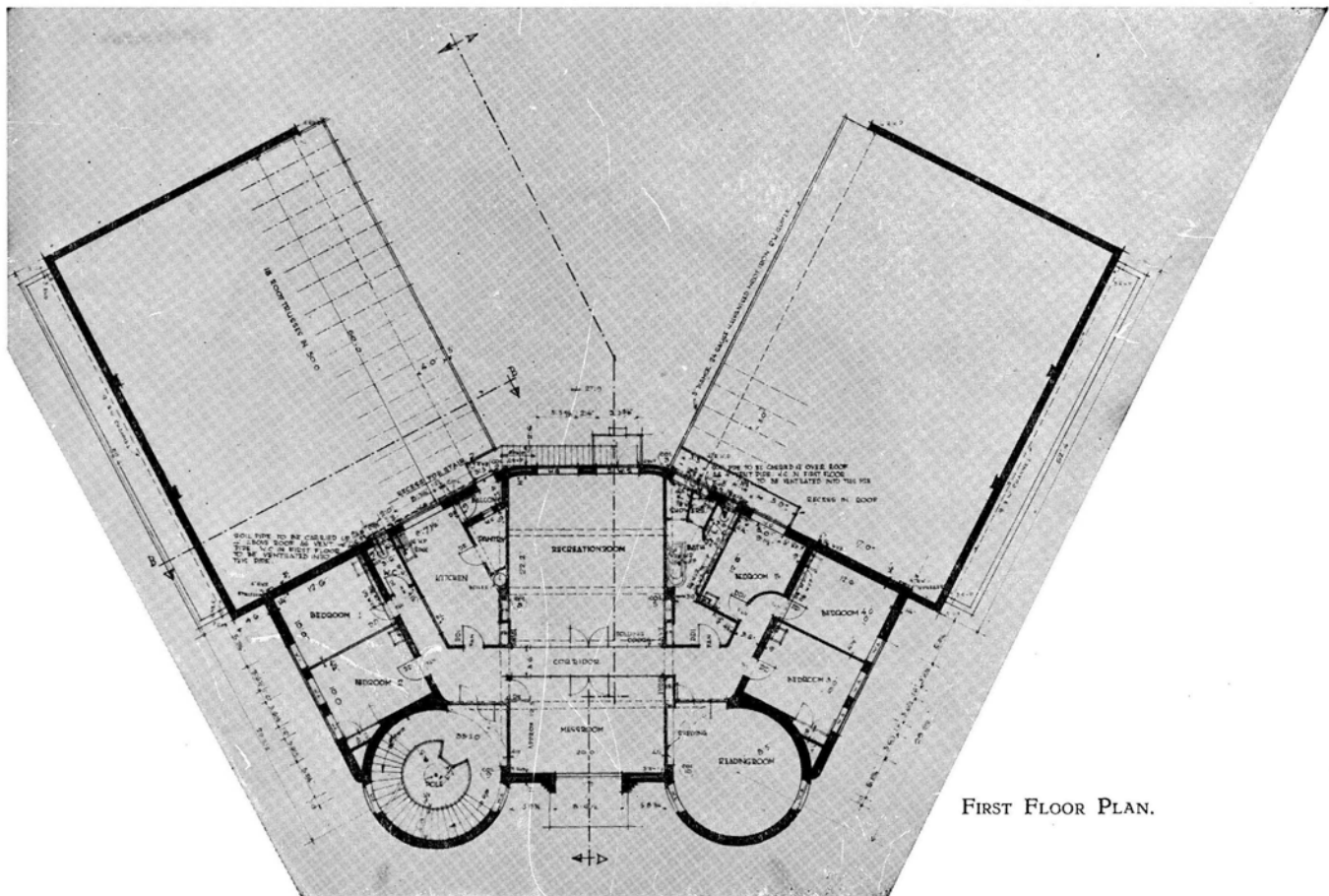
Reference was made in our February number to the fabrication of the steelwork for the new flying-boat hangars at Durban harbour by the Railway workshops. I have since ascertained that this was carried out in the East London workshops of Messrs. Alpheus Williams & E. G. Dowse (Pty.), Limited, who also erected the structure. Our apologies are due to this firm for this error.

E. T.



Kruger sdrorp
Fire
Station

GROUND FLOOR PLAN.



FIRST FLOOR PLAN.

New Fire Station for Krugersdorp

★ A WELL-PLANNED BUILDING DESIGNED
TO FACILITATE EFFICIENT SERVICE ★

[CONTRIBUTED.]



KRUGERSDORP FIRE STATION: PERSPECTIVE SKETCH.

THOSE who have had to site a Fire Station realise the importance of this first step. First of all the site should be chosen with due regard to the road system of the town. Every point to be served should be easily accessible, especially the high-risk areas. This means that the site should be near the main road through the town and near its centre, but avoiding points with high traffic intensities. The site should preferably lie at a level above the areas to be served, as this reduces travelling time and wear of plant.

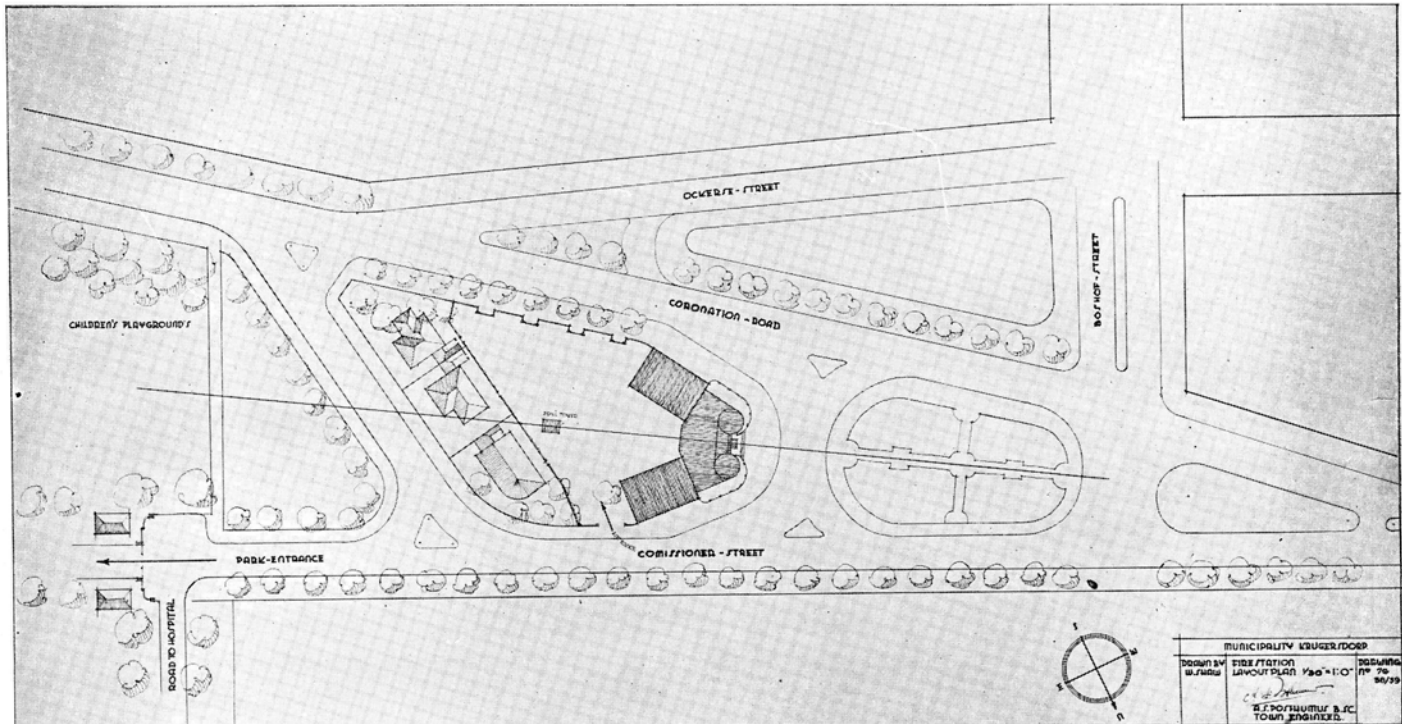
Due regard should be given to the dual purpose which Fire Brigades have to fulfil in South Africa, *i.e.*, the fire service and the ambulance service. On account of the latter the site should, if possible, be chosen between the hospital and that portion containing the bulk of the population. When capitalising the running time and costs of ambulances for different sites, the economics of this factor loom largely. All these points should therefore be studied with the utmost care.

In Krugersdorp the process of finding and eliminating

possible sites has been a lengthy one extending over several years. The site eventually selected is situated at the eastern end of Commissioner Street, where this artery, through a swan neck, enters Coronation Road, both being portions of the Main Reef Road. This site until recently was an appendix to Coronation Park, but, on account of its narrowness and old blue-gum trees, did not lend itself to effective garden lay-out.

By erecting the Fire Station on this site and laying out the surrounding area in accordance with the plan, which is reproduced here, several important town-planning improvements will result:—

- (1) A site eminently suitable for a Fire Station has been created.
- (2) Traffic conditions will be improved as a result of the design of the road lay-out. Commissioner Street will be extended beyond the present park gates, and, after passing the Fire Station on the north side, will enter Coronation Road by means of easy curves. Traffic will further be regulated by making the roads surrounding the Fire Station one-way carriageways.



KRUGERSDORP FIRE STATION: SITE PLAN.

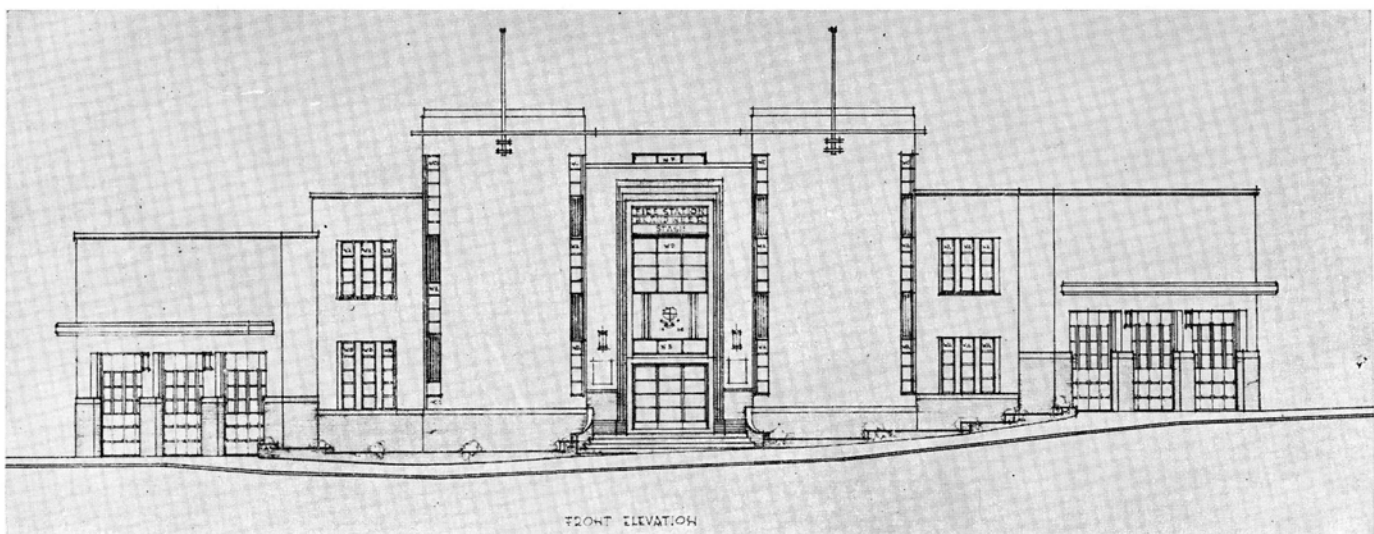
- (3) A dignified vista to Commissioner Street is being created. The architectural features of the building will blend with the garden lay-out in front and the majesty of high trees in the background.
- (4) A monumental entrance to Coronation Park, one of the most beautiful parks in the country, will be erected further east. The park itself will have a large frontage, which is more suitable for an attractive garden treatment.
- (5) A direct link between the town and the hospital will be established by the construction of a road from the Fire Station to the latter institution.
- (6) The sports grounds will be separated from the park, the combination of which in the past has proved to be unsatisfactory.

- (7) The building itself will be an imposing structure striking a note of originality befitting its unique position.

The perspective drawing, which was prepared for a different site, will convey this impression more clearly than a lengthy description.

The keynote in the design of this Fire Station is the manner in which its dual purpose, having regard for efficiency, co-ordination of fire-fighting and ambulance services, has been treated.

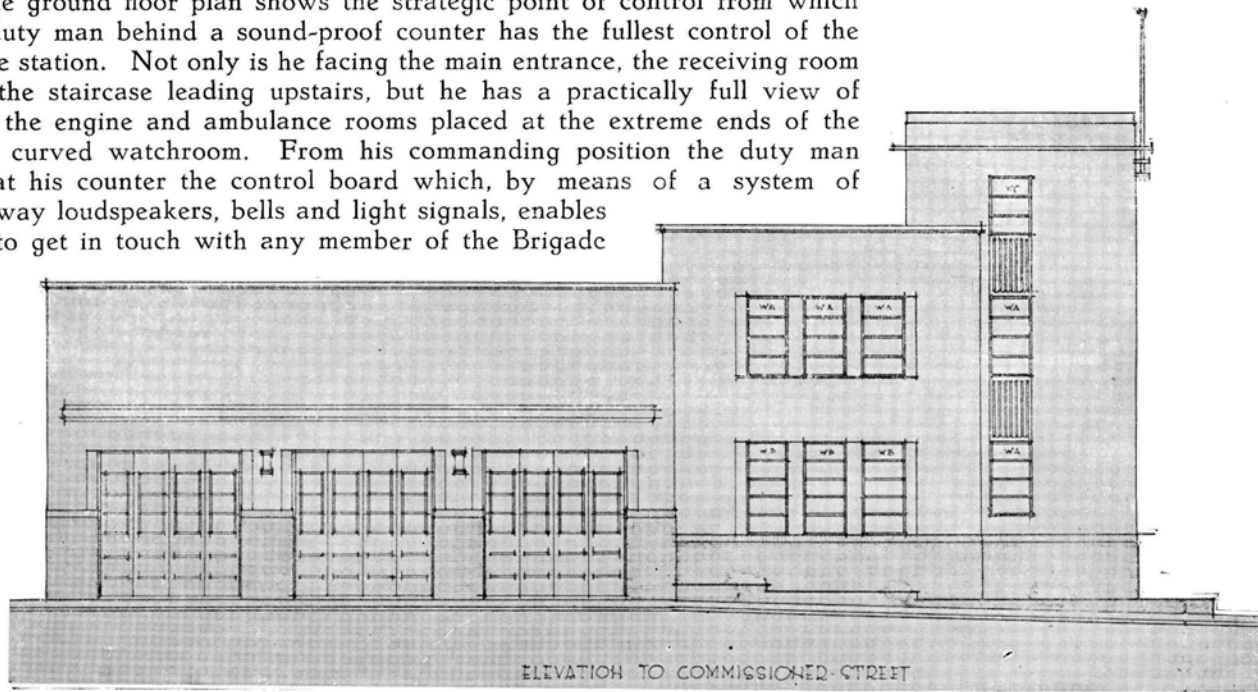
Two separate and equal rooms are provided for fire engines and for ambulances. These rooms are so placed in relation to each other that the two services cannot interfere with each other. Entrances are completely separated, as are the exits to the streets.



FRONT ELEVATION

FRONT ELEVATION.

The ground floor plan shows the strategic point of control from which the duty man behind a sound-proof counter has the fullest control of the whole station. Not only is he facing the main entrance, the receiving room and the staircase leading upstairs, but he has a practically full view of both the engine and ambulance rooms placed at the extreme ends of the wide curved watchroom. From his commanding position the duty man has at his counter the control board which, by means of a system of two-way loudspeakers, bells and light signals, enables him to get in touch with any member of the Brigade



SIDE ELEVATION.

anywhere on the premises. Telephones, alarm systems, etc., will form contact with the outside world. The duty man is therefore placed in the very heart of the Station; and not only does he supervise all activities, but he can provoke instantaneous action from the right quarters, a decided advantage in a service where every second is precious.

The interior lay-out also reflects this need for rapid reaction to an alarm. The circular staircase, semi-circular corridors and wide openings are all designed to avoid obstructions and loss of speed which would add confusion to the rush when the rush comes. The ground floor plan shows the arrangement of the offices and compartments for sundry purposes. The first floor contains a recreation room, a mess room and a reading room, as well as single men's quarters. A double collapsible glazed partition separates the mess room from the recreation room. By removing this partition a large room suitable for social gatherings, lectures,

etc., is created. Additional rooms are allowed for on the upper floor, together with a drill terrace. A drill tower will be erected behind the Station at a later date.

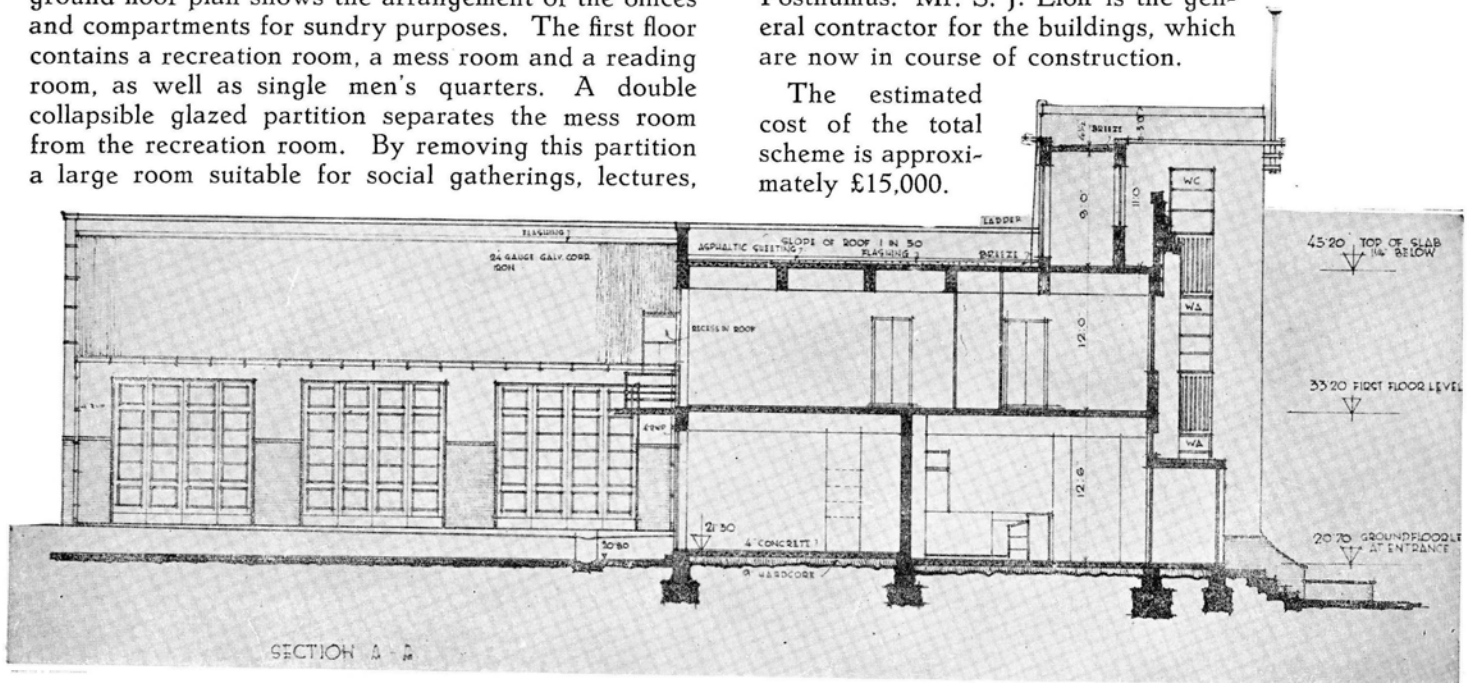
The yard itself, totally enclosed, will be paved and drained to a collecting sump for pumping drills.

East of the Station, but on the same island, the cottages for the officers of the Brigade will be erected.

The attractive surroundings and adjoining sporting facilities make this Station an ideal one for the men to reside in.

The plans were prepared in the Town Engineer's Department under the Town Engineer, Mr. A. S. Posthumus. Mr. S. J. Eloff is the general contractor for the buildings, which are now in course of construction.

The estimated cost of the total scheme is approximately £15,000.



CROSS SECTION.

Modern Concrete Engineering

Contributed



Expanding Uses of
Reinforced Concrete—
Concrete by Strength

ONE of the most prominent features in building construction today is the expanding use of concrete. The development of concrete engineering during the last decade or so is amply illustrated by the way this material has replaced structural steel in the tall buildings erected in South Africa. Alongside of this development has come the gradual elimination of the belief that concrete and steel had their respective and separate constructional markets and that the former material would never invade the field of the latter. Today there is hardly anything that cannot be built of concrete, even in fields of most ambitious design, and though structural steelwork still retains a separate and distinct market for special purposes, concrete in the last few years has come more and more to the fore in all types of work.

The most familiar forms of modern concrete construction are to be seen in the "sky-scrapers" of the metropolis, but the scope of concrete constructional activity going on in isolated sites is almost unknown except to those engineers and architects who make a special study of the subject.

In South Africa today there are many concrete structures that are landmarks in the development of this type of work, chief among these being the grain elevators erected by the Union Government.

In addition to these, concrete construction has rapidly come into its own in the design of factories. Lately, a number of mills have followed in this path and, though concrete has played a prominent part for years in bridge construction, some astounding strides have been taken especially in France and Italy, where spans up to 800 feet have been carried out.

Further illustration of the development of concrete engineering in South Africa is erection by means of moving forms, a method which has been greatly developed in America and Australia. It is easy to visualise what rapid progress can be made in the erection of silos, tanks, chimneys or any other types of construction where height is required, when it is considered that moving forms can be "moved" at the rate of 10 feet in 24 hours. By this means time, labour and shuttering are saved, and cost is reduced considerably, an important factor in South Africa, where timber is very costly.

Concrete by Strength.

Following the acquisition of recent knowledge an overseas committee on standard specifications for concrete and reinforced concrete recommended in their report that a concrete of the *desired strength be specified* instead of stating definite and arbitrary proportions.

This suggested radical change naturally gave an impetus to investigations of field methods to determine whether it would be popular with the average contractor. The suggestion was a step in the right direction, since the engineer and the architect are concerned mainly with obtaining a concrete of uniform quality and of the strength required, and not

with the methods the contractor may use to get these results. One consequence of the suggestion, however, was that it would throw a burden on the contractor who is naturally sceptical as to whether such a scheme can be put into practice without undue hardship to himself and increased cost.

The scheme was put to the test by some of the

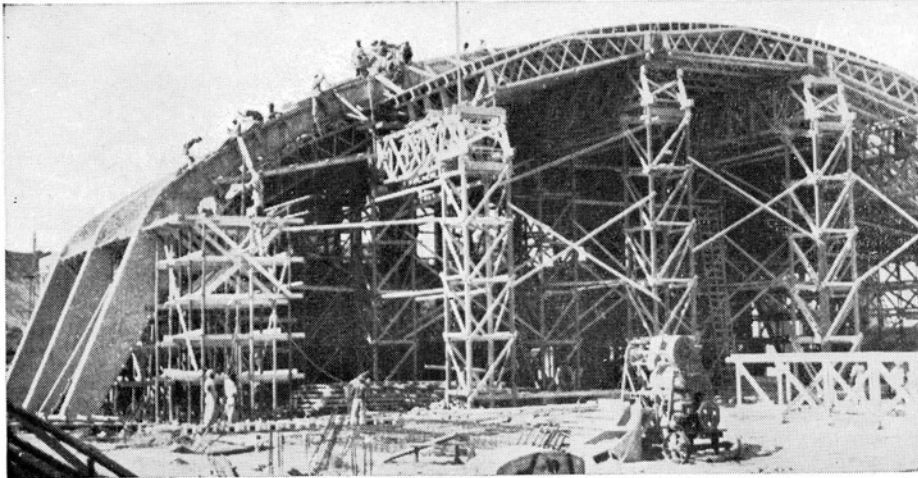


With acknowledgements to the Electricity Supply Commission.
ESCOM HOUSE, JOHANNESBURG.

larger contractors who on their own initiative and in co-operation with the engineers tried out field control methods on their work, comparing the result and cost obtained with those of the old methods. The results were so satisfactory that the use of control methods is rapidly extending, and on important undertakings overseas this method is now the universal practice.

Ready-mixed Concrete.

One of the chief factors, too, in the adoption of the specification of concrete by strength method by the huge majority of overseas municipal and public works departments has been the erection of ready-mixed concrete factories. Ready-mixed concrete is ordinary concrete scientifically mixed in a special factory and delivered to the building site in specially constructed motor lorries fitted with rotating drums. Numerous



factories exist in America and on the Continent, and the steady increase in the number of these factories is a certain indication of the realisation by construction engineers and contractors of the importance to them of this modern trend in the manufacture and handling of concrete. The concrete from these factories is always delivered with a guaranteed strength according to specification. It is to be hoped that the Union's leading municipal and Government engineers will take up this important aspect in modern concrete engineering, for, besides the many other advantages it offers, it provides an additional safeguard to all the parties concerned in any undertaking.

This modern trend in the manufacture and handling of concrete has one of its chief reasons in improved methods of cement manufacture by which the standard of quality and the factor of safety in concrete construction have been raised to a degree unknown until recent years.

Most of the cement factories in the Union have been erected in the last few years or modernised; and today with an annual production of about 1,000,000 tons of cement, they are able to cope with the Union demand. The quality of the material, too, is unsurpassed elsewhere in the world. The high standard of the product is guaranteed further by the fact that its manufacture is controlled by highly efficient staffs.

For the benefit of the lay reader it would be useful to detail a few of the advantages of concrete construction. Its one great advantage is that it requires no up upkeep such as painting or renewals because of the deterioration of its constructional parts. Once it is

erected it is there for ever. Strange to say, this has been one of the strongest arguments against the use of concrete for constructional purposes in cities. Its strength and durability make it a formidable problem when demolition becomes necessary. Modern machinery, however, can be bought for cutting down the different members of the concrete construction so that the position is not as black as it is painted.

Another consideration which formerly set people against concrete construction was the fact that it took too long to harden—as much as from two to three weeks. This delay in hardening retarded other trades,

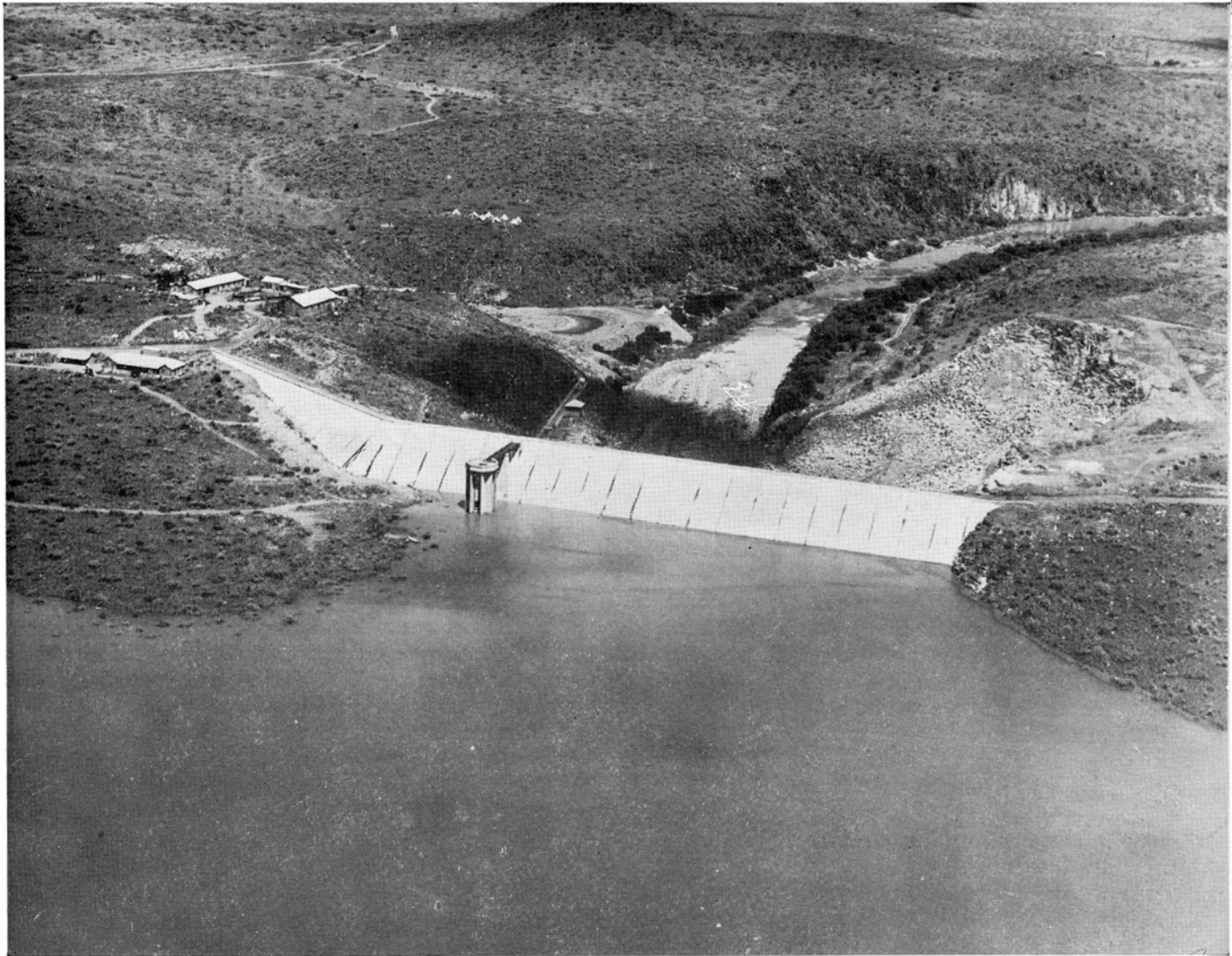
a fact which was especially noticeable where machinery had to be erected at different levels. Modern concrete, however, has lessened the enormous advantage of steel construction, the members of which could bear their full load as soon as they had been placed in position. Cement manufacturers in recent years evolved a

rapid-hardening cement which in 24 to 36 hours obtains the strength acquired by ordinary cement in 28 days.

The fact, too, that all daring pioneering efforts in concrete design and construction proved eminently satisfactory has been an important factor in the rapid advancement in this form of engineering. The principle of concrete construction possesses the advantage, too, that concrete can be fabricated on the building site, in nearly all cases the main materials being obtainable from the environs of the job. Cement, which constitutes the smallest portion of the aggregate, is the only material which involves transport.



A Continental motor lorry fitted with a rotating drum, used for conveying ready-mixed concrete from factory to building site.



The Kalkfontein Dam :
An Aerial View.

Another Great Irrigation Scheme

THE KALKFONTEIN DAM

— IN THE —

FAURESMITH DISTRICT

IN our December and January numbers we gave short accounts of two huge irrigation schemes in the Transvaal, namely, the Vaal Bank Dam and the Loskop Dam. The Free State, however, can also boast of a similar huge scheme, namely, the Kalkfontein Dam. It is situated on the Riet River, in the Fauresmith district.

This new dam, the construction of which was commenced in 1935, is only just complete, and it is the second-largest dam in the Union of South Africa. Although more than $1\frac{1}{2}$ times as big as the Loskop Dam, and over twice as big as the Hartebeestpoort Dam, it has only about one-third of the capacity of the Vaal Bank Dam. Again, interesting comparisons can be made between the figures relative to this dam and those dealing with both the Loskop and Vaal Bank Dams, given in previous issues of this Journal. The capacity of the Kalkfontein Dam is 298,000 acre feet. The crest length of the wall is 1,040 feet, and its maximum height above the river bed is 113 feet. In its construction, 27,000 cubic yards of rock have been used, while the slab and toe wall used 11,000 cubic yards of concrete.

It will, by means of 80 miles of main canal, irrigate an area of approximately 23,000 acres. The country which will benefit by this scheme is a naturally fertile district, and an excellent grazing ground, but is seriously handicapped by shortage of water. With the completion of this irrigation scheme, some time next year, at a total estimated cost of £700,000, this district will be practically immune from the danger of drought.

This dam is not constructed with the overspill wall and dispersers, as are the Loskop and Vaal Bank Dams, but has a natural spillway some two miles from the wall, against some high kopjes, where it will flow into the Riet River below, which will be broadened and deepened for a distance of 23 miles.

The river bed was scraped before the construction of the wall was begun, until solid rock was reached. The foundation was then laid into the rock.

Fifty cusecs, that is 125 million gallons, will flow from the dam along the canals every day. In addition to this, an overflow is led off down the river to private irrigation schemes and municipalities. This is rationed to 2,500,000 gallons a day, but will be increased to a practically unlimited quantity when the dam is full. When the dam is full the water will be 105 feet deep at the wall.

A tunnel two miles long will carry the water through the hills surrounding the dam, to the canals in the flat country below. This tunnel is 9 ft. high, and traverses first through soft shale, which was easy to bore, but later through hard dolorite, which wears down the drills in a day. To increase the speed of working on the tunnel, drilling is being done in three places. It has entered the hillside for a distance of over 3,000 feet from the dam end. An entry has also been made from the opposite end, where the canal system begins. In addition to this, a shaft has been sunk in the middle, from which boring is proceeding in both directions.

Power for the boring, which is being done with the most up-to-date machinery, and for the electric lighting system, is supplied by crude-oil diesel engines.

The water will be led into the tunnel by means of a concrete aqueduct.

The main canals are concrete-lined, and are being extended at the rate of 4,500 feet a week.

• For 18 months, 800 men worked day and night to build the wall, with the aid of searchlights when the natural lighting failed. Even now, with the dam complete, the work goes on day and night in three shifts, with a 24-hour break from noon on Saturdays. Six hundred Europeans and a thousand Natives are still employed on this great engineering work, which, we hope, when complete, will spell prosperity for the Free State farmers.

It should be added that the Resident Engineer is Mr. D. H. Leverkind.

E. T.

Page 37.

King William's Town's Non-European Population

REHABILITATION PLANS include:

*Slum Clearance, Re-Housing
and a well-equipped ———
Communal Recreation Hall*

THE Borough of King William's Town has during the past year made a genuine effort to alleviate the lot of the Native and Coloured populations of the town. During the year steps were taken to deal with the Brownlee Location under the Slums Act, and considerable progress has been made in this direction. The Government cancelled the Certificate of Reservation of the eight acres of land on which most of the insanitary dwellings are built. The whole of the condemned dwellings, one hundred and twenty-nine in number, were inspected and valued at slightly over £5,000. The Council has decided to pay compensation to the individual owners, the amounts appearing on this valuation roll.

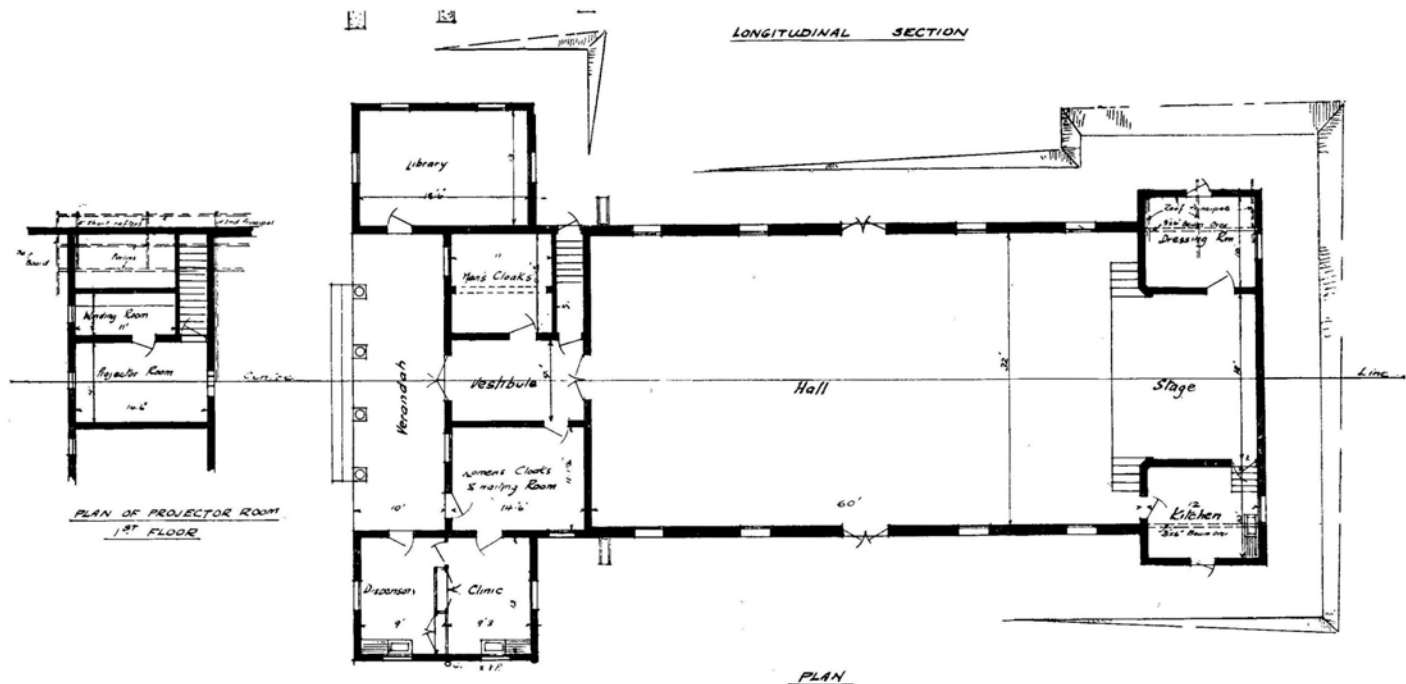
The question of rehousing these people has also received careful attention, and the Central Housing Board has granted a sub-economic loan of £23,000 for this purpose. This loan provides funds for building

ten types of houses for Natives and Coloured people, and building operations will probably commence in the near future.

A sub-economic loan of £2,500 has been approved by the Housing Board for the provision of a Recreation Hall for Non-Europeans, and this hall is now in the course of erection at Leightonville, under contract, by Mr. W. L. Higgs. The drawings for this hall were prepared in the office of Mr. H. M. Tait, Borough Engineer.

The Hall is 60' x 32' in floor area, with suitable stage, dressing rooms, kitchen and cloakrooms. A clinic, dispensary, library, cinema-operating room and spool-winding room are also incorporated in the building, the plan of which is reproduced here.

This recreation centre will supply a long-felt want on the part of the non-European section of the town.



PLAN OF LEIGHTONVILLE RECREATION HALL.

Tenders Accepted

THE following are particulars of contracts which have been awarded. The name of the successful tenderer is given in each case, and, where practicable, the contract price:—

AIR-CONDITIONING AND CENTRAL HEATING.

Air-conditioning plants (two) and accessories for Central Automatic Telephone Exchange and Central Telegraph Office, Johannesburg (P.W.D. 78): A. E. Barker, Johannesburg. £6,681.

Air-conditioning plant for New Aquarium, Sea Point (P.W.D. 108): A. E. Barker, Johannesburg. £2,093.

BUILDINGS AND ALTERATIONS, ETC.

Post Office, Wakkerstroom: J. W. Petersen, Krugersdorp. £3,010 5s. 3½d.

Automatic Telephone Exchange, Auckland Park — alterations and additions: J. W. Petersen, Krugersdorp. £50.

Post Office, Randfontein (P.W.D. 157): M. Klavansky, Krugersdorp. £8,978 19s. 2d.

Additions to Indian School, Estcourt: Johnston & Keith (Pty.), Ltd. £1,064.

Additions to Mount Edgecombe Indian School: Armitage & Lagerwall. £1,548 5s. 7d.

Native huts, complete (Tvl. Prov. tender 184/1938): F. A. Poole (Pty.), Ltd. £44 12s. each, f.o.r. Pretoria.

COOKING EQUIPMENT, ETC.

Steaming-oven for Tuberculosis Sanatorium, Nelspoort: W. R. Boustred, Ltd., Johannesburg. £194 16s. 3d.

(1) **Mincer**, (2) **toaster**, (3) **urn**, (4) **food mixer**, (5) **electric boiling table**, (6) **hot closet** (P.W.D. 132): (1) S.A. Scale Co., Ltd., Johannesburg: £27 5s. 0d. delivered in bond; (2) Thos. Barlow & Sons (S.A.), Ltd., Durban: £18 15s. 0d. delivered, duty paid; (3) Thos. Barlow & Sons, (S.A.), Ltd., Durban: £10 5s. 0d. delivered, duty paid; (4) Chas. Westwood, Johannesburg: £53 10s. 0d. delivered in bond; (5) Engineering Agencies (Pty.), Ltd., Johannesburg: £22 10s. 0d. delivered in bond; (6) British General Electric Co., Ltd., Durban: £28 10s. 0d. delivered in bond.

Heat storage cooker for Natal Mental Hospital, Pietermaritzburg (P.W.D. 131): P. Henwood, Soutter & Son, Durban. £198 delivered.

Cooking utensils for Natal Mental Hospital, Pietermaritzburg (P.W.D. 131): Union Engineering Co., Ltd., Durban. £37 2s. 0d. delivered in bond.

Excelsior kneading plants (Tvl. Prov. tender 146/1938): MacAdams, Ltd. £78 each, in bond, Durban.

ELECTRICAL EQUIPMENT.

Sixteen-cell battery for Border Experimental Station, Dohne (P.W.D. 124): Automobile Electric Supply, Ltd., Johannesburg. £39 7s. 6d., delivered in bond, f.o.r. Dohne Station.

"Lister" engine and "Higgs" Dynamo (P.W.D. 124): Griffin Engineering Co., Ltd., Johannesburg. £67, delivered in bond, f.o.r. Dohne Station.

Candelabra for The Castle, Cape Town (P.W.D. 111): Hubert Davies & Co., Ltd., Cape Town.

High-tension underground cable — 4,250 feet (P.W.D. 145): A. E. G. Engineering Co. (S.A.) (Pty.), Ltd., Johannesburg. £238.

(1) **Radio receivers**, (2) **A.C. inverters** (S.O. 1062): W. Gray, Durban. (1) £78 each f.o.b. New York; (2) £7 5s. each f.o.r. Durban.

Covered wire for Department of Posts and Telegraphs (A.L. 166): British Insulated Cables (S.A.), Ltd., Johannesburg.

(1) **Switch unit**, (2) **Low-tension switch pillar**, (3) **Transformer** (P.W.D. 120): (1) British General Electric Co., Ltd., Johannesburg: £109 10s. 0d. delivered in bond; (2) Johnson & Philips (S.A.) (Pty.), Ltd., Johannesburg: £48 delivered, duty paid; (3) S.A. General Electric Co., Ltd., Johannesburg: £73 delivered in bond.

Condensers for Department of Posts and Telegraphs (A.L. 168): Danish S.A. Trading Co. (Pty.), Ltd., Johannesburg.

REFRIGERATING PLANT.

Refrigerator for Natal Mental Hospital, Pietermaritzburg (P.W.D. 132): S.A. General Electric Co., Ltd., Johannesburg. £97 10s. 0d. delivered, duty paid.

ROADS AND ROAD-MAKING EQUIPMENT.

Creosote (S.O. 1066): (1) Creosote Producers' Association, Ltd., London; (2) Steel Sales Co. of Africa (Pty.), Ltd., Johannesburg.

Bitumen spraying and grit screening of roads — 4,400 sq. yds. — at National Zoological Gardens, Pretoria (P.W.D. 153): Wolton Gray (Pty.), Ltd., Johannesburg. £220.

Grader for Stellenbosch-Elsenburg College of Agriculture (S.O. 1070): E. G. Nyman (Pty.), Ltd., Maitland. £55 4s. 0d.

Dump trailers (Tvl. Prov. tender 187/1938): Mitchell, Cotts & Co. (S.A.). £190 each, f.o.r. Durban.

Ingersoll Rand jackhammers (Tvl. Prov. tender 194/1938): Ingersoll Rand Co. (S.A.). £47 5s. 0d. each, in bond, f.o.r. Port Elizabeth.

Crushed stone, 4,600 cu. yds. (Tvl. Prov. tender 195/1938): Capital Granite & Slate Quarries, Bon Accord.

Tractor-grader unit (Tvl. Prov. tender 198/1938): W. S. Thomas & Co. £492 in bond, f.o.r. East London.

Motor-graders (Tvl. Prov. tender 199/1938): Jeffrey-Galion (Pty.), Ltd. £465 each, f.o.r. in bond, Port Elizabeth.

Caterpillar model tractor-angle dozers (Tvl. Prov. tender 219/1938): Thos. Barlow & Sons. £1,120 15s. 0d. each, f.o.r. Durban.

Portable tar boilers (Tvl. Prov. tender 201/1938): Mitchell, Cotts & Co. (S.A.), Ltd. £165 each, in bond, f.o.r. Durban.

Tipping bodies (Tvl. Prov. tender 234/1938): British Mining Supply Co. (Pty.), Ltd. £57 each, f.o.r. Johannesburg.

Water sprinkler equipments (Tvl. Prov. tender 235/1938): Ussher Inventions (Pty.), Ltd. £96 each, f.o.r. Booyens.

Bitumen emulsions, 8,000 gallons (Tvl. Prov. tender 284/1938): Micron Asphalt Products (Pty.) Ltd. 10d. per gallon, f.o.r. Siding 1095, Industria.

Satmar Bitumen, 30,000 gallons 200 penetration (Tvl. Prov. tender 289/1938): S.A. Torbanite Mining & Refining Co., Ltd. 10d. per gallon, delivered into Administration's vehicles.

Iscor tar prime, 100,000 gallons (Tvl. Prov. tender 189/1938): Steel Sales Co. of S.A. (Pty.), Ltd. 8d. per gallon, f.o.r. Siding 1143, Cordelfos.

Crushed stone (Tvl. Prov. tender 325/1938): West Crusher (Pty.), Ltd., Krugersdorp. 5,000 cu. yds. grade (1) at 5/6, and 1,800 cu. yds. grade (2) at 6/5 delivered on road.

Bitumen, 63,000 gallons (Tvl. Prov. tender 326/1938): Shell Co. of S.A., Ltd., Johannesburg. 7½d. per gallon f.o.r. in bond Lourenço Marques.

Road tar, 135,000 gallons Iscor No. 2 (Tvl. Prov. tender 353/1938): Steel Sales Co. (S.A.), Ltd., Johannesburg. 7d. per gallon in bulk, or 8d. per gallon (f.o.r. Siding 1143, Cordelfos).

Shelspra RC. 2, 78,000 gallons (Tvl. Prov. tender 353/1938): Shell Co. of S.A., Ltd., Johannesburg. 7.75d. per gallon, f.o.r. Lourenço Marques.

Miscellaneous tools and equipment, for period 1st January, 1939, to 31st December, 1939 (Cape Province tender F.87/1938): Associated Engineers Co., P.O. Box 894, Cape Town; African Tool Co. (Pty.), Ltd., P.O. Box 757, Cape Town; Baldwins (S.A.), Ltd., P.O. Box 628, Port Elizabeth; Blane & Co., Ltd., P.O. Box 435, Johannesburg; Bulbring Bros., P.O. Box 255, Port Elizabeth; Jack Benson & Co., P.O. Box 1765, Cape Town; Chubb & Maxwell (Pty.), Ltd., P.O. Box 299, Cape Town; A. Comay & Sons., P.O. Box

22, George; Cymot, Ltd., P.O. Box 710, Cape Town; Cape Gate, Fence & Wire Works, P.O. Box 17, Parow; Hayward, Young & Co., Ltd., P.O. Box 169, Port Elizabeth; Holden & Co., P.O. Box 3018, Port Elizabeth; S. Jocum & Co., P.O. Box 1615, Cape Town; Kirkwood & Sons, P.O. Box 705, Port Elizabeth; S. Machanick & Co., P.O. Box 803, Cape Town; Adolph Mosenthal & Co., P.O. Box 1, Port Elizabeth; Millars Trading & Timber Co. (Overseas), Ltd., P.O. Box 2152, Cape Town; National Trading Co., Ltd., P.O. Box 538, Cape Town; Sam Newman, Ltd., P.O. Box 1573, Cape Town; Oswald Bros., P.O. Box 366, Cape Town; Potlansky Bros. & Schrauder, P.O. Box 140, Port Elizabeth; Geo. Parkes & Sons., Ltd., P.O. Box 12, Knysna; Premier Timber Co., Ltd., P.O. Box 260, East London; Edward Searle & Co., P.O. Box 430, Port Elizabeth; South African Wire Co., Ltd., P.O. Box 1591, Durban; Stewarts & Lloyds (S.A.), Ltd., P.O. Box 722, Cape Town; E. W. Tarry & Co., Ltd., P.O. Box 162, Port Elizabeth; Thesen & Co., Ltd., P.O. Box 10, Knysna; Jas. W. Weir & Co., Ltd., P.O. Box 241, East London; Woolf Engineering Co. (Pty.), Ltd., P.O. Box 444, Bloemfontein.

MISCELLANEOUS.

Disc harrow and three-furrow disc plough for Central Tobacco Research Station, Kroondal, Rustenburg (S.O. 1020): Mangold Bros., Ltd., Johannesburg. £36 5s. 0d. and £56 10s. 0d., respectively, f.o.r. Johannesburg.

Pull-power hay pressers (S.O. 218): Dunell, Ebdon & Co. (Pty.), Ltd., Port Elizabeth. £63 each, f.o.r. Port Elizabeth.

Lathe for Trigonometrical Survey Division, Mowbray (S.O. 1031): National Engineering (Pty.), Ltd., Johannesburg. £110 f.o.b. Antwerp.

Bodies for mechanical trucks (S.O. 249): (1) Wevell Bros., Ltd., Johannesburg; (2) Jenkins & Son, Johannesburg.

Toll entrance cable (A.L. 165): Wilson & Herd, Ltd., Johannesburg. (1) for Pretoria: £630 13s. 6d. f.o.b. London; (2) for Baragwanath: £1,345 12s. 6d. f.o.b. London.

Enamelled Plates (P.O. 712): Niven, Mitchell & Co., Ltd., Johannesburg.

Steel lockers — 1112 (S.O. 226): S.A. Steel Equipment Co., Ltd., Johannesburg. £3 5s. 6d. each, f.o.r. Pretoria.

Plane iron grinder (S.O. 1039): Tower Industries, Johannesburg. £31 f.o.b. Hamburg.

Compressor plant (S.O. 1039): Danish Industries (Pty.), Ltd., Johannesburg. £44 f.o.b. Copenhagen or Hamburg.

Single spindrell moulder (S.O. 1039): General Machinery (Pty.), Ltd., Johannesburg. £54 10s. f.o.b. Gothenburg.

Wardrobes and club easy chairs for S.A. Police (S.A.P. indent 226): Netherlands Furniture Works, Johannesburg.

Coke — 500 tons (S.O. 1): Pretoria Coal Co., Ltd., Pretoria. £1 7s. 5d. per 2,000 lb. delivered Pretoria West.

Motor cutter for Government Guano Islands (S.O. 1015): Fritz Nieswandt, Luderitzbucht. £2,085.

Combined motor-driven mower for Cedara School of Agriculture (S.O. 233): Robertson & Mass, Ltd., Durban. £105 f.o.r. Durban.

Waterborne drainage at Eshowe School — Boys' and Girls' Hostels and Headmaster's House: R. Getliffe. £1,326 8s. 8d.

Durban North School: Improvements to grounds: F. S. Bishop. £496 10s. 6d.

Holman drills sharpening machines (Tvl. Prov. tender 191/1938): Holman Bros. (Pty.), Ltd. £186 15s. each, f.o.r. East London.

CMC. single-drum air winch (Tvl. Prov. tender 192/1938): Sturrock (S.A.), Ltd., Johannesburg. £104 in bond, f.o.r. Durban.

Air compressors (Tvl. Prov. tender 193/1938): Gardner-Denver Co. (Afr.) (Pty.), Ltd. £815 each, f.o.r. Durban or Port Elizabeth.

Tacheometers (Tvl. Prov. tender 197/1938): Cooke Troughton & Simms. £71 each, f.o.r. Johannesburg.

Heavy motor trucks (Tvl. Prov. tender 236/1938): Reunert & Lenz., Ltd. £1,093 each (f.o.r. Durban) and body and cab (f.o.r. Johannesburg).

Concrete mixer (Tvl. Prov. tender 202/1938): Sturrock (S.A.), Ltd. £134 10s. in bond, f.o.r. Durban.

Pump, Rex Model (Tvl. Prov. tender 203/1938): Thos. Barlow & Son (S.A.), Ltd. £57 10s. f.o.r. in bond, Port Elizabeth.

Delivery vans, Ford V-8, $\frac{3}{4}$ -ton (Tvl. Prov. tender 232/1938): Ford Motor Co. £158 each f.o.r. in bond Port Elizabeth.

Chevrolet chassis (Tvl. Prov. tender 233/1938): Alderson & Flitton. 16 at £190 each, 7 at £196 each, f.o.r. Port Elizabeth.

Tenders Invited

THE following are particulars of the more important tenders which have been invited, up to the time of going to press, by Government Departments and Provincial Administrations. In each case the date by which tenders must be submitted, and the office to which application should be made, are given.

AIR-CONDITIONING AND CENTRAL HEATING.

Central heating installation for Post Office and Automatic Telephone Exchange, Benoni (supply, delivery and erection: P.W.D. tender 191): P.W.D., Pretoria (Room 531, phone 5477). **6th April.**

Central heating installation for old European Ward Block and old Coloured Ward Block, Nelspoort Sanatorium (supply, delivery and erection: P.W.D. tender 195): P.W.D., Pretoria, as above. **20th April.**

BRIDGES.

Horn River Bridge — substructure, approaches and reinforced superstructure (P.W.D. tender 203): P.W.D., Pretoria (Room 531, phone 5477), and District Representative, P.W.D., Pietermaritzburg. **5th April.**

Bridgework (S.A.R. tender 2115): Stores Superintendents at Salt River, Uitenhage, East London, Durban, Bloemfontein, Pretoria, and Chief Stores Superintendent, Room 46, S.A.R. & H. headquarters, Johannesburg. **15th May.**

Ingagane River Bridge — substructure, approaches and reinforced superstructure (P.W.D. tender 205): P.W.D., Pretoria (Room 531, phone 5477), and District Representative, P.W.D., Pietermaritzburg. **12th April.**

BUILDINGS, ALTERATIONS, ETC.

Automatic Telephone Exchange, Parkview, Johannesburg (alterations and additions: P.W.D. tender 202): P.W.D., Pretoria (Room 531, phone 5477), and District Representative, P.W.D., Johannesburg. **6th April.**

Structural steelwork, etc., for Engine Shed, Pretoria (S.A.R. tender 2078): Stores Superintendents at Salt River, Uitenhage, East London, Durban, Bloemfontein, Pretoria, and Chief Stores Superintendent, Room 46, S.A.R. & H. headquarters, Johannesburg. **3rd April.**

Officers' quarters for Defence Department, Grand Magazine Road, Pretoria (P.W.D. tender 171): P.W.D., Pretoria (Room 531, phone 5477). **13th April.**

Automatic Telephone Exchange, Boksburg (P.W.D. tender 204): P.W.D., Pretoria (Room 531, phone 5477), and District Representative, P.W.D., Johannesburg. **13th April.**

Structural steelworks for S.A.R. & H. (S.A.R. tender 2123): Railway Stores at Salt River, Uitenhage, East London, Durban, Bloemfontein, Pretoria, and Chief Stores Superintendent, Room 46, S.A.R. & H. headquarters, Johannesburg. **8th May.**

Additions to Excelsior Primary School, Port Elizabeth
Division: Messrs. Jones & McWilliams, F.F. & A.R.I.B.A., Architects, Library Building, Port Elizabeth. **11th April.**

Additions to Upington High School, Gordonia Division: Messrs. Louw & Louw, Architects, 600 Sanlam Building, Cape Town, and 130 Main Street, Paarl. **11th April.**

Additions to Bellville Primary School, C.P.: Messrs. Jones & Day, Architects, 6 Church Square, Cape Town. **11th April.**

Vrede School Hall, O.F.S.: Secretary, School Board, Vrede. **8th April.**

COOKING EQUIPMENT, ETC.

Steam boiling pans and L.P. steam traps for Fort Napier Mental Hospital, Pietermaritzburg (P.W.D. tender 176): P.W.D., Pretoria (Room 531, phone 5477). **6th April.**

Food-mixer for Fort Napier Institution, Pietermaritzburg (tender S.O. 255): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, phone 3121), Pretoria. **6th April.**

Food carriers for Valkenberg Mental Hospital, Cape Town (P.W.D. tender 190): P.W.D., Pretoria (Room 531, phone 5477). **20th April.**

Crude oil fired range and automatic burner to existing hotwater boiler at Police Mess, Cape Town (P.W.D. tender 199): P.W.D., Pretoria (Room 531, phone 5477), and District Representative, P.W.D., Cape Town. **27th April.**

Stove (and engine-driven pumping plant) for Superintendent's House, Olifants River Settlement (tender S.O. 280): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, phone 3121), Pretoria. **6th April.**

ELECTRICAL EQUIPMENT.

Low-tension underground cable for Recreation Hall, Roberts Heights (P.W.D. tender 177): P.W.D., Pretoria (Room 531, phone 5477). **6th April.**

Electric service lift for The Castle, Cape Town (supply, delivery and erection: P.W.D. tender 178): P.W.D., Pretoria (Room 531, phone 5477), and District Representative, Cape Town. **6th April.**

Overhead electric travelling crane for Postal Stores, Durban (supply, delivery and erection: P.W.D. tender 175): P.W.D., Pretoria (Room 531, phone 5477). **13th April.**

Motor alternator sets for S.A.R. & H. (S.A.R. tender 2117): Railway Stores at Salt River, Uitenhage, East London, Durban, Bloemfontein, Pretoria; Chief Stores Superintendent, Room 46, S.A.R. & H. headquarters, Johannesburg. **24th April.**

Power plant for Pretoria Central Telegraph Office (P.O. tender 732): District Stores Superintendents, Johannesburg, Cape Town, Port Elizabeth, East London, Durban, Bloemfontein; Divisional Controller, Post Office, Pietermaritzburg; Controller of P.O. Stores, Room 77, G.P.O. Annexe, Pretoria. **4th May.**

4-Ton electric jib cranes (two) for S.A.R. & H. (S.A.R. tender 2085): Railway Stores at Salt River, Uitenhage, East London, Durban, Bloemfontein, Pretoria, and Chief Stores Superintendent, Room 46, S.A.R. & H. headquarters, Johannesburg. **15th May.**

LABORATORY AND HOSPITAL EQUIPMENT.

Chemicals and apparatus, etc., for Low Temperature Research Laboratory, Fruit Inspector and Senior Entomologist at Cape Town (tender S.O. 276): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, phone 3121), Pretoria. **4th May.**

Chemicals and apparatus, etc., for Pasture Research Stations at Leeuwkuil, Estcourt, Tabamhlope, Athlone and Dohne (tender S.O. 277): Union Tender and Supplies Board, as above. **4th May.**

Chemicals and apparatus for Chief, Division of Plant Industry (tender S.O. 278): Union Tender and Supplies Board, as above. **4th May.**

X-ray apparatus and accessories, etc., for S.A.R. & H. Sick Fund, Cape Town: District Secretary, S.A.R. & H. Sick Fund, Cape Town. **17th April.**

REFRIGERATING PLANT.

Refrigerators for Onderstepoort Laboratory (supply, delivery and installation: tender S.O. 285): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, phone 3121), Pretoria. **6th April.**

ROADS AND ROAD-MAKING EQUIPMENT.

Stone crusher, portable compressor unit, pneumatic-tired tractor and vibrating screen for State Alluvial Diggings, Alexander Bay (tender S.O. 250): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, phone 3121), Pretoria. **6th April.**

Tractor, ripper and scrapers for Native Affairs Department (tender S.O. 254): Union Tender and Supplies Board, as above. **13th April.**

Mechanical shovels (two) for National Roads Board, Transvaal (Transvaal Provincial tender 85/1939): Superintendent of Provincial Stores, P.O. Box 857, Pretoria. **26th April.**

Bulk bitumen distributors for Transvaal Provincial Administration (tender 74/1939): Superintendent of Provincial Stores, P.O. Box 857, Pretoria. **12th April.**

Motor graders for Transvaal Provincial Administration (tender 77/1939): Superintendent of Provincial Stores, P.O. Box 857, Pretoria. **12th April.**

Motor trucks, heavy, for Transvaal Provincial Administration (tender 80/1939): Superintendent of Provincial Stores, P.O. Box 857, Pretoria. **12th April.**

Steel and galvanised iron for National and Provincial Roads in Cape Province (tender F.35/1939): Provincial Roads Engineer, P.O. Box 2603, Cape Town. **21st April.**

Miscellaneous materials and equipment for use on National and Provincial Roads in Cape Province for period 1st July, 1939 – 30th June, 1940 (tender F.33/1939): Provincial Roads Engineer, P.O. Box 2603, Cape Town. **21st April.**

Mechanics' vans for National Roads, Natal: Provincial Roads Engineer, P.O. Box 417, Pietermaritzburg. **19th April.**

WATER SUPPLY AND IRRIGATION EQUIPMENT.

Windmill, tank and tankstand for Motiton Police Station, near Vryburg, Bechuanaland (supply, delivery and erection: P.W.D. tender 183): P.W.D., Pretoria (Room 531, phone 5477). **6th April.**

Pumping plant, pressure tank and fittings for Vaal-Hartz Depôt, Taungs (tender S.O. 267): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, phone 3121), Pretoria. **6th April.**

Pumping plant and engine for Waterkloof Air Station (P.W.D. tender 198): P.W.D., Pretoria (Room 531, phone 5477). **27th April.**

Windmill, tank and tankstand for Police Station, Warrenton, C.P. (P.W.D. tender 206): District Representative, P.W.D., Bloemfontein. **6th April.**

Boring for water at New Hostel, Piet Retief (Irrigation tender 329): Controller of Stores, Irrigation Department (P.O. Box 277), Pretoria. **6th April.**

Engine-driven pumping plant (and stove) for Superintendent's House, Olifants River Settlement (tender S.O. 280): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, phone 3121), Pretoria. **6th April.**

MISCELLANEOUS.

Continuous drying-room for Valkenberg Mental Hospital (P.W.D. tender 179): P.W.D., Pretoria (Room 531, phone 5477), and District Representative, P.W.D., Cape Town. **6th April.**

Laundry machinery for Prince Alfred Infirmary, Grahamstown Chronic Sick Hospital (P.W.D. tender 180): P.W.D., Pretoria (Room 531, phone 5477). **6th April.**

Rock-drilling equipment and air compressors (P.O. tender 728): District Stores Superintendents, Johannesburg, Cape Town, Port Elizabeth, East London, Durban, Bloemfontein; Divisional Controller, Post Office, Pietermaritzburg; Controller of Post Office Stores, Room 77, G.P.O. Annexe, Pretoria. **13th April.**

Woodworking machine, Universal type (P.O. tender 729): See above. **13th April.**

Power engine, agricultural implements, trolley and camera for Dohne Pasture Research Station (tender S.O. 269): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, phone 3121), Pretoria. **6th April.**

Workshop equipment (including tools) for King George V. Hospital for Tuberculosis, Durban (supply and delivery: P.W.D. tender 189): P.W.D., Pretoria (Room 531, phone 5477). **20th April.**

Steam generating set for Nelspoort Sanatorium, Nelspoort, C.P. (supply and delivery: P.W.D. tender 194): P.W.D., Pretoria, as above. **20th April.**

Tractor for Vaal-Hartz Settlement (tender S.O. 272): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, phone 3121), Pretoria. **6th April.**

Crane for Department of Prisons, Pretoria (tender S.O. 273): Union Tender and Supplies Board, as above. **6th April.**

Land rollers and seed drills for Native Affairs Department in Natal (tender S.O. 274): Union Tender and Supplies Board, as above. **6th April.**

Steam disinfector and vertical cross-tube boiler for Defence Department, Wynberg, Cape Town (P.W.D. tender 197): P.W.D., Pretoria (Room 531, phone 5477). **27th April.**

Steel bogie drop-sided wagon underframes, type D.27 — South African manufacture (S.A.R. tender 2126): Railway Stores at Salt River, Uitenbage, East London, Durban, Bloemfontein, Pretoria, and Chief Stores Superintendent, Room 46, S.A.R. & H. headquarters, Johannesburg. **29th May.**

Trolleys (two) for Onderstepoort Laboratory (tender S.O. 282): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, phone 3121), Pretoria. **6th April.**

Hardwood sleepers for State Alluvial Diggings, Alexander Bay (S.O. tender 286): Union Tender and Supplies Board, as above. **13th April.**

Washing machine, windmill and conveyor belt equipment for State Alluvial Diggings, Alexander Bay (tender S.O. 281): Union Tender and Supplies Board, as above. **27th April.**

Pillar posting boxes, reinforced concrete (P.O. tender 730): Divisional Controller, P.O., Pietermaritzburg; District Stores Superintendents, Johannesburg, Port Elizabeth, Cape Town, Durban, Bloemfontein, East London; Controller of P.O. Stores, Room 83, G.P.O. Annexe, Pretoria. **6th April.**

Vacuum brake gear rubber parts for S.A.R. & H. (S.A.R. tender 2118): Railway Stores at Salt River, Uitenbage, East London, Durban, Bloemfontein, Pretoria, and Chief Stores Superintendent, Room 46, S.A.R. & H. headquarters, Johannesburg. **12th June.**

School bedsteads: Provincial Accountant, P.O. Box 373, Pietermaritzburg. **7th June.**

Waterborne drainage, installation of, at Wentworth School, Durban: P.W.D., Durban. **5th April.**

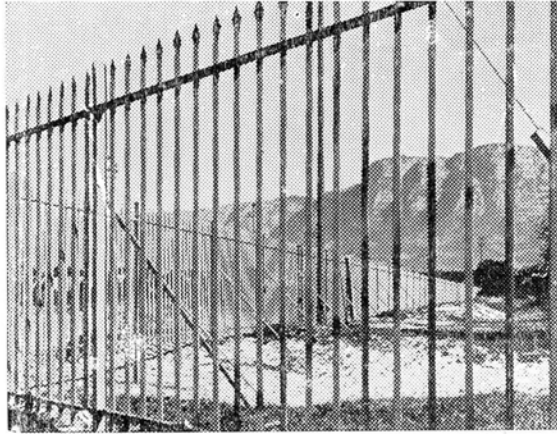
Waterborne drainage, installation of, at Montclair School, Durban: P.W.D., Durban. **5th April.**

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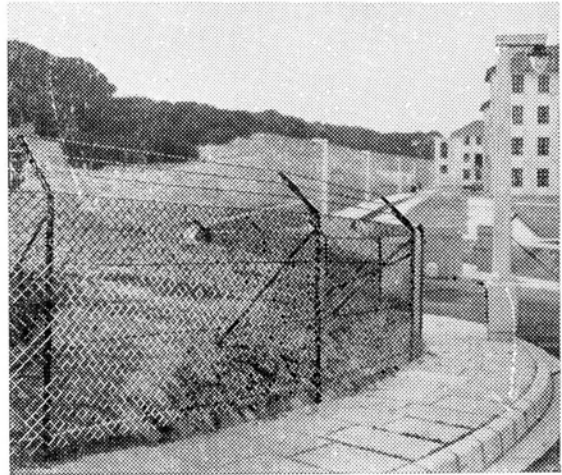
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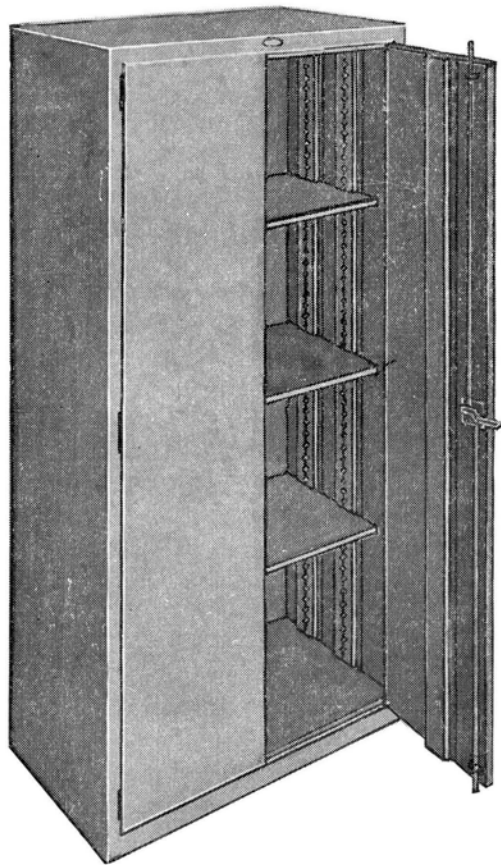


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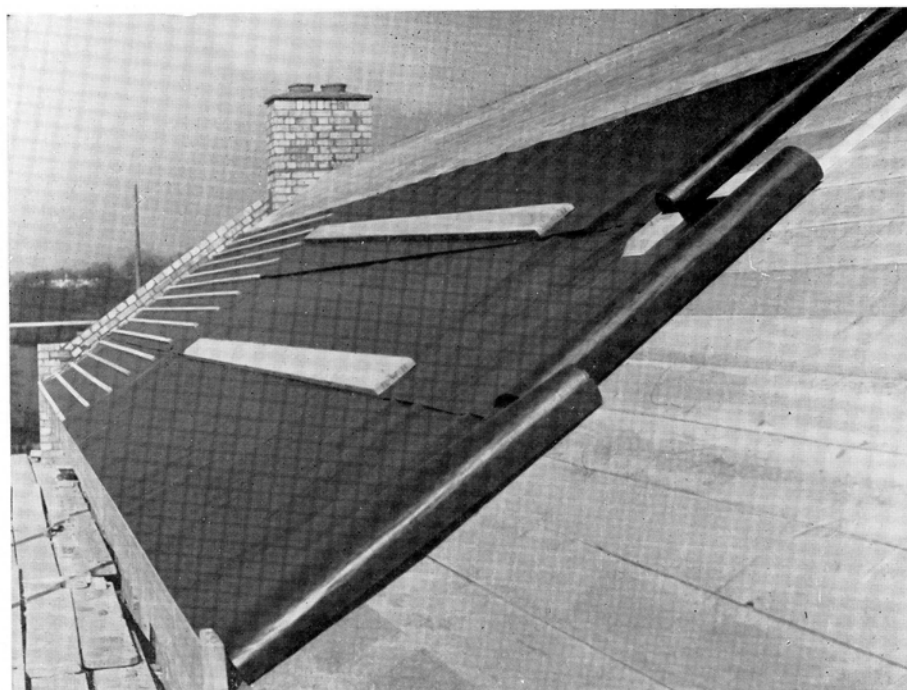
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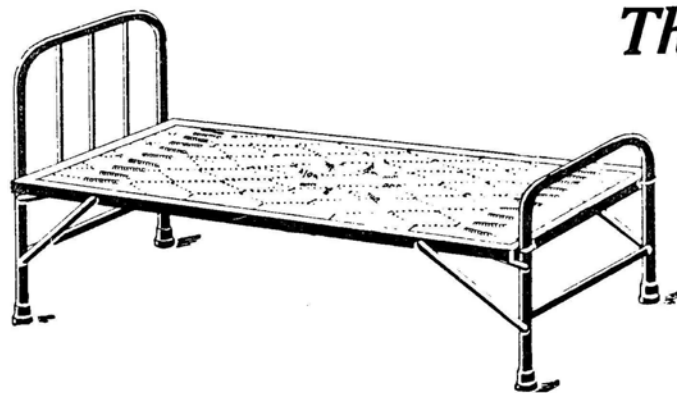
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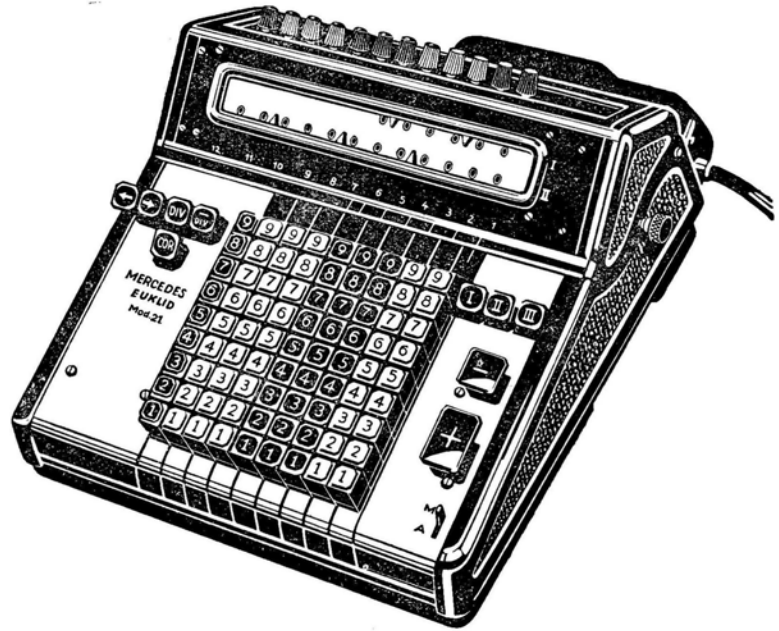
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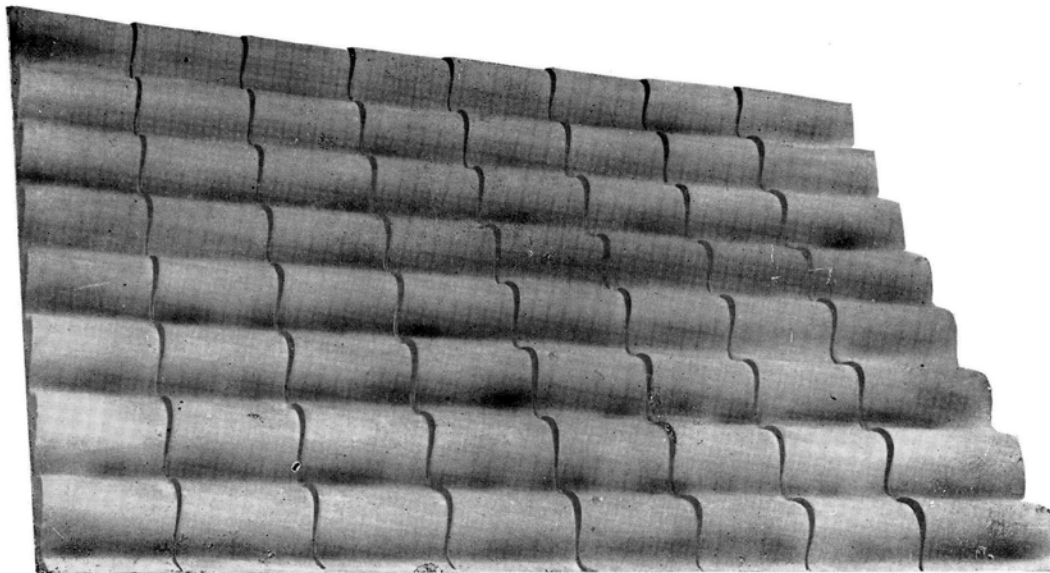


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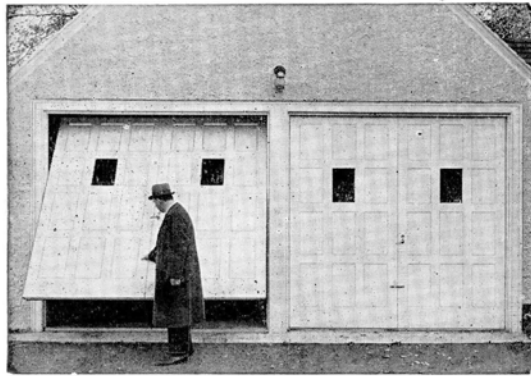
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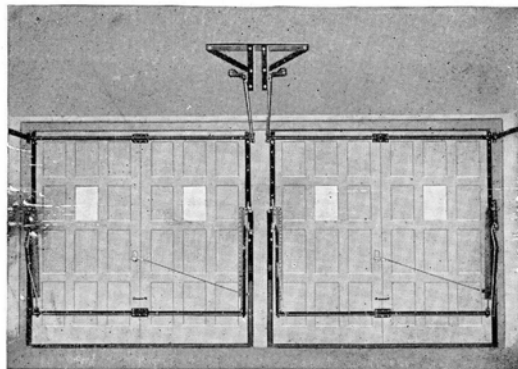
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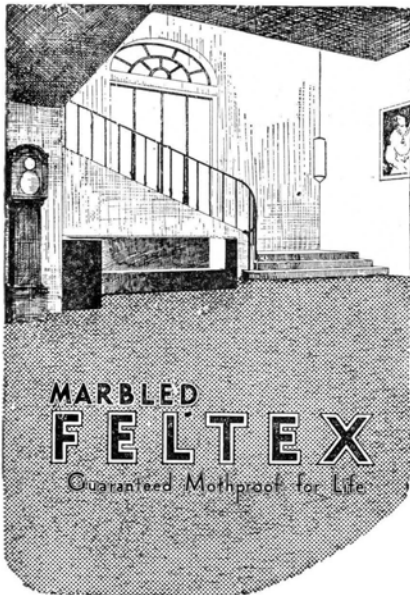
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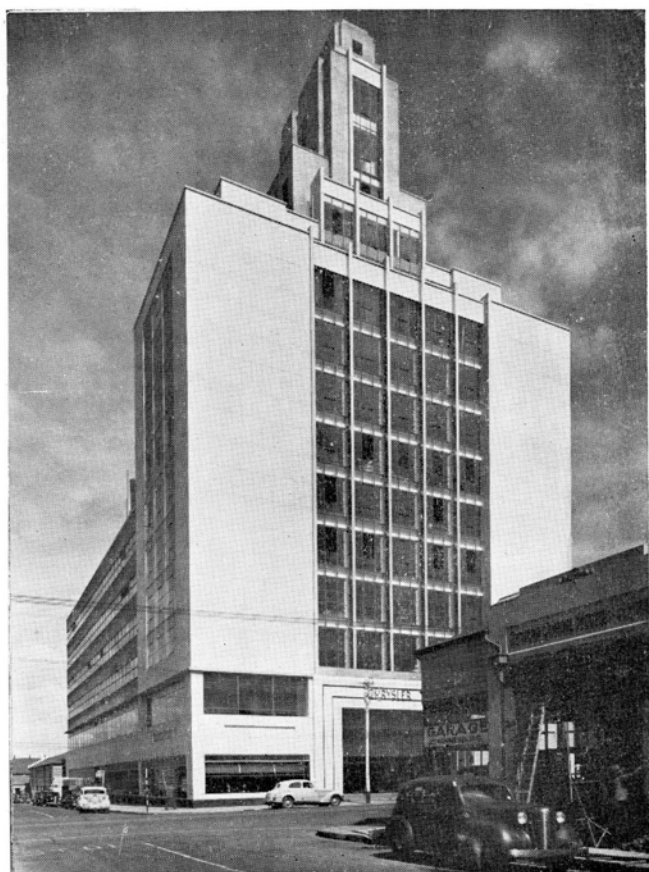
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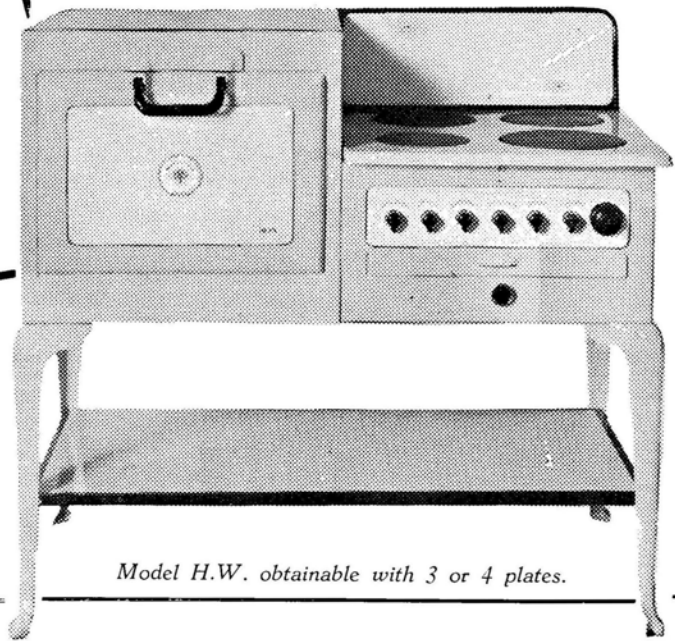
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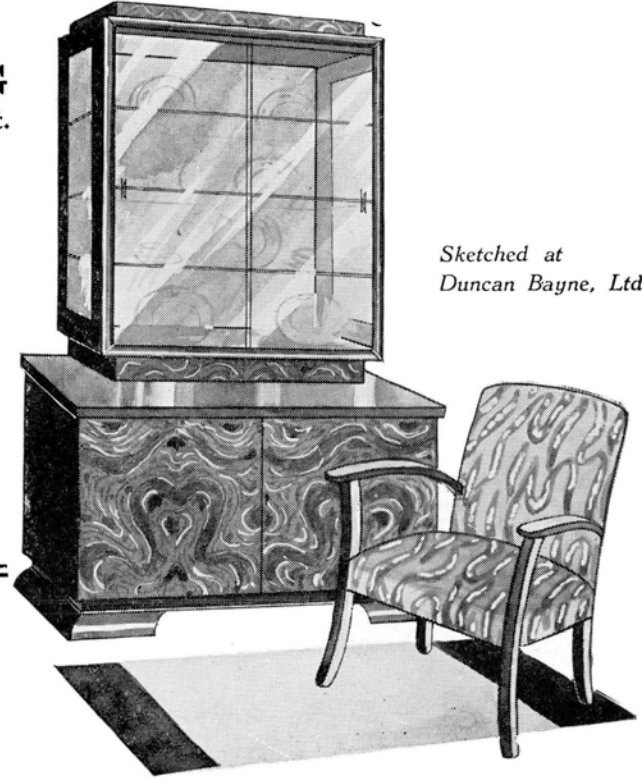
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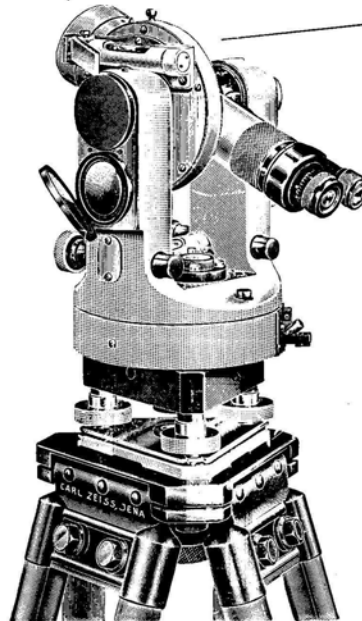
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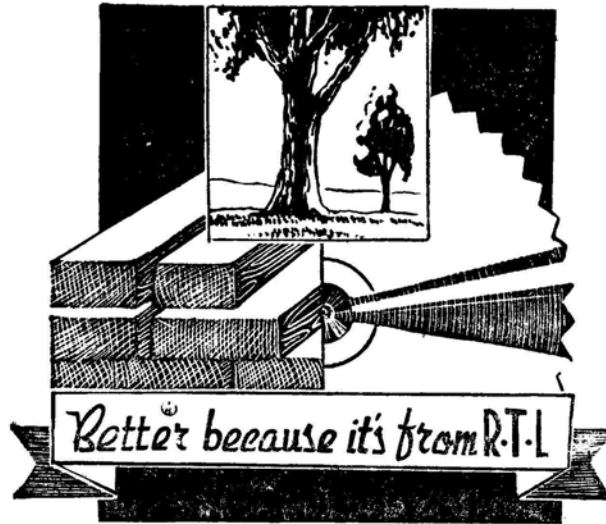
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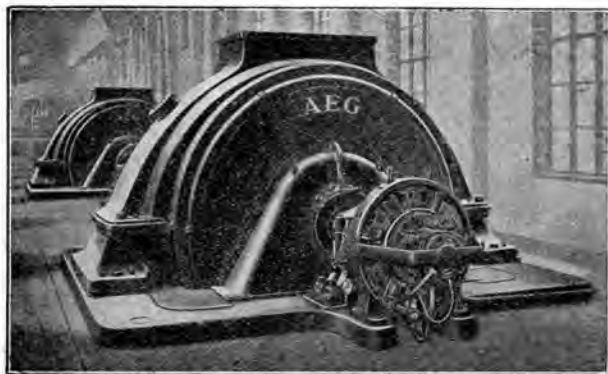
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