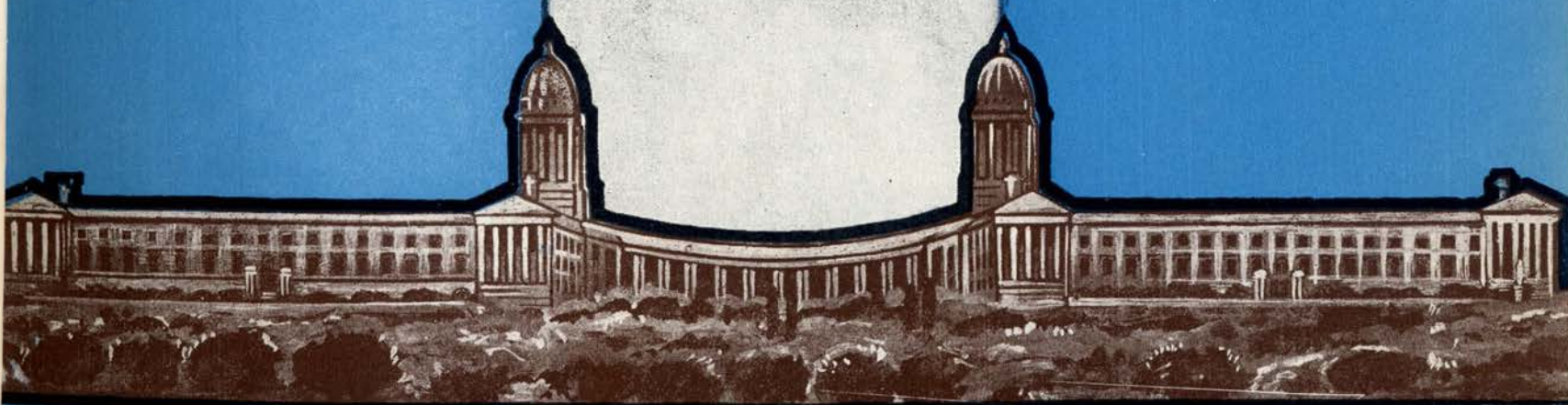


Vol. III.

No. 13.

NOVEMBER :: 1939.

# PUBLIC WORKS OF SOUTH AFRICA



Registered at the General Post Office as  
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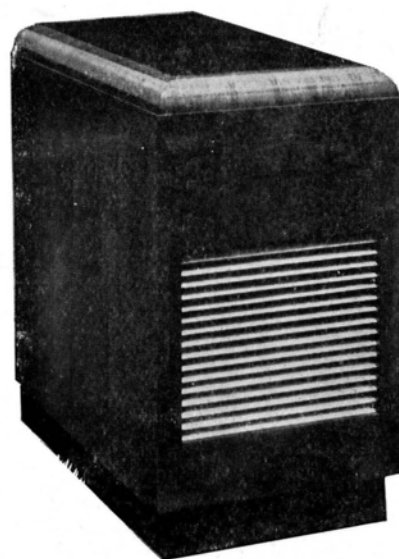
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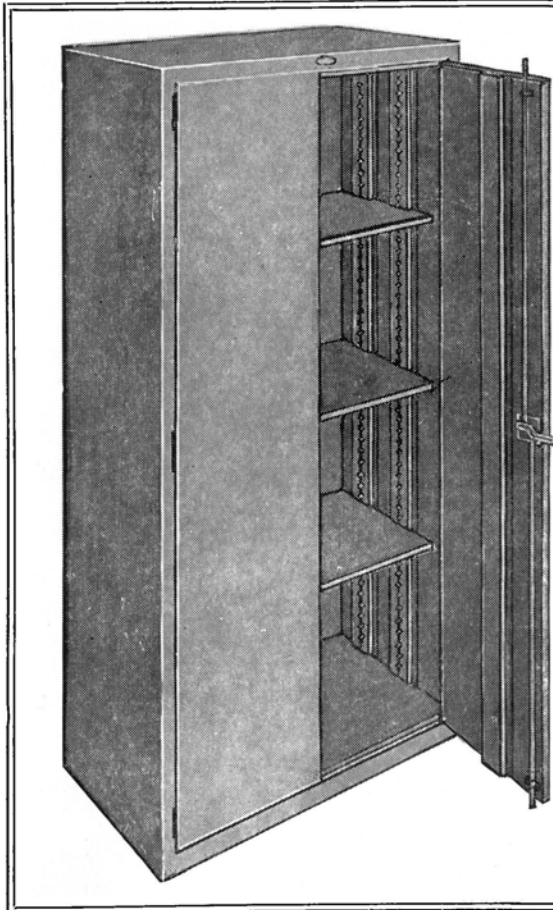
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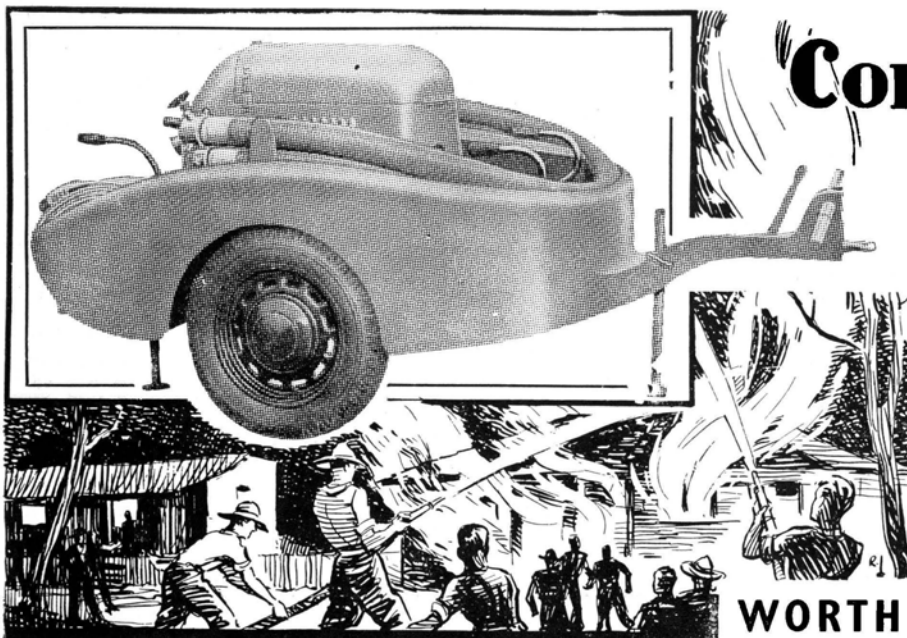
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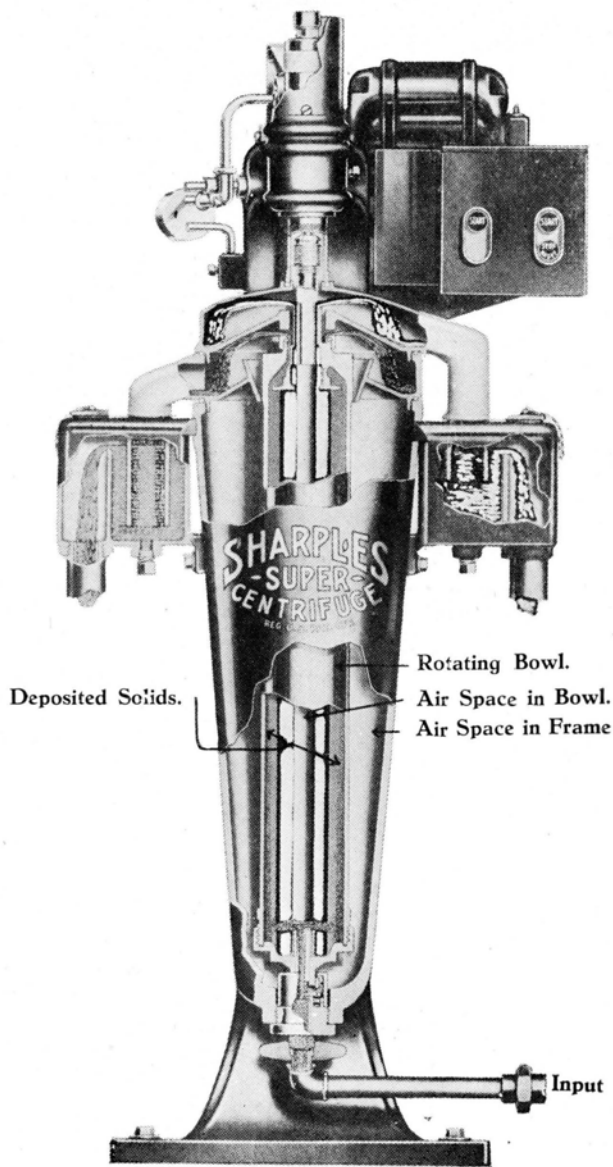


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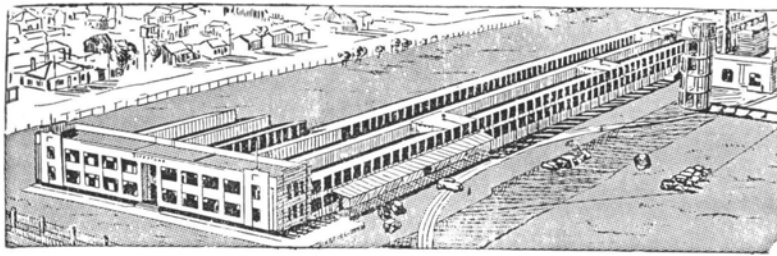
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Reproduced from "Building" (London), October, 1939.

# Advertising in War-Time

By .....  
**PERCIVAL MARSHALL.**

*Mr. Percival Marshall is Executive  
 Chairman of The Periodical Trade  
 Press and Weekly Newspaper  
 Proprietors' Association. : : :*

**I**T is a remarkable thing that one of the most unexpected reactions to the outbreak of war should have come from those whom we regard as levelheaded business men. I refer to the widespread rush to stop advertising in both the periodical and trade and technical press, which marked the first few days of the new regime. That rush soon showed signs of subsiding, and in a number of cases cancelled appropriations have been resumed, and even new business has been placed. This is only common sense.

**P**RESUMABLY this panic was dictated mainly by a desire to effect an immediate economy in the conduct of business, and to cancel advertising contracts seemed such a simple way of saving money. Actually, this method of economising is a two-edged weapon which cuts both ways. The advertiser's name, and the goodwill of his particular product, which he has built up through years of intensive effort, disappears from the consumer's sight immediately. The buying public is left in the dark as to whether the advertiser and his goods are still in existence; his customers wonder whether he is loyally responding to the Prime Minister's definite request that all business should carry on, or whether he is on the point of fading out of the commercial sphere.

**B**Y stopping his publicity the advertiser is in fact subjecting his business to a "black-out" in his particular market, a step backwards from which it may take a long time to recover. Business is bound to continue, and both private and general requirements will need to be filled on a large scale. The demand for certain existing goods of special service will be intensified, and new demands of all kinds will arise to meet the new conditions of life.

**T**O stop advertising is to cut yourself off from the market, and to say to the readers of the journals you use: "Relations are suspended — we are not longer interested in you." The psychological effect of ignoring your buying public in this way may have far-reaching results. How much better to say to them: "WE are carrying on — let us supply your needs." Members of the public will more than ever need appropriate building material to divert thoughts from the tragedy of the war, and to occupy their minds and entertain them during the enforced "black-out" hours. The periodical and magazine press will supply this want effectively and will continue to give good publicity value.

**S**O far as the trade and technical press is concerned, that two-edged weapon cuts another way. It inflicts injury on the journals which render such admirable service with vital news and important trade and technical information. These journals are themselves determined to carry on their service to industry. The stopping of your advertising can only diminish their resources for giving you that news and intelligence service which you must have, if you are to carry on yourself. Why not make common cause with them, and help yourself by helping them in these difficult times?

**T**HE press is out to give both readers and advertisers the fullest possible value, consistent with any official restrictions, and it is in your interest to co-operate in the fullest possible measure. Do not "black-out" your business from your market; rather let the searchlight of the buyer be focussed upon it. Above all, let your world know that you are following the lead of the Prime Minister, and are loyally "carrying on."



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EDITOR : ERIK TODD.

EDITORIAL OFFICES :  
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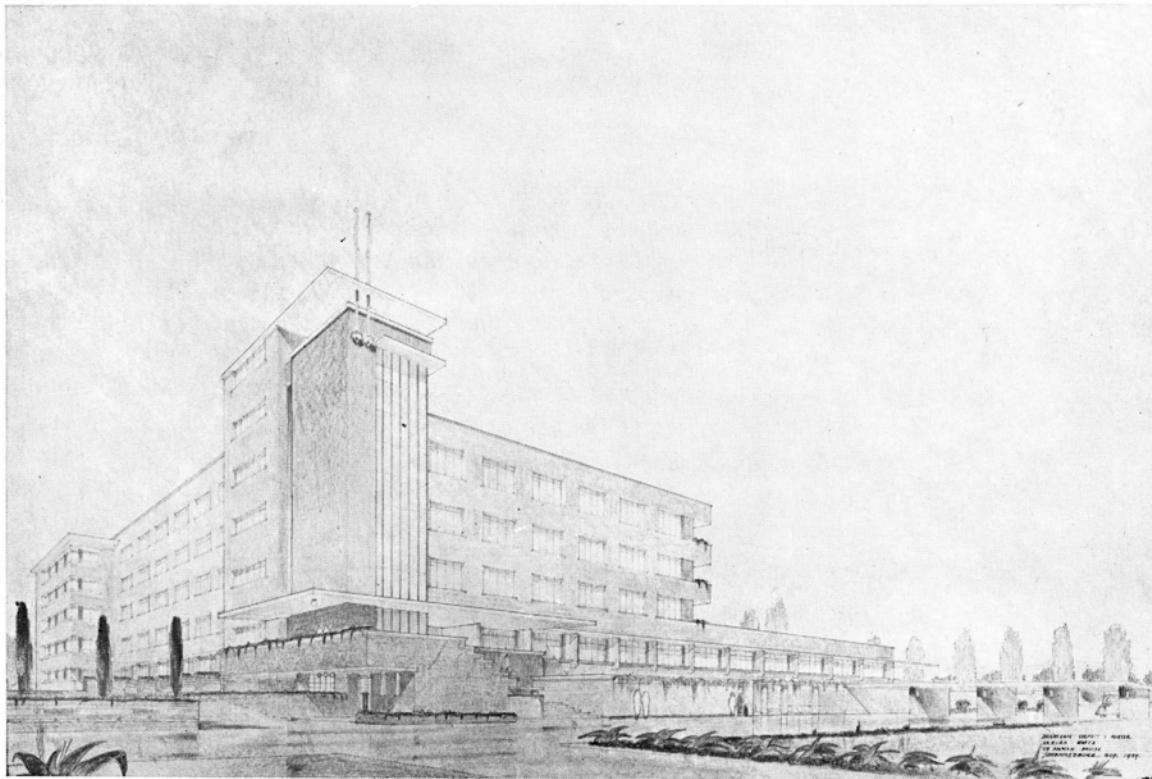
NOVEMBER,  
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PUBLICITY DEPARTMENT :  
FIRST FLOOR,  
92 MAIN ST., JOHANNESBURG

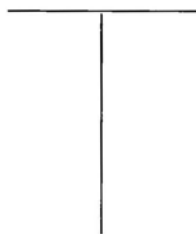
*“PUBLIC WORKS OF SOUTH AFRICA,” which is published monthly, is intended to keep the public up-to-date in regard to projects of the Public Works Departments of South Africa, Union, Provincial and Local Government, giving expression to the activities of each of these departments of service.*

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Administration and  
Special Departments  
Block :



*Construction: Reinforced concrete frame-work, with 11-inch hollow-brick walls. Interior walls of brick, 4½ inches thick. Flat concrete roof covered with waterproof sheeting and hollow-block insulation. Interiors: cement-plaster and oil-painted walls, with lime-plaster and water-painted ceilings. Floors, generally wood-block, rubber tiles in corridors and ceramic tiles in service rooms.*

# COSTLY MODERNIZATION OF BOKSBURG-BENONI HOSPITAL

## £200,000 Rebuilding Operations Offer Some Difficult Siting Problems

**E**XTENSIVE building operations are being carried out at the Boksburg-Benoni Hospital, involving many additions and several new blocks, to cost in all approximately £200,000. When completed, these operations will result in the conversion of the present hospital into an institution of major importance offering up-to-date facilities to the whole of the East Rand.

The work in hand should prove of great interest to architects, for the additions, particularly the new Isolation Hospital block, contain several points in hospital design which may be regarded as revolutionary to this country. In addition to this, the architects, Messrs. Stegmann, Orpen & Porter, were confronted with an acute site problem, namely, the problem of planning additions on a site occupied to a large extent by the existing old buildings.

### THE PROBLEM.

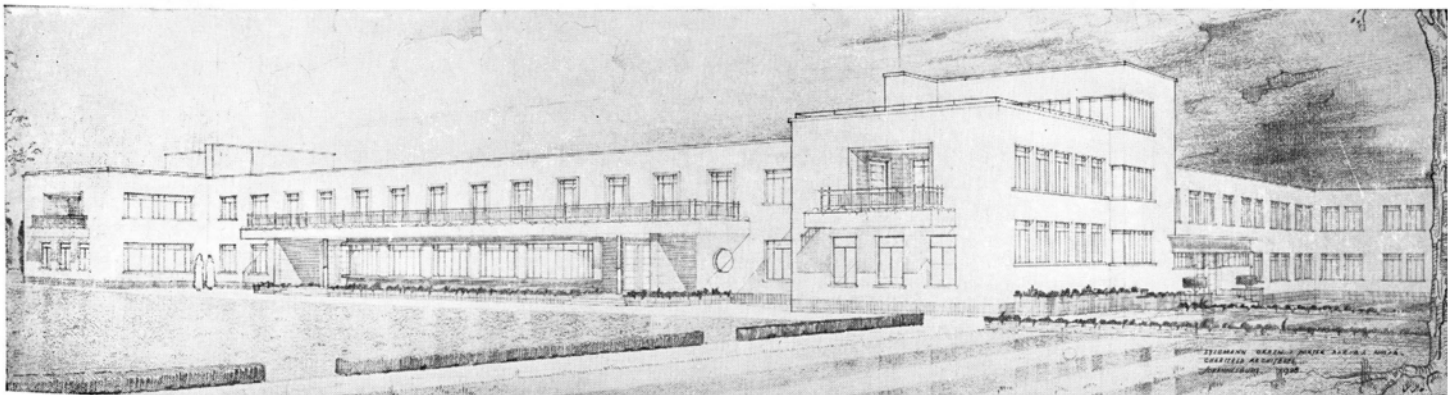
**T**HE initial problem was to situate the new structures in such a way that their disposition would ensure the most practical and economic linking-up with those existing buildings which have to be retained. It was also necessary to arrange the new buildings so as to allow extensive future expansion covering a period of at least 50 years. Another consideration was the

desirability of opening up the site to provide generous approaches and gardens, and ensure, not only the æration of all units, but their proper relation to each other as well.

In seeking the solution to this problem the architects were restrained by a number of limiting factors, namely, those existing buildings which had to be retained, either to be welded into the final hospital or replaced by the new structures. These factors were the five-storey European Hospital, the double-storey Nurses' Home, and the boiler house and service block, all of which will remain as part of the final hospital. The existing Native hospital is being retained until the new Native Hospital block offers accommodation sufficient to render the old premises unnecessary.

The final lay-out has been so arranged that, when completed, the Hospital will be grouped into the following self-contained units:—

**The Main European Hospital.**— This will include all wards, operating theatres, out-patients and special departments, administrative offices, Resident Medical Officers' quarters, the central hospital kitchen and the stores. The Maternity Section, at present in the existing European block, will be formed finally as a self-contained wing to the completed European Hospital.



Nurses' Home :

*Construction: Reinforced concrete framework. Lime-plaster and water-painted interior walls and ceilings. Wood-block floors throughout, except in lavatory blocks and hair-washing rooms, which are floored with ceramic tiles.*



**The New Native Hospital.** — This has been completed, and is arranged to link up with the old wards until the latter are replaced by a further block to be connected to the newly completed block by Admission and Special Departments. The final structure will form a self-contained Native Hospital. Provision has been made also for a future wing to be added to this unit for Indian wards.

**The Nurses' Home.** — The new building has already replaced the demolished single-storey sections of the old home. The double-storey section has been retained and welded into the new structure.

**The Isolation Hospital.** — Though to be erected shortly at the expense of the Public Health Authorities and the Provincial Administration, the new Isolation Hospital will form part of the Boksburg-Benoni Hospital group, and will be under the same administration.

**The Boiler House and Service Block.** — This block is to be re-designed to provide scope for the gradual replacement of the existing plant, from time to time, by the most efficient and up-to-date boilers.

#### HISTORICAL NOTE.

IT will thus be seen that the final Hospital will be quite a large institution. The extensions and alterations will result in 100 new beds for European adults, 56 of the old beds being retained. In addition, there will be 34 new beds for children, 10 of these being reserved for infants. In the Native Hospital there will be 158 new beds.

In this connection it is interesting to quote a short historical note prepared by the Secretary, Mr. J. Myburgh:—

*"The Boksburg-Benoni Hospital was opened in August, 1905, at which time it had accommodation for 70 patients — 40 European and 30 non-European. At its inception it was a combined Mines and Government Hospital, the East Rand Proprietary Mines, Ltd., having contributed a sum of £7,500 towards the estimated capital cost of £30,000. The grounds of the Hospital were then approximately 8 morgen, another 4 morgen being added recently.*

*"The original Native Ward was a wood-and-iron shanty, replaced some time later by a building to accommodate 50 Non-Europeans — 38 males and 12 females.*

*"In 1935 a new European surgical block was erected to accommodate 72 patients. This block, which has now been welded into the new buildings, contains, in addition to ward units, an operating theatre suite, a midwifery ward with labour rooms and delivery suite, and an X-ray department."*

**European Hospital** **E**XTENSIONS to this block at present consist of five 18-bed wards divided into sections of 6 beds arranged on the "parallel-bed" system, each section having large sliding glass-panelled doors opening out on to wide concrete cantilever balconies. These wards have all the necessary secondary rooms, and are linked directly to the existing 5-storey European ward block, to which an additional floor has been added to provide four 6-bed wards for children and 10 single-cot wards for infants.

An interesting point in the design of this additional floor is that all the partitions between the wards are fully glazed. This facilitates full supervision and creates an atmosphere of bright friendliness for the young patients. Deep sunning balconies have been provided for all these wards also.

Directly linked up with the new wing, which extends northwards and contains the five 18-bed wards, is a southward extension containing the administrative, out-patients', casualty and special departments, and R.M.O.'s quarters. This extension forms the remaining section to the European Hospital still to be built. Future ward extensions will link up with this south wing and run westwards in banks of 30-bed units, five floors high. This provision for the future will allow an ultimate capacity of approximately 600 to 700 European beds.

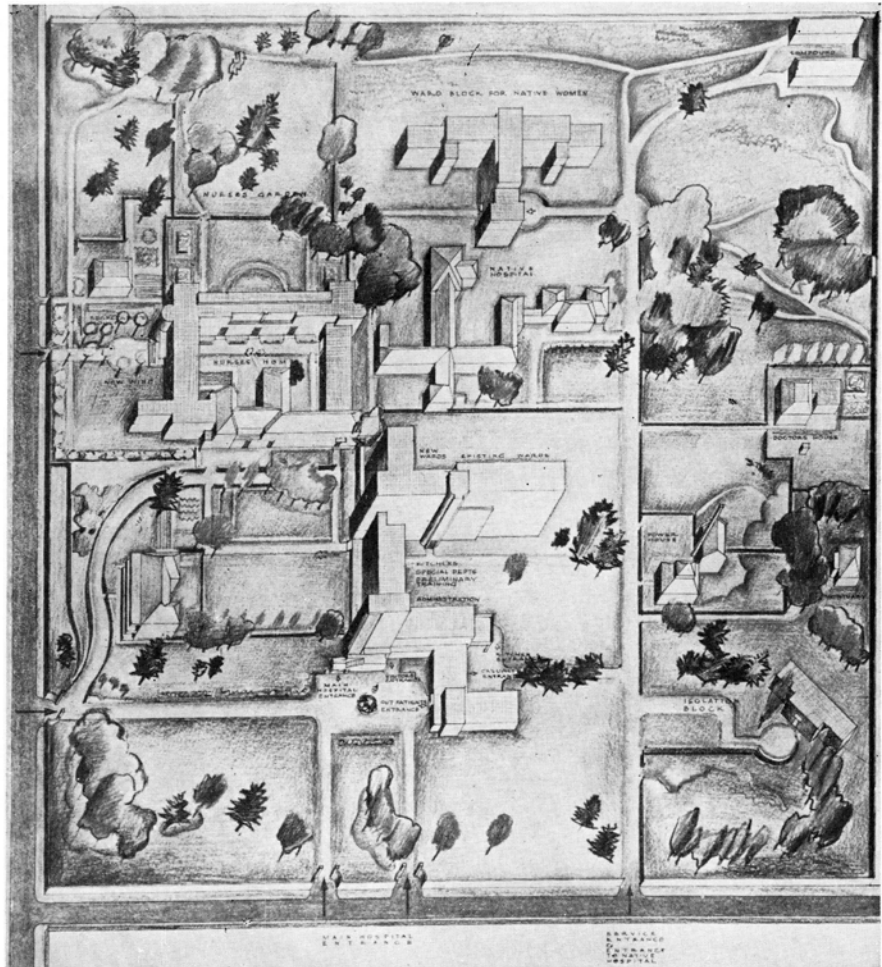
In the south wing the out-patients and casualty departments will comprise large and small waiting halls, consulting rooms, examination rooms, surgeries, etc. The X-ray and massage departments and the preliminary Nurses' Training School will be directly connected to the out-patients' and casualty departments as well as to the ward unit proper. Quarters for the Resident Medical Officers will be situated on the top floor of this new wing.

**Native Hospital** **A** COMPLETELY new three-storey, Non-European hospital block has been built to accommodate the 158 new beds in ward units of 36 beds each. These wards are of similar design to those of the European block: that is, they are arranged on the "parallel-bed" system, each section having fully opening windows facing north.

In this new block a new Native maternity floor has been provided. It accommodates 24 beds, and contains a delivery room, a sterilizing room, a room for immediate waiting cases, operating theatre, surgeons' wash-up, etc. The operating and delivery units have artificial ventilation. In addition to these, an 8-bed self-contained maternity isolation unit has been provided.

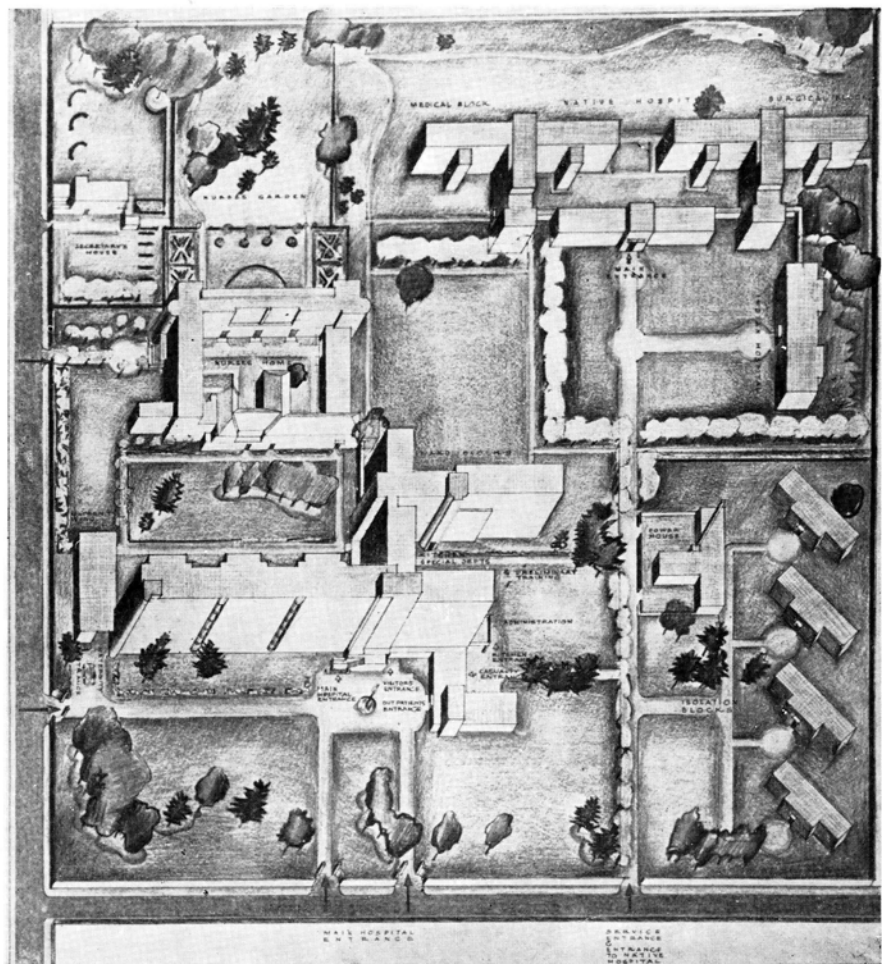
The Native block has its own admission department, comprising a large waiting hall, a surgery and examination room, and patients' bathroom and lavatory blocks. It is designed to take two additional floors and also to link up with a future block.

Present Additions



These two axonometric views illustrate in part the restrictions of the site. The view at the top shows the hospital group as it will appear when the present £200,000 additions are complete; that at the bottom depicts possible future extensions and demolitions. The Isolation unit, set in the bottom right-hand corner of each view, is now of different design to that represented here, and will be erected on an adjoining site.

Future Extensions



**Isolation Hospital** ONE of the most interesting of the additions to the Boksburg-Benoni Hospital will be the Isolation Hospital, for the plans contain many revolutionary ideas.

Under the present scheme the Isolation Hospital consists of a cubicle ward block containing 10 European and 10 Native wards of two beds each, making the total accommodation up to 40 patients. The European and Native wards are each contained in a separate wing, that for the Natives being recessed back and linked to the European wing by the service wing.

The wards have been designed as self-contained two-bed units, each with its own lavatory accommodation and special facilities for bed-pan washing, etc. To each ward there will be a visitors' cubicle and a nurses' changing and disinfecting lobby.

#### VISITORS' CUBICLES.

OF special interest is the provision for visitors. These are not allowed in the wards themselves, but are ushered into a cubicle glazed off from the ward itself. From this cubicle they may see the patients through a glass screen and converse with them by means of a telephone. This arrangement prevents the danger of visitors contracting infection or carrying it to their homes. It has an additional safeguard in that it prevents the patients from surreptitiously receiving food, a practice which in many cases, such as enteric, is likely to prove fatal.

In addition to this, the lay-out of the wards has been so arranged that the nurse in charge has complete control of visitors, patients and hospital staff, and the supervising nurse has control over the entrance to the building and the corridors.

As the building is a single-storey structure, good cross-ventilation has been provided for by fully opening sliding doors to all the cubicles on the north side, and by clerestory lights on the south side. The cor-

ridors and visitors' cubicles are under a roof, the level of which is lower than that of the wards, thus allowing for separate lighting and ventilation.

Provision has been made also for surgeons' and nursing staff changing rooms, so that the staff may make a complete change of clothing on entering or leaving the hospital. This eliminates the carrying of infection to the Nurses' Home and elsewhere.

**Nurses' Home** **T**HOUGH not yet completed, the new Nurses' Home already reveals careful planning to provide pleasant up-to-date quarters for the nursing staff and to prevent the intrusion of a hospital atmosphere into one of comfortable domesticity.

In the lay-out of this new Home the architects have provided a pleasant look-out for the staff bedrooms and sitting rooms. In addition to this private garden there will be a fine swimming bath for the staff.

The new Home has been planned around the existing buildings. All the single-storey parts of the old Nurses' Home have been demolished to make room for the new building, which, however, has been welded into the existing double-storey section on account of the latter's recent erection.

In addition to the dormitories, the Home will contain the nurses' and matron's sitting-rooms, a matron's and assistant matron's flat, facing north over a garden which is to be effectively screened from the Native Hospital situated some distance away in that direction. An interesting point about the two sitting-rooms is that they are designed with large fully glazed doors and large windows allowing an uninterrupted view of the private garden and a palm court, which latter will serve as the main entrance to the Home.

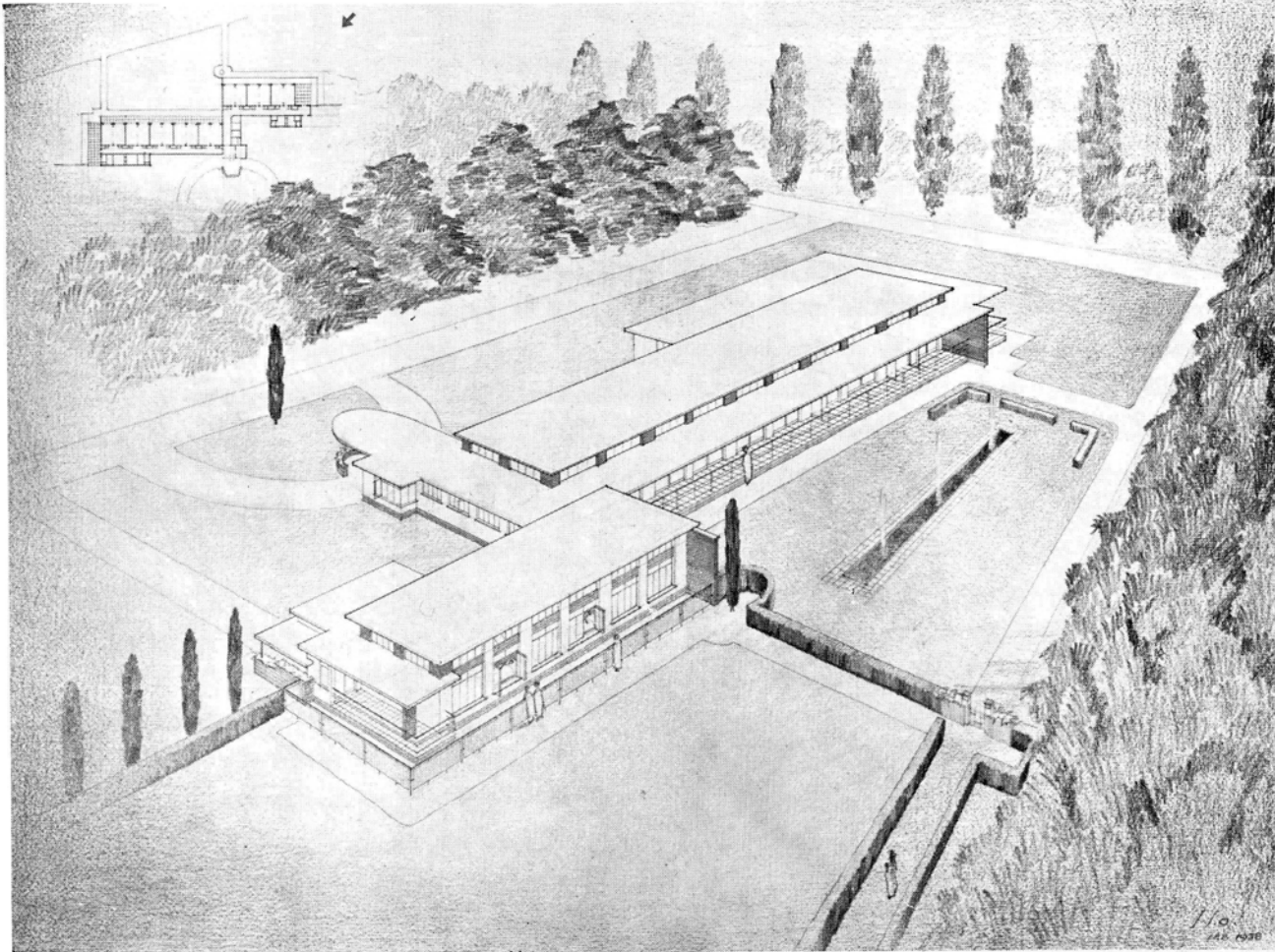
From the reproduced sketches accompanying this article the reader will perceive that when the new hospital and all its units are completed it will form one of the most up-to-date institutions on the Rand.



#### Native Hospital :

*Construction: Reinforced concrete framework, brick-filled. Interiors: Cement-plaster, oil-painted walls and lime-plaster, water-painted ceilings. Floors, generally Armourfloor, granolithic in service rooms and ceramic tiles in operation suite.*





Isolation  
Hospital:

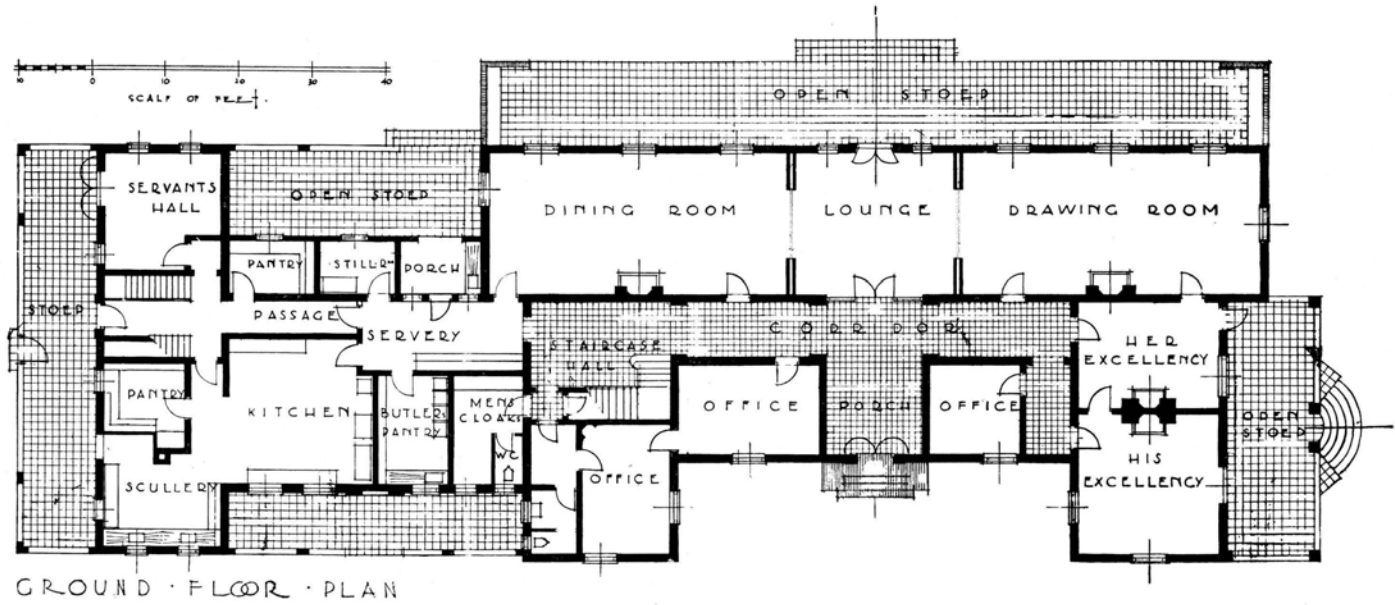
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*Construction: 11-inch hollow-brick walls with 4½-inch and 9-inch internal walls. Flat concrete roof, water-proof sheeting and hollow-block insulation. Interiors: cement-plaster, oil-painted walls and ceilings. Floors: in wards, wood-blocks; in corridors, rubber tiles; in service rooms, ceramic tiles.*

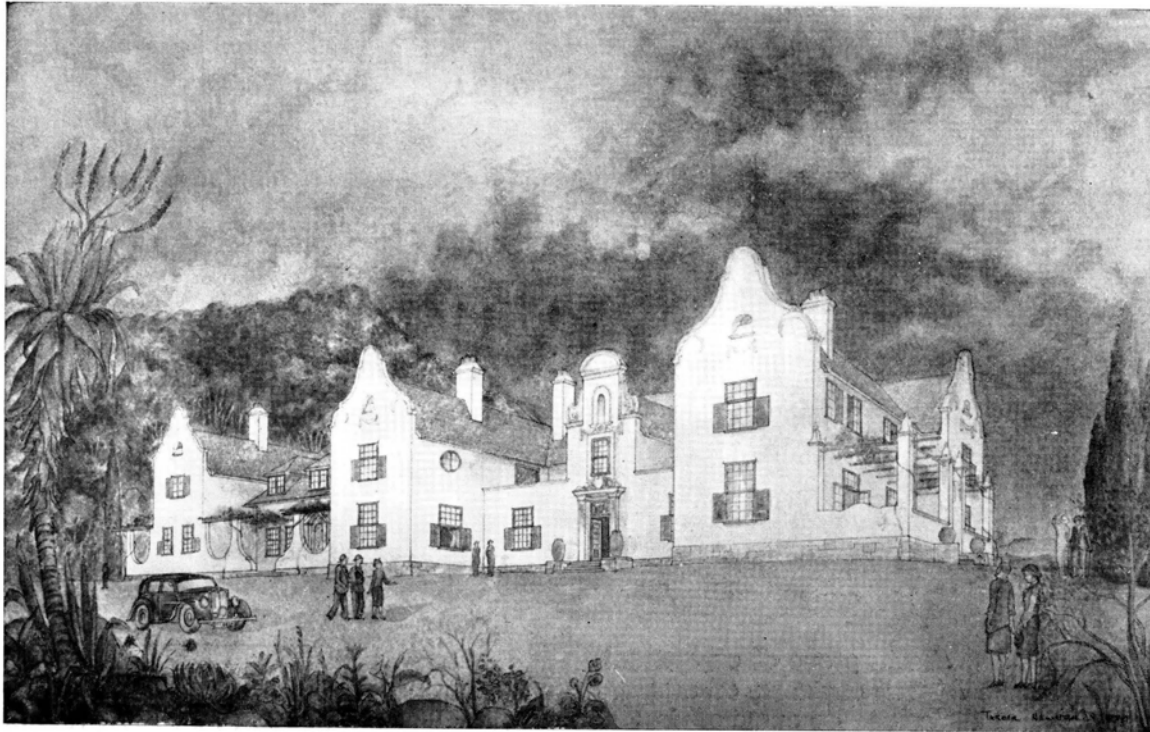
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*New Residence for  
Governor - General*



# New Residence at Bloemfontein for Governor - General



**C**ONSTRUCTION has now started in Bloemfontein on the new residence for the Governor-General of the Union of South Africa. The site was donated by the Bloemfontein Municipal Council, and is beautifully situated on a level platform halfway up the hillside to the north of the town between the Arboretum and Signal Hill. The site is sufficiently high up to give an extensive view of the country and hills some 50 miles away.

The new residence has been designed in the traditional South African manner, with white-plastered walls and gables, a special feature being made of the flowered pergolas and long open stoeps.

The main entrance to the building is from the south-west. All the principal reception rooms overlook the gardens on the north-east. An interesting point is that it will be possible to throw the sitting-room, dining-room and the lounge into one, by means of sliding glass doors. Easily accessible from these principal reception rooms is the private sitting-room and the study of Her Excellency and the Governor-General. Both sitting-room and study lead to a private stoep which overlooks Signal Hill and past the City.

On either side of the entrance hall are arranged the offices of the staff, with attendant cloak rooms. To the left are the kitchen quarters and general service rooms. Generally speaking, the first floor is given over to bedrooms, with the servants' wing over the kitchen quarters.

**Foundations and Lay-out of Grounds** **T**HE foundations have been built of the local blue ironstone, and the roof is to be covered with plain-pattern Broseley red tiles.

The main approach to the house on the south-west frontage is along a broad gravelled walk. On both sides of this approach, stretching up to the house, are grass lawns, including a circular drive flanked by indigenous plants and natural rock gardens. The drive curves round on either side of the entrance.

A large lawn on the north-east or garden frontage will be used for garden parties. This lawn will be bordered by flower-beds and terraces of coloured shrubs, the terraces being arranged to drop away down the hill to a belt of trees below.

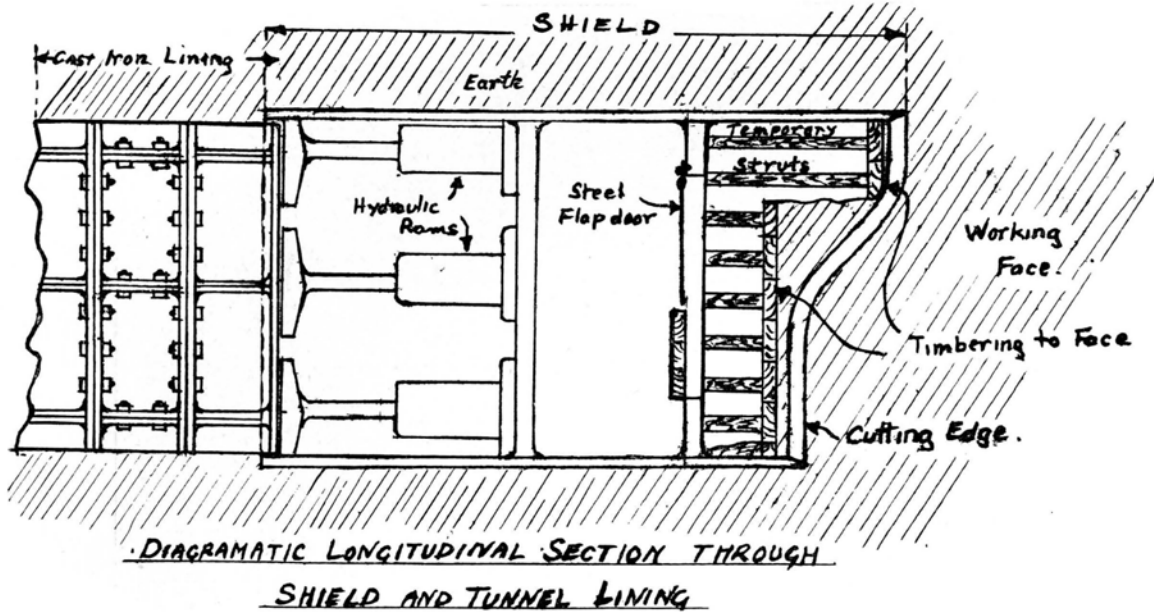
Rising with the contours of the hill to the north, the lay-out includes a swimming pool and tennis courts. Here again terraces are worked into the natural formations.

Further to the north-west, behind a small rise, the hillside has been excavated to hold the Native quarters and transformer house. This group, reminiscent of a small rest-camp, takes the form of thatched rondavels at each end of the garage block. The guard-room, caretaker's house and nursery gardens are arranged out of view on the lowest part of the site.

TURNER NEWHAM.

# DRIVING A TUNNEL THROUGH QUICKSAND

*Construction of 850-ft. Sewage Tunnel through Durban Bluff a Battle Between Ingenuity and Circumstance*



By  
JOSEPH  
HARDING.



**A**N undertaking that should prove of exceptional interest to South African engineers on account of the unusual difficulties encountered is the driving of an 830-foot tunnel through the first Bluff at Fynnlands, Durban. Happily embarked upon, progress was not very far advanced when difficulties were revealed that previous borehole soundings had not indicated. The result has been a battle between ingenuity and circumstances, the story of which makes interesting reading. Further interest attaches to the undertaking in that excavations were made entirely by means of a Greathead Shield, probably the first time this method has been used in South Africa.

The tunnel forms a link in the main sewer serving Greater Durban, its purpose being to convey the sewage through the Bluff to the sea at a point south of the Harbour considered suitable because of the direction of the currents. To gain this point, it was necessary to carry the main round the Bay-head to Fynnlands, passing Jacobs and Wentworth on the way. At Fynnlands the sewage enters the tunnel and is carried in a southerly direction through the first Bluff into storage tanks situated in a valley. From these tanks the sewage is pumped to a high-level tunnel piercing the second Bluff to be carried finally by pipe-lines to the sea. Each tunnel was tendered out separately, that through the first Bluff being awarded to a Johannesburg firm of Engineers, Messrs. Green & MacNicol. It is with this tunnel that the following article is mainly concerned. The tunnel through the second Bluff did not present unusual difficulties, and ordinary mining methods of tunnelling were adopted.

## CONSTRUCTION.

**T**HE results of borehole soundings showed that the tunnel would have to be driven through sand all the way and that the water table was above the crown of the tunnel. It was for these reasons that the shield method of driving was adopted. Excavation was carried out by the use of a Greathead shield operated by six hydraulic rams giving a 21-inch thrust of 200 tons. After each thrust cast-iron lining or tubing was inserted, consisting of rings made up of five segments bolted together. The rings in turn were bolted together, flanged ribs being provided for this purpose.

The advantages of cast-iron tubing are its great strength, the increased safety afforded to workmen, greater ease in driving and a decrease in the risk of damage to property due to any caving-in of the tunnel.

In this undertaking the shield used had an external diameter of 6 feet 8 inches and a length of 10 feet. These dimensions have an important bearing on the difficulties of the job, owing to the fact that the control of the shield is directly affected by the ratio the diameter bears to the length. The higher the ratio the easier it is to control the direction, vertical and horizontal, of the shield. In this instance the ratio was about 2:3, which was very low and made it practically impossible to keep to the specified line and level.

The tunnel was driven in one direction from the valley or sea end, the grade being 1:1,000. Here the depth of the tunnel invert below ground surface level was 18 feet.

Construction began with the excavation of a close-timbered trench 40 feet long and 10 feet wide, having an approach ramp to facilitate the removal of excavated material. During the excavation of this trench water was encountered at 8 feet above the invert, necessitating pumping which had to be carried on continuously thereafter.

On completion of the trench, the shield, weighing 12 tons, was erected on a concrete apron laid on the tunnel invert. The shield was half-encased in concrete in order to guide it during the initial thrust, the strain of which was taken by a specially-erected concrete abutment supported behind by heavy 12-by-12-inch timbers. The trench timbering in front of the shield was then removed for the initial thrust.

**First Method:** IN the first stages of excavation it was considered that it might be possible to carry out the job without the use of compressed air. The method adopted was as follows:—

The face of the tunnel was first timbered up with horizontal 9-by-3-inch boards supported individually against the shield diaphragm by means of struts. The facing was then supported by means of struts passing through the shield and bearing directly on the cast-iron tubing, after which the struts on the diaphragm were removed. This twofold operation was necessary because the timber facing had to be placed in position board by board owing to the fact that the tunnel face consisted of loose sand. When completed, the individually supported boards could be strutted *en bloc* off cast-iron tubing, thereby freeing the shield for its thrust.

On reaching the full extent of the thrust the hydraulic rams of the shield were collapsed and the segments of cast-iron tubing bolted together inside the tail of the shield. The facing timbers were then removed one by one from the top down, the material behind each board being excavated to a distance of 2 feet ahead of the shield. The process of timbering up, strutting and thrusting was then repeated.

#### QUICKSAND ENCOUNTERED.

IN this way the tunnel was driven in a distance of 80 feet, when the first difficulty cropped up. The drive entered fine-running quicksand, compelling a change in method. It was soon found that far more material than was necessary was being excavated, as the sand above the tunnel crown ran in through the opened facing boards. The full extent of the difficulty will be appreciated when it is mentioned that, as the tunnel face was excavated, the fine quicksand poured in to such a degree that large subsidences formed on the surface of the Bluff. Some of these cavities were large enough to prove dangerous.

**Second Method:** IT was decided that the only method of counteracting this difficulty was to use compressed air. At the mouth of the tunnel an airlock 20 feet long was constructed, consisting of two bulkheads of concrete 2 feet thick, containing built-in steel doors. Compressed air, supplied from a plant situated outside the tunnel, was introduced at a pressure of 2 lb. above atmosphere. Under this method it was found unnecessary to timber

up the face of the tunnel so that excavation was carried out openly.

The use of compressed air, however, introduced difficulties of its own. Owing to the fact that the water-table was only 1 foot above the crown of the tunnel, the water-seal was insufficient, with the result that large quantities of compressed air escaped through the sand. Actually it was found necessary to pump 1,000 cubic feet of air a minute into the tunnel. This circumstance meant that, while it was possible to dry the top four feet of the tunnel face for excavation it was not possible to drive the water back from the lower parts, which remained wet and so added appreciably to the difficulties of the job. Under these conditions the tunnel was driven in another 600 feet.

**Shield Obstructed** PROGRESS, however, was again held up when the shield encountered large sandstone boulders. As the work was being performed under compressed air it was considered dangerous to blast away the boulders. Compressed air rock-breakers were used. So long as the boulders were located fairly high up in the tunnel their removal did not present over much difficulty. Unfortunately, an almost solid dyke of sandstone was struck in the invert extending about 1 foot above. As this part of the tunnel face could not be dried the excavation proved difficult, continual bailing at the face being necessary. Consequently, progress was very slow. The dyke and boulders were passed, however, after the tunnel had been driven in another 50 feet. Pure sand was again encountered until the completion of the drive.

#### FINAL TOUCHES.

IT will be remembered that the outside diameter of the shield was 6 feet 8 inches, while that of the cast-iron tubing was 6 feet 6 inches. This meant that an inch void was left round the tubing. Accordingly, cement at 100 lb. pressure was pumped in behind the lining to fill up.

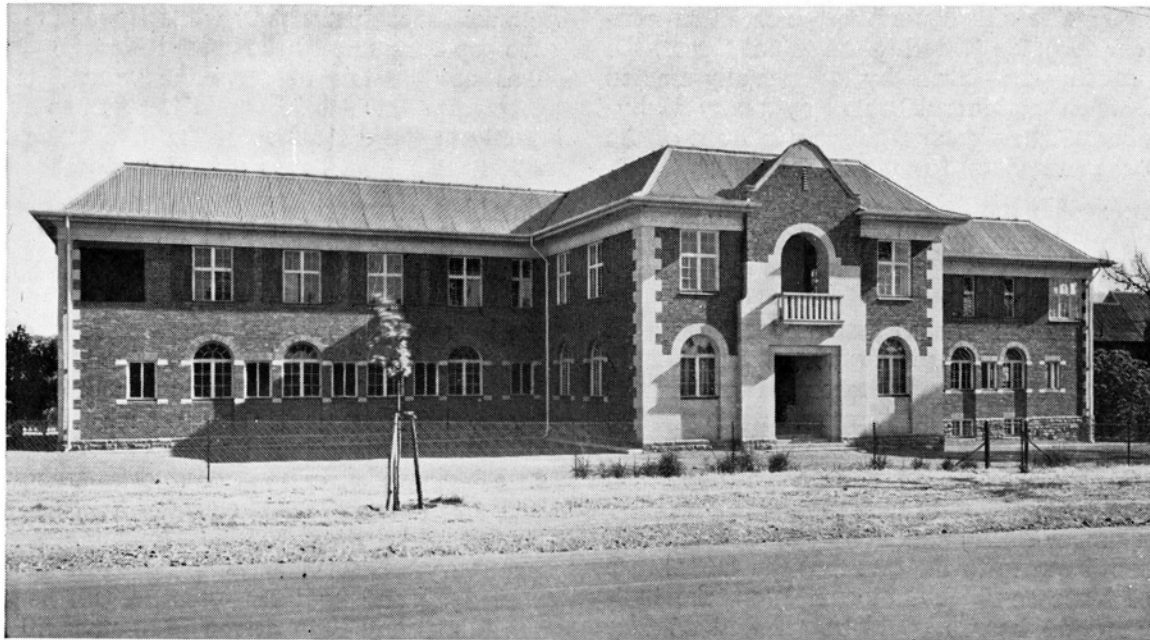
As the tunnel is to act as a sewer it is to be lined with concrete, and finally brick, reducing the present diameter of 6 feet 6 inches to 4 feet 6 inches. The brick lining is essential to protect the concrete from the acids in the sewage.

During the excavation the tunnel was lighted from a 30-volt system, a low voltage being chosen in order to avoid accidents resulting from short-circuiting. Tracks were laid through the tunnel, and the familiar mine cocopans were used for removing the excavated material. Owing to the fact that continual air pressure had to be maintained in the tunnel, work was carried on continuously in three shifts of 8 hours each. The drive was started about the beginning of February last, and it is expected to complete the tunnel early next year. The cost of this section, excluding the cast-iron tubing and the shield, was about £8,000.

It might be of interest to mention that the second tunnel, which is situated well above the water-table, is 2,500 feet long. Its line appears to lie through sand all the way along. In section it is rectangular, approximately 4 feet 6 inches wide and 7 feet 6 inches high, the roof being curved. As mentioned before, ordinary mining methods are being used.



*New Lease of Life for the*  
**NORMAL COLLEGE at PRETORIA**



★ Extension of  
 35 - Year - Old  
 Building  
 to  
 Provide Better  
 Training Facilities

ONE of the older educational institutions in Pretoria was substantially extended when in 1937 a new block was added to the Normal College. This building was carried out for the Provincial Administration by Mr. J. Lockwood-Hall, and was built by Messrs. P. Leemhuis & Sons at the completed cost of £18,710.

The scheme presented many difficulties, perhaps the most important of which was the difficulty of planning modern lecture-rooms while at the same time conforming to the general architectural feeling of the existing buildings.

On this point of conformity there are, however, two distinct schools of thought, one championing the principle of a complete break-away from the existing into something quite free and new, and the other championing the principle of moulding and developing the existing architectural feeling into a form in which it will be up-to-date to a sufficient degree, while yet being in complete harmony with the old.

The architect, in his acceptance of the latter principle, set himself a truly difficult little problem, as anyone knowing the old buildings will realize. He has, however, succeeded admirably in his efforts to conform to the general style of architecture in the existing groups, by the careful use of a "Koppie" stone plinth, sandstone dressings and Kirkness red vertex bricks. The plan is simple and direct, with the main entrance

facing Mears Street and leading past the principal's office, waiting-room, clerks' and messengers' offices, into the staircase hall, located at the back of the building. To the left of the staircase hall, on the ground floor, are the gymnasium, a large lecture room, an electrical switch room and the female lavatory accommodation, and to the right a manual training room and office for the Lecturer, another large lecture room, and the male lavatory accommodation. The first floor provides a large art room 50 feet by 32 feet, with store and ante-room, a class-room for junior students, a demonstration clinic, a large domestic science room, with pantry and office, a nature study room 47 feet by 25 feet, with stores and greenhouse attached, and planned projector room and screen, a Staff common room and library, and further lavatory accommodation.

Good light and cross-ventilation have been provided to each room; and the centrally situated lavatories are lit and ventilated from small irregular-shaped courts. The windows are steel, in teak frames, and the doors are of Oregon pine, stained.

The gymnasium is well equipped and has a spring floor. The floors of the lecture-rooms are sloped to provide easy vision for each student; and each lecture-room is fitted with cupboards, sinks, etc., appertaining to its particular purpose.

This new building is a distinct asset to the old group, with which it is in complete harmony.

\* \* \*

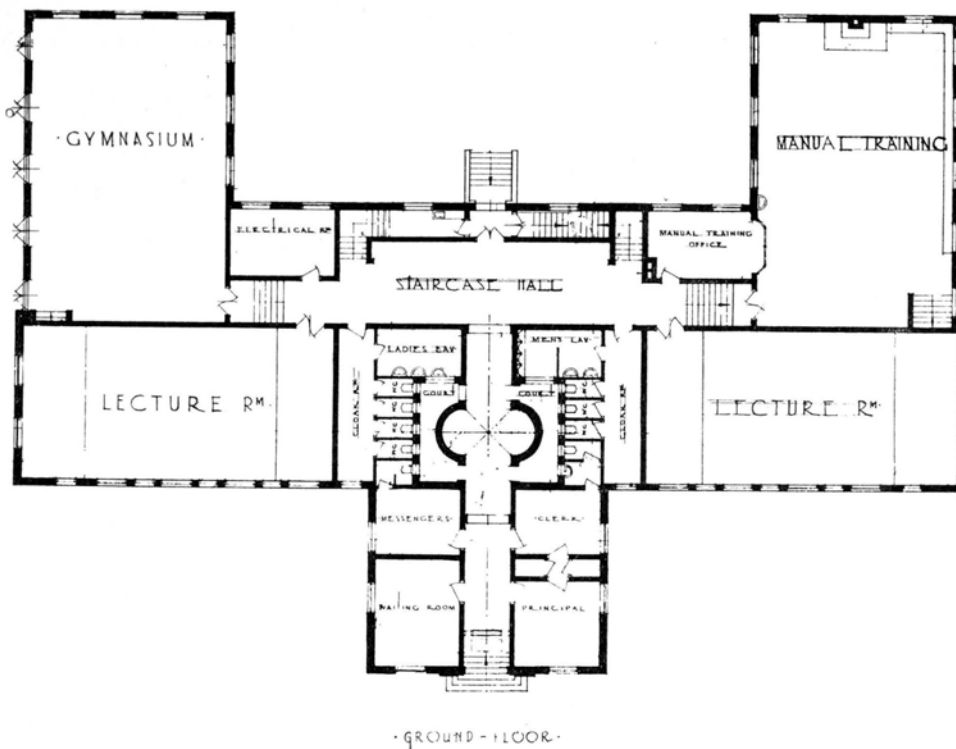
**F**OR those readers who would like a more detailed study of the facilities which the new, or rather

extended, building provided, it may be said that, in addition to the provision of administration offices, further accommodation has been provided for the teaching of arts and crafts,—in other words, manual training, drawing, domestic science and gymnastics. Provision has also been made for Method and Theoretical training, which comprise approximately twelve subjects.

For manual work and domestic science two very spacious rooms have been provided in the north wing. For gymnastics and drawing, provision has been made by two rooms in the south wing. These four rooms are exceptionally suitable for the teaching of these respective subjects, as each receives light and air from three different directions, and it is essential that these subjects be taught in well-lighted and ventilated rooms. Further, suitable store rooms for material have been provided adjoining each of these rooms. From the educational point of view very efficient provision has been made for these four subjects in the new block.

The administrative offices and rooms for the arts and crafts subjects occupy about two-thirds of the whole building. The remaining third is occupied by four reasonably-sized class rooms and about seven small rooms used as dressing rooms and common room.

One of the two class rooms on the first floor has been specially planned as a cinematograph room and the other for training in kindergarten work. The latter room is an ordinary class room and suitable as such.



# Book Reviews:

## STEEL CONSTRUCTION

By the Late HENRY JACKSON BURT,  
revised by C. E. SANDBERG.

(American Technical Society, Chicago.)



THE American Technical Society has once again shown its appreciation of good technical works by publishing a revised edition of "Steel Construction."

This book of 438 pages contains 248 illustrations and 37 tables, and is the result of a careful and thorough revision by C. E. Sandberg, M.S., C.E., of the well-known and popular original work by the late Henry Jackson Burt, B.S., C.E., formerly structural engineer for Holabird and Roche, Architects. Mr. Sandberg is a licensed structural engineer and an Associate member of the American Society of Civil Engineers, a member of the American Railway Engineering Association, and is employed as Assistant Engineer by the Santa Fé Railroad.

The revision has brought the volume right up to date, while much of the material has been rearranged into a more convenient chapter order. A treatise on welding and welded structures and a chapter on industrial buildings have now also been included.

For the information and guidance of those readers who do not know the original work, the scope of the whole book will be given very briefly. It covers every point in the use of structural steel for the supports of buildings, whether in the form of isolated members or a complete framework. It deals especially with architectural structures, such as business buildings, warehouses, mills, office buildings, and residences.

The manufacture of steel is dealt with and dispatched in a brief and scholarly manner, so that the student can without effort assimilate knowledge on the subject. Specifications, the production of structural steel sections, difficulties likely to be encountered in, and methods of, fabrication and erection, the design of beams, girders and columns, the computation and assessment of loads and wind pressures, are amongst the many important subjects handled.

An interesting feature of the work is the inclusion of a full investigation of a school building, for which complete drawings and schedules are given. This section also illustrates an approximate but workable

(Continued in next column.)

## REINFORCED CONCRETE BRIDGES

By the Late FREDERICK W. TAYLOR, SANFORD  
E. THOMPSON & EDWARD SMULSKI.

(Chapman & Hall, Ltd., London. 32/6.)



IN conformity with the general practice amongst technical authors of to-day, the authors of this excellent book on reinforced concrete bridge design, have included in its four hundred odd pages, a number of fully worked out numerical examples and furthermore the work has been illustrated abundantly with clear and efficient diagrams, sketches and drawings. A number of useful designing tabulations have also been incorporated within the volume.

The treatise is comprehensive, dealing fully with slab bridges, simple deck bridges, through girder bridges, cantilever and continuous girder bridges, rigid frames and flat slab bridges, a unique feature being the full treatment of the latter.

Some excellent information is also given on temperature changes, expansion joints, shrinkage, bearings, wearing surfaces, abutments in general, gravity and semi-gravity sections, piers and footings.

The calculations are generally based on American practice, and data is given both for railway and highway bridges.

The diagonal bridges, so important in the planning of modern railways or highways, now that the elimination of changes in direction has become so necessary because of increased traffic speeds, have been ably handled and should be of great interest to contemporary designers and students.

I would conclude by commending the volume to those professional and technical men and students into whose sphere of interest it may enter.

E. T.

(Continued from previous column.)

method by which a satisfactory analysis of wind stresses can be made.

After a careful study of "Steel Construction," one is left with the knowledge that the volume is exceptional in its directness and the straightforward presentation and solution of design problems. There is no doubt whatever that the work is a valuable reference and text book for students, structural engineers and architects interested or engaged in the design of steel supports and frames for buildings, and I can recommend it to all such persons.

E. T.

# "QUARZITE"

## *The Revival of an Historic Building Material*



SWIMMING BATHS — KINGSTON-UPON-THAMES, ENGLAND.  
*After 210,000 bathers the quartzite tile surrounds are still non-slip.*

**I**N a modern world typified in every direction by man's inventive genius, not only in construction, but in the manufacture of synthetic material playing a large and important part in building, it is interesting to discover that Nature can still go one better. It can still supply materials, the characteristics of which are, as yet, beyond the emulative skill of the synthetic chemist.

This is the case with quartzite, a natural laminated stone found in the quarries at Mount Bracco and Mount Viso, Italy. Quartzite was first quarried in 1250 A.D., but, although it was recognised for centuries as a material of unequalled hardness and durability, it was not used extensively on account of the difficulty of cutting it. Modern machinery, however, has solved this problem, and now quartzite, which is actually two-and-a-half times harder than granite, can be supplied in accurately cut tiles, with, if necessary, highly polished surfaces. The machine, therefore, has resulted in a revival of this material, much to the advantage and beautification of architecture.

As a result of this revival quartzite is now being used extensively as a paving, flooring and wall-facing tile, and is playing its part as an extremely durable decorative material on account of the beauty of its colours. These are gold, olive and grey. In addition

to this, the stone has an iridescent nature which makes it show up magnificently under bright sunlight or flood-lighting. Conversely, it is delightfully quiet and restful under dull or artificial light. Because of this, and its extreme imperviousness to moisture and grime, it is now being used to advantage as an external facing material on the façades of many a large building overseas.

### CHARACTERISTICS.

**Q**UARTZITE is an interesting material. It has been defined geologically as a rock produced from a sandstone by the action of intense stress combined with moderate temperature. The analysis continues: "They are metamorphic rocks. Their main component, quartz, will be unaffected by acid; there is no calcareous or ferruginous cement in the rocks which might decay. The rocks consist of well over 90 per cent. quartz."

Interesting experiments have been made to illustrate the characteristics of quartzite. The rubbing of a piece of granite on a quartzite tile, for instance, shows the relative hardness of the two materials. The granite is rapidly reduced to a powder, while the quartzite tile is not even scratched.



This astonishing hardness has enabled quartzite to be used for many industrial purposes where other materials have rapidly deteriorated. At the Billingsgate Fish Market, London, 600 tons of fish are handled daily. The fish are packed in heavy boxes carried by porters whose practice it is to throw the boxes from shoulder to floor. Concrete floors could not stand up to this treatment. As a last resort quartzite tiles were laid down. This paving is still in service and is completely unaffected by the treatment meted out to it.

One of the prime characteristics of quartzite is its non-slip quality. For this reason it has been used as a surround to swimming baths on many important passenger liners and has been laid in the kitchen of the "Mauretania" to prevent the cooks slipping. When quartzite is laid on the bottom of a swimming bath it gives a delightful appearance of sand.

Another important characteristic is its imperviousness to moisture and its resistance to the penetration of grime. This makes the stone non-stain and ageless. Accurate immersion tests carried over a period of 48 hours have revealed that in three specimens, grey, olive and gold, the absorption was .127, .160 and .147 per cent. respectively.

Impermeability was further tested by an experiment in which a central area of 3 square inches on each of three plates of quartzite was submitted to a jet of water at a pressure head of 20 feet over a period of six days. No trace of the penetration of moisture was evident on the surfaces. Weighing tests showed an absorption of only .141, .100 and .150 per cent., in the grey, olive and gold specimens respectively. Because of its impermeability, polished quartz has been used on the counter top of the bar in the "Queen Mary."

In addition to these characteristics, quartzite is capable of resisting wide and rapid changes of temperature, withstanding a sudden reduction from 300 degrees Centigrade to 20 degrees without cracking or splitting. Plates of quartzite have been frozen in a block of ice and then submitted to the flames of a blow-lamp without any effect. The stone can resist a transverse loading of 4,652 lb. to the square inch and a compression loading of 26,649 lb. to the square inch. It also resists the impact of an iron ball weighing 2,204 lb. dropped from a height of 6 feet.

It will be seen, therefore, that the revival of quartzite is an important milestone in the history of architecture. Its appeal is based on its natural origin, quality, durability, beauty of texture and strength.

## Tenders Invited

**T**HE 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**, supply, delivery and erection of, at Female V.D. Block, Rietfontein Hospital, T.P. (P.W.D. tender 422): P.W.D., Pretoria (Room 531, 'phone 5477). **28th December.**

### BRIDGES AND MATERIALS.

**Reinforced concrete arch bridge**, construction of, over Riet River, near Modder River Station (tender F.122/1939): Provincial Roads Engineer, 40, Queen Victoria Street, Cape Town. **5th December.**

### BUILDINGS AND ALTERATIONS, ETC.

**Married quarters** for 3 officers, 4 warrant officers, 7 senior N.C.O.'s, and 11 junior N.C.O.'s and privates at Air Station, Waterkloof, Pretoria (P.W.D. tender 425): P.W.D., Pretoria (Room 531, 'phone 5477). **7th December.**

**New dining hall, etc.**, at Kroonstad Girls' Hostel: Secretary, School Board, Kroonstad. **1st December.**

**Addition of offices** to Public Offices at Bellville, C.P. (P.W.D. tender 428): District Representative, P.W.D., Cape Town. **7th December.**

**New Hospital**, at Ladysmith: Corrigan and Crickmay, F.R.I.B.A., M.M.I.A., Smythe's Buildings, Fraser Lane, Pietermaritzburg. **13th December.**

### CHEMICALS, LABORATORY EQUIPMENT, ETC.

**Glassware**, supply of, to Onderstepoort Laboratory (tender S.O. 484): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, 'phone 3121), Pretoria. **7th December.**

**Anthrax Vaccine bottles**, supply of, to Onderstepoort Laboratory (tender S.O. 509): Particulars as above. **21st December.**

**Rubber stoppers**, supply of, to Onderstepoort Laboratory (tender S.O. 510): Particulars as above. **21st December.**

**Apparatus and chemicals**, supply of, to Stellenbosch-Elsenburg College of Agriculture, Stellenbosch (tender S.O. 521): Particulars as above. **28th December.**

**Microscopes**, supply of, to Division of Entomology, Department of Agriculture and Forestry, Pretoria (tender S.O. 549): Particulars as above. **11th January.**

### COOKING EQUIPMENT.

**Electric stoves**, refrigerators, etc., for Durban Hospital: Provincial Accountant, P.O. Box 373, Pietermaritzburg. **6th December.**

### DRAINAGE AND SANITATION.

**Waterborne drainage** at Paulpietersburg School, installation of: P.W.D., Pietermaritzburg. **6th December.**

## ELECTRICAL EQUIPMENT.

- Telephones, table, magnets**, supply of (P.O. tender 811): District Stores Superintendents, Johannesburg, Cape Town, Port Elizabeth, East London, Durban, Bloemfontein; Divisional Controller, P.O., Pietermaritzburg; Controller of P.O. Stores, Room 77, G.P.O. Annexe, Pretoria. **7th December.**
- Solder**, supply of (P.O. tender 807): Particulars as above. **7th December.**
- Transformers**, for Waterkloof Air Station, Pretoria, supply and delivery (tender P.W.D. 403): P.W.D., Pretoria (Room 531, 'phone 5477). **7th December.**
- Staples, steel, insulated**, supply of (P.O. tender 813): District Stores Superintendents, Johannesburg, Cape Town, Port Elizabeth, East London, Durban, Bloemfontein; Divisional Controller, P.O., Pietermaritzburg; Controller of P.O. Stores, Room 77, G.P.O. Annexe, Pretoria. **7th December.**
- Telex switchboard system**, supply of, for Port Elizabeth Central Telegraph Office (P.O. tender 814): Particulars as above. **21st December.**
- Telephone switchboard**, supply of (P.O. tender 816): Particulars as above. **4th January.**
- Wireless apparatus**, supply of (S.A. Police Indent 237): Quartermaster, S.A. Police (P.O. Box 449), 149 Koch Street, Pretoria. **11th January.**
- Cable markers**, supply of (P.O. tender 819): Particulars as above. **7th December.**
- Lead sleeves**, supply of (P.O. tender 820): Particulars as above. **7th December.**
- Bells, extra receivers, switches, telephones and timometers**, supply of (P.O. tender 818): Particulars as above. **11th January.**

## HOSPITAL AND SURGICAL EQUIPMENT.

- Furniture**, for New Maternity Block, Durban Hospital: Provincial Accountant, P.O. Box 373, Pietermaritzburg. **6th December.**
- X-Ray equipment** for King Edward VIII Hospital: Particulars as above. **13th December.**
- Back rests, ward trolleys, screens, dressing tables and bed pans**, all in metal, for Grey's Hospital, Pietermaritzburg: Particulars as above. **6th December.**

## REFRIGERATING PLANT.

- Refrigerators, electric stoves, etc.**, for Durban Hospital: Provincial Accountant, P.O. Box 373, Pietermaritzburg. **6th December.**

## ROADS AND ROAD-MAKING EQUIPMENT.

- Road scarifier**, supply of for Kareepoort Settlement (tender S.O. 486): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, 'phone 3121), Pretoria. **7th December.**
- Rock Crusher**, supply of, for Loskop Settlement (tender S.O. 485): Particulars as above. **7th December.**
- Workshop equipment**, supply of, for use in National Roads Workshop at Bellville South, C.P. (tender F.123/1939): Particulars in Cape Provincial Gazette of 20th October. **1st December.**
- Major plant** for construction of National Roads in Cape Province (tender F.120/1939): Particulars in Cape Provincial Gazette of 3rd November. **8th December.**
- Fertiliser spreaders, disc harrows, and tar distributors**, for use on National Roads in O.F.S., supply of (tender 7, 1939/40): O.F.S. Provincial Tender Board, Government Buildings, Bloemfontein. **15th December.**

## WATER SUPPLY AND IRRIGATION EQUIPMENT.

- Sinking of bore holes** in districts of Peddie, Kingwilliamstown and

Victoria East, for Native Affairs Department (tender S.O. 548): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, 'phone 3121), Pretoria. **7th December.**

- Cast-iron outlet pipes** (Irrigation tender 222): Controller of Stores, Irrigation Department (P.O. Box 277), 474 Carl Street, Pretoria; Circle Engineer, Irrigation Department, P.O. Box 23, Cape Town; Circle Engineer, Irrigation Department, P.O. Box 3020, Port Elizabeth; Circle Engineer, Irrigation Department, P.O. Box 1018, Durban. **7th December.**

## MISCELLANEOUS.

- Nickel chrome steel** for S.A.R. & H. (tender 2436): Railway Stores, Salt River, Uitenhage, East London, Durban, Bloemfontein, Pretoria; and Chief Stores Superintendent, S.A.R. & H. Headquarters Offices, Johannesburg. **2nd January.**
- Woodworking machinery** for Alexandra Mental Hospital, Cape Peninsula, supply and delivery (P.W.D. tender 412): P.W.D., Pretoria (Room 531, 'phone 5477), and District Representative, P.W.D., Cape Town. **14th December.**
- Pneumatic tube system**, supply of, for Cape Town Central Telegraph Office (P.O. tender 777): District Stores Superintendents, Johannesburg, Cape Town, Port Elizabeth, East London, Durban, Bloemfontein; Divisional Controller, P.O. Pietermaritzburg; Controller of P.O. Stores, Room 77, G.P.O. Annexe, Pretoria. **21st December.**
- Steel measuring bands and spring balances**, supply of, to Trigonometrical Survey Office, Mowbray (tender S.O. 515): Union Tender and Supplies Board, 271 Visagie Street, (P.O. Box 371, 'phone 3121), Pretoria. **21st December.**
- Combination Kjeldahl digestion and distillation unit**, supply of, to Division of Soil and Veld Conservation, Department of Agriculture and Forestry (tender S.O. 514): Particulars as above. **21st December.**
- Lathe**, supply of, for Senior Ordnance Officer, Cape Town, (tender S.O. 513): Particulars as above. **21st December.**
- Tractor**, supply of, to Stellenbosch-Elsenburg College of Agriculture, Stellenbosch, (tender S.O. 520): Particulars as above. **28th December.**
- Tubular steel furniture**, supply, delivery and fixing of, in Lecture Room, New East Wing Additions, G.P.O., Johannesburg (P.W.D. tender 423): P.W.D., Pretoria (Room 531, 'phone 5477). **28th December.**
- Steel drawer cabinets**, for Surveyor-General's Office, Bloemfontein, supply and delivery of (P.W.D. tender 420): Particulars as above. **28th December.**
- Two passenger and one goods lift**, for New G.P.O., Bloemfontein, supply, delivery and erection of (P.W.D. tender 421): Particulars as above. **1st February.**
- Independent boilers and cylinders**, supply and delivery of, to Fort Napier Mental Institution, Pietermaritzburg (P.W.D. tender 426): Particulars as above. **4th January.**
- Continuous mechanical filter plant** for Barberton Prison swimming baths, supply, delivery and erection (P.W.D. tender 427): Particulars as above. **4th January.**
- Fencing material**, supply of, to Department of Lands (formal tender S.O. 546): Union Tender and Supplies Board, 271 Visagie Street (P.O. Box 371, 'phone 3121), Pretoria. **7th December.**
- Portable air compressor**, supply of, (P.O. tender 822): District Stores Superintendents, Johannesburg, Cape Town, Port Elizabeth, East London, Durban, Bloemfontein; Divisional Controller, P.O. Pietermaritzburg; Controller of P.O. Stores, Room 77, G.P.O. Annexe, Pretoria. **18th January.**
- Lead seals**, making of (P.O. tender 821): Particulars as above. **15th February.**

# Tenders Accepted

**T**HE following are particulars of some of the contracts which have been awarded by Government Departments and Provincial Administrations. The name of the successful tenderer is given in each case, and, wherever practicable, the contract price:—

## AIR-CONDITIONING AND CENTRAL HEATING.

- Air-conditioning and central heating installation** at Krugersdorp Automatic Telephone Exchange (P.W.D. tender 278): Henderson-Smart Air Conditioning & Refrigeration Engineers (Pty.), Ltd., Johannesburg. £1,515.
- Central heating installation** at New G.P.O., Germiston (P.W.D. tender 330): A. E. Barker, Johannesburg. £569 10s.
- Central heating installation**, New G.P.O., Bloemfontein: A. E. Barker, Johannesburg. £27,114.
- Ventilating plant** at G.P.O., Bloemfontein (P.W.D. tender 337): Reunert & Lenz, Ltd., Johannesburg. £2,400.

## BRIDGES AND MATERIALS.

- Limpopo River Bridge**, Stockpoort (P.W.D. tender 347): A. J. Bester, Vredenburg. £10,254.
- Klip River Bridge**, Oranjefontein (P.W.D. tender 383): C. Savoia, Vredefort. £1,548 15s.

## BUILDINGS AND ALTERATIONS, ETC.

- Government Offices, Barrack Square, Capz Town — Contract No. 2** (P.W.D. tender 338): Chas.U. Church, Cape Town. £79,945.
- Steel roof trusses**, New Disinfecter House, Military Camp, Wynberg (P.W.D. tender 372): Dorman Long (Africa), Ltd., Cape Town. £85.
- Additions and alterations, Post Office, Ladysmith** (tender P.W.D. 365): A. B. Cartwright, Durban. £8,115.
- Addition of Post Office to Public Offices, Evaton** (P.W.D. tender 361): A. S. Dunstan, Johannesburg. £970.
- Signal Block, Voortrekkerhoogte** (P.W.D. tender 397): N. Plomp, Pretoria. £1,170.
- Public Offices, Randfontein** (P.W.D. tender 373): M. Klawansky, Krugersdorp. £12,142 17s. 3d.
- Police Mortuary and Staff Quarters, Johannesburg** (P.W.D. tender 352): Daniels & Skippage, Johannesburg. £22,500.
- Additions to Z.A.S.M. House, Pretoria** (tender P.W.D. 394): R. Leggat (Pty.), Ltd. £12,500.
- Military Camp, Potchefstroom** (P.W.D. tender 417): E. G. Egerer & Co., Benoni. £15,936 4s. 3d.
- Garages** at S.A. Military College, Voortrekkerhoogte (P.W.D. tender 395): H. S. Potgieter, Mayville. £1,735.
- Magnetic Observatory, Westcliffe** (P.W.D. tender 380): J. Forster & Co. (Pty.), Ltd., Kenilworth. £4,936.
- Accommodation for N.C.O.'s, S.A. Military College, Voortrekkerhoogte** (P.W.D. tender 406): Engel & Ruyter, Pretoria. £7,047.
- Alterations, etc., Automatic Telephone Exchange, Rosebank** (P.W.D. tender 382): A. S. Dunstan, Glensesk. £887.

**Accommodation for Cadets, S.A. Military College, Voortrekkerhoogte** (P.W.D. tender 405): A. Busby, Pretoria. £6,155.

**Gas Chamber, S.A. Military College, Voortrekkerhoogte** (P.W.D. tender 404): J. W. Petersen, Krugersdorp. £2,450.

## CHEMICALS, LABORATORY EQUIPMENT, ETC.

- Glycerine** (6,000 lb.) for Onderstepoort Laboratory: Lever Bros. (S.A.) (Pty.), Ltd., Durban. £75 10s., less 2½%, f.o.r. Durban.
- Guaranteed reagents, stains and pure chemicals**, for Onderstepoort Laboratory (tender S.O. 424): (1) W. J. Fawley (Pty.), Ltd., Johannesburg; (2) Surgical Instrument Co., Johannesburg; (3) Macdonald, Adams & Co., Ltd., Johannesburg; (4) B. Owen Jones, Ltd., Johannesburg.
- Chemicals and apparatus** for Pathological Laboratory, Cape Town (tender S.O. 419): (1) Heynes Mathew, Ltd., Cape Town; (2) Macdonald, Adams & Co., Ltd., Johannesburg; (3) Cooke, Troughton & Simms, Ltd., Cape Town; (4) Surgical Instrument Co., Ltd., Johannesburg.

**Milk recording equipment** for Dairying Division, Pretoria (tender S.O. 403): (1) Otley-Jardine Dairy Supply Co., Ltd., Johannesburg; (2) Macdonald, Adams & Co., Ltd., Johannesburg; (3) Zenith Marine Engineering Co., Ltd., Durban; (4) Geo. Schachna, Johannesburg; (5) Harry T. White, Ltd., Pietermaritzburg.

**Syringes** (1,000) for Onderstepoort Laboratory (tender S.O. 399): Geo. Schachna, Johannesburg. £644 15s. 10d., f.o.b. Southampton.

**Chemicals and apparatus** for Government Laboratory, Durban (tender S.O. 408): (1) Macdonald, Adams & Co., Ltd., Johannesburg; (2) S.A. Liquid Gas Co. (Pty.), Ltd., Cape Town; (3) Heynes, Mathew, Ltd., Cape Town; (4) B. Owen Jones, Ltd., Johannesburg; (5) Surgical Instrument Co., Johannesburg.

**Guaranteed reagents, stains and pure chemicals** for Onderstepoort Laboratory (tender S.O. 351): (1) Hubert Davies & Co., Ltd., Johannesburg; (2) Motor & General Supplies (Pty.), Ltd., Johannesburg; (3) Barry, Colne & Co., Ltd., Johannesburg; (4) Cymot, Ltd., Johannesburg; (5) Motor Car Equipment Co., Ltd., Johannesburg; (6) D. H. Saker & Co., Johannesburg; (7) A. Fairweather, Kroonstad; (8) Illings (Pty.), Ltd., Durban; (9) Griffin Engineering Co., Ltd., Johannesburg.

**Bacteriological peptone** (850 lb.) for Onderstepoort Laboratory (tender S.O. 426): French Distributing Co., (S.A.) (Pty.), Ltd., Johannesburg. £340, c.i.f. Durban.

(1) **Acidifying tablets**, (2) **Alkalisising tablets**, for Onderstepoort Laboratory (tender S.O. 452): Geo. Schachna, Johannesburg: (1) £890, f.o.b. London; (2) £281 5s., f.o.b. London

**Glycerine** (4,000 lb.) (tender S.O. 472): Lever Bros. (S.A.) (Pty.), Ltd., Durban. £75 10s. per 2,000 lb., less 2½%, f.o.r. Durban.

**Laboratory ware** for Stellenbosch-Elsenburg College of Agriculture (tender S.O. 482): (1) Heynes, Mathew, Ltd., Cape Town; (2) Macdonald, Adams & Co., Ltd., Johannesburg.

## COOKING EQUIPMENT, ETC.

**"Aga" cookers** (2), for Mental Hospital, Pretoria (P.W.D. tender 351): Aga Heat (Africa) (Pty.), Ltd., Johannesburg. £275 10s.

## DRAINAGE AND SANITATION.

- Waterborne drainage**, Magistrate's house and Native Commissioner's Office, Heidelberg (P.W.D. tender 358): W. C. Brown & Co. (East Rand) (Pty.), Ltd., Springs. £889 13s. 6d.
- Waterborne drainage**, Krugersdorp Gaol (P.W.D. tender 357): B. J. Venter, Krugersdorp. £1,935 12s. 4d.
- Drainage**, Postal Stores, Braamfontein (P.W.D. tender 360): Milne Bros. (Pty.), Ltd., Johannesburg. £576 10s.
- Waterborne drainage**, Residency, etc., Oudtshoorn (P.W.D. tender 366): A. Rogers & Son, George. £585.
- Waterborne drainage**, Dundee High School, Natal: Johnston & Keith (Pty.), Ltd. £530 7s.

## ELECTRICAL EQUIPMENT.

- Cable** (tender A.L. 203): Crompton Parkinson (S.A.), Ltd. Johannesburg.
- Pipes** — 86,000 ft. (tender A.L. 195): Dowson & Dobson, Ltd., Johannesburg. £4,191 11s. 0d., f.o.b. Liverpool.
- Cable** (tender A.L. 193): Henley's (S.A.), Telegraphs Co., Ltd., Johannesburg. (1) 5,877 yards F.2005, £7,320, f.o.b. London; (2) 2,705 yards F.2021, £1,175, f.o.b. London.
- Floodlights (72) for hangar lighting** (P.W.D. tender 314): British General Electric Co., Ltd., Johannesburg. £310 16s. 0d.
- Electric hoist**, Pretoria West Forest Products Institute (P.W.D. tender 342): Griffin Engineering Co., Ltd., Johannesburg. £137 10s.
- Condensers** (tender A.L. 211): Automatic Telephones (S.A.), Ltd., Johannesburg.
- 4,000 yards wire** (tender A.L. 192): Wilson & Herd, Ltd., Johannesburg. £1,260, f.o.b. Liverpool.
- (1) **3 transformers**, (2) **3 switches**, (3) **3 switchgears**, for Parkview, Rosebank and Auckland Park Automatic Telephone Exchanges (P.W.D. tender 316): (1) British General Electric Co., Ltd., Johannesburg: £222, f.o.r. in bond Durban; (2) Rice & Diethelm, Ltd., Johannesburg: £346 6s., f.o.r. Durban; (3) Johnson & Phillips (S.A.) (Pty.), Ltd., Johannesburg: £153 15s., delivered.
- Electric motors** for State Alluvial Diggings, Alexander Bay (tender S.O. 416): (1) Crompton Parkinson (S.A.), Ltd., Johannesburg; (2) Johnson & Phillips (S.A.) (Pty.), Ltd., Johannesburg; (3) Zenith Marine Engineering Co., Ltd., Durban; (4) Hubert Davies & Co., Ltd., Johannesburg; (5) Steam and Mining Equipment (Pty.), Ltd., Johannesburg; (6) Griffin Engineering Co., Ltd., Johannesburg; (7) Neuman Industries, Ltd., Johannesburg.
- Electric cable, etc.**, for State Alluvial Diggings (tender S.O. 410): (1) Siemens Bros. & Co. (British), Ltd., Johannesburg; (2) Johnson & Phillips (S.A.) (Pty.), Ltd., Johannesburg; (3) British Insulated Cables (S.A.), Ltd., Johannesburg; (4) Hubert Davies & Co., Ltd., Johannesburg; (5) Standard Telephones & Cables, Ltd., Pretoria; (6) British General Electric Co., Ltd., Johannesburg.
- Cable** for Department of Posts and Telegraphs (tender A.L. 208): (1) Stratford Engineering Co., Ltd., Johannesburg; (2) British Insulated Cables (S.A.), Ltd., Johannesburg.
- Distribution boxes** (750) for Department of Posts and Telegraphs (tender A.L. 215): Standard Telephones & Cables, Ltd., Pretoria. £862 10s., f.o.b. London.

**Wire** (600,000 yards) for Department of Posts and Telegraphs (tender A.L. 213): British Insulated Cables (S.A.), Ltd., Johannesburg. £2,992, f.o.b. Liverpool.

**Telex switchboard system** for Central Telegraph Office, Cape Town (tender P.O. 707): Standard Telephones & Cables, Ltd., Pretoria. £1,396, f.o.b. London.

**Switchboards** (20) for Central Telegraph Office, Cape Town (tender P.O. 685): Rogers-Jenkins & Co. (Pty.), Ltd., Johannesburg. £440, f.a.s. Gothenburg.

(1) **Transformer**, (2) **high-tension switch**, (3) **low-tension switch**, for Automatic Telephone Exchange, Randfontein (P.W.D. tender 341): (1) Hubert Davies & Co., Ltd., Johannesburg: £79 10s.; (2) Rice & Diethelm, Ltd., Johannesburg: £115 8s. 8d.; (3) Johnson & Phillips (S.A.) (Pty.), Ltd., Johannesburg: £51 5s. 0d.

**Insulators** for Department of Posts and Telegraphs (tender A.L. 218): Armstrong, Ltd., Johannesburg.

**Telephones** (75) for Department of Posts and Telegraphs: Automatic Telephones (S.A.), Ltd., Johannesburg. £345, f.o.b. Antwerp.

**Cable** for Department of Posts and Telegraphs (tender A.L. 217): (1) Henley's S.A. Telegraph Works Co., Ltd., Johannesburg; (2) British Insulated Cables (S.A.), Ltd., Johannesburg; (3) Wilson & Herd, Ltd., Johannesburg.

**Dry cells** for Department of Posts and Telegraphs (tender A.L. 225): Siemens Bros. & Co. (British), Ltd., Johannesburg.

**Switchboards** (10) for Department of Posts and Telegraphs (tender P.O. 777): Standard Telephones & Cables, Ltd., Pretoria. £900, f.o.b. London.

**Switchboards, complete** (12) for Department of Posts and Telegraphs (tender P.O. 771): Rogers-Jenkins & Co. (Pty.), Ltd., Johannesburg. £2,510, f.a.s. Gothenburg.

**Instrument tables** for Department of Posts and Telegraphs (tender P.O. 795): Francis & Graham (Pty), Ltd., Durban. £845.

**Cable** (3,520 yards) for Department of Posts and Telegraphs (tender A.L. 224): Siemens Bros. & Co. (British), Ltd., Johannesburg. £275, f.o.b. London.

**Cable** for Department of Posts and Telegraphs (tender A.L. 226): (1) Rice & Diethelm, Ltd., Johannesburg; (2) R. T. Urquhart & Co. (Pty.), Ltd., Johannesburg; (3) Stratford Engineering, Ltd., Johannesburg.

## HOSPITAL AND SURGICAL EQUIPMENT.

**Furniture**, for Tuberculosis Hospital, Durban (P.W.D. tender 367): McNamee & Co., Durban.

**Dental requirements** for Central Prison, Pretoria (tender S.O. 405): Taylor & Horne, Johannesburg.

## LAUNDRY EQUIPMENT.

(1) **Hydro-extractor**, (2) **washing, boiling and rinsing machine, with spares**, (3) **soap and soda dissolvers**, (4) **motor**, for Fort Napier Mental Hospital (P.W.D. tender 349): (1) Rogers-Jenkins & Co., Durban: £125 f.o.r. Durban; (2) Thos. Barlow & Sons (S.A.), Ltd., Durban: £165 and £15 19s. 6d., f.o.r. Durban; (3) Griffin Engineering Co., Ltd., Johannesburg: £10 15s., f.o.r. Durban; (4) Griffin Engineering Co., Ltd., Johannesburg: £20 4s., f.o.r. Durban.



## REFRIGERATING PLANT.

**Refrigerating plant**, Police Mortuary, Vereeniging (P.W.D. tender 332): Barlow's Electrical Department (Pty.), Ltd., Johannesburg. £449.

## ROADS AND ROAD-MAKING EQUIPMENT.

**Macadamising of roads**, National Zoological Gardens, Pretoria (P.W.D. tender 376): Darling & Hodgson, Johannesburg. £161 16s. 6d.

**Bitumen emulsion surfaces**, Governor-General's residence, Westbrooke (P.W.D. tender 371): J. Donaldson & Sons, Salt River. £571 8s. 4d.

**"Le Tourneau" road rippers** (3) for Transvaal Provincial Administration (tender 157/1939): Thos. Barlow & Sons (S.A.), Ltd., Johannesburg. £391 each, in bond, f.o.r. Durban.

**Steel for National and Provincial Roads**, Cape Province (tender F.97/1939): (1) Patlansky Bros. & Schauder, Port Elizabeth; (2) Woolf Engineering Co. (Pty.), Ltd., Bloemfontein.

## WATER SUPPLY AND IRRIGATION EQUIPMENT.

**Boring for water**, Rustenburg District (tender I.D. 152): D. W. van Asperin, Johannesburg.

**Windmills** at Pongola Settlement (tender S.O. 436): Gearings, Ltd., Johannesburg.

**Reconditioning and cement lining of water mains**, Military Camp, Wynberg (P.W.D. tender 354): Tate Pipe Lining Co. (Pty.), Ltd., Salt River. £1,392 14s. 2d.

**Pumping plant** (tender S.O. 454): Stewarts & Lloyds of S.A., Ltd., Kimberley. £67 16s. 0d.

**Boring for water**, Amersfoort School (tender I.D. 151): E. H. A. Rohrbeck, Pietersburg.

**Boring for water**, Native Location, Glen Grey (tender S.O. 451): J. P. Viljoen, Indwe.

**Windmill, reservoir and piping**, Frankfort Gaol (P.W.D. tender 390): Frankfort Koöperatiewe Handelsvereniging, Bpk., Frankfort. £204 11s. 11d.

## MISCELLANEOUS.

**Portable hoists** (16) for Department of Posts & Telegraphs (tender P.O. 766): Sturrock (S.A.), Ltd., Johannesburg. £164, f.o.r. Johannesburg.

**Cupboards, lockers and sorting presses**, for Department of Posts and Telegraphs (tender P.O. 777): Peerless Steel Equipment Manufacturing Works, Johannesburg; and Thos. Barlow & Sons (S.A.), Ltd., Johannesburg.

**Steam boiler and automatic stoker** for Onderstepoort Laboratory (P.W.D. tender 313): Steam and Mining Equipment (Pty.), Ltd., Johannesburg. £1,813.

(1) **2 steam pumps**, (2) **1 boiler**, (3) **1 chimney**, for State Sawmills, Stutterheim (tender S.O. 420): Stewarts & Lloyds of S.A., Ltd., East London. (1) £47 18s., f.o.r. Durban; (2) £1,120, c.i.f. East London; (3) £110, c.i.f. East London.

**Wheat-threshing machine** for Olifants River Settlement (tender S.O. 385): Wm. Spilhaus & Co., Ltd., Cape Town. £520, f.o.r. Parow.

**Scientific instruments** for Geological Survey Division (tender S.O. 428): (1) Macdonald, Adams & Co., Ltd., Johannesburg; (2) Siemens (S.A.), Ltd., Johannesburg.

**Woodworking machine** for Low Temperature Research Laboratory (tender S.O. 395): Henry S. Potter, Ltd., Johannesburg. £147 10s., f.o.b. Glasgow.

**Rock crusher** for Mental Hospital, Pretoria (tender S.O. 398): Rutherfords, Cape Town. £132 17s. 6d., f.o.r. Pretoria.

**Safes** (tender S. 8): Rand Offices and Shop Furnishing Co., Johannesburg.

**Steel furniture and fittings** for G.P.O., Johannesburg (P.W.D. tender 374): Thos. Barlow & Sons (S.A.), Ltd., Johannesburg. £1,342 19s. 0d.

**Stone crusher** for Kareepoort Settlement (tender S.O. 414): E. G. Nyman (Pty.), Ltd., Maitland. £259 18s. 0d., f.o.r. Maitland.

**Naphthalene oil** (tender S.O. 155): Cotona Oil & Cake Mills, Ltd., Germiston.

**Steam engine** for State Sawmills, Stutterheim (tender S.O. 415): Guest Sykes, Ltd., Johannesburg. £405, f.o.b. London.

**Cable** for Waterkloof Air Station (tender S.O. 477): H. Alers Hankey, Ltd., Johannesburg.

**Metal-turning lathe** for Trades School, Middelburg (tender S.O. 396): National Engineering (Pty.), Ltd., Johannesburg. £70 10s. 0d., f.o.b. New York.

**Steel wire rope** (4,150 meters) for Berlin Forestry Settlement (tender S.O. 547): Haggie, Son & Love (1936), Ltd., Johannesburg. £624 12s. 4d., f.o.r. Jupiter.

**Manhole frames** (50) for Department of Posts and Telegraphs (tender P.O. 783): Saxon Foundry & Engineering Works, Johannesburg. £275, f.o.r. Johannesburg.

**Lead seals, making of**, for Department of Posts and Telegraphs (tender P.O. 778): Castle Lead Works, Cape Town.

**Tipping trucks** (20) for State Alluvial Diggings (tender S.O. 483): Orenstein & Koppel (S.A.), Ltd., Johannesburg. £256, f.o.r. Durban.

**Rails** (200, 24 ft.) for State Alluvial Diggings (tender S.O. 470): Orenstein & Koppel, Ltd., Johannesburg. £240, f.o.r. Durban.

**Tractor** for Loskop Settlement (tender S.O. 367): International Harvester Co. (S.A.), Ltd., Durban. £961 10s. 6d., f.o.r. in bond Durban.

**Index cabinets** (11) for Immigration Department, Pretoria (tender S.O. 522): Thos. Barlow & Sons (S.A.), Ltd., Johannesburg. £223.

Standard type galleys (3,000) for Government Printer (tender G.P.W. 39): S.A. Steel Equipment Co., Ltd., Johannesburg. 2s. 6d. each, f.o.r. Johannesburg.

(1) 10,000 ammunition boxes, (2) 10,000 ammunition boxes, (3) 20,000 liners for Royal Mint (tender S.O. 494): (1) Dudley Joinery Co. (Pty.), Ltd., Roodepoort: £5,250, f.o.r. Roodepoort; (2) Herbert Fürst, Johannesburg: £4,750, f.o.r. Johannesburg; (3) Maythams, Ltd., Johannesburg: £2,708 6s. 8d., f.o.r. Johannesburg.

(1) Land roller, (2) binder, (3) mower, for Stellenbosch-Elsenburg School of Agriculture (tender S.O. 417): (1) Malcomess Ltd., Parow: £24, f.o.r. Elsie's River; (2) Massey Harris & Co. (S.A.), Ltd., Maitland: £45, f.o.r. Maitland; (3) Massey Harris & Co. (S.A.), Ltd., Maitland: £16 10s., f.o.r. Maitland.

Railway material, Stutterheim (tender S.O. 458): (1) Robert Hudson & Sons, Ltd., Johannesburg; (2) Orenstein & Koppel (S.A.), Ltd., Johannesburg.

LIST OF TENDERS RECEIVED FOR STANDERTON HOSPITAL.

C. Jamieson	£48,989	0	0
A. E. J. Littleton	49,668	0	0
P. Leemhuis & Sons	49,977	0	0
James Thompson (Prop.), Ltd.	50,550	0	0
E. G. Egerer & Company	50,600	0	0
Kaminer & Woolf	51,190	0	0
D. J. Venter	51,371	0	0
W. Stretton (Pty.), Ltd.	51,569	0	0
Clark & Downie (Pty.), Ltd.	51,770	0	0
P. J. Fitzgerald	52,000	0	0
F. C. Holton	52,000	0	0
C. M. Crossling	52,071	0	0
Roseman & Co. (Pty.), Ltd.	52,759	0	0
L. Terblanche	53,130	0	0
Kopilis & Shipper	54,530	0	0

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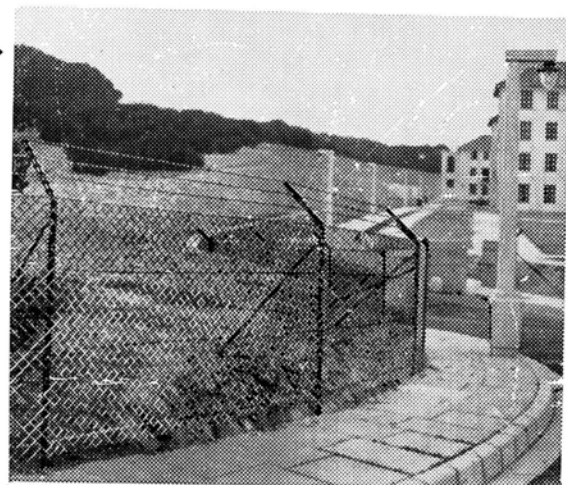
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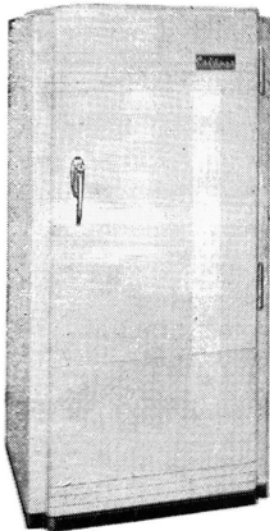
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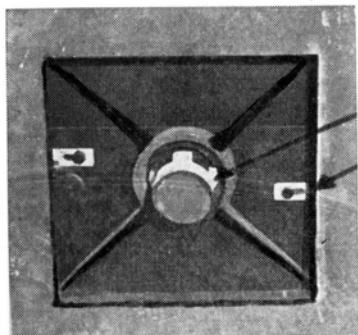
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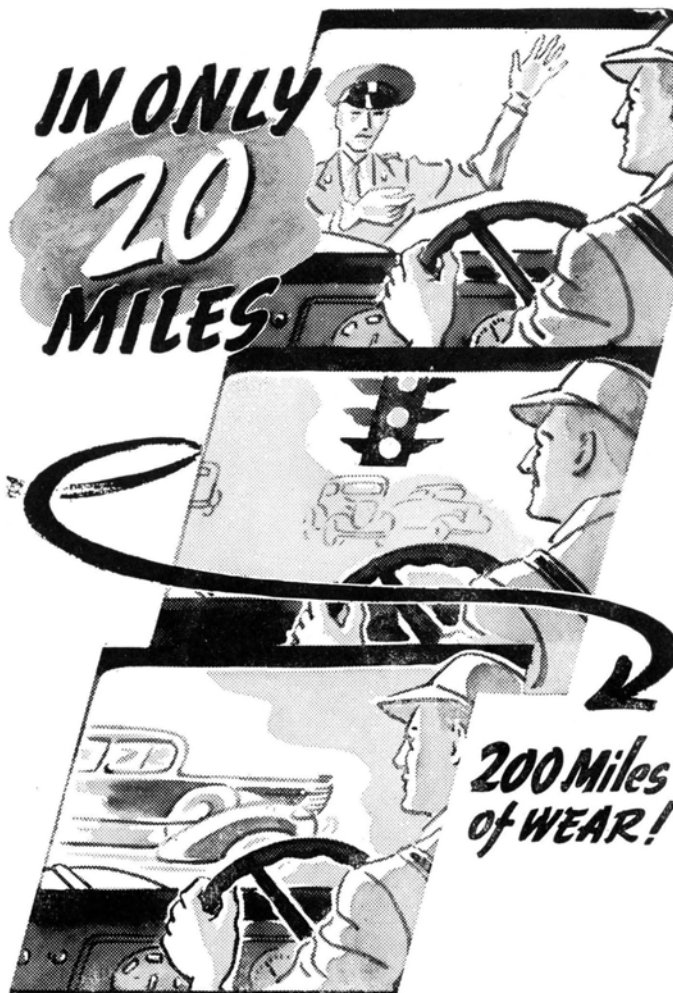
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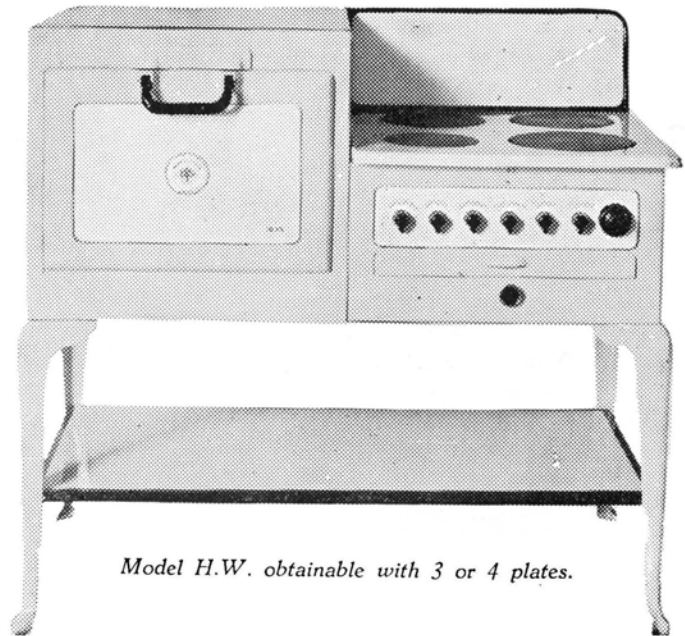
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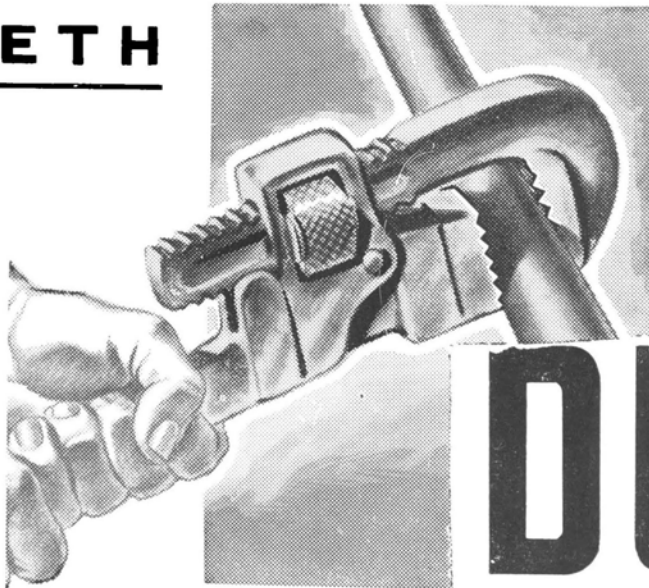


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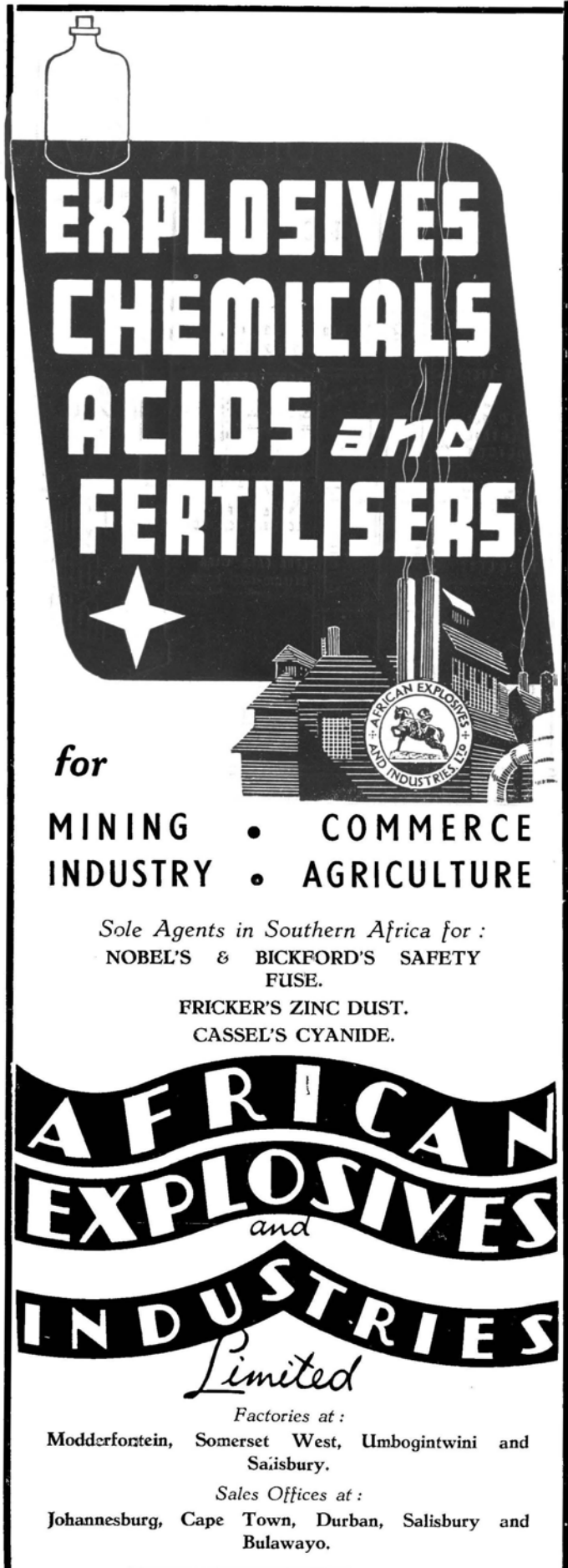
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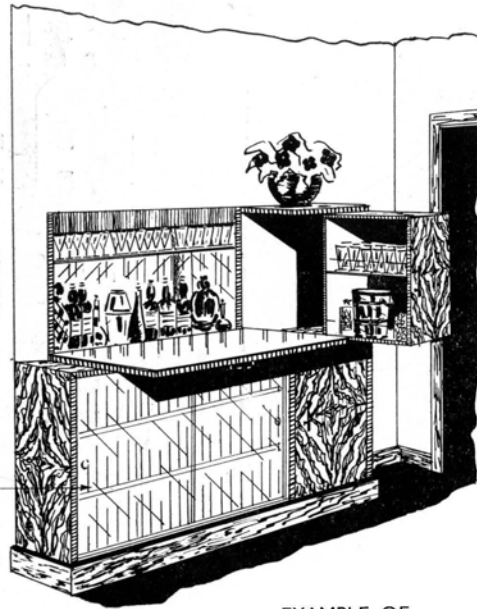
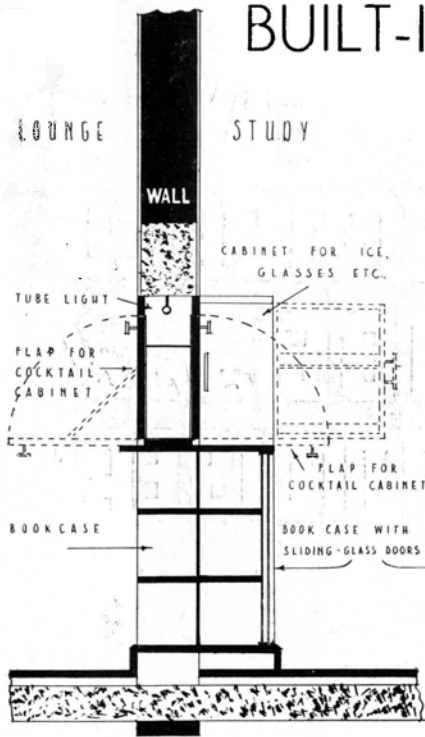
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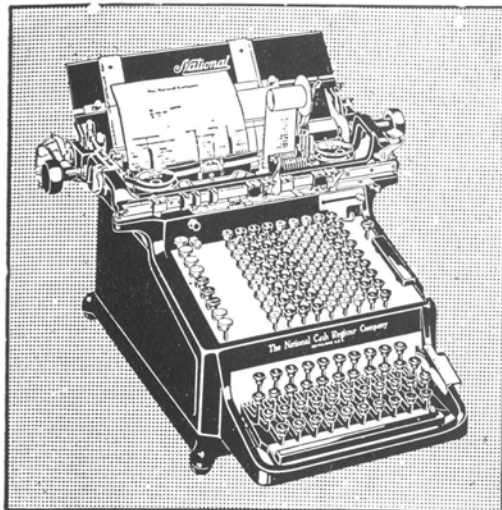
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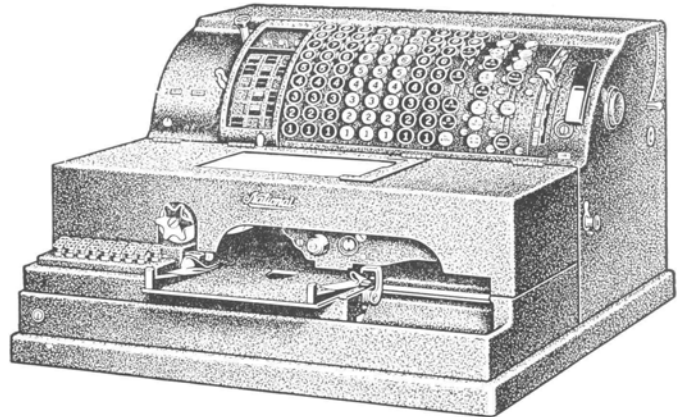
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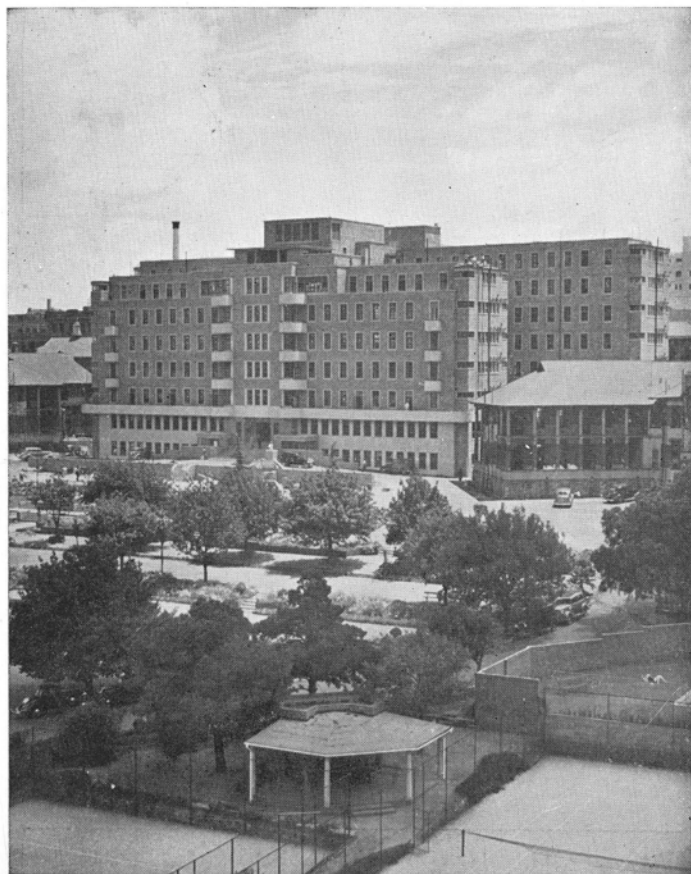
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