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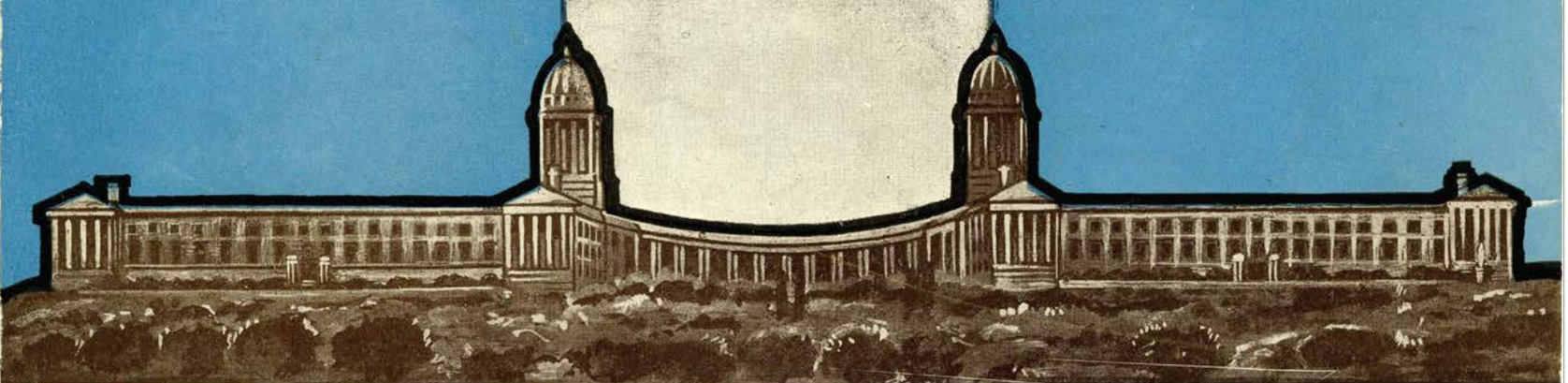
PUBLIC WORKS OF SOUTH AFRICA



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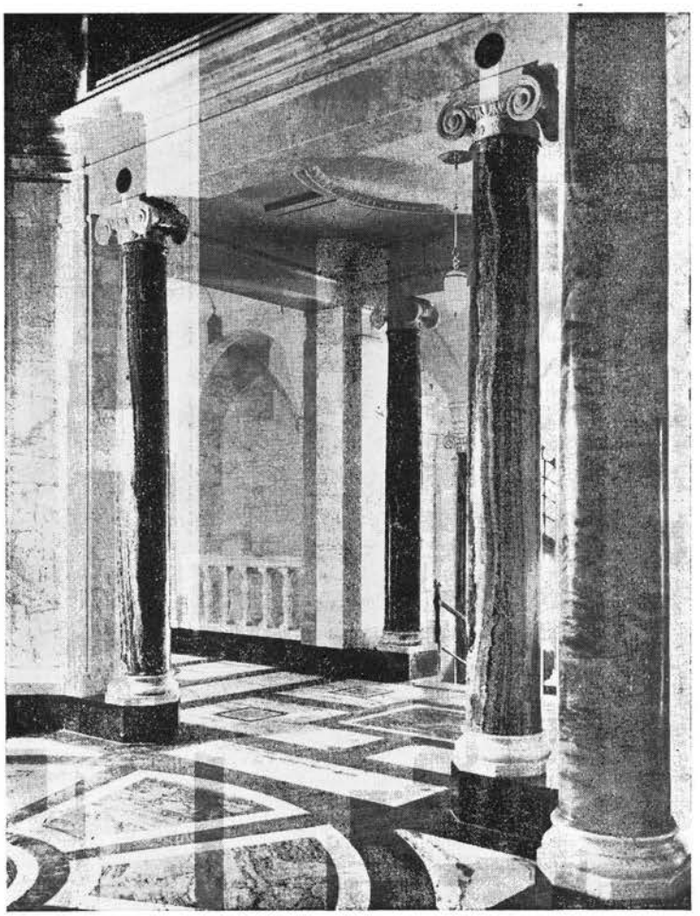

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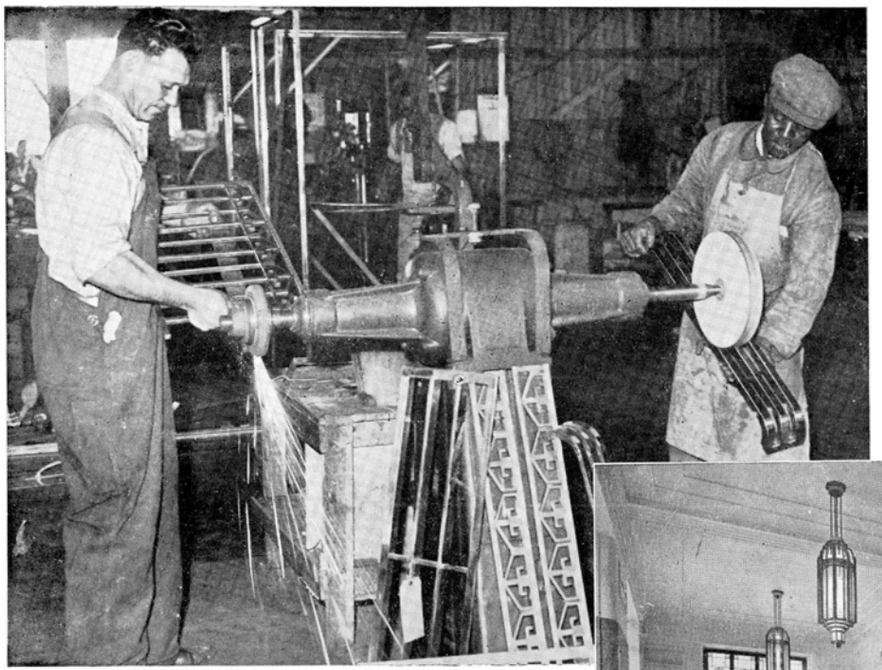

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"PUBLIC WORKS OF SOUTH AFRICA," which is published monthly, is intended to keep the public up-to-date in regard to projects of the Public Works Departments of South Africa, Union, Provincial and Local Government, giving expression to the activities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

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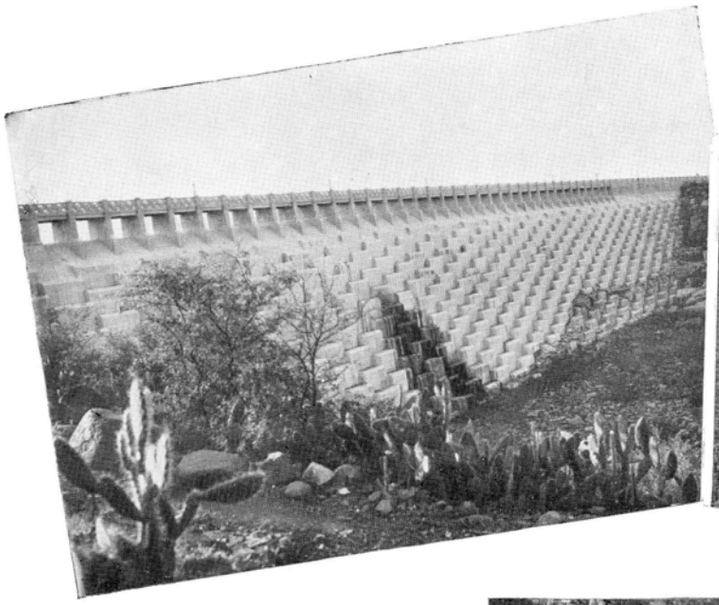
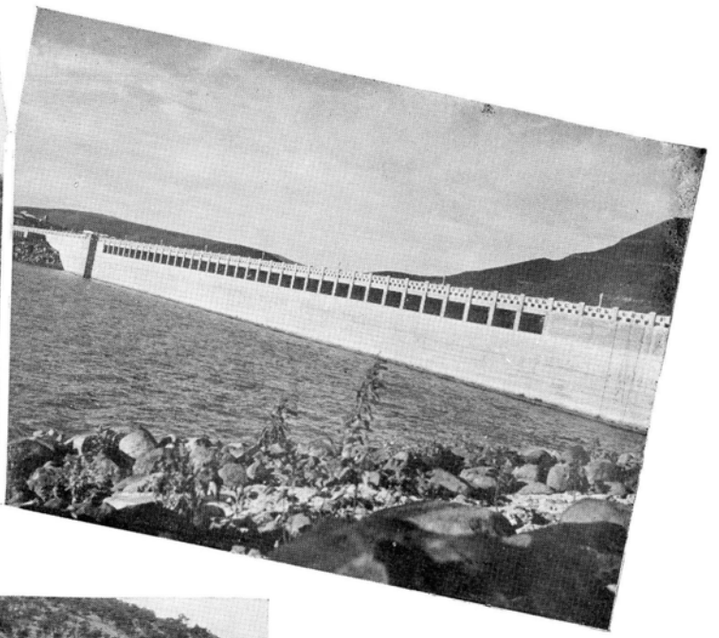
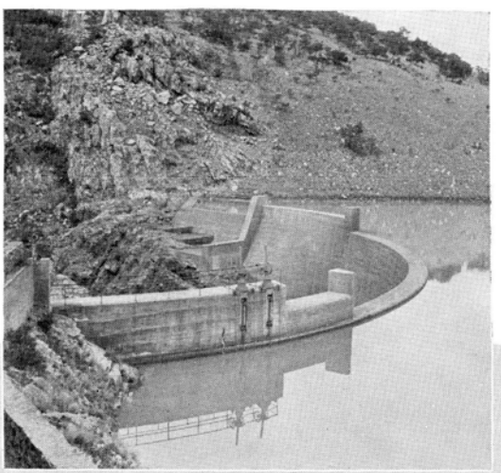
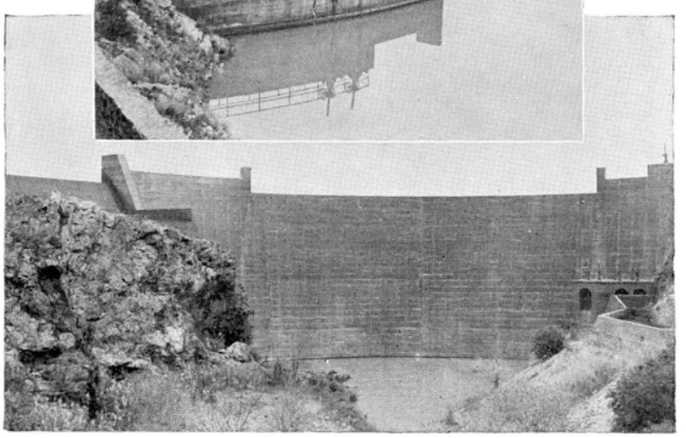


Down-stream view of the Van Ryneveld's Pass Dam.



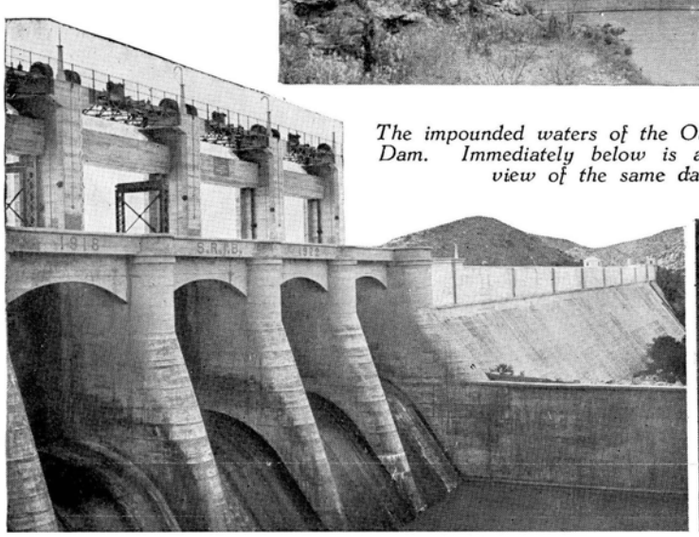
Upstream view of Van Ryneveld's Pass Dam.



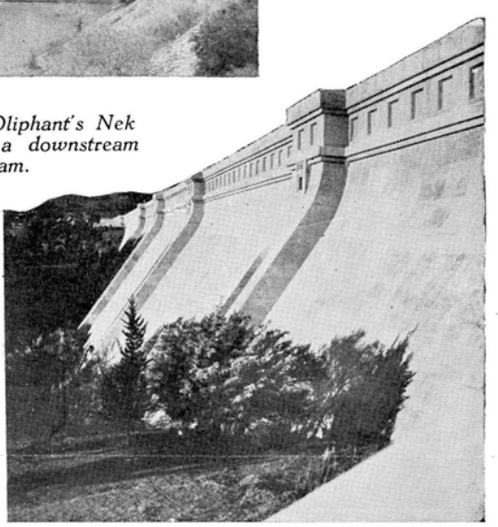


(Below) The sluice gates of the Lake Mentz Dam (downstream side).

(Below) The wall of the Kamanassie Dam.



The impounded waters of the Oliphant's Nek Dam. Immediately below is a downstream view of the same dam.



S. Africa's £15,000,000 Campaign Against Drought

★

A Review of the Union Irrigation Department's Thirty-Nine Years of Construction : : : : : :

BY

JOSEPH HARDING.

EUROPEAN civilisation first began its struggle for existence in South Africa when Jan van Riebeeck landed at the Cape in 1652 to plant his little vegetable garden. Civilisation came to stay; but from the day it set foot on the threshold at Table Bay it has had to put up a fight, drought being not the least of its enemies. In those early pioneering days of South Africa's nationhood drought may not have been a conspicuous enemy. It inherited full status, however, when the Voortrekkers pioneered the hinterland to settle down as agriculturists in areas the climates of which were soon to prove their vagaries and cruelties. Though South Africa was to prosper by reason of its mineral wealth, the idea has always persisted that, in the last resort, the nation's economics must be based on agriculture. And so a vigorous policy has been pursued. Loans and subsidies to the tune of many millions have been given to farmers, and from the time of Union to the present day the sum of £15,000,000 has been invested by the Irrigation Department in irrigation construction works throughout the country.

Though the Union Irrigation Department has launched some of the largest civil engineering projects in the history of South Africa, it has worked for a long time in comparative obscurity. Besides a few of the larger undertakings such as the Vaal-Hartz scheme, the Hartebeestpoort Dam, etc., that have captured popular imagination, very little is known generally of the full extent of the work carried out by the Department. Even some of the larger schemes have remained a mystery to many people. An attempt is being made in this article to arouse some pitch of enthusiasm for the important work of launching the Union into a world of agricultural prosperity. This work will take years, involving the construction of large irrigation works, and advancing at a pace measured to the growth of the Union's markets abroad. Nevertheless it is a spectacular work, and one that has already achieved much.

Why Irrigation?

BEFORE embarking on a description of some of the major schemes that have been completed by the Irrigation Department or which are at present under construction, it will be of value to review the many reasons why irrigation is necessary in South Africa. Such a review will do much to enhance an appreciation of the work already done by the Department.

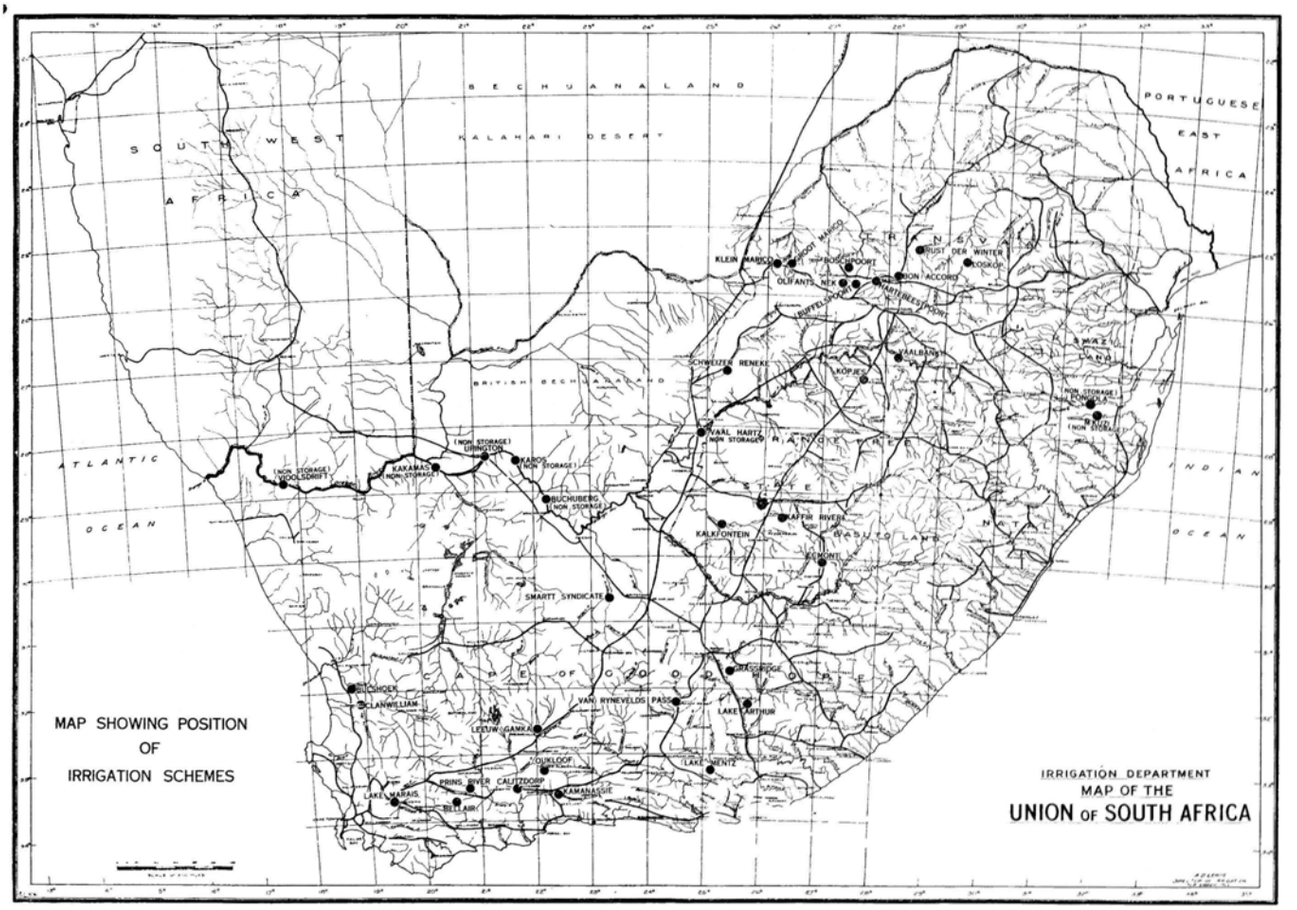
The most important reason for irrigation in this country is, obviously, an insufficient and varying rainfall. Allied to this is the fact that, though native plants, through long periods of evolution and survival of the fittest, have become inured to the rigours of the South African climate, agricultural crops are more exacting in their demands on the soil, requiring the necessary amount of water at the proper time. These crops, therefore, are more vulnerable because, during the most critical periods of crop production, the rainfall over almost the entire Union is desultory and uncertain.

The critical months of the year are August, September and October. In parts of the Cape Province and the southern Free State the most critical months are August and September. In the more northerly parts spring conditions appear earlier, so that September and October are the more critical months for crop-raising. During these months crops of any kind require water, and, unfortunately, it is during this time that there is little rain over the greater part of the country normally. During this period the percentage areas over which the mean rainfall is below 1 inch are 81.5, 62.3 and 33.8 for August, September and October respectively.

In addition to this there is the rather curious anomaly that in certain parts of the country a low annual rainfall is able to produce regular, fair-sized crops without irrigation, while other districts with twice or three times the rainfall require irrigation. This is a circumstance which does not always exist in a favourable relationship with the disposition of the more important agricultural areas; further, it amply illustrates the complexities of irrigation in South Africa.

In plain language, the Union is one of the most difficult countries to build up agriculturally. Some have even despaired that the country will ever be placed on an agricultural footing comparable with other countries, taking into account the vast areas of land available.

It has been stated that the geological history of South Africa is not one tending to produce large areas of agricultural land. The sub-continent is made up mainly of high plateaus with a "surprisingly limited and disconcerting proportion" of cultivable land. There are many areas which look good, being comparatively flat; but when examined they are found to consist of very shallow soil overlying either original rock or thick beds of secondary formations such as calcareous tufa or laterite. These shallow soils are



generally unfit for cultivation, as they will rarely bear the cost of even the most simple and inexpensive irrigation.

It is a striking fact that, despite the vastness of the country and its variations in climate and rainfall, agricultural South Africa is to be found concentrated mainly over large areas of medium and poor soils in the coastal belt, and in the valleys of our rivers where good soils of alluvium are found. The northern and eastern parts of the Union are covered with comparatively shallow soils more particularly suitable for the cultivation of maize, millets, wheat and other cereals. Unless these soils happen to be suitable also for the cultivation of fruit and tobacco they rarely permit the economic growing of crops under irrigation.

From this it will be seen that the total area of land in the Union potentially cultivable and irrigable is comparatively small. It is probable that it represents about only 2 per cent of the total extent of the country. And of this 2 per cent only a portion is capable of being irrigated or suitable for that purpose, as in many cases sufficient water is not available. It has been stated that out of South Africa's 473,000 square miles of territory only about 10,000 square miles, or 6,500,000 acres, can be described as really high-class culturable land, on which a further limitation is imposed by the absence of water or irrigation facilities.

Irrigation Zones

IRRIGATIONALLY, South Africa is divided into three zones. These are: (1) Areas in which climatic conditions make irrigation unnecessary — the coastal belt; (2) areas in which no crops can be grown without irrigation — the greater part of the Karoo in the Cape Province and south-western Free State and the whole of the arid or semi-arid region in the north and north-west of the Cape Province, and (3) those areas in which irrigation is necessary for certain crops at certain times of the year — most of the south-western and easterly portions of the Cape Province, the northern and eastern parts of the Free State and the greater part of the Transvaal and inland Natal.

A great deal can be written on the Union's rainfall in relation to irrigation. The following table, however, speaks for itself:—

Mean annual rainfall.	Square miles.
Under 5"	 8,987
5.1 - 15"	 173,118
15.1 - 25"	 154,671
25.1 - 35"	 108,317
35.1 - 50"	 26,015
50.1 - over 70"	 1,892
	473,000

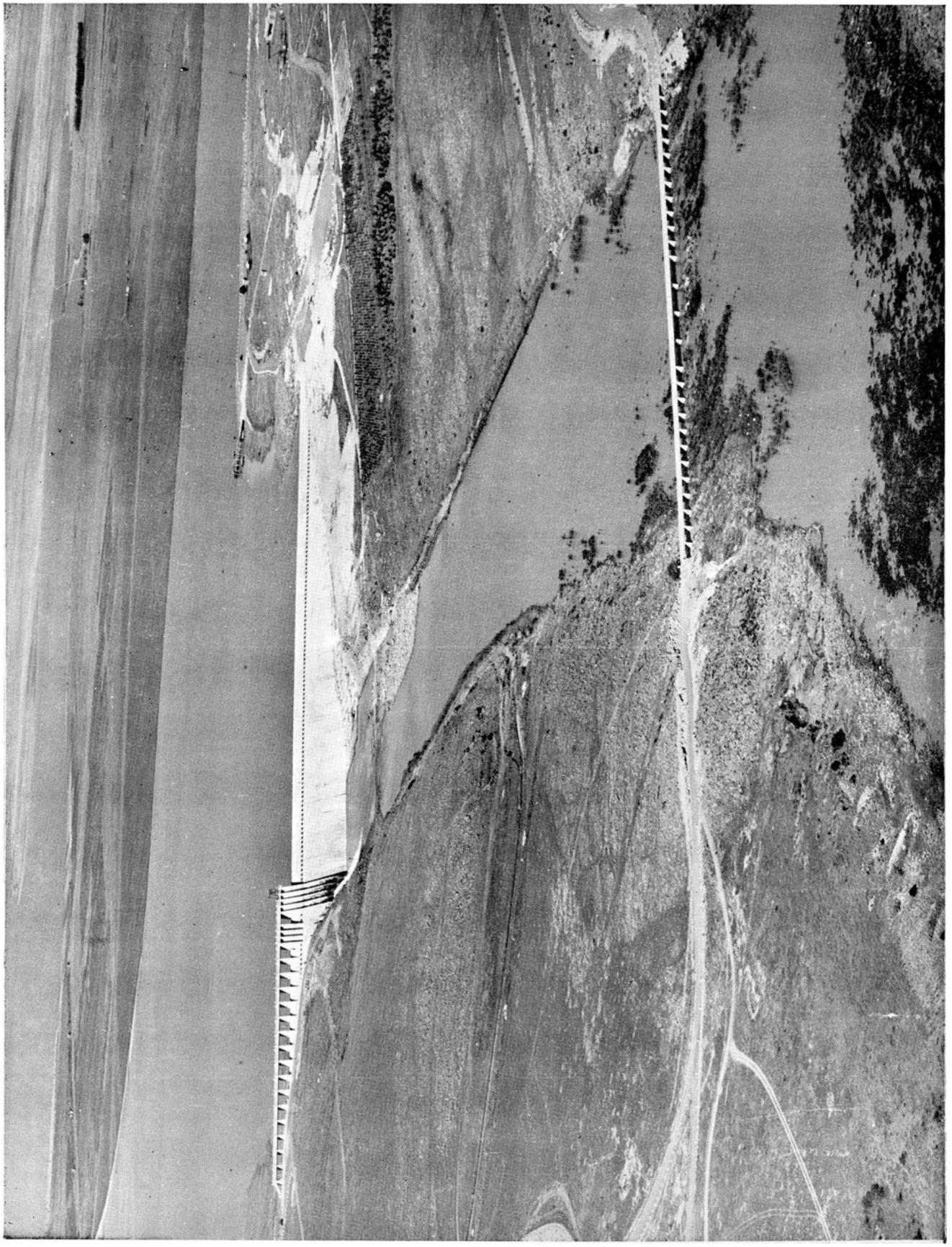
THE total number of completed board schemes in the Union to date is 136. The following Government schemes have been completed:—

SCHEME.	Capacity. Acre-feet.	Cost.
Hartebeestpoort (near Pretoria)	123,233	£1,300,959
Olifants River, Cape (Bulshoek)	5,308	£766,433
Buchuberg (Orange River)	30,000	£663,293
Groot Marico (Marico Bosveld)	24,715	£274,590
Clanwilliam (Olifants River, Cape)	56,657	£249,798
Pongola River, Natal	Diversion Weir and Canals	£192,044
Rust der Winter	22,525	£142,611
Egmont	10,510	£55,000

THE following is a list of major schemes, completed, under construction or authorised:—

Name of Scheme and District.	Original storage capacity, liable to reduction by silting. million cu. ft.	Actual or Estimated cost. £
CAPE OF GOOD HOPE.		
Bellair: Ladismith and Swellendam	425	45,300
Blyde River: Pearston	81	34,235
Breede River: Conservation	1,600	83,713
Buchuberg Dam: Prieska	1,306	663,293
Calitzdorp: Oudtshoorn	205	168,054
Grass Ridge (Great Fish River), Cradock	2,757	171,000
Kamanassie: Calitzdorp and Oudtshoorn	1,355	726,000
Lake Mentz (Sundays River), Uitenhage and Jansenville	4,122	564,000
Leeuw Gamka: Prince Albert	355	83,600
Oliphants River: van Rhynsdorp	231	766,433
Olifants River: Clanwilliam	2,611	249,798
Oukloof: Prince Albert	83	93,296
Prins River: Ladismith	135	22,116
Stoltz River: Beaufort West	56	31,700
Tarka (Great Fish River) (Lake Arthur), Cradock	2,500	613,801
Van Rynevelds Pass: Graaff Reinet	2,800	410,000
NATAL.		
Pongola: Piet Retief	diversion weir	192,044
TRANSVAAL.		
Bon Accord: Pretoria	415	115,000
Bospoort: Rustenburg	125	34,265
Buffelspoort: Rustenburg	174	78,789
Hartebeestpoort: Pretoria	5,369	1,300,959
Klein Marico: Zeerust	139	45,716
Klerksdorp: Klerksdorp	188	28,700
Klipdrift: Potchefstroom	443	97,434
*Loskop: Middelburg	6,400	1,500,000
Olifants Nek (Hex River), Rustenburg	574	110,000
Marico Bosveld: Zeerust	2,587	274,590
Rust der Winter: Pretoria	980	142,611
Schweizer Reneke	152	51,931
†Lindleyspoort: Rustenburg	428	200,000
ORANGE FREE STATE.		
*Egmont: Wepener	453	55,000
Kaffir River: Bloemfontein	1,356	90,000
*Kalkfontein Dam: Riet River, Fauresmith	12,980	700,000
Kopjes: Vredefort	313	109,637
CAPE OF GOOD HOPE, TRANSVAAL AND ORANGE FREE STATE.		
*Vaal River Development scheme under two organisations:		
(a) Vaalbank Dam: Heilbron and Vereeniging	38,000	900,000
(b) Vaal-Hartz Irrigation scheme: Christiana and Barkly West	diversion weir	2,600,000

* = under construction.
† = authorised.



[Photo by Aircraft Operating Company of Africa (Pty.), Ltd.]

THE VAAL BANK DAM.

Allied to considerations of rainfall must be the mean annual evaporation. This has been rated as follows:—

Coastal areas, comprising Natal, South Coast and Cape Province	48	inches
Area comprising rest of Cape Province and Free State	60 - 110	,,
Central and Eastern Transvaal....	50 - 70	,,
Western Transvaal	60 - 80	,,

Irrigation Works

IRRIGATION works fall mainly into two classes, namely, Government schemes and those carried out by irrigation boards. These boards were formed under the Irrigation and Conservation of Water Act, No. 8 of 1912. Until recently most of the irrigation work in the Union was carried out by the Irrigation Boards, especially in the Cape Province. Latterly, however, activity has been greater under Government schemes. There are approximately 130 irrigation boards in the Union, of which total 78 are in the Cape and 45 in the Transvaal. Up to the end of March, 1937, a total of nearly £5,000,000 had been loaned by the Government to these boards, this being in addition to a sum of £7,855,147 spent from capital funds on Government works.

Vaal River Scheme

OF all irrigation works the Vaal River Development scheme is by far the largest and most spectacular. Its history is interesting.

The idea is said to have originated first with Mr. Orpen and Cecil John Rhodes, who discovered that the topography of the Vaal-Hartz valley clearly indicated the possibility of a scheme to divert the waters of the Vaal into the Hartz River valley. As early as 1882, survey work was undertaken by the Government, and a scheme was devised for taking out a canal from above Fourteen Streams to irrigate the land in the Hartz River valley.

This scheme, however, suffered many vicissitudes, and, in 1883, was referred to a commission, which did not have time to tackle the matter. Transportation was then one of the main difficulties facing any commission required to travel, for it was only in the following year that the railway line was extended to Kimberley.

In 1886, Parliament passed a resolution granting monetary facilities to "any joint stock company or individual who would be prepared to execute and carry out, to the satisfaction of the Government, a plan laid before the House by the Hydrographical Engineer for the irrigation of the Hartz River valley at a cost not exceeding £130,000." A company was formed for this purpose but could not raise the necessary capital.

A reconnaissance in the year 1905, however, definitely established that such a scheme required the building of a huge storage dam, and that the two outstanding valleys that could be included in the scheme were the Rhenoster Valley in the Free State and the Hartz Valley in the Cape. For some years the Government vacillated between a Vaal-Rhenoster scheme and a Vaal-Hartz scheme, the latter scheme being investigated in 1924 and 1925. Reconnaissance work on the Vaal was renewed in 1929, in conjunction with aerial photography.

The reasons for the choice of the Vaal-Hartz scheme are obvious. Below Fourteen Streams the Vaal River drops over 250 feet in 30 miles, and again, below Barkly West down to the inflow of the Hartz River, it drops some 260 feet in a distance of 25 miles. The total drop is 580 feet in a distance of 100 miles.

Compared with this the Hartz River, which takes a more direct course, has a fall of 400 feet from Brussels siding, 13 miles south of Vryburg, to the infall, a distance of 115 miles along the river. It will be seen from this that Brussels, 66 miles from Fourteen Streams, north-west along the railway line, lies 180 feet lower than the Vaal River at Fourteen Streams. The valley of the Hartz River is 450 feet lower than the Vaal, the two valleys being separated by a watershed which has a nek four miles back from Fourteen Streams, only 27 feet above the level of the Vaal River.

During the Parliamentary Session of 1934, the Vaal River Development Scheme, Act No. 38, was passed by the Legislature providing for the construction by the Government of irrigation works on the Vaal River. Work was begun in the same year.

By far the largest irrigational undertaking, the Vaal River Development Scheme consists of a huge storage dam situated about 14 miles below the confluence of the Vaal and Wilge Rivers. The dam is 21 miles from Vereeniging. It consists of a concrete overspill wall of the gravity type, which pushes the water back for a distance of 70 miles to form a lake, the surface area of which is 60 square miles. The actual capacity of the dam, which was completed in 1937, is 873,000 acre-feet, or 220,000 million gallons. At flood level the area submerged is 87 square miles. The approximate cost of this Vaal Bank Dam was £1,500,000. This figure included land purchases.

At a distance of 300 miles below the Vaal Bank Dam is a diversion weir, the second part of the Vaal River development scheme. This weir is approximately three miles above the railway bridge at Warrenton. The weir is 30 feet high and has three main sluice gates controlling the flow of water down the river. These sluices are colossal contrivances carried by concrete pylons rising up approximately 30 feet above the control deck. They are worked on the counterweight principle, and are quite easily operated. To build this weir took 800 to 900 men nearly three and a half years.

The gates controlling the flow of water into the main canal are located at the side of the northern main sluice gate. The canal is roofed in from this point until it passes clear of the river, this arrangement allowing flood water to pass over the canal. The

main canal is now complete as far as Mogogong and will continue as far as Taungs. This canal, tunnelling under two hills and twisting and turning to the contours of the country, will be about 75 miles long. The farms expropriated for this scheme embrace an area of about 300 square miles to be divided into 30 morgen plots. When finally completed the total cost of the Vaal River Development Scheme will be £4,000,000.

Other Schemes

THE following are a few descriptive paragraphs on the remaining large Government irrigation schemes.

Perhaps one of the best known of these is the Hartebeestpoort Dam, situated in a poort in the Magaliesburg mountains about 25 miles west of Pretoria on the Rustenburg Road. Taking in and storing the waters of the Crocodile and Magalies Rivers, the dam is of concrete, of the constant angle arch type, 460 feet long and 161 feet above the river-bed. The wall is 193 feet above the lowest foundation level. This dam at full supply stores 123,255 acre-feet of water covering an area of 6½ square miles. By means of canals it irrigates 38,098 acres of land. Work on this dam was started in August, 1916.

Lake Mentz on the Sundays River, Cape, is situated 42 miles below Jansenville. This dam consists of a concrete gravity section type 1,260 feet long, 94 feet above the river-bed and 114 feet above the lowest foundation level. At full supply the water stored covers an area of 7½ square miles. The initial capacity of the dam was 94,000 acre-feet, but this has by now been reduced by silting. This scheme irrigates 23,445 acres of land.

On the Kamanassie River about 12 miles from Oudtshoorn is the Kamanassie dam, consisting also of a concrete gravity section wall 1,265 feet long, 115 feet above the river-bed and 145 feet above the lowest foundation level. The surface area of the reservoir at full supply is 1¼ square miles, the storage capacity of the dam being 31,110 acre-feet. This capacity, however, can be raised. The area of land irrigable by means of this scheme is 26,814 acres. Work on this dam was begun in July, 1919.

Situated on the Tarka River, a tributary of the Great Fish River, is the Tarka Dam, perhaps best known as Lake Arthur. This dam, which is 18 miles south of Cradock, consists of a concrete gravity section wall 1,640 feet long, 107 feet above the river-bed and 124 feet above the lowest foundation level. At full supply the stored water covers an area of 3¼ square miles. Its initial capacity, now reduced by silting, was 58,000 acre-feet. Started in 1921, the work was completed in 1925, and in 1937 the crest-level was raised another 6 feet, temporarily increasing the capacity of the dam by 13,800 acre-feet. This dam irrigates 25,500 acres of land.

The Grass Ridge scheme, situated on the Great Brak River, 9 miles above the Fish River Station, irrigates an area of 44,763 acres. It consists of an earthen wall with a concrete core. The wall is 1,530 feet long, 80 feet above the river-bed and 96 feet above the lowest foundation level. The area covered by the water at full supply is 5 square miles and the capacity of the dam was 63,272 feet, now reduced by silting. Work was started in 1921.

Slightly larger is the Van Ryneveld's Pass dam situated on the Sunday River immediately above Graaff Reinet. This dam, which was started in July, 1920, consists of a concrete wall across the river 1,160 feet long, 106 feet above the river-bed and 141 feet above the lowest foundation level. Its waters cover an area of 4 square miles, at full supply with an initial capacity of 64,000 acre-feet. The scheme irrigates 20,000 acres of land.

The next scheme is the Tygerspoort dam on the Kaffir River, 22 miles south of Bloemfontein. Begun in 1922, it consists of an earthen dam wall strengthened by means of a reinforced concrete core. The wall is 395 feet long, 65 feet above the river-bed and 95 feet above the lowest foundation level. The waters of this dam also cover an area of 4 square miles, with a capacity of 30,000 acre-feet. It irrigates 2,700 acres of land.

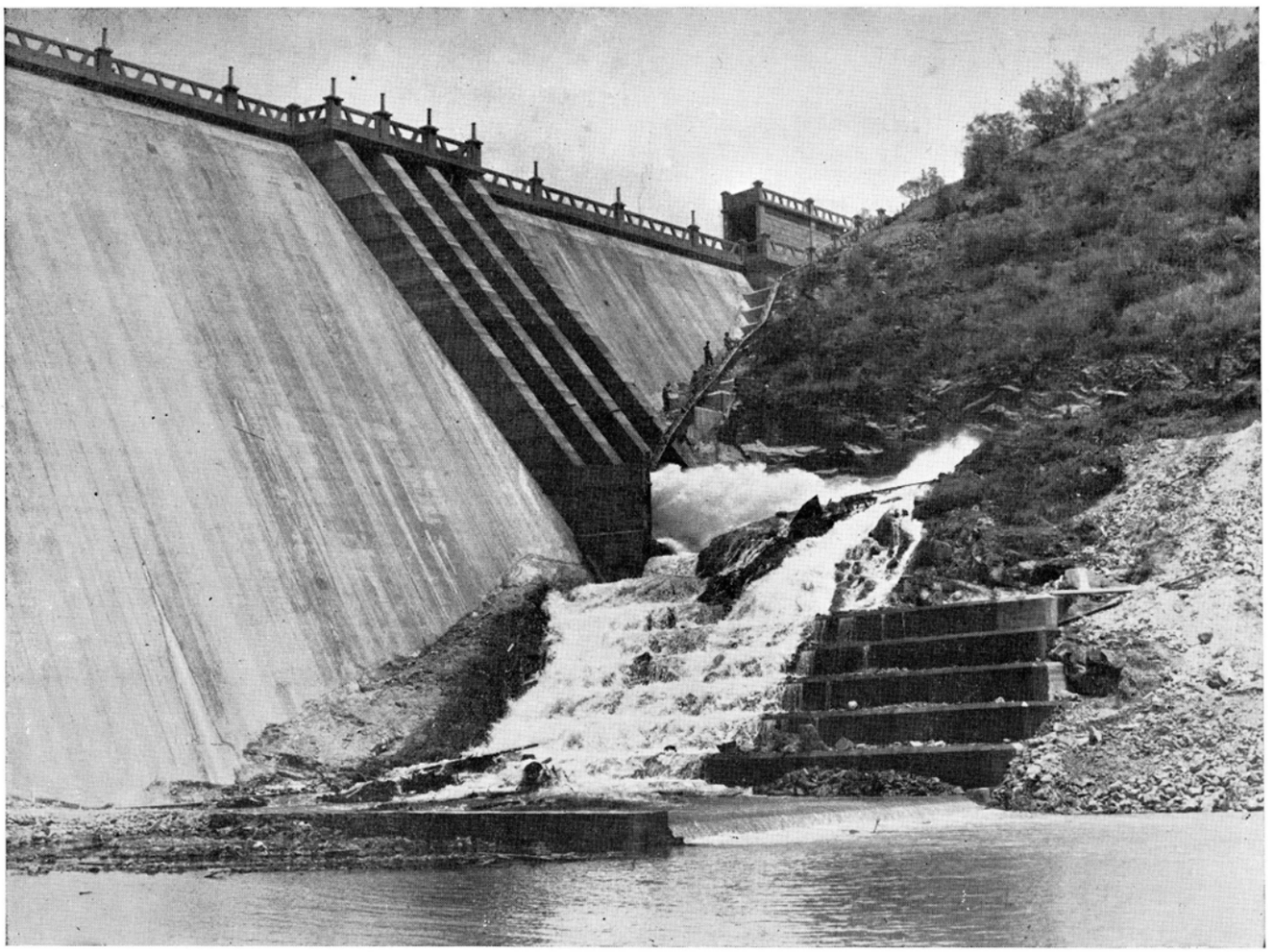
A much smaller scheme is the Cliphants Nek dam, situated in the Magaliesburg Mountains, 9 miles south of Rustenburg. Begun in 1926, the dam wall is of the constant radius arch type 440 feet long, 80 feet above the river-bed. Only one square mile is covered by the stored waters, the dam having a capacity of 13,119 acre-feet. This capacity, however, can be increased. The scheme irrigates 4,290 acres of land.

Brandvlei Dam

THE Brandvlei conservation dam on the Breede River is among the larger irrigation works of the Union. It is known also as Lake Marais and is situated some 6 miles south of Worcester. The dam comprises an earthen embankment 3,252 feet long, having a maximum height of 285 feet. The area of water conserved totals 6 square miles, and the capacity of the dam at full supply is 38,062 acre-feet, irrigating 19,033 acres. Work was started on this dam in July, 1922. The dam is filled by means of a supply channel two miles long from the Holsloot River, and additional replenishment is occasionally obtained by means of regulator gates which let in the flood waters of the Breede River flowing along the downstream side of the embankment. As the supply is controlled, no spillway has been provided.

The Loskop Dam, the centre of another large Government Irrigation scheme, is situated in the Middelburg and Pretoria districts on the Oliphants River. It is about 36 miles north of Middelburg. Started in July, 1934, the dam has not been long completed. The total scheme will be completed in something like two years' time at a cost of £1,500,000. Its 40,000 million gallons of water will form a huge reserve to irrigate 20,000 morgen of land.

The dam wall is of the concrete gravity overspill type, the crest being 1,420 feet long and 120 feet above the river-bed. The dam took 300,000 cubic yards of concrete to construct. The storage capacity



THE LOSKOP DAM.
THIS VIEW SHOWS THE IMPOUNDED WATER RUSHING THROUGH THE SLUICE GATES.

is one-fifth of that of the Vaal Bank dam. A hydro-electric plant is being erected near the wall, which will enable the sluice gates to be operated by means of electricity. The main canals will be cement-lined, and, in one place, tunnels will be carried through a hill for a distance of 3,000 feet.

Finally, there is the Kalkfontein dam, the second largest in the Union. This dam, which has a main canal 80 miles long, is situated on the Riet River in the Fauresmith district, Orange Free State. Construction work, started in 1935, has only just been completed. The dam has a capacity of 298,000 acre-feet, which makes it 1½ times as big as the Loskop dam, twice as big as the Hartebeestpoort dam, and one-third the size of the Vaal Bank Dam. The dam wall is of the rock-fill type, the crest length being 1,040 feet, 113 feet above the river-bed. There were 270,000 cubic yards of rockfill used in the construction of the wall. No spillway has been provided, as there is a natural spill-way against some high kopjes two miles from the wall. Daily 125,000,000 gallons will flow along the main canals, while the overflow will be rationed to 2,500,000 gallons daily down the Riet River. This overflow will in time be increased to practically an unlimited quantity when the dam is full. A tunnel two miles long carries the water through the hills surrounding the dam, the water being led to the tunnel by means of a concrete viaduct.

This irrigation scheme will be completed some time next year at a total estimated cost of £950,000 by which time the district, naturally fertile with excellent grazing ground, will be practically immune from the danger of drought.

Kalahari Proposal

No discussion on South African irrigation would be complete without reference to a dramatic and spectacular alternative suggested by Professor Schwarz. Professor Schwarz stalks across the picture, a solitary figure, a man who is perhaps much misunderstood. He conceived the spectacular plan of increasing the Union's rainfall by filling in the almost dried-up lakes of the Kalahari region. His argument was that the beginning of drought conditions in the Union was synchronous with the drying up of these lakes, and that a scheme

of Kalahari Renaissance would reverse this process, returning to vast areas in the Union their pristine abundance of vegetation.

Before this Kalahari Renaissance scheme can be fully understood it will be necessary to set out briefly the important river systems and lakes of that region.

To the north-west of the Kalahari lie the Angola highlands, an area of high summer rainfall and the source of the Cunene, Okavongo, Linyanti and Zambezi rivers. All these rivers have a rapid flow, which becomes more gradual over the high plains of Barotseland, Ovamboland and the northern Kalahari territory.

The river Cunene flows westward to the Atlantic, and at times may feed the great Etosha Pan — one of the Kalahari lakes. In times of flood the waters of the Cunene may spill over the left bank to inundate part of Ovampoland. Some of this water finds its way to the Etosha Pan, if there is sufficient, by way of easterly depressions in the sandy plain.

In the east, large areas of the Barotse Valley are inundated by the Zambezi. These areas are known as the Caprivi Strip. The waters of the Zambezi then pass down a rapid-strewn strip eventually to tumble over the Victoria Falls.

Most curious of these rivers is the Okavonga, situated in the centre of this system. Though almost as large as the Zambezi river above the Victoria Falls, practically none of its water reaches the sea except in abnormal years of flood, when the water rushes over the Makwegana Spillway into the Linyanti. The channels below Andara strike out in several divergent branches, each bordered by wide flats that are inundated annually. Within these swamps, which have a total area of several thousands of square miles, the bulk of the flow evaporates. In the neighbourhood of Mogogelo the overflow separates, a small amount flowing northwards to the Mababe depression. The remainder passes southwards into the Themalalakane and eventually into the Botletle, where it is ultimately lost.

In exceptional years, however, the excess flow finds its way in part into Lake Ngami via the Lake River, and in part into the Makarikari Depression, which forms the termination of the Botletle.

Outside of this system there is no permanent water, although the sandy soil is well timbered. This is actually the thirstland or Kalahari desert.

After surveying these regions and collecting various kinds of evidence, Professor Schwarz came to the conclusion that not very long ago the Etosha, Ngami and Makarikari lakes were much larger and more permanent, and that the gradual deepening of the Cunene River in the west and the Zambezi in the east had progressively drained this flat central region. He argued, too, that when these lakes were larger the Union received a much heavier and more evenly spread rainfall, and buttressed up this argument by adducing evidence that at that time the now arid or semi-arid regions of the Union carried sufficient vegetation to support herds of even the largest kinds of game.

Inversely then, Professor Schwarz believed that, if these Kalahari lakes could be filled to their former size, the earlier conditions of rainfall over most of the Union would again prevail, and that what he described as the encroachment of the Kalahari Desert would be stopped. He went so far as to suggest that such a scheme would even put the Kalahari into retreat. His scheme to restore these lakes was to build weirs across the Cunene and Linyanti rivers, so creating in these rivers conditions that normally would prevail only at flood time. The lakes would fill and the evaporation from the additionally impounded waters in the lakes would render the atmosphere more humid and help to bring about a condensation of vapour, and its precipitation as rain over large areas of the Union. This extra rainfall would, he urged, swell the rivers naturally and the overflow from the Okavongo and Linyanti lakes could be led across the central Kalahari for irrigation purposes.

Scheme Rejected

PROFESSOR SCHWARZ'S scheme, however, was unfortunate from the start. Its chief disability was lack of evidence of the kind to silence all criticism. In other words, the evidence adduced by Professor Schwarz was not sufficiently powerful to convince the Union Government that the proposal, if carried out, would have the desired effect.

Nevertheless, the Government was sufficiently impressed to appoint in 1925 a Kalahari Renaissance Commission to investigate the matter. This commission found that many of the Professor's assertions bordered on premises unsubstantiated by evidence, and that, even on the evidence collected by the Commission, the expenditure of many millions of pounds on any renaissance scheme was likely to turn out an unsuccessful gamble. The Government was not prepared to risk public money on a scheme without conclusive assurance of its ultimate success.

But the truth of many of the Professor's assertions may exist. The accounts of many early-day travellers, as far as they are reliable, point to the possibility of conditions envisaged by Professor Schwarz. The famous explorer, La Vaillant, speaks of the many types of large game he encountered in the now semi-arid regions north and south of the Orange River. Added to these tales, Professor Schwarz found a number of Natives living in the vicinity of the Kalahari Lakes. These Natives could recall the days when the pans "were much bigger," and when game and vegetation were more abundant in regions now almost devoid of life.

Irrigation Opposed

PROFESSOR SCHWARZ'S advocacy of Kalahari renaissance was based to a large extent on his conviction, by no means universally shared by others, that irrigation

from water conservation schemes was not suitable as it would spoil the soils through the creation of a brak substratum of deposited salts. He argued that in a country possessing a dry climate, as is found in South Africa, the rapidity of evaporation over irrigated lands would cause salts to be precipitated. The absence of sufficient rainfall would prevent these salts being washed away.

There is no gainsaying the fact that a certain amount of danger from brak soils does exist with irrigation schemes other than that used on the Nile in Egypt, where the annual flooding of that river serves the same purpose as rainfall.

Irrigation, however, is not the only cause of brak soils; and it is in this respect that South Africa is perhaps fortunate. If the land has sufficient surface drainage, the brak condition will not occur. Sometimes there is insufficient drainage caused by the outcropping of dykes along drainage areas. In such cases, however, it is often possible to restore the drainage by cutting through these dykes.

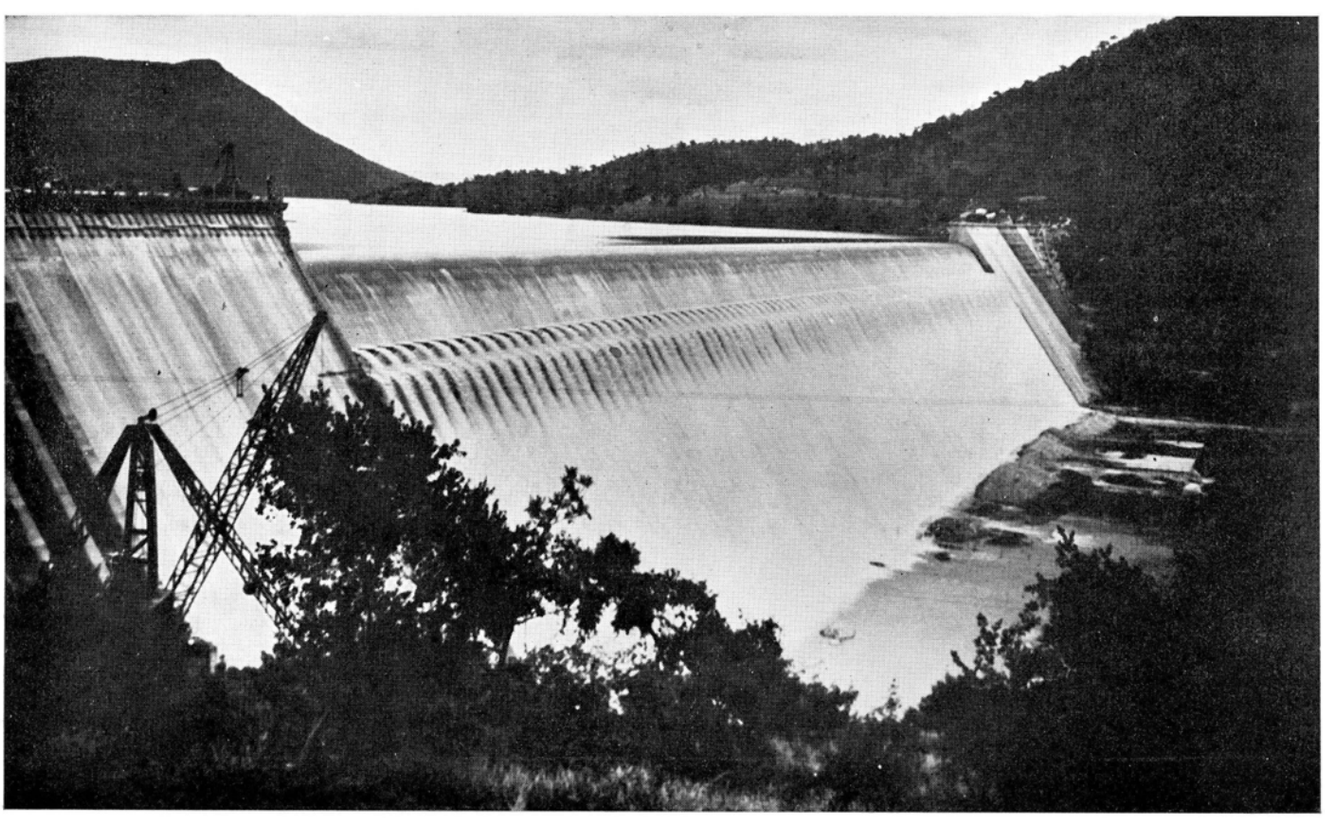
Certain types of soil, such as are found in the Karoo, naturally become brak because the soil texture permits excessive surface evaporation at a rate exceeding any drainage that may exist. Over a period salts are, therefore, precipitated. Fortunately there are very few areas in the Union where brak soils are inevitable because of any lack of natural drainage or by reason of the texture of the soil.

This process of precipitation of salts appertains not only to land, but to natural vleis and dams as well. Where water is held up over long periods it becomes brak itself, sometimes to such an extent that, as in the case of the Van Wyk vlei, frogs cannot live in it.

However, in spite of all these potential obstacles to successful irrigation in the Union, no irrigation project can be said to have failed through the creation of brak soils. Before any irrigation project is carried out, soil surveys are made with the object of establishing whether the land is suitable for irrigation or not. The Vaal-Hartz irrigation scheme was found to embrace areas containing four different classes of soils suitable for irrigation.

In any event, brak soils may be cured by the addition of gypsum. In this connection an interesting statement was made at a recent agricultural conference. This statement pointed out that in the valley regions of the Union the soil was composed in part of calcium clay. This was good soil. The waters of most South African rivers, however, contained sodium salts in solution. When this water was run on to the land composed of calcium clay, a chemical exchange was made, the calcium in the clay passing off in solution and the sodium in the water combining with the clay to form sodium clay. Such clay soils when dried became flocculated and striated with cracks, as is commonly seen along the banks of South African rivers when flood waters have subsided.

ANOTHER VIEW OF THE LOSKOP DAM AT FULL SUPPLY.
(Rand Daily Mail Photo).



Another important factor mitigating the payability of irrigation through water conservation is the gradual and inevitable silting-up of dams. This naturally reduces their capacity in time, sometimes to such an extent that during the initial stages of construction provision has to be made so that the crest of the dam wall can be raised at will. The average quantity of silt in South African rivers is 2 per cent. Such heavy percentages rapidly diminish the efficiency of reservoirs.

Other factors acting against irrigation are the extreme fluctuations in run-off, evaporation and alkali. The combined effect of those adverse conditions is considerably worse in that region of country between the Karoo escarpment and the sea. The slopes and steppes of these regions are easily erodable and the percentages of silt and alkali in the water running off is very high. Fluctuations in run-off, too, are considerable. These adverse factors have less effect in the Transvaal, but the soils in this Province are less uniformly good. North-east of the Karoo escarpment conditions improve also.

Government Policy

IT remains to make a few remarks about the policy of the Government in regard to future irrigation contruction, bearing in mind the two almost anomalous facts that irrigation and water conservation in this country are highly essential, and that Irrigation Commissions have increasingly come to regard irrigation and settlement schemes as financial failures. In this latter respect, South African irrigation is similar to that in most other countries, though by comparison conditions in the Union are stated to be much less favourable to success. The following excerpt from the report of the 1937 Irrigation Commission, probably indicates the most likely policy of the Government:

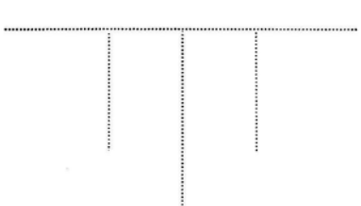
> "Criticism that progressive irrigation construction tends to result in over-production of agricultural produce, which raises the problem of dealing with surpluses, is shortsighted, as the necessity to conserve water — a valuable South African national asset — is overlooked. In this country rainfall is uncertain and subject to such variation that it is not possible to forecast with any degree of certainty even for 24 hours in advance. With the exception of very few areas within the Union, it is quite impossible for the farmer to estimate even roughly what his crop production will be."

It is pointed out in the Commission's report that, while financial considerations will naturally affect the Government's policy in regard to future irrigation construction, in the opinion of the Commission the principle has been established that the best way to provide for agriculture to a degree consonant with the great strides of mining and its relative industries in the Union is to launch a programme of irrigation construction in those areas where people have already settled.

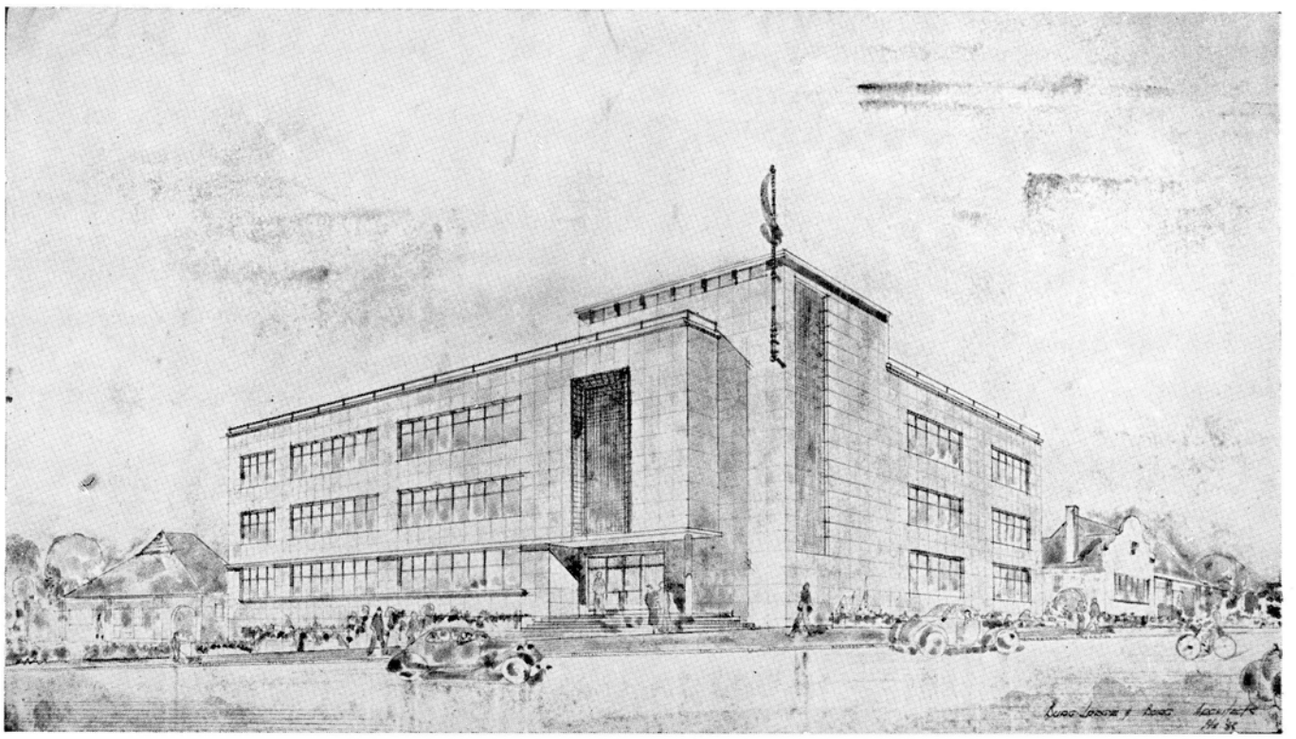
The Commission, however, expresses its opinion that irrigation in this country has already reached a point where further construction may be considered dangerous. This is emphasised by reference to the large areas of land under Government irrigation, such as Loskop, Rust der Winter, Groot Marico, Pongola, Vaal-Hartz Valley, etc., all generally requiring settlement and, therefore, involving heavy expenditure. It is the opinion of the Commission that these areas will not be settled rapidly, and that care should, therefore, be exercised so as not to aggravate the position by encouraging additional irrigational settlement schemes before the existing areas are well developed.

The Irrigation Department has mentioned, however, that other large schemes are under investigation, but until the results are known they cannot be regarded as potentially feasible.

When compared with the vast capital investments in the Reef mines, the £15,000,000 spent on irrigation construction may not seem impressive. But it must be remembered that this figure does not include the enormous sums invested in agriculture by way of farmers' loans and subsidies. In conjunction with this agricultural commodities are a competitive produce and too rapid development may prove as disastrous as neglect. Under such circumstances the development of agriculture, which above a certain point can be only under the aegis of irrigation, must follow in the wake of widening markets and increasing demand. The launching of the Union into an era of agricultural prosperity is a spectacular task, but it will take time.



MODERN UTILITY STYLING
IN NEW MEALIE CONTROL BOARD BUILDING



THE Mealie Industry Control Board, an organisation brought into being in 1935 for the purpose of fostering the production of maize in South Africa, is shortly to be housed in an impressive new building now in the course of erection in Pretoria. The contract cost of the building is £18,854, and it will be situated on the corner of Hamilton and Edmund Streets, Arcadia.

It is three storeys high, and of the concrete-frame type of construction. It may be said to have a corner motif, as both the Hamilton and Edmund Street façades, featuring horizontal lines set by long window sections, lead the eye to the entrance situated in a recessed porch in the corner of the building. This corner motif is strengthened by the inclusion in the south wall immediately over the entrance porch of a continuous glass-brick window set in a splayed reveal or recess rising from the top of the ground floor to the roof. This window is 7 feet wide, and provides the sole illuminating feature for the lift halls on the upper floors. A similar window, 6 feet wide and flush with the wall will illuminate the stairs leading up from the entrance hall. This window rises to the full height of the light tower, and will be situated, as seen in the sketch above, on the corner of the east façade.

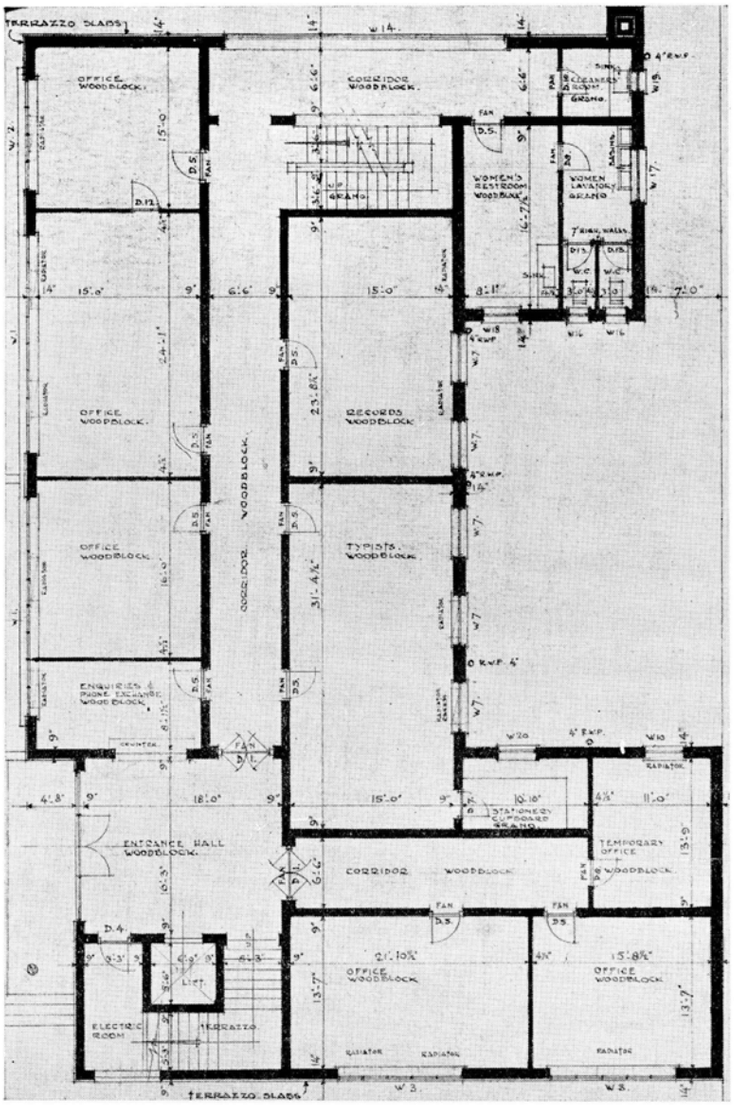
The façades have been faced with 2-foot square precast slabs of a buff colour and rough surface, fixed with cramps to a brick backing. The windows are purpose-made and comprise 20-foot and 10-foot sections. A small coping and handrail on the roof parapet adds to the modern appearance of the building.

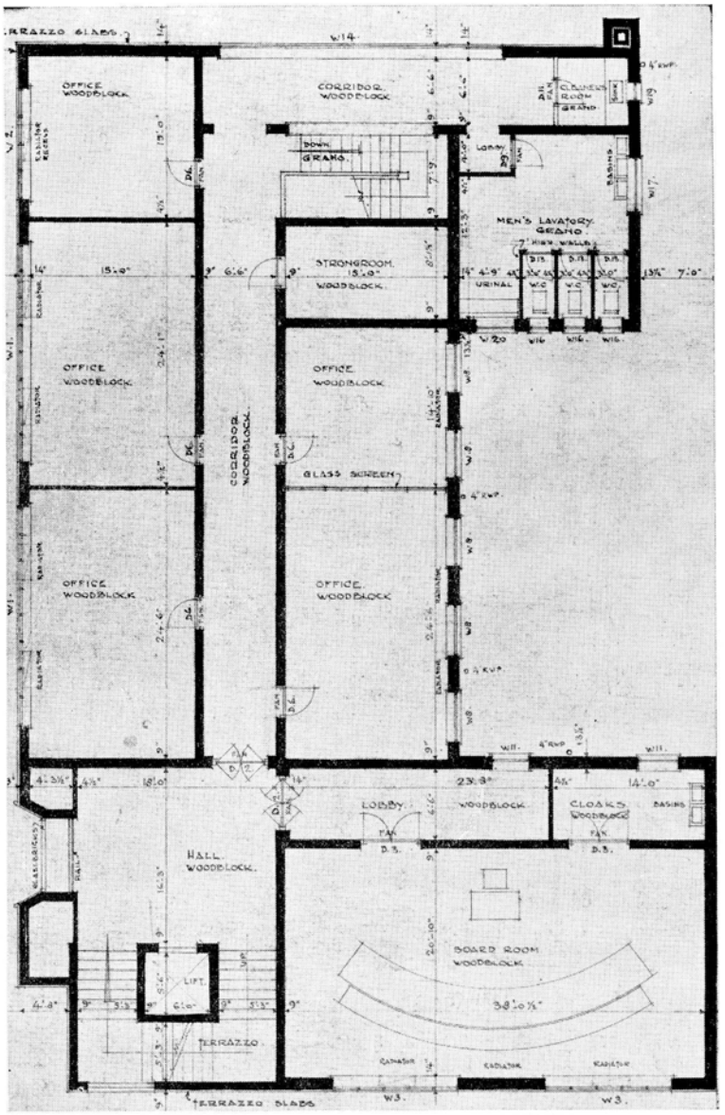
LAY-OUT.

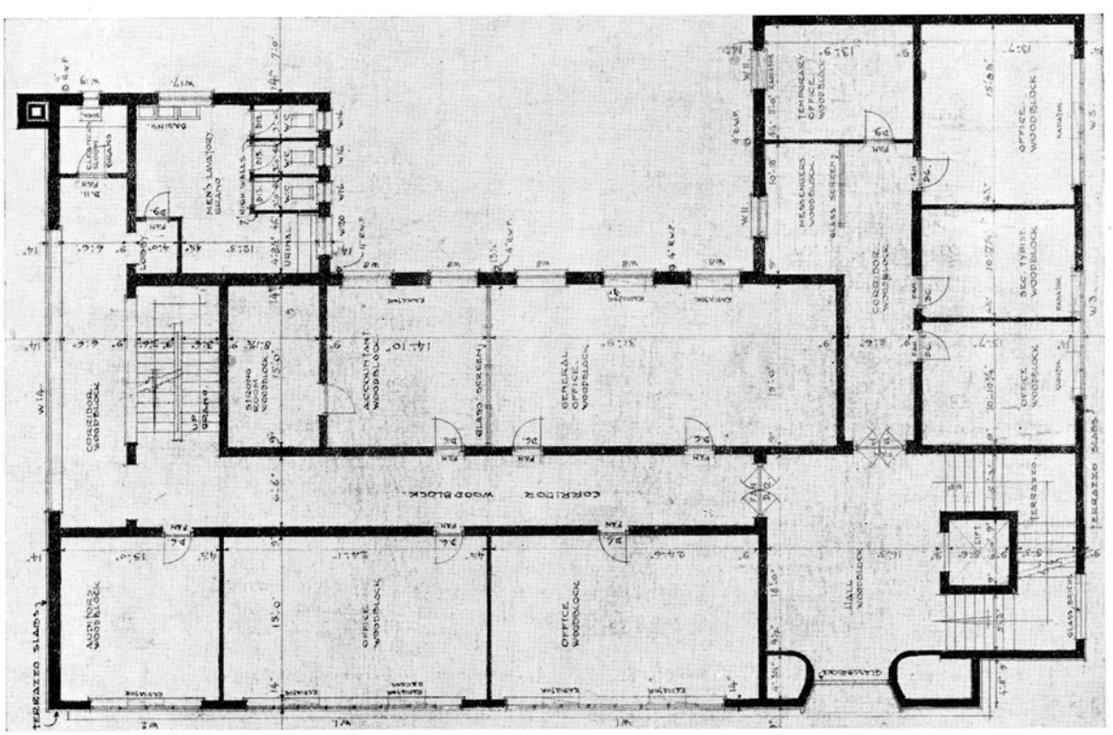
ACCESS to the entrance hall on the ground floor is through metal doors having a white-metal spray finish. The hall is 18 feet by 16 feet, is panelled in kejaat up to door height, and has a continuous sculptured frieze above representing the maize industry. The floor will be laid out in wood blocks, as will be the floors of all the offices. Indirect artificial lighting will be provided by a continuous cove above the frieze. On the left of the entrance hall is to be an enquiry counter with ornamental grille, and on the right the lift and staircase.

Swing glass-panelled doors lead into corridors running along the south and east wings of the building, giving access to offices 15 feet wide and ranging from 15 to 20 feet long. In addition there are women's rest rooms and conveniences.

The first floor follows a similar lay-out except for a few minor differences, and the same applies to the top floor, which, however, is provided with a large board room in the east wing. This board room, which is temporary until further extensions permit a larger room being set aside for this purpose, is 38 feet long by 21 feet wide. The walls up to a height of seven feet are panelled in kejaat, the outside wall being taken up by two large windows 12 feet long. Access to this room is through double swing-doors leading off a lobby which takes the place of the corridor on other floors. Adjacent to this lobby a cloak-room has been provided. The men's conveniences are situated on this and the first floor.







(*Top Left*)
GROUND FLOOR.

(*Top Right*)
FIRST FLOOR.

(*Left*)
TOP FLOOR.

MEALIE INDUSTRY CONTROL BOARD BUILDING.

On the western portion of the building there is a basement, made possible without too much excavation by the slope of the ground. This basement contains a large records room, an archives room and other store rooms. Access is either from outside through a west-facing doorway on ground level or by means of a stairway connecting all floors on this side of the building. This alternative stairway will provide also an emergency exit. The roof of the building is a reinforced concrete slab.

The interior treatment besides that already mentioned is along modern lines. All joinery is of teak, and the doors are to be of the flush-panel laminated type. All central heating pipes and radiators will be concealed in recesses in the walls; and an automatic stoker is to be fitted to the heating plant. The lift installation will comprise a high-speed Waygood-Otis lift with metal automatic opening gates and a metal car. Flushing valves will be fitted on all W.C. and urinal fittings. The usual fire and electrical services are also to be provided. Between the offices there will be telephone and dictaphone communication.

In the back yard there is a garage block containing seven open garages and two block garages. Over and above this there is ample room for future extensions, for which provision has been made in the design of the building.

A start has been made with building operations, and the basement is now completed. It is expected the building will be completed by about mid-September next. The architects were Messrs. Burg, Lodge & Burg, and the contractors are Messrs. R. Leggat (Pty.), Ltd.

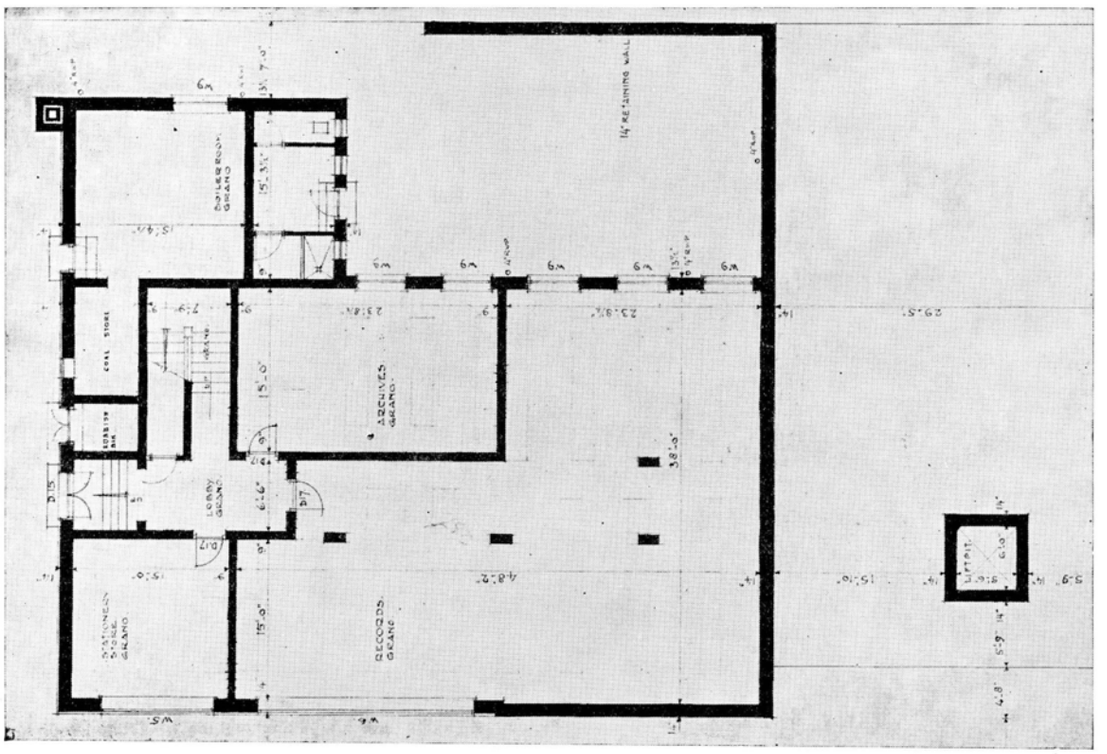
It may be of interest to remark that the Mealie Control Scheme, which is administered by the Mealie Industry Control Board, was brought into being in 1935, by the Mealie Control Amendment Act (Act 59 of 1935).

The object of this Board is to foster the production of maize in this country. Firstly, a levy is imposed on all maize and maize products purchased or acquired by a trader from a producer. No person is allowed to export maize or maize products, without the authority of the Board. A subsidy is paid to any person exporting maize under such an authority. The funds of the Board are used to improve the marketing of maize, and to assist the development and betterment of the maize industry generally.

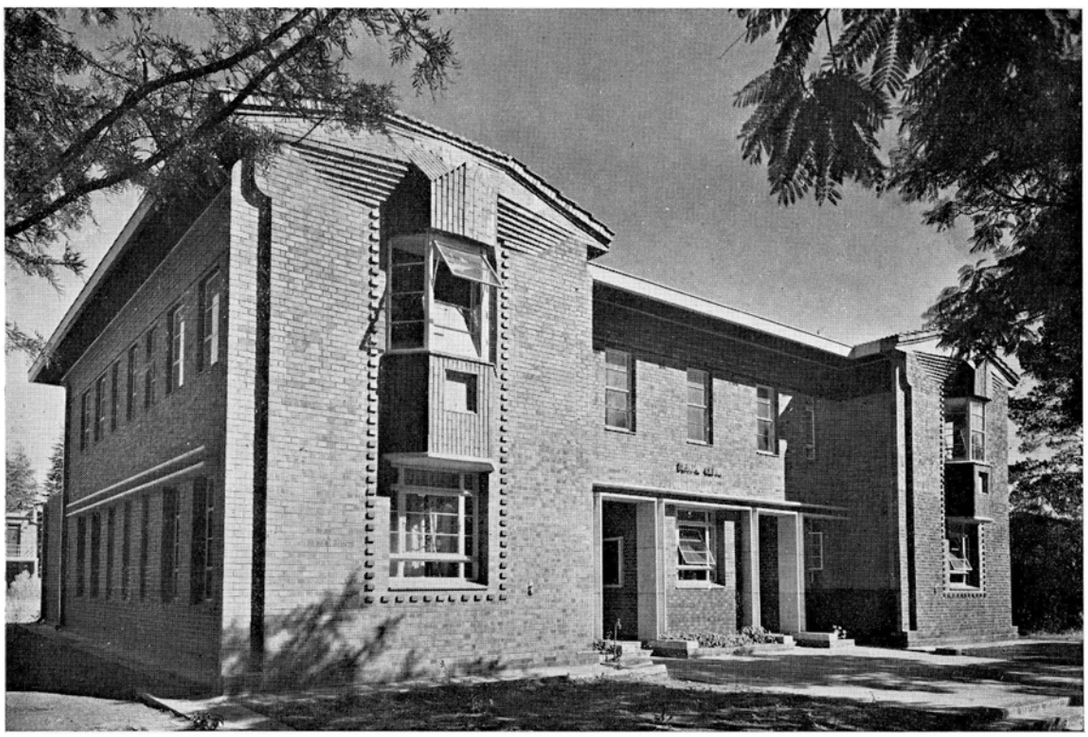
The Board publishes from time to time information regarding the production and marketing of maize. It also acts as agents for the receipt and sale of maize and maize products.

A levy of ¾d. per bag is imposed on all ground, crushed or otherwise processed maize, exception being granted in respect of maize ground for the personal consumption of the producer.

A levy of 1/- per bag was imposed on all maize and maize products purchased or otherwise acquired from a producer . This levy has now been raised to 1/6. The funds derived from this levy are utilized for the purpose of elevating the price of maize to the producer above world values. This is done by means of a refund to persons exporting maize and maize products of the amount of the levy paid by them on the maize purchased from a producer, and the amount which they were required to pay the producer over and above export parity. In January this year the amount was fixed at 2/6 per bag. In September, 1938, it stood at 3/3 per bag, while in June of the same year it was only 2/3.



PLAN OF BASEMENT



AN EXTERIOR VIEW OF THE PRETORIA DENTAL CLINIC.

THE CHILDREN'S WAITING ROOM AND LECTURE HALL, *showing the heavy furniture, the sliding and folding partitions and the mural decorations.*

Planning for Psychological Uplift in

PRETORIA'S NEW DENTAL CLINIC

THE Pretoria Dental Clinic is the first of its kind to be completed in the Union of South Africa, and is unique because of the fact that its provision was made possible by the co-operation of the Provincial Council in a municipal public service, to which service, in the form of the clinic buildings and equipment, the Provincial Council, the City Council of Pretoria, and the citizens of Pretoria, under the Pretoria Rotary Club's organisation, all sub-subscribed. The scheme, originally sponsored by the Dental Association, was practically a free dental service to school children, built on the unassailable fact that 100 per cent. healthy teeth in the child means eventually a trouble-free dental condition in the man. The practising dentists of Pretoria all give part-time service free to the clinic.

Allied to this laudable dental service, is a social undertaking, the utilisation of the few hours during which the child is at the clinic, to educate by giving facilities for the absorption of knowledge in hygiene, art, and a general heightening of the appreciation of the child of "things beautiful" in work, living and play. These facilities are in tangible form in the children's waiting-room.

The children's dental service is catered for on the ground floor of the building, and a large well-fitted and well-lit surgery adjoins their waiting-room. The adults are provided for on the first floor in two surgeries above that for the children. Rest-rooms for both children and adults are provided adjoining their respective surgeries, to which are allied very up-to-date amenities in the matter of well-equipped laboratory, X-ray and photographic dark rooms.

The staff of the clinic has been provided with a comfortable rest-room, and suitably placed offices for administration; also a large board-room for the use of the governing body of the clinic.

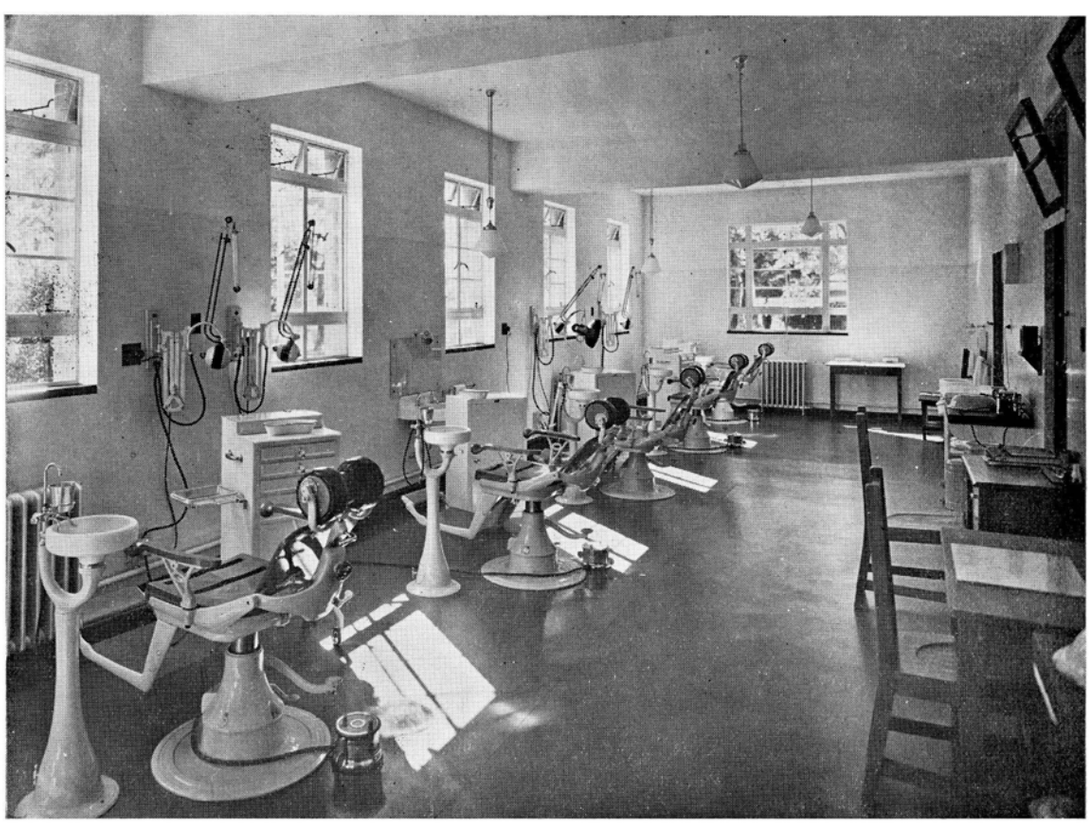
The waiting-rooms on the ground floor are convertible into one large hall for lectures, etc., giving facilities for the furtherance of the social educational side of this service.

The clinic was built by Mr. A. C. H. Clark, contractor, Pretoria, at a cost of £7,500, excluding the dental equipment.

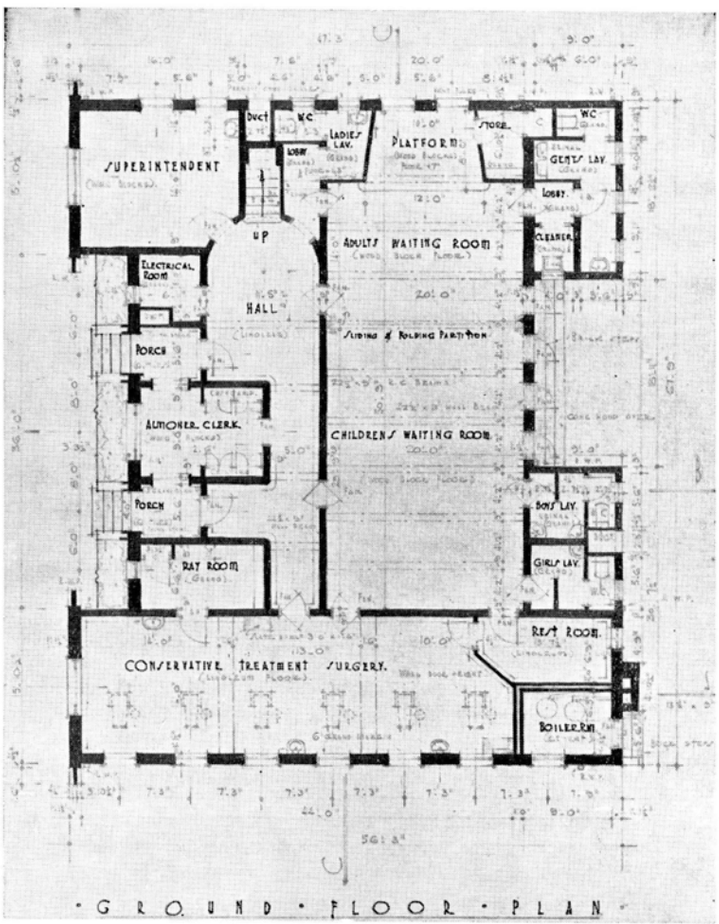
The external treatment is in Kirkness brick, of colours from the black of the foundation walling, red of the dado to ground-floor window-sill height, to buff-coloured Vertex bricks for the remainder of the superstructure. The gable ends of the east front are ornamented in black and red bricks, receding in various planes from the projecting first-floor bay windows.

Internally the finish is plain; painted walls, flush doors, wood-block and linoleum floors, rounded skirtings in wood and granolithic all help to reduce the labour directed towards "spotlessness."

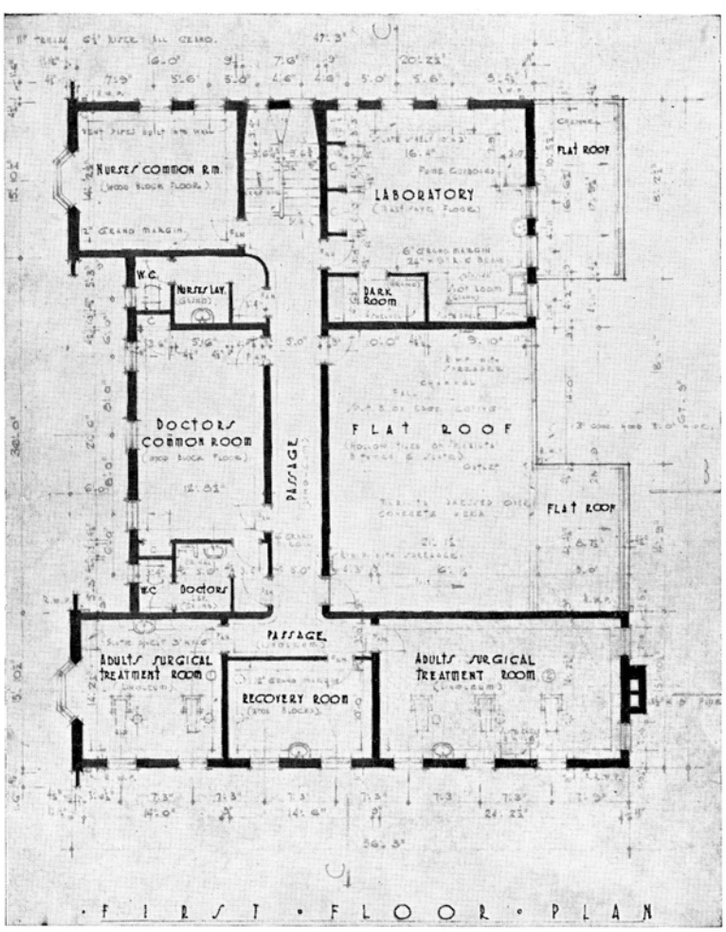
The walls of the children's and adults' waiting-rooms were decorated in oil-colour by the children of



THE CONSERVATIVE TREATMENT SURGERY FOR CHILDREN.



PLANS OF THE DENTAL CLINIC, PRETORIA.



the Pretoria Art Centre, the results of which effort have to be applauded for their appeal, truthfulness and directness of attack, in a subject — mural decoration — hitherto reserved only for the "lions" of the profession.

The essential services have been abundantly provided for. All plumbing pipes have been concealed in the walls, and the water service and waste pipes in floors are of copper, and, where appearing internally to fittings, chromium-plated.

The rooms are heated throughout by a hot-water radiator system.

The electrical system is quite an extensive one, with power points in abundance for dental machinery requirements. Electric clocks are fitted throughout, and loud-speakers and intercommunicating telephones link every room and service throughout the building.

The layout scheme for the grounds, boundary wall, etc., around the clinic are now being proceeded with.

A point of interest regarding this clinic is to be found in the list of specifications that were handed to the architect in June, 1936. After detailing the requirements for the building, special reference was made to the children's waiting-room in the following words:—

"This is, from the psychological point of view, of primary importance. It should be large and well-appointed, colourful, and designed in such a way as to provide scope for the activities of social workers who may realise the opportunity of reaching the minds of thousands of children who will pass through this institution.

"At the present inadequate clinic there are some 4,500 attendances per annum. We know of no greater opportunity for reaching so large a number of child-minds for the purpose of conveying to them helpful incentives for the future.

"The waiting-room should be suitable for lecture purposes, and should be capable of accommodating, say, 200 persons for this purpose.

"Incidentally, such a lecture-waiting-room might be a potential revenue producer, as suitable accommodation of this kind is at present at a premium in Pretoria."

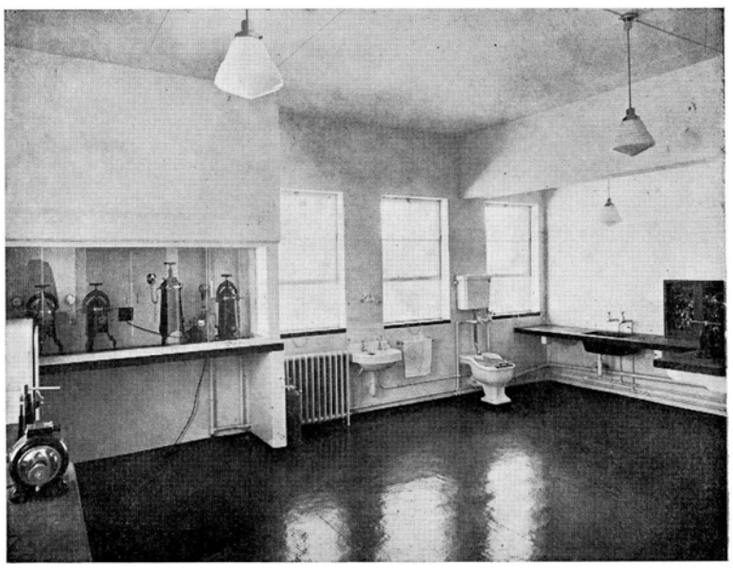
In the interpretation of these requirements a room of a distinctive character has been designed. The furnishings strike an interesting note. These consist of oak tables and chairs designed by the American Women's Association. All these articles are designed simply, of exceptionally heavy members as a precaution against the usual wear and tear to which they will be submitted by the children. The board room upstairs has also been furnished with distinction, the tables, chairs and incidental pieces being made of kejaat.

The equipment throughout is of the most up-to-date, an includes a modern dental X-ray installation costing over £200. A point of interest in the lay-out is that all the surgery, rest and anæsthetic rooms have large windows facing north. These rooms, consequently, have an abundance of daylight which, if need be, can be augmented by direct diffused electric light on adjustable fittings.

A few of the dimensions provided in this clinic might be of interest. The children's waiting room is 50 feet long by 20 feet wide and is divided into two rooms by a sliding and folding partition. At the south end a recessed platform 8 feet deep has been provided for lecture purposes. The next largest room is the conservative treatment surgery, approximately 50 feet long by 15 feet wide. This spacious apartment has six large windows facing north and one facing east. It contains six dental chairs with all the necessary dental appurtenances. Leading off this room is a rest room containing five dental spittoons where the children may recover from the unpleasant effects of their treatment.

Upstairs, again on the north side of the building, are two surgery treatment rooms separated by a rest and recovery room. The one surgical treatment room, containing two dental chairs, has been reserved by special arrangement for the employees of Iscor; the other, containing three chairs, is for the use of general adults. Between the Laboratory on the south end and this latter surgical treatment room is a large solarium fenced off at the open sides. This is at present used as such, but actually is a provision made for future extensions. The floor of this area is covered with slate tiles.

The architect, Mr. A. Fraser Lawrie, is to be complimented on his able handling of the elements of the plan and his judicious use of materials to produce a building both beautiful and serviceable.



THE LABORATORY AT THE DENTAL CLINIC EQUIPPED WITH FUME CHAMBER.

NEW PUBLIC OFFICES AT WHITE RIVER, Transvaal

THE first portion of this attractive type of Government building was completed and handed over for occupation towards the end of November, 1938.

White River is on the main road from Nelspruit to the Game Reserve, and the buildings have been placed on a prominent site, practically in the centre of the village. Generally speaking, the impression given is South African in feeling. Plaster walls throughout, the simple monumental entrance feature, and red Marseilles-pattern tile roof, combine to give a feeling of smartness and order.

Immediately upon entering, it is seen that the plan is T-shaped; and from the entrance hall, one is led through directly to the Court Room, an interesting piece of architectural design, with its open timbered roof.

On the left, and leading off from the "through" verandah, are arranged the Revenue Office, Records Office, Malaria Officer and Stock Inspector; while on the right, similarly, are the offices for the Senior Justice of the Peace and the Agricultural Officer.

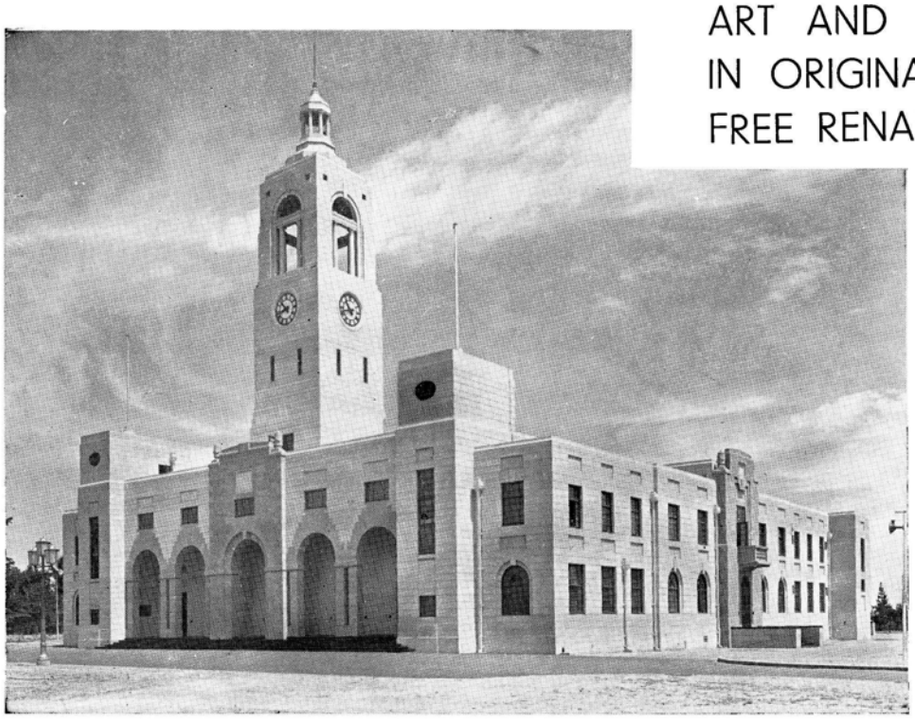
The woodwork generally is of teak, oiled. Quarry tile floors have been used for all public halls and verandahs.

The general contractor for the work was Mr. J. H. Botes, of Pretoria, and the completed cost of the building approximately £4,750.

T. N.

BENONI'S NEW TOWN HALL

ART AND UTILITY COMBINED IN ORIGINAL ADAPTATION OF FREE RENAISSANCE STYLE : : :



A Happy Departure in Civic Architecture

AFTER many years of makeshift, Benoni now possesses a town hall which, besides being one of the most modern and up-to-date of its kind, sets a new note in civic architecture. Opened in October, 1938, by the Governor-General, Sir Patrick Duncan, this town hall may, without exaggeration, be said to be one of the most beautiful civic buildings in the Union.

As will be seen from the illustrations reproduced here, the building consists of a two-storeyed structure in modernised free Renaissance style, the general treatment being off-white cement plaster. The front façade presents a dignified appearance, comprising two end pylons projecting above the parapet height of the building. These pylons house the staircases leading off from the main entrance foyer to the main gallery and first floor. The interval between the pylons is embellished with arches of pre-cast, granite-faced concrete leading on to the entrance loggia, which is approached from the tarmacadam drive by a short series of slate steps. A slightly projecting central motif, of the same granite-faced pre-cast concrete, reaches to just above the parapet height of the building, leading the eye naturally up the clock tower complete with belfry and cupola.

The side façades have been provided with relief effects by two similar end pylons, a central motif again being included on each façade by a granite-faced, pre-cast projection rising to above the parapet height. In each of these central projections is an entrance door leading into a side foyer on each side of the main hall. Above each entrance door is a small balcony to which access is gained through double glass-panelled doors set in a series of small stepped recesses.

Very simple treatment has been given to the back or north façade, which is plain, except that the three central arches, leading in through the south loggia to the entrance foyer of the subsidiary or small hall, have granite-faced, pre-cast surrounds, rising over the central arch to above parapet height. The top storey in this façade is occupied by the caretaker's flat, which has achieved distinction by the remarkable fact that every room in the house has its windows facing north.

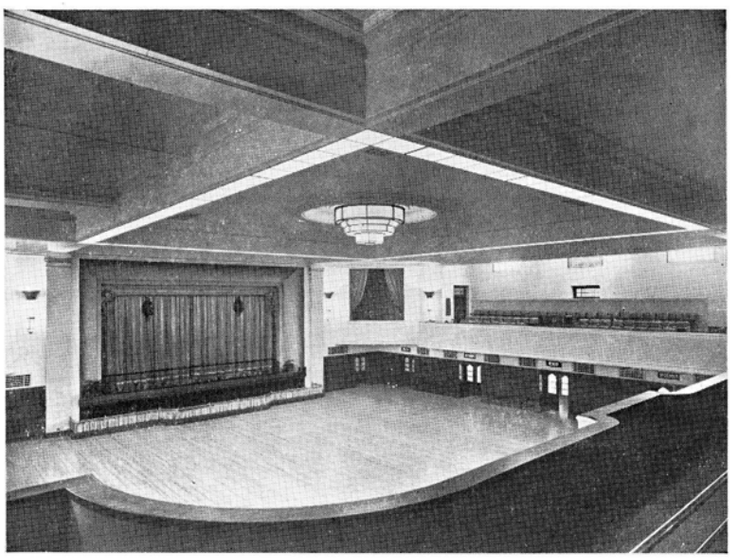
The Town Hall is situated in Curtiss Park, near the Benoni Railway Station. It is in large, spacious grounds in which gardens are being laid out. The area in front of the building will be occupied in time by a sunken garden with slate sides and crazy paving, and ornamented by means of fountains. Work is proceeding on this at the moment.

INTERIOR TREATMENT.

ONE of the most interesting aspects of the Benoni Town Hall is its plan. While no less than 14 functions of different kinds can be held simultaneously within the building, it is a remarkable fact that even if these functions be led by the loudest brass bands conceivable, no one function will interfere with the other. Each public part of the building is acoustically separate from the other; a factor which contributes in no small measure to its usefulness.

The plan consists chiefly of two public halls set on the same axis, the main hall having its entrance in the front or south façade and the smaller hall in the north façade. The recessed stages of both halls are separated by an open-air passageway behind the stage, this arrangement not only providing an acoustical barrier between the two halls, but allowing light to penetrate through roof lanterns into a storage basement underneath the two stages.

The main hall in its design and treatment presents a fine combination of utility and art. It is rectangular in shape, 88 feet long and 82 feet wide with a height of 30 feet. There is a main gallery at the back of the hall capable of seating 216 people. This gallery, furnished with plush seats, extends along both sides of the hall, each of the side galleries seating 120 people. The seats are stepped up and the line of vision from each to the stage is uninterrupted.



BENONI'S NEW TOWN HALL : VIEW OF INTERIOR.

An important feature of the side galleries is that they do not overlap the main hall in any way, being recessed back over the side entrance foyers. The main gallery at the back overlaps the hall only to a slight extent. There is, therefore, no obstruction to the ventilation and lighting of the main hall.

The walls of the main hall up to within a few feet of the gallery balustrades are flush-panelled in modern kejaat wood panelling with straight moulding. The remainder of the walls are of cream-coloured plaster, the ceiling being of off-white plaster. The floor is sprung and covered with maple. Access to the floor is gained through double teak glass-panelled doors leading off from the main entrance foyer at the back of the hall and the two side entrance foyers.

CONTROLLED COLOUR ILLUMINATION.

THE ceiling is plain and comprises a 50-foot square panel in the centre. Four projecting beams intersect to form the square, which is treated with an acoustic plaster. Around the square the beams have a continuous, flush lay light which may be illuminated with any colour, or combination of colours, controlled by a dimmer-board set behind scenes on the stage. In the centre of the square is a main circular luminous feature set in a circular recess embellished with a moulded representation of the Horn of Plenty. This central light feature may also be colour-controlled. At each corner of the square is an opening to the ventilation ducts for the extraction of foul air. The in-ducts are situated just under the balustrades of the balconies. At each corner of the stage-end of the hall is a large chamber. These at present are used as boxes on such occasions as dances, where a view of the stage is unnecessary. Actually they were designed for an organ to be installed at some future date.

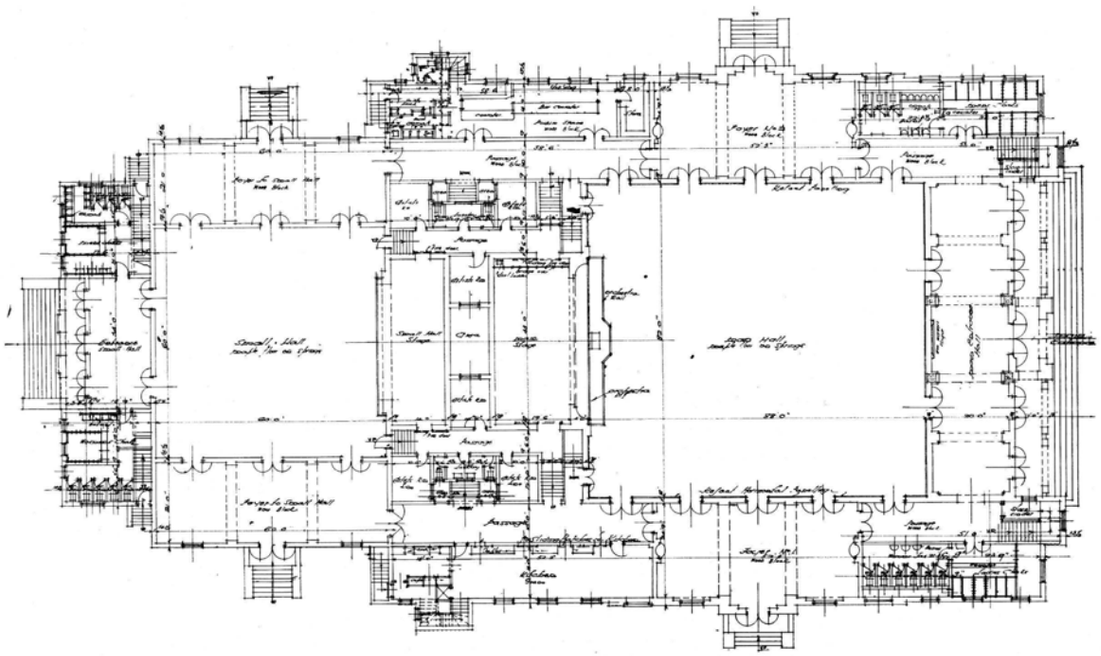
One of the main decorative features of the hall is the stage proscenium, which has gold and blue moulded surrounds, with a gold and silver-coloured pelmet. The curtains, which are electrically operated, are made of gold fire-resisting satin, bearing two medallions inscribed "M.B." Besides this, there is the usual electrically operated fire curtain. In front of the stage is a sunken orchestral pit. The proscenium rises to almost the full height of the ceiling, while the stage itself is 43 feet wide by 9 feet 6 inches deep. The stage flooring is inclined slightly. Leading off the stage wings are adequate men's and women's dressing-rooms serving both the main and the smaller hall.

A word should be said about the entrance foyers to the main hall. The main foyer, leading off the loggia in the front façade, is a well-designed area in terrazzo rubber composition floors. The walls and ceiling are cream-plastered, the former being relieved by plain beams surmounted by tuscan caps. The wings of this foyer lead to the staircase on each side, by which the upper floor and galleries are gained. Passageways lead off this foyer also to the two side foyers. These are treated simply also, having parquet flooring and painted plaster walls, relieved by alcoves and bevelled mirrors fixed on plain pilasters. On the east side, the foyer adjoins a modernly equipped bar fitted with refrigeration counters and divided into two sections, one being reserved for soft drinks. This latter section can be partitioned off from the other when necessary by means of a roller shutter. The west foyer adjoins a large kitchen equipped with electric stoves, boilers, urns and refrigerators.

THE SMALL HALL.

THE small or south hall is 60 feet square, and is provided with two side foyers 60 feet by 21 feet, treated in the same way as the side foyers to the main hall. The entrance hall, approached from the loggia in the south façade, is 24 feet wide by 15 feet 9 inches deep, flanked on either side by men's and women's cloak rooms and conveniences. There are no galleries in this hall, and the walls are cream-plastered from floor to ceiling. The floor is sprung and covered with maple wood. The proscenium is simply treated ; two capped pilasters spanned by a beam finished off with a

GROUND FLOOR PLAN.



blue and silver pelmet. The curtain is made of blue fire-resisting satin. The ceiling is of the same design as that in the main hall, except that the central light feature is plain and there is no continuous lay lighting in the beams forming the square panel. This panel is acoustically treated as well.

It should be mentioned that both halls are equipped with projector and winding rooms for the use of "talkie" machines.

UPPER STOREY.

THE plan of the upper storey may best be described as consisting of two corridors each running along the side of the building behind the side galleries. Various apartments lead off these corridors. On the east side is the mayor's parlour which is in good taste and has an appearance of sumptuousness. Here again the flooring, as throughout the corridors and foyers, is of parquet, the walls and ceiling being cream-plastered. The furniture is upholstered in light tapestry. On the walls are two attractive South African scenes by de Jongh. From the mayor's parlour double teak doors lead through to a supper or luncheon apartment which is connected again to a bar similarly equipped to that on the ground floor.

On the east side is the mayoress's parlour, furnished in a similar style. Here again double teak doors lead through to a handsomely equipped lounge used by the mayoress for women's meetings, tea-parties and other social gatherings.

This lounge is fed from the kitchen on the ground floor by an automatic electric food lift in the south wall.

An interesting series of stepped roof gardens has been provided on the upper floor. Flanking the small hall on the roof of the ground floor on each side is a spacious asphalt-covered flat roof with a high parapet all round. Access is gained to these open spaces from the caretaker's flat and from doors at the end of each of the corridors running past the side galleries in the main hall. The roof above the top storey in the southern section of the building is also a concrete slab asphalt-covered and used as a roof garden. The main and small halls both have pitched corrugated iron roofs.

AIR-CONDITIONING.

ON the first floor immediately above the artists' dressing rooms on either side of the stages are two rooms 37 feet 9 inches by 18 feet 6 inches for air-conditioning plant. The room on the west side is occupied by a delivery plant and that on the east by extract fans, the plenum system of air conditioning being employed. This plant is capable of changing the air content of both halls approximately 18 times an hour.

Each hall can be separately controlled, and a comfortable temperature during the winter months is maintained by passing the air through an electric heating battery, which is controlled thermostatically. During summer months the air is thoroughly washed and cooled by being drawn through heavy showers of circulating water.

An interesting fact relating to the air conditioning of the Benoni Town Hall is that in both halls a pressure effect is maintained while the plant is running in order to prevent the ingress of dust through the doors and windows.

Erected at a cost of approximately £70,000, the Benoni Town Hall justified itself in the first month after its opening, when a total of 42 functions was held. Hardly a day or night passes without some function being held, proving that the hall has satisfied a long-felt want. Prior to its erection the residents of Benoni were obliged to have recourse to halls along other parts of the Reef for the holding of their functions. To-day the position has been reversed, and the inhabitants of many places along the Reef near Benoni have come to regard this building as a highly suitable centre for their functions.

The architect was Mr. J. Lockwood Hall, of Johannesburg and Pretoria.

Brakpan Sewage Disposal Works

£250,000 Undertaking Opened in June, 1939

LAST month Brakpan officially opened its new £250,000 sewage scheme and disposal works; and on June 1 the connections were made, bringing to a conclusion the work of two-and-a-half years on an undertaking that was departmentally designed and constructed throughout. Up-to-date sewage lines have been laid, serving about three-quarters of Brakpan proper. When the scheme is finally completed it will include the reticulation of the whole of Brakpan proper and the two suburbs Daleview and Brenthurst. A total of about £100,000 has already been spent. Of the grand total of £250,000 about £30,000 was spent on the erection of the disposal works.

Designed on the latest lines, involving the complete enclosure of the sedimentation tanks in concrete-domed houses so as to prevent any fouling of the air around the building, the disposal works are capable of dealing with 1,000,000 gallons of sewage daily. At present, however, there is barely sufficient sewage to fill both sedimentation tanks, so that the disposal works will not be on a full working basis until sufficient connections have been made.

Before dealing with the works in detail, the general scheme of treatment of sewage should be outlined as follows. From the main, the sewage flows through an outfall sewer, past two detritus channels where heavy solids such as ground, etc., are deposited. The sewage then passes through screens where indissoluble solids such as rags, empty tins, etc., are screened off to be dumped in a trolley pan standing alongside. From the screens the sewage flows through another set of detritus channels to the sedimentation tanks.

In these tanks the sludge is separated from the effluent over a period of 13 hours' detention. The effluent flows into two large sumps, from where it is pumped to primary filters, containing graduated layers of filtering material. Here ærobic action purifies the effluent to a certain degree, after which the filtered effluent is drained to humus tanks where further sedimentation of suspended and humus solids takes place. It is then led to secondary filters comprising sand filter-beds, from which the now pure effluent is run down to a pan to be used by the adjacent Victoria Falls Power Station for cooling purposes.

The sludge is dealt with in a different manner to the effluent. Separated from the effluent in the sedimentation tanks, the sludge, comprising heavy solids in suspension, is forced from the bottom of the tanks by the pressure head into a sludge sump. From the sumps two macerating pumps force the sludge into the digestors, where, by a natural process, the putrefying matter is digested. The digested sludge, completely odourless, is run off by gravity to sludge-drying beds, where it is dried and carted away to be used as a fertilizer. The process of digestion in the digestor tanks produces a highly inflammable gas called methane. This, in some sewage works, such as the Delta Works at Johannesburg, is used as a fuel to drive a gas engine or generate heat to assist the digestion of the sludge. At the Brakpan disposal works, however, this gas is allowed to escape at present, though provision has been made in the design of the digestor tanks for floating gas collectors, should it be decided in future to utilise this gas.

An interesting point in the treatment of the sludge is to be found in the seeding of the sewage as it enters the works. A pipe is connected between the sludge digestors and the main sewer for the delivery of supernatent liquor back into the sewage for further treatment. This provision stimulates further the digestive action in the tanks.

MAIN BUILDING.

THE main building of the disposal works comprises a brick-built structure set out on an H-shaped plan. The frontage is 53 feet wide and the building goes back to a depth of 72 feet. Double swing-doors in the front façade lead into a well-finished entrance hall 10 feet wide, flanked on the west by a laboratory 20 by 16 feet, and on the east by an office of the same dimensions. Both these apartments and the entrance hall have wood floors. At the back of the entrance hall double swing-doors lead into a corridor running parallel to the width of the building. Immediately opposite the swing-doors leading in from the entrance hall, is a panel containing various meters registering the flow of effluent at various stages by the electrical distant recording system.

Off the corridor is a door leading into the sump room. This room, 33 feet 6 inches wide, contains underground sumps for sludge and effluent together with venturi meters. The room has a granolithic floor and the walls up to a height of five feet from the floor are covered with white glazed tiles.

There are two underground effluent sumps and one

underground sludge sump. The effluent sumps are approximately 12 feet square by 18 feet deep.

From the sump room a door leads into the screen chamber which is 50 feet 9 inches long by 21 feet 3 inches wide. This chamber is similarly finished out in white glazed tiles and granolithic floor. The main sewer, which is 24 inches in diameter and placed underground, leads into two detritus channels each 4 feet wide, containing the screens. The flow of the sewage may be diverted from one channel to the other by penstocks, two of which have been placed at the entrance to the channels and two at the exits. Above the screens is a raking platform connected by a chute to the sludge sump. Liquids from the rakings will therefore run into the sump.

From this chamber the screened sewage passes outside in an underground pipe, past a venturi flume, to be divided to either one or the other of two sedimentation tanks through an 18-inch supply pipe. These tanks will be described later.

Returning to the main building, immediately under the sump room in the basement is the pump room, 15 feet wide and separated from the sumps by a 14-inch concrete wall. The pump room houses a battery of six pumps, two of which are disintegrator or macerating pumps for the sludge. The pumps are electrically driven and those for the effluent are operated automatically by means of float switches in the respective sumps. A novel arrangement allows a battery-operated siren to sound the moment the effluent reaches the level in the sumps at which the motors switch on. This serves as a warning that the effluent sump is filling up and a check can be made to ascertain that the motors have cut-in and that there has been no failure of the current, etc.

Another interesting feature about the building is the provision in the screening chamber of a sliding cover for the screens. When the screens are not being raked, a large steel cover, supported on wheels fitted with ball-bearings, is drawn over the screen. The cover slides back under the concrete floor of the room and has only one guide rail to prevent jamming. When the cover is pushed back only the screens and raking platform are exposed. Both detritus channels are underground or covered by the concrete floor.

SEDIMENTATION TANKS.

THE sedimentation tanks are of orthodox design, being conical in shape with the usual baffle suspended in the centre immediately above the intake pipe. The tanks are of reinforced concrete, 30 feet in diameter and almost 28 feet deep. Around the circumference is another baffle which retains the sum in the tanks while allowing the effluent to spill over the weir and ultimately reach the effuent sumps in the sump room after passing venturi flumes outside.

The two sedimentation tanks are housed under two reinforced domed roofs with a common entrance on the axis connecting the two centres. A 9-inch circular brick parapet circumscribes the tanks, allowing a 2-foot 6-inch walking space all the way around. Air ducts opening out immediately above the tanks are connected to an air-conditioning plant in the main building. It should be mentioned that the sewage duct from the last two detritus channels to the delivery pipe in the sedimentation tanks has a fall of 1 in 600. The sewage is diverted into one or other of the two sedimentation tanks by means of 18-inch circular penstocks. On each tank slotted pipe scum collectors have been fitted.

A 6-inch cast iron pipe leads up from the bottom of the sedimentation tanks, from where the sludge is forced upwards through the pipe by the pressure exerted by the head of sewage in the tank. The sludge then runs by gravity to the sludge sump, from where it is pumped to the digestors.

The primary filters to which the effluent is next pumped are circular in shape, with a diameter of 75 feet. The effluent is sprayed over the filters by means of rotating arms operated by the pressure of the effluent. The filtering material is composed of crushed stone placed in layers of different sizes, resting on semi-circular tiles laid in rows along the floor of the filters. This arrangement of tiles permits ventilation which is highly necessary for the successful operation of filters acting on the ærobic principle, a principle comprising the cultivation in the filter of living bacteria that feed on the putrefying material in the effluent. The floor of the primary filters slopes towards the centre, from which the filtered effluent is run by gravity to the humus tanks.

HUMUS TANKS.

THESE latter tanks are of similar design to the sedimentation tanks and are used for separating out the smaller solids and humus suspended in the effluent. Here again the sediment is forced out and run by gravity to the sludge sump. In the humus tanks the effluent runs over weirs into an 18-inch pipe line dropping 1 in 450 to five secondary filter beds 50 feet wide by 100 feet long. The floors of these beds are arched and slope laterally towards the centre, from where the purified effluent is led to the power station dam.

There are two sludge digestors of substantially the same shape as the sedimentation tanks, with the exception that they are capped by concrete domes provided with manholes covered with steel plates. The sludge is led in through a flexible pipe and, when digested, run by gravity to the sludge-drying beds, of which there are 12, each 15 feet wide by 80 feet long. In these respects the design follows closely that employed at other sewage works.

An important point in the design of any sewage disposal works is the provision for future economical expansion. At Brakpan this will be achieved in such a way that the symmetrical grouping of the various tanks and departments will be preserved. The two humus tanks adjacent to the sedimentation tanks can be housed and converted into sedimentation tanks and further humus tanks built immediately behind.

Tenders Accepted

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

AIR-CONDITIONING AND CENTRAL HEATING.

Air-conditioning plant for Randfontein Automatic Telephone Exchange (P.W.D. tender 218) : J. H. Vivian & Co., Ltd., Johannesburg. £1,380.

Central heating installation for S.A.A.F., Voortrekkerhoogte (tender P.W.D. 248) : A. E. Barker, Johannesburg. £1,073, delivered and installed.

BRIDGES.

Pongola River Bridge at Koppie Alleen (tender P.W.D. 232) : Green & MacNicol (Pty.), Ltd., Johannesburg. £11,635 5s. 3d.

CHEMICALS, LABORATORY EQUIPMENT, ETC.

Glycerine (8,000 lb.) for Onderstepoort Laboratory (tender S.O.333) : Lever Bros. (S.A.) Pty., Ltd., Durban. £75 10s. per 2,000 lb., less 2½%, f.o.r. Maydon Wharf.

Hypodermic syringes (2,000) for Onderstepoort Laboratory (tender S.O. 357) : Transatlantic Trading Co. (Pty.) Ltd., Johannesburg. £750 f.o.r. Bordeaux.

Tsetse fly traps (3,000) for Onderstepoort Laboratory (tender S.O.334) : Peach & Hatton Ltd., Durban. £3,300 f.o.r. Durban.

ELECTRICAL EQUIPMENT.

Power plant for Central Telegraph Office, Pretoria (tender P.O. 732) : Griffin Engineering Co., Ltd., Johannesburg. £1,120 f.o.b. London.

Electric service lift for Castle, Cape Town (P.W.D. tender 178) : Waygood-Otis (S.A.), Ltd., Cape Town. £206, delivered and erected.

Dry cells for Department of Posts & Telegraphs (tender A.L. 179) : (1) British General Electric Co., Ltd., Johannesburg ; (2) Siemens Bros. & Co. (Br.), Ltd., Johannesburg.

Stillage for battery racks, Automatic Telephone Exchange, Pretoria (tender P.O.745) : A. van Stek, Pretoria. £75.

Outdoor telephones (50) (tender P.O.735) : Standard Telephones & Cables, Ltd., Pretoria. £325 f.o.b. Antwerp.

Loading coil pots (4) for Department of Posts and Telegraphs (tender P.O.738) : Cable & Engineering Co. (Pty.), Ltd., Johannesburg. £327 f.o.b. Antwerp.

Receivers and rotary convertors for Department of Posts and Telegraphs (tender P.O.740) : Chenik & Barnett (Wireless), Ltd., Johannesburg.

(1) Transformer, (2) Low-tension switch, (3) High-tension switch, for Automatic Telephone Exchange, Brakpan (P.W.D. tender 214) : (1) S.A. General Electric Co., Ltd., Johannesburg, £73 delivered in bond on site ; (2) Johnson & Phillips (S.A.) Pty., Ltd., Johannesburg, £51 5s. delivered on site ; (3) Crompton & Phillips (S.A.), Ltd., Johannesburg, £109 delivered in bond on site.

ROAD-MAKING.

Bitumen spraying and grit screeding to macadam road surfaces at Waterkloof Air Station (tender P.W.D. 247) : Wolton Gray (Pty.), Ltd., Johannesburg. £610 16s. 9d.

WATER SUPPLY AND IRRIGATION EQUIPMENT.

Boring for water at Military Training Ground, Umlazi Location : P. S. du Plooy, Harrison.

"Lister" engine pumping plant for Superintendent's House, Olifants River Settlement (tender S.O.280) : Stewarts & Lloyds of S.A., Ltd., Cape Town. £90 f.o.r. Cape Town.

Windmills for State Alluvial Diggings, Alexander Bay (tender S.O.281) : Wm. Spilhaus & Co., Ltd., Cape Town. £27 f.o.r. Parow.

MISCELLANEOUS.

Fire-fighting equipment (P.W.D. ref. 25/1/758) : (1) Associated Engineers Co., Ltd., Johannesburg ; (2) George Angus & Co. (S.A.), Ltd., Johannesburg ; (3) H. Alers Hankey, Ltd., Johannesburg ; (4) General Fire Appliances Co., Johannesburg.

Crane for Department of Prisons (tender S.O. 273) : Bartle & Co., Johannesburg. £155 f.o.b. Liverpool.

Gymnasium equipment (tender S.O.310) : (1) Herby Taylor & Ellis, Durban ; (2) Geo. L. Kustner (Pty.), Ltd., Johannesburg.

Washing machine for State Alluvial Diggings, Alexander Bay (tender S.O. 281) : Griffin Engineering Co., Ltd., Johannesburg. £233, f.o.b. London.

Conveyor belt equipment for State Alluvial Diggings, Alexander Bay (tender S.O.281) : Guest Sykes, Ltd., Johannesburg. £782 15s. f.o.r. port of shipment.

Cattle weighbridge for Onderstepoort Laboratory (tender S.O. 308) : S.A. Scale Co., Ltd., Johannesburg. £179 f.o.r. Durban.

Fire-fighting equipment (tender S.O.251) : (1) W. S. Thom & Co. (Pty.), Ltd., Johannesburg ; (2) General Fire Appliances Co., Ltd., Johannesburg.

Steam generating set for Nelspoort Sanatorium (tender P.W.D. 194) : Reunert & Lenz., Ltd., Johannesburg. £892, delivered on site.

(1) Trolley, (2) hay-stacker, for Pasture Research Station, Dohne (tender S.O.269) : (1) Burgess & Co., Kingwilliamstown (£33 f.o.r. Kingwilliamstown) ; (2) Dunell, Ebden & Co. (Pty.), Ltd., Port Elizabeth (£43 10s. f.o.r. Port Elizabeth).

(1) 1 Concrete mixer, (2) steel bending machines, (3) 2 concrete mixers, (4) tractor, (5) air compressor, (6) 4 jackhammers, (7) grinder, (8) crusher, (9) "Lister" engine, (10) 3 trailers, (11) 6 cocopans, for Defence Department at Robben Island (tender S.O.328) : (1) Orenstein & Koppel (S.A.), Ltd., Johannesburg, £125 ; (2) Seligson & Clare, Ltd., Cape Town, £22 10s. ; (3) Rogers-Jenkins & Co. (Pty.), Ltd., Cape Town, £109 ; (4) Wm. Spilhaus & Co., Ltd., Cape Town, £405 10s. ; (5) Holman Bros. (Pty.), Ltd., Johannesburg, £1,336 13s. ; (6) Holman Bros. (Pty.), Ltd., £224 1s. ; (7) Holman Bros. (Pty.), Ltd., £97 10s. ; (8) Samuel Osborn (S.A.), Ltd., Johannesburg, £177 ; (9) Samuel Osborn (S.A.), Ltd., £121 19s. ; (10) Griffin Engineering Co., Ltd., Johannesburg, £675 ; (11) Orenstein & Koppel, Ltd., Johannesburg, £93.

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 additions at Orange Grove Automatic Exchange, Johannesburg (supply, delivery and erection ; P.W.D. tender 287) : Secretary for Public Works, Pretoria (Room 531, 'phone 5477). **10th August.**

Air-conditioning plant for Automatic Telephone Exchange, Parkview, Johannesburg (supply, delivery and erection ; P.W.D. tender 292) : Secretary for Public Works, Pretoria (Room 531, 'phone 5477). **17th August.**

Air-conditioning plant for Automatic Telephone Exchange, Orange Grove, Johannesburg (supply, delivery and erection ; P.W.D. tender 293) : Particulars as above. **17th August.**

BRIDGES.

Ifafa River Bridge : Secretary for Public Works, Pretoria (Room 531, 'phone 5477) ; District Representative, P.W.D., Pietermaritzburg ; and Inspector of Works, P.W.D., Durban. **2nd August.**

BUILDINGS AND ALTERATIONS, ETC.

G.P.O. Contract No. 5 — main superstructure, etc., Cape Town (P.W.D. tender 270) : Secretary for Public Works, Pretoria (Room 531, 'phone 5477) ; District Representatives, P.W.D., Johannesburg, Cape Town, and Inspector of Works, P.W.D., Durban. **10th August.**

Erection of steelwork in workshop for Road Motor Services, S.A.R., Cape Town : Chief Civil Engineer, S.A.R. & H., Johannesburg, System Managers at East London, Bloemfontein, Pretoria and Durban, and District Engineer, Railway Improvements, Cape Town. **31st July.**

Central Government Offices, Pretoria, Completion Scheme, Contract No. 1 — foundations, basement and drainage (P.W.D. tender 298) : Secretary for Public Works, Pretoria (Room 531, 'phone 5477) ; and District Representative, P.W.D., Johannesburg.

CHEMICALS, LABORATORY EQUIPMENT, ETC.

Microscope with accessories for Government Pathologist, Durban (tender S.O. 371) : Union Tender and Supplies Board, 271, Visagie Street (P.O. Box 371, 'phone 3121), Pretoria. **3rd August.**

Commercial ether, oxygen, nitrous oxide, acetylene, absolute alcohol, rectified spirit, and methylated spirit : Provincial Accountant, P.O. Box 373, Pietermaritzburg. **16th August.**

ELECTRICAL EQUIPMENT.

Rectifiers automatic charging, complete, supply of (P.O. tender 755) : District Stores Superintendents at 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. **10th August.**

Loading coil pots, supply of (P.O. tender 756) : Particulars as above. **10th August.**

Manual ancillary morse concentrator, supply of (P.O. tender 759) : Particulars as above. **17th August.**

Telex switchboard system, supply of, for Cape Town Central Telegraph Office (P.O. tender 760) : Particulars as above. **17th August.**

Dial thermostat, relays and tubular heaters for Onderstepoort Routine Laboratory (P.W.D. tender 290) : Secretary for Public Works, Pretoria (Room 531, 'phone 5477). **17th August.**

REFRIGERATING PLANT.

Refrigerating plant for Germiston Police Mortuary (supply, delivery, and erection ; P.W.D. tender 281) : Secretary for Public Works, Pretoria (Room 531, 'phone 5477). **3rd August.**

ROAD-MAKING EQUIPMENT.

Road implements for Loskop Irrigation Settlement, supply of (tender S.O. 369) : Union Tender and Supplies Board, 271, Visagie Street (P.O. Box 371, 'phone 3121), Pretoria. **3rd August.**

Grader blades — approx. 20,900 (Tvl. Prov. tender 143/1939) : Superintendent of Provincial Stores, P.O. Box 857, Pretoria. **23rd August.**

Major plant for maintenance of Provincial roads in Cape Province and Transkei (Cape Prov. tender F.73/1939) ; Cape Provincial Tender Board, Industry Buildings, cnr. Loop and Castle Streets, Cape Town. **11th August.**

MISCELLANEOUS.

Steel pale fencing for Alexandra Institution, Maitland, Cape Town, supply and delivery of (P.W.D. tender 280) : District Representative, P.W.D., Cape Town. **3rd August.**

Steam boilers and automatic stokers for Bloemfontein Mental Hospital (supply, delivery, and erection ; P.W.D. tender 282) : Secretary for Public Works, Pretoria. (Room 531, 'phone 5477). **3rd August.**

Perforated pipes for subsoil drainage at Young's Field Aerodrome, Wynberg (supply and delivery ; P.W.D. tender 283) : Secretary for Public Works, Pretoria (Room 531, 'phone 5477), and District Representative, P.W.D., Cape Town. **3rd August.**

Fruit research requisites for Stellenbosch-Elsenburg College of Agriculture (tender S.O. 386) : Union Tender and Supplies Board, 271, Visagie Street (P.O. Box 371, 'phone 3121), Pretoria. **3rd August.**

Wheat-threshing machine for Olifants River Settlement (tender S.O. 385) : Particulars as above. **3rd August.**

Woodworking and workshop machinery for Mental Hospital, Fort Beaufort, C.P. (P.W.D. tender 289) : Secretary for Public Works, Pretoria (Room 531, 'phone 5477). **17th August.**

Crude-oil engine for Glen School of Agriculture (P.W.D. tender 288) : Particulars as above. **17th August.**

Motor-driven lathes for metal and woodwork for Pretoria Mental Hospital (P.W.D. tender 296) : Particulars as above. **17th August.**

Steam calorifiers and cylinders for Pretoria Mental Hospital (P.W.D. tender 297) : Particulars as above. **17th August.**

Electric luggage lifts at E. and F. cargo sheds, Table Bay Harbour (S.A.R. tender 2257) : Particulars as above. **8th August.**

X-Ray Films : Provincial Accountant, P.O. Box 373, Pietermaritzburg. **16th August.**

OBITUARY.

MR. C. C. DEUCHAR, A.R.I.B.A.

THE death on Tuesday evening, June 27, of Mr. Charles Cunnold Deuchar, Chief Architect of the South African Railways and Harbours, robs the profession of one of its outstanding figures. His passing will be deeply regretted, not only by the Railway staff to whom his unfailing courtesy and genial personality endeared him, but also by the staff of the Public Works Department, Pretoria, where, until 1929, he held the position of Assistant Architect.

The Late
Mr. C. C. DEUCHAR.

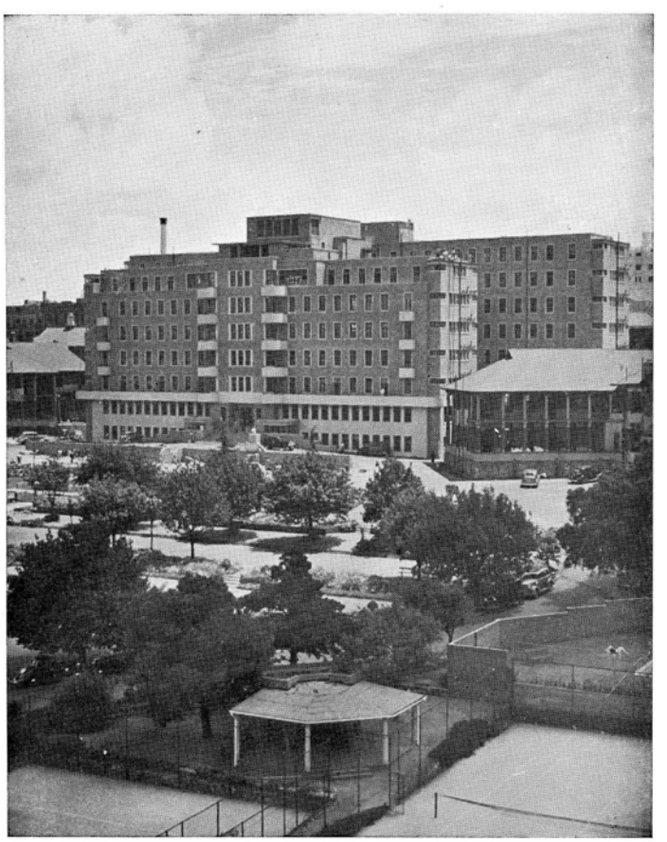
Mr. Deuchar was born in England on August 3, 1883. He came to South Africa in 1904, when he joined the Government Service of the Orange River Colony as a draughtsman in the Public Works Department.

At the time of Union (1910) he was transferred to the Union Public Works Department, Pretoria, attaining in time the position of Assistant Architect. He held this position till 1929, when he was transferred to the South African Railways and Harbours Administration as Chief Architect, with headquarters at Johannesburg. This position Mr. Deuchar held at the time of his death.

During his period of office as Chief Architect Mr. Deuchar supervised the erection of many important works, including the new Johannesburg Railway Station. He designed numerous Government buildings, chief among which were office buildings at Uitenhage and Johannesburg; the System Manager's offices at Kimberley and Johannesburg, and a number of important station buildings on the Reef and elsewhere, including Jeppe and Mayfair; hostels at the larger railway centres to accommodate younger members of the staff living away from home; extensive alterations to railway institutes, and the erection of new compounds.

Mr. Deuchar served with Enslin's Horse in the 1914 Rebellion and the South-West African campaign, and subsequently with the South African Horse in the German East African campaign.

Public Works associates itself with the late Mr. Deuchar's many friends in extending its deepest sympathy to his widow and family.



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