

1938.
NEW ZEALAND.

DEPARTMENT OF LANDS AND SURVEY.

DRAINAGE OPERATIONS IN HAURAKI PLAINS.

REPORT FOR THE YEAR ENDED 31st MARCH, 1938, TOGETHER WITH STATEMENTS OF ACCOUNTS.

Presented to both Houses of the General Assembly pursuant to Section 20 of the Hauraki Plains Act, 1926.

Department of Lands and Survey, Wellington, 1st June, 1938.

SIR,—

I have the honour to present herewith the report of the Land Drainage Engineer on operations carried out during the past year on the Hauraki Plains in accordance with the provisions of the Hauraki Plains Act, 1926.

I have, &c.,

W. ROBERTSON,

Under-Secretary for Lands.

The Hon. Frank Langstone, Minister of Lands.

REPORT OF THE LAND DRAINAGE ENGINEER.

SIR,—

I have the honour to present to you herewith the thirtieth annual report on the reclamation works carried out on the Hauraki Plains. The report covers the fiscal year ending 31st March, 1938.

The district has been favoured with a good production season, and, with the assurance of favourable prices for dairy-produce, encouraging progress has been recorded by the farming community. None of the returns from which the year's production figures for the Hauraki Plains district are usually compiled for this report is available at the time of writing, but it is expected that these returns will show a satisfactory increase in volume of all the principal farm products.

The rainfall for the year was above the average for the district. The weather from the middle of April to end of September was continually showery, and, though the rainfall was seldom sufficient to fill the drains, continual light rain caused saturation of reasonably well-drained fields and consequential poaching by stock. Dry weather in October continuing through to the end of January, followed by abundant rainfall in February, have been ideal summer weather conditions for this district, and the summer and autumn growth of grass has seldom been more prolific. The rainfall records for Kerepehi since 1916 are as follows:—

RECORDS OF DAILY PRECIPITATIONS, KEREPEHI, HAURAKI PLAINS.

Year.	Number of Days, with given Daily Precipitation in Inches.											Total Days.	Total Fall.	Wettest Month.	Driest Month.		
	0.00 to 0.49.	0.50 to 0.74.	0.75 to 0.99.	1.00 to 1.24.	1.25 to 1.49.	1.50 to 1.74.	1.75 to 1.99.	2.00 to 2.49.	2.50 to 2.99.	3.00 to 3.99.	4.00 to 4.99.					5.00 to 5.99.	6.00 to 7.00.
1916 ..	109	12	9	7	2	3	..	1	..	..	1	..	..	144	52.19	Nov. 6.65	Feb. 1.05
1917 ..	131	11	4	4	3	..	1	1	1	..	..	..	..	156	45.61	Feb. 6.26	Jan. 0.65
1918 ..	145	14	6	4	..	1	..	..	1	..	..	..	..	171	44.06	Oct. 7.47	May 2.24
1919 ..	122	9	1	3	2	..	..	..	..	..	..	..	..	137	27.36	July 4.52	Dec. 0.89
1920 ..	85	7	10	3	1	1	3	2	..	..	..	..	..	112	43.16	Feb. 6.10	July 1.73
1921 ..	93	12	5	3	2	..	..	1	..	..	..	..	..	116	34.43	Oct. 5.89	Feb. 0.72
1922 ..	101	17	9	3	..	1	1	..	1	..	..	..	..	133	42.81	Feb. 6.62	April 1.73
1923 ..	151	6	5	4	..	1	1	..	..	..	..	..	1	169	47.04	April 9.76	March 1.72
1924 ..	132	8	10	5	2	5	1	1	..	2	..	..	..	166	60.37	April 8.55	July 1.87
1925 ..	142	15	4	2	..	..	..	..	1	..	..	..	..	164	37.64	June 6.67	April 0.84
1926 ..	149	15	6	4	5	2	2	..	..	..	..	..	..	183	55.53	May 8.86	Feb. 1.79
1927 ..	159	10	6	5	..	4	..	..	..	..	..	..	..	184	45.33	July 6.29	April 2.01
1928 ..	125	7	9	2	3	2	2	1	..	..	..	..	..	151	47.30	May 7.52	Jan. 0.01
1929 ..	124	19	8	3	1	..	..	..	..	..	..	..	..	155	41.05	April 5.09	Feb. 0.74
1930 ..	131	4	2	2	3	..	2	2	..	..	..	..	..	146	37.72	Jan. 6.87	Dec. 0.80
1931 ..	144	10	7	..	4	..	..	..	..	2	..	..	..	167	43.23	July 7.80	March 0.98
1932 ..	126	7	5	4	..	1	..	..	..	..	..	..	..	143	32.05	Feb. 4.95	Nov. 0.93
1933 ..	152	13	1	4	3	..	..	1	..	..	..	..	..	174	38.93	Feb. 6.54	March 1.20
1934 ..	138	11	6	5	2	2	..	1	..	1	..	..	..	166	43.23	June 6.15	Oct. 2.05
1935 ..	163	15	6	4	2	2	..	1	..	1	..	..	..	194	53.42	July 9.56	Jan. 0.93
1936 ..	127	11	6	3	..	1	..	..	..	2	..	..	..	150	40.62	Feb. 5.83	May 1.63
1937 ..	76	21	8	5	1	1	1	1	..	..	..	..	..	114	45.51	May 5.89	Feb. 0.51
1938*	11	1	4	..	1	1	1	1	..	..	..	..	..	20	13.18	Feb. 9.42	March 1.10

* First three months of year only.

Average rainfall over twenty-two years is 43.57 in.

During the summer, fires have caused more trouble than has been experienced since a fire district comprising the peat lands was constituted in 1933. During the four years that the fire district regulations have been in force there has not been one instance of fires getting out of control where the fire regulations have been observed, and this fact is conclusive proof that with the willing co-operation of all the settlers the fire risk and heavy annual cost of fire-fighting can be considerably reduced.

The works carried out by the Drainage Branch now fall into two general categories :—

- (1) The reclamation of swamp lands by flood protection, drainage, and the construction of access roads.
- (2) The preparation of waste lands for settlement by pasture establishment, stocking, the erection of farmhouses, buildings, and fences, and the provision of water-supplies and other amenities.

The first of these has been in progress since the inception of the Hauraki Plains scheme; the second has in the past been associated with small-farm-development schemes outside the Hauraki Plains district. This year the foundation has been laid for a progressive scheme of pre-settlement development of the Hauraki Plains lands, with the advantage of a planned long-term programme of work.

The number of men employed on the works controlled from the Kerepeehi office have varied between 156 and 207, and these figures do not include extra labour employed for short-term seasonal undertakings such as drain-cleaning. Most manual labour operations are carried out under the co-operative contract principle, with very satisfactory results to the Department and the workers concerned.

The following is a general review of the works carried out during the year :—

DREDGES.

One floating dredge and three drag-line excavators have been in commission during the year, and the combined output of these machines was 261,347 cubic yards. One item that seems worthy of mention is the successful refloating of No. 2 Priestman dredge. This plant was engaged almost continuously from the inception of the Hauraki Plains reclamation works in 1908 until 1932, when, to preserve the timber pontoon, it was purposely submerged in the Maukoro Canal. To dock this dredge on the slip at Kerepeehi would have necessitated dismantling the machinery and superstructure to pass the pontoon under a concrete highway bridge at Waitakaruru, and also the removal of a temporary dam controlling the water-level in the canal to prevent bank-caving. After thirty years' exacting service, the pontoon of this dredge is still sound, and the machine will shortly be put into commission on the Maukoro Canal. This canal extends inland several miles from the shore of the Hauraki Gulf at Waitakaruru. Below spring-tide level the canal is excavated in alluvial soil underlying peat originally varying in depth from about 1 ft. near the coast to 25 ft., six miles inland. As the result of drainage provided by the canal this peat has considerably subsided, and No. 2 dredge will be used to deepen the upper three miles of this canal, and at the same time provide a continuous alluvial-spoil bank above the peat which will eventually be used for a roadway, but will in the meantime provide support for a bank-operating drag-line excavator to be used deepening the canal as the banks subside.

No. 23 steam dipper dredge was engaged deepening the Awaiti and Elstow Canals from April, 1937, to March, 1938, when the dredge was laid up and the crew transferred to No. 2 Priestman dredge. The dipper dredge removed silt accumulated as the result of upstream dredging in the Awaiti Canal above the temporary dam at peg 6 miles 30 chains, and deepened the Elstow Canal for its entire length of 5 miles 35 chains. This canal is excavated in soft peat, and movement of the canal banks and bottom will necessitate periodical redredging until the peat consolidates. The output of this dredge for the year was 71,024 cubic yards and the unit cost 7·65d.

No. 15 Bucyrus drag-line excavator has been engaged enlarging the Reservoir Canal leading to the Kerepeehi Block pumping-station. This work is nearing completion, and the machine, after overhaul, will be used on the Piako River improvements works upstream from Kerepeehi Wharf. While widening the Reservoir Canal an effort has been made to smooth and shape the spoil-banks with the machine so that implements can in future be used to control growth of noxious weeds. The drag-line operating with a 50 ft. boom and half-yard Page bucket excavated and placed 56,757 cubic yards of material, at cost of 6·5d. per cubic yard.

No. 16 drag-line excavator has made good progress on the Maukoro Canal, which it is enlarging. Working along the left bank, the canal has been widened and the canal side road completed to peg 3 miles 74 chains, where the excavator crossed the canal on the temporary dam and has since worked downstream on the right bank to peg 2 miles 23 chains. Three operations will be necessary to complete the canal-widening and road-construction on the right bank. The approximate finished dimensions of the Maukoro Canal will be: Top width, 80 ft.; depth, 10 ft.; bottom width, 20 ft.; and the roadway along the right bank is to be placed to leave a space 75 ft. wide between the canal and road for spoil from maintenance dredging. Using a half-yard bucket and 50 ft. boom, this machine handled 69,021 cubic yards at unit cost of 5·86d.

No. 29 drag-line excavator has done excellent work. During the first seven months of the year it was employed raising the Waitakaruru Stream and Canal stop-banks. On the completion of this work, by arrangement with the Hauraki Plains County Council, the machine was used to remove silt from one mile of main drains of the Miranda drainage system. Mounted on a trailer, the machine was taken by road to Orongo, where it has since raised 59 chains of stop-bank on the foreshore of the Ngataipua Block. Operating a $\frac{3}{4}$ -yard bucket and 30 ft. boom, the very creditable output of this excavator was 64,545 cubic yards, and the average cost 2·78d. per cubic yard.

The following table shows the quantities excavated by the dredges during the past seventeen years, with the average unit cost for each year:—

Year.	Cubic Yards.	Cost per Cubic Yard.
1921-22	246,022	7·29d.
1922-23	440,092	8·20d.
1923-24	508,654	7·27d.
1924-25	822,286	5·86d.
1925-26	856,653	6·32d.
1926-27	647,182	7·42d.
1927-28	652,413	7·32d.
1928-29	619,911	6·54d.
1929-30	595,565	6·25d.
1930-31	536,692	8·32d.
1931-32	390,611	7·99d.
1932-33	200,954	8·00d.
1933-34	116,224	5·96d.
1934-35	52,517	10·02d.
1935-36	164,046	8·26d.
1936-37	171,717	8·69d.
1937-38	261,347	5·72d.

KEREPEEHI-AWAITI DISTRICT.

With a view to reducing the cost of cleaning drains, a weed-cutting launch was used experimentally in some of the large machine-dug drains in this district last autumn; 3 miles 43 chains of drain-cleaning was carried out by this method, at about two-thirds the cost of cleaning by manual labour. A total length of 7 miles 31 chains of drains were cleaned by hand. The metalling of Wani Road was completed, 1,932 cubic yards of metal being used for resurfacing road for a distance of 200 chains southwards from Wairou Road and laying two courses of metal along 52 chains of road between Awaiti West and Pukahu Road intersections.

A camp established in 1934 to accommodate twenty to thirty men employed on drainage, roading, clearing scrub, and general land-development work on the Kerepeehi Extension Block was closed in November and the men transferred to other work. The land is now showing rapid response to drainage. Fair pasture has been established in the alluvial soil, and a large area of shallow peat is now in grass. To hasten consolidation, arrangements are being made to systematically stock a peat area of 1,100 acres. Four to eight men have been continuously employed on the Kerepeehi Extension Block clearing 393 acres of blackberry, scrub, and rushes, constructing 257 chains of field drains (7,710 cubic yards of excavation), and controlling noxious weeds. The metalling of the Awaiti Canal Left Embankment Road, commenced last year, was completed for a distance of 140 chains; 100 chains of the Reservoir Canal Road was also metalled, and the total quantity of metal spread on these two roads was 4,281 cubic yards. Extensive alterations have been made to the office, depot, and yards at Kerepeehi. The workshop staffs have been busily employed on building, construction, and maintenance, and repairs to plant and machinery. The Piako River ferry service has been in continuous operation at Kaihere.

WAITAKARURU AND TOREHAPE DISTRICTS.

Activities in these districts have been connected principally with the development of the Pouarua Block, an area of 11,000 acres of peat land on which intermittent development-work has been in progress over a number of years. As the result of a recent decision, a progressive scheme for the development of this area has been planned in detail, and includes not only drainage and roading, but also grassing, fencing, and stocking. The scheme marks an important advance in the method in preparing peat lands of the Hauraki Plains for settlement. Experience has shown that the peat, after an initial response to drainage, goes through a period of suspended development. Time is required for the formation of soil by the decomposition of the peat, and during this period the carrying-capacity of the land is uncertain. These variable conditions have in the past proved a real difficulty to the early settlers striving to improve sections of suitable area for farming when fully productive. Future hardship will now be avoided by large-scale State development, with the necessary control of stock continued until the land has reached a stage approaching stable production. Two main camps are provided for the men engaged on this work, one at Torehape, the other three miles from Waitakaruru Township. Each has accommodation for thirty to forty men. Smaller camps for six to eight men have been established during the year at the junction of the Waikumete Stream with the Maukoro Canal, on Pitts Road, and on Orchard West Road. Two working-parties operating from houseboats have been engaged on the southern portion of the Pouarua Area. The works carried out on the co-operative contract principle comprise the excavation of 58,257 cubic yards of material in widening and deepening 2,882 chains of existing drains, and 29,496 cubic yards of excavation in construction of 863 chains of new drains. An area of 560 acres of scrub was cleared near Waitakaruru, and this area will be burnt and sown in grass this autumn and should be ready for light stock next spring. For road-construction in the Pouarua Block 16,420 cubic yards of clay ballast has been hauled by light railway an average distance of five miles from the pit at Torehape for ballasting the peat subgrades of Central and Torehape Roads; 5,630 fascines were laid; and 932 willow sleepers cut on the banks of the Piako River were used for laying 54 chains of light railway. The formation of a peat section of the Orchard West Road, one mile in length, from the Pouarua Canal eastwards was commenced in January, 1938, and to date 3,085 cubic yards of clay ballast has been delivered with motor-trucks along 25 chains of this

road and 930 fascines cut for the temporary support of the road on soft foundation material. At Waitakaruru the Maukoro Canal Left Embankment Road has been re-formed for a distance of 100 chains, and 1,593 cubic yards of metal used in metalling 60 chains of this road. Annual drain-maintenance work included cleaning 33 miles 74 chains of drains.

PATETONGA-TAHUNA DISTRICT.

Extensive drain-improvements in the Patetonga district have been carried out during the last two years, and practically all the main drains have now been reconditioned. Six to eight men have been employed on this work throughout last year and excavated 16,939 cubic yards of material in the improvement of 437 chains of drains and cleaned 38 miles 76 chains. A 25-ft.-span hardwood bridge was erected on the Patetonga Main Road. A party of four to seven men has been engaged snagging and removing willows previously killed by ring-barking and poisoning from the banks of the Piako River. The river-banks have now been cleared for a distance of six miles downstream from the Whakahoro Road flood-gate. The work was frequently delayed by high stages of the river during the winter and spring of 1937, and the men had to be transferred to other work at Hoc-o-Tainui. A reach 2 miles 6 chains in length was cleared during the past year. In November, 1937, authority was received to commence similar work on the Waitoa River, and No. 11 Priestman dredge was prepared for this work by removing the chutes and lowering the boom. This machine cleared the river-banks of willows for a distance of 75 chains, when owing to channel-silting the work had to be continued upstream with log-hauler operating from the river-bank. One mile ten chains of the Waitoa River has been cleared of willows. It is proposed to continue this work downstream with the dredge when flooding interferes with work of the log-hauler.

SURVEYS AND OFFICE WORK.

Land and engineering surveys carried out during the year comprised 4,142 chains of traverse, 3,058 chains of levels, topographical and other land surveys of 1,867 acres. Plans and specifications for contracts are prepared in the Kerepehi office, and a considerable amount of routine work is involved in the periodical measurement of work carried out by the dredges, the preparation of fortnightly wages and contract payments, payment in cash to the men scattered over a wide area, and the receipt and issue of stores.

SUMMARY.

The total length of subsidiary drains constructed on the Hauraki Plains to date is now 794 miles 68 chains.

The principal works carried out on the Hauraki Plains are summarized in the following schedule:—

	Length. M. Ch.	Excavation. Cubic Yd.
Drains cleaned by manual labour	96 22	..
Drains widened and deepened by manual labour	41 64	76,183
New drains constructed by manual labour	14 0	37,186
Total quantity of drainage excavation by manual labour .. .. .	.. ..	113,369
Drains cleaned by weed-cutting launch	3 43	..
River and canal and stop-bank improvement by machine construction	13 31	251,829
Clay ballast delivered on peat roads by light railway	0 78	16,420
Clay ballast delivered on peat roads by motor-lorries	0 25	3,085
Fascines cut and used for road-construction .. .. .	.. ..	6,060
Light railway laid	0 54	..
Sleepers cut and delivered for tramway .. .. .	.. ..	932
Road metalling—		
Resurfaced	0 200	Cubic Yd.
New work, top course only	0 69	7,806
New work, two courses	0 284	Acres.
Area cleared of scrub, rushes, &c. .. .. .	.. ..	953
River-banks cleared of willow and scrub	3 16	..
Road-bridges erected: 20 ft. to 25 ft. span .. .. .	.. ..	No. 3

I have, &c.,

R. L. INNIS,

Land Drainage Engineer.

The Under-Secretary for Lands, Wellington.

HAURAKI PLAINS SETTLEMENT SCHEME.

RATE ACCOUNT AS AT 31ST MARCH, 1938.

<i>Dr.</i>				<i>Cr.</i>									
				£	s.	d.	£	s.	d.				
Maintenance completed works	2,313	11	1	Balance brought forward .. .. .	..	..	2,381	17	7	
Remission of rates	17	13	3	Rates levied .. .. .	..	..	1,797	1	0	
Balance	1,902	8	6	Ten-per-cent. penalty added to unpaid rates .. .. .	..	..	54	14	3	
				£4,233	12	10					£4,233	12	10

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1938.

<i>Receipts.</i>				<i>Payments.</i>								
				Public Works Fund.	Consolidated Fund.	Public Works Fund.	Consolidated Fund.					
				£	s.	d.	£	s.	d.			
Rates .. .. .	..	..	..	1,684	8	7	Drainage works : Stop - banks, clearing channels, and other expenditure incidental to conducting drainage operations (including formation and metal-ling of roads), materials sup-plied, &c.	18,640	18	9		
Law-costs .. .. .	..	..	..	17	11	1	Material and stores	10,650	9	1		
Sale of land .. .. .	..	..	15,336	14	3	..	Maintenance completed works .. .. .	..	..	1,757	7	7
Rents and grazing fees .. .. .	..	..	..	8,324	5	5	Refund rent and interest .. .. .	..	..	138	12	5
Interest on sales of land .. .. .	..	..	..	1,116	0	9	Refund miscellaneous receipts .. .. .	..	..	213	15	3
Artesian-well boring—	..	..	..	..	..	..	Refund proceeds sale of land	5	0	0	..	..
Repayment of advances .. .. .	..	..	..	20	7	11	Discharged Soldiers Settlement Account: Recoupment in respect of merged transactions .. .. .	..	..	12	11	8
Interest on advances .. .. .	..	..	..	4	12	10	Kaihere Ferry expenses .. .. .	..	..	288	9	0
Instalments on buildings .. .. .	..	..	..	1	18	11	Transfer receipts to Treasury Ad-justment Account .. .. .	..	..	11,893	14	8
Ferry fares .. .. .	..	..	..	204	7	6	Transfer receipts to Public Works Fund	25,202	8	4	..	..
Credits in reduction of expenditure	9,865	14	1	..	..	..	£54,498	16	2	£14,304	10	7
Miscellaneous receipts .. .. .	..	..	..	317	0	9	£54,498	16	2	£14,304	10	7
Royalties .. .. .	..	..	..	203	0	11	..	..	..	..	..	..
Transfer expenditure to Treasury Adjustment Account .. .. .	..	..	..	2,410	15	11	..	..	..	..	..	..
Transfer expenditure to Public Works Fund	29,296	7	10	..	..	..	..	..	..	..	..	..

REVENUE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1938.

<i>Dr.</i>				<i>Cr.</i>								
				£	s.	d.	£	s.	d.			
Interest on Public Works Fund capital	34,659	19	5	Accrued rents .. .. .	..	..	8,419	3	3
Kaihere Ferry expenses	293	4	0	Interest on sales of land .. .. .	..	..	1,443	17	9
Administration expenses	451	15	0	Grazing fees .. .. .	..	..	10	9	5
Remissions of rent	519	8	3	Ferry fares .. .. .	..	..	199	10	3
Rebates	604	4	10	Forfeited deposits .. .. .	..	..	2	0	0
Irrecoverable rents, &c.	0	0	6	Kaihere Ferry: Portion of loss charged to County Council .. .. .	..	..	0	0	2
Premiums on conversion	14	10	0	Hire of plant .. .. .	..	..	103	16	11
				£36,543	2	0	Royalties .. .. .	..	..	203	0	11
				..	..	..	Net loss carried down .. .. .	..	..	26,161	3	4
				..	..	..	£36,543	2	0	..	..	..
Net loss brought down	26,161	3	4	..	..	..	..	..	..
Balance from previous year	283,131	8	5	Balance carried forward .. .. .	..	..	309,292	11	9
				£309,292	11	9	..	..	..	..	..	..

HAURAKI PLAINS SETTLEMENT SCHEME—continued.

BALANCE-SHEET AS AT 31ST MARCH, 1938.

<i>Liabilities.</i>				<i>Assets.</i>								
	£	s.	d.	£	s.	d.	£	s.	d.			
Capital Account—												
Public Works Fund	868,624	7	5	Improved lands handed over to Land Board for settlement—								
Value of Crown land set apart under Act	45,000	0	0	Leased	152,390	8	3					
Transferred from Discharged Soldiers Settlement Account..	264	15	0	Unleased	11,437	17	0					
				Unpaid purchase-money for land sold on deferred payment .. .	24,050	2	6					
								187,878	7	9		
Employment Promotion Fund capital .. .				893,889	2	5	Unimproved value, land not disposed of ..	41,693	3	11		
Consolidated Fund capital				8,593	15	5	Improvements on adjoining Crown lands ..	7,710	0	0		
Reserve for loss on Discharged Soldiers Settlement assets				6,112	4	9	Permanent reserves	8,851	0	0		
Sundry creditors—				140	0	0	Works in progress: Expenditure on land in course of reclamation, including formation and metal- ling of roads	624,116	14	9		
Miscellaneous	2,423	18	10				Capital expenditure—					
Departmental	513	16	0	2,937	14	10	Employment Promotion Fund	8,593	15	5		
				1,900	0	0	Consolidated Fund	6,112	4	9		
Rent charged in advance				1,902	8	6	Artesian wells					
Rate Account							£	s.	d.			
Payments in advance—							Crown tenants, Hauraki Plains..	288	8	8		
Grazing fees		0	15				Permanent reserves and Crown lands	216	10	9		
Rent		92	7									
Rates		0	0						504	19	5	
Instalment of principal on de- ferred-payment sales		29	0				Buildings			3,898	5	2
Instalment of interest on de- ferred-payment sales		18	4				Wharves			200	0	0
							Machinery and plant			17,167	4	5
Suspense Account							Live-stock			10	11	0
Writings-off in Suspense							Stores			6,155	8	11
Treasury Adjustment Account							Stamps on hand			0	1	0
							Sundry debtors—					
				£1,262,381	3	2	Rent	3,054	4	1		
							Rates	3,663	13	3		
							Instalment of principal on de- ferred-payment sales	94	14	9		
							Instalment of principal on build- ings	4	0	10		
							Interest on well-boring	105	0	3		
							Interest on deferred-payment sales	326	5	10		
							Law-costs	132	18	0		
							Tram freights and ferry fares .. .	16	9	3		
							Grazing	31	2	5		
							Miscellaneous	5,112	3	2		
							Departmental	10,328	2	3		
										22,868	14	1
							Postponed rent (Mortgagors and Lessees Rehabilita- tion Act, 1936)			143	1	4
							Postponed rent (Land Act, 1924) .. .			92	10	7
							Losses in Suspense			16,639	16	7
							Interest accrued but not due			325	0	0
							Premiums on conversion			72	10	0
							Cash in transit from Post Office ..			55	2	4
							Revenue Account: Balance forward ..			309,292	11	9
										£1,262,381	3	2

W. ROBERTSON, Under-Secretary for Lands.

W. E. SHAW, Chief Accountant.

I hereby certify that the Rate Account, the Revenue Account, and the Balance-sheet have been duly examined and compared with the relative books and documents submitted for audit, and correctly state the position as disclosed thereby, subject to the explanatory notes dealing with departmental Accounts generally as appearing at commencement of parliamentary return [B.—I, Pt. IV]. The following comment is appended: The balance of the Works in Progress Account—viz., £624,116 14s. 9d.—appearing in the Balance-sheet greatly exceeds the value of lands the control of which has not yet been transferred to the Land Board.—J. H. FOWLER, Controller and Audit-General.

Approximate Cost of Paper.—Preparation, not given; printing (700 copies), £5 10s.

By Authority: E. V. Paul, Government Printer, Wellington.—1938.

Price 6d.]