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DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. II.

JANUARY, 1921.

No. 1.

The weather of the month of January, 1921, was characterized by a practically general serious shortage of rainfall, absolute drought prevailing at many stations in the Karroos and northern border; persistent cool, cloudy weather over the south-west of the Cape; good light rains over the greater part of the Transvaal, Orange Free State, Natal, and south-east Cape in the early part of the month, followed by a hot, droughty spell broken only by highly localized thunderstorms; hot, drying, and occasionally destructive winds, and some severe hailstorms, causing damage to crops and fruit.

Pressure.—As will be seen from the accompanying mean isobaric map, pressure was practically normal over the west, but slightly under the average over the eastern half of the Union. The equatorial depression was in evidence during the whole of the month, and "highs" were present on eleven days moving along the south coast, viz., on the 5th to 7th over the south-west and south; on the 14th on the west; from 21st to 24th, moving from west to north-east and south-east; on the 29th over the east, and on the 30th and 31st from south to east. The weather was generally cloudy and unsettled on the eastern half of the Union, with rain or thunderstorms from the 1st to 12th, but generally fine, with local thunderstorms, the remainder of the month. Over the rest of the Union it was mostly fine, although cloudy and unsettled weather was experienced over the south-west from the 12th to the 15th.

Temperature.—The mean temperature during January was 71.1 degrees, or 0.3 degree less than usual. Over Natal there was a fairly large deficit of 2.1 degrees, but only 0.4 degree over the Cape Province. In the Transvaal and Orange Free State temperature during the month was almost normal, there being an excess there of only 0.1 degree and 0.2 degree respectively. The general deficit of 0.3 degree in the monthly temperature was due to the nights being 0.9 degree lower, whilst the days were 0.3 degree warmer than the corresponding averages. On considering, however, the mean monthly temperature at individual stations, it is seen that excesses were confined to the more southerly and south-easterly portions of the Transvaal and to Komati-poort in the east, whilst the stations over the remainder were below normal by a few tenths to 1.3 degree; the deficits were greatest over the more central portions of that province, but decreased to nil at Louis Trichardt in the north and Harbison in the east. In the Orange Free State, the only deficit was one of half a degree at Harrismith in the east, which in this respect more closely resembled the conditions in Natal, where the stations were mostly about 2.1 degree colder than usual. Over the Cape Province the month was colder

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than usual, commonly by 1 to 2 degrees, except over the north-east, east-central Karroo, the northern border, and Bechuanaland, where the temperature was from 0.7 degree at Graaff-Reinet and Vryburg to 3.0 degrees at Queens-town in excess of the average. Both days and nights were colder than usual over the western half of the Cape Province, along the south coast, part of the south-east, and in Natal, the deficits in the day temperatures being usually the larger, particularly in Natal, where it amounted to as much as 4.5 degrees at Maritzburg. A similar state of affairs prevailed in Bechuanaland and the north-west Transvaal. On the other hand, the mean maxima and minima were both higher than the normal in the east-central Karroo and the northern border of the Cape, and parts of the south-central portions of the Transvaal. The night temperatures only were sub-normal over the east, north, and west of the Transvaal, the Orange Free State generally, the north-east Cape, Kaffraria, and the south of the northern Karroo. Deficits in the mean maxima or day temperatures were confined to the north-central Transvaal, Zululand, and the Kaffrarian coast. The highest temperatures for the month were registered on thirteen days, viz., 2nd, 3rd, 5th, 19th to 22nd, 24th to 28th, and 31st, most widely over the Transvaal and Orange Free State on the 21st, over the Cape on the 31st, whilst in Natal the 3rd was generally the warmest day; maxima were also common on the 25th and 26th. There was an absence of any general decidedly cool spell, although extreme minima were registered widely on the 23rd; lowest temperatures were also recorded on 1st, 2nd, 8th, 10th, 11th, 13th to 17th, and 19th to 25th. The mean warmest station during January was Komatipoort, with a temperature of 80.5 degrees, and the mean coolest Belfast, with 63.0 degrees, a difference of 17.5 degrees. The extreme temperatures registered during the month were 112.0 degrees at Clanwilliam on the 31st, and 33.0 degrees at Belfast on the 25th, a range of 79.0 degrees.

Precipitation in excess of the normal was confined to a few areas of very limited extent, notably the south-west of the Cape, including the Peninsula, the neighbourhood of Knysna, Port St. Johns, and Umtata, and Durban along the coasts; inland excesses to the neighbourhood of Rustenburg and Nylstroom, where the month's totals were 2.02 inches and 3.02 inches respectively above the normal; and Heidelberg, where the surplus was only 0.03 inch. Elsewhere large shortages were experienced, ranging from 0.01 inch to more than 3 inches over the Cape; from a few tenths to about 3 inches in the Orange Free State; from $\frac{1}{2}$ inch to more than 6 inches in Natal; and from about $\frac{1}{2}$ inch to 7 inches over the Transvaal, where the shortage was greatest in the east, south-east, and south-west. Absolute drought prevailed throughout the month over large sections of the Karroos and northern border. The early portion of the month was very favourable to agriculture, light rains falling from the 1st to 12th over the south-east Cape, Natal, Orange Free State, and Transvaal. These rains were particularly favourable, falling mostly during the latter part of the evening and throughout the night, thus not interfering with the day's work. Unfortunately, this was succeeded by a spell of hot, droughty weather, relieved only by very local thunderstorms, occasionally of considerable intensity. These were occasionally accompanied by hailstorms and strong winds, which caused considerable damage to crops, buildings, etc. Even the rains in the early part of the month yielded some heavy falls, notably on the 7th in the Orange Free State, when cattle, sheep, and other animals were drowned at Modderpoort (District Ladybrand), whilst damage was caused to dams and reservoirs in the Vrede District. The other notably stormy days were the 15th, when a heavy wind caused damage to trees, roofs of houses, etc., at Nomahasha in the Barberton District, and at Verkeerdepan, in the Carolina District, on the 22nd.

(Continued on Page 7)

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), JANUARY, 1921.

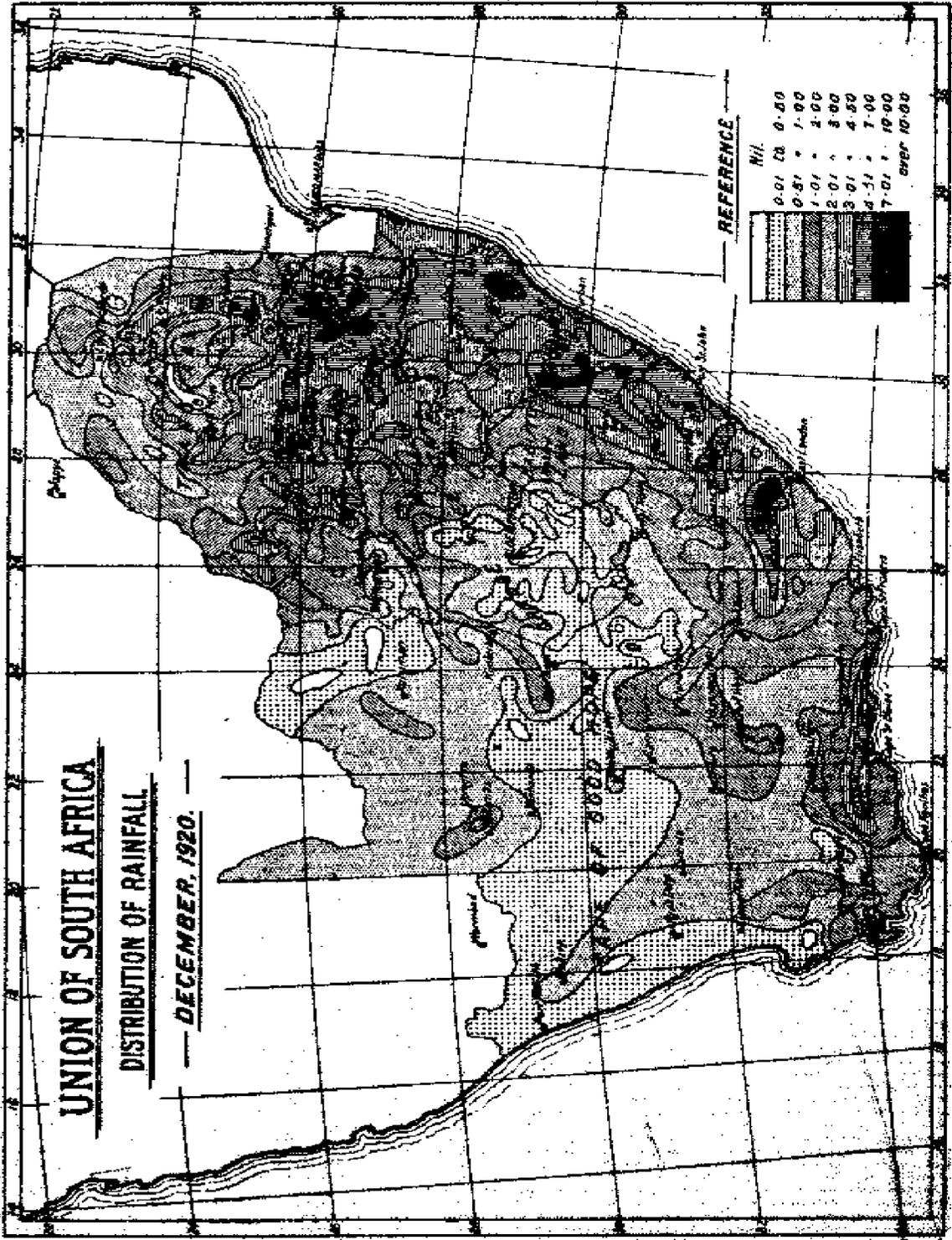
Place.	Observer.	Month.—Jan., 1921.		Normal Monthly Temperature.	Difference from Normal.	Extremes.		Date.	Date.
		Mean Max.	Mean Min.			Highest.	Lowest.		
		° F.	° F.			° F.	° F.		
<i>Freeport—</i>									
Belmont.....	The Forester.....	74.4	49.5	62.0	+ 1.0	86.0	38.0	27th.....	25th.....
Bacharach.....	W. Grubb.....	83.4	63.0	73.2	+ 0.0	100.0	66.0	21st.....	25th.....
Johannesburg (Observatory).....	The Staff.....	58.0	58.0	65.4	+ 1.2	88.9	49.8	20th & 20th.....	17th.....
Karlsdorp (Stanthmore).....	C. Scott.....	89.3	59.5	74.4	+ 0.5	96.0	49.0	27th.....	25th.....
Komatiport.....	B. J. Fohbergill.....	92.8	68.8	80.8	+ 0.3	110.0	59.0	28th.....	1st.....
Louis Trichard.....	P. A. Otto.....	81.1	70.0	70.0	+ 0.0	97.0	52.0	21st.....	20th.....
Sydenham.....	G. Baker.....	66.4	71.0	72.3	+ 0.4	93.0	53.0	27th.....	20th.....
Pietermaritzburg.....	J. A. Sutton.....	56.5	60.0	68.0	- 1.1	92.5	45.0	27th.....	20th.....
Pretoria.....	W. Franklynne.....	80.4	59.4	69.9	+ 0.8	92.0	58.0	21st.....	16th.....
Pretoria (Exp. Farm).....	The Manager.....	89.0	59.0	71.0	+ 4.4	100.0	44.0	21st.....	14th.....
Pretoria (Meteorological Office).....	The Staff.....	81.4	59.0	71.8	+ 1.8	92.1	65.2	21st.....	23rd.....
Pies River.....	J. Werner.....	77.2	57.4	67.3	+ 0.4	92.0	60.3	21st.....	17th.....
Zeerust.....	H. Dietrich.....	86.0	60.8	73.0	+ 0.8	97.7	51.2	27th.....	23rd.....
<i>Swaziland—</i>									
Mbabane.....	Swaziland Police.....	76.0	57.4	67.2	- 0.2	98.0	51.0	20th.....	16th.....
<i>Orange Free State—</i>									
Bloufontein.....	G. A. Schepers.....	83.3	58.7	73.5	+ 1.0	95.0	49.5	21st.....	23rd.....
Barklymouth.....	The Forester.....	77.0	51.0	64.3	+ 0.5	90.0	39.8	21st.....	16th.....
Indley.....	J. Collister-Dates.....	82.0	54.0	68.8	+ 0.8	92.5	46.0	21st.....	10th.....
Ladybrand.....	The Forester.....	83.4	54.3	68.8	+ 0.8	92.0	46.0	21st.....	10th.....
<i>Natal—</i>									
Durban.....	Capt. D. Black.....	80.5	68.0	74.2	- 2.4	89.4	60.6	27th.....	22nd & 23rd.....
Laundee.....	West Thorold.....	82.8	56.7	69.8	- 2.6	98.0	51.0	27th.....	15th & 23rd.....
Elabala.....	The Gaoler.....	83.4	64.1	73.8	- 0.6	98.0	59.0	3rd & 5th.....	22nd & 23rd.....
Martinsburg (Mental Hospital).....	The Superintendent.....	80.7	61.0	70.8	- 2.5	95.0	51.0	3rd.....	8th.....
<i>Cape—</i>									
Allival North.....	A. Alcock.....	86.7	54.0	70.8	+ 1.2	94.5	43.0	18th & 26th.....	14th.....
Bedford.....	T. C. Hall.....	81.4	55.5	68.4	+ 1.2	102.0	44.0	26th & 31st.....	26rd.....
Carnarvon.....	A. P. Malherbe.....	86.0	59.5	71.2	- 2.3	97.0	42.0	31st.....	18th.....
Cape Town (Royal Observatory).....	The Staff.....	77.2	58.8	68.0	- 1.3	97.8	62.8	31st.....	10th.....
Cherwilliam.....	W. J. Downes.....	89.8	57.8	73.0	- 2.0	112.0	48.0	31st.....	22nd.....
East London.....	M. G. Grogan.....	75.7	62.8	69.2	+ 0.8	86.0	55.0	31st.....	25th.....
Graaf-Reinet.....	S. E. D. Treadwell.....	88.0	59.5	74.2	+ 0.7	103.0	48.0	31st.....	23rd.....
Groot-Prakteslein.....	Lionel Baker.....	81.7	57.0	69.0	- 0.6	102.4	49.5	31st.....	16th.....
Kokstad.....	H. D. Coyte.....	79.2	53.4	66.3	- 0.1	94.0	44.0	19th.....	24th.....
Kimberley.....	J. Aetou.....	93.1	61.0	77.4	+ 1.0	102.0	58.0	26th.....	14th.....
Moskely (Convent).....	The Mother Superior.....	89.0	60.0	75.0	+ 0.6	100.1	49.0	22nd.....	14th.....
Mosses Bay (Cape St. Blaize).....	The Lightkeeper.....	75.5	62.0	68.8	- 1.0	91.0	65.0	24th.....	21st.....
Murraysburg.....	A. Cameron.....	87.3	54.6	72.5	- 1.9	99.9	45.0	25th, 26th, & 31st.....	23rd.....
<i>O'kepp—</i>									
Port Elizabeth.....	J. Barrows.....	84.0	56.4	70.2	+ 0.0	97.0	45.0	30th.....	18th.....
Port St. Johns (Cape Hermes).....	J. E. Allen.....	74.0	61.7	67.3	- 2.1	81.0	56.0	24th & 31st.....	19th.....
Queensdown.....	The Lightkeeper.....	76.2	65.0	70.9	+ 0.3	83.0	58.0	2nd.....	22nd.....
Wyburg.....	H. Holley.....	87.8	57.4	72.4	+ 3.0	101.0	49.0	26th.....	23rd.....
Wyberg (Convent).....	Chas. Ruttler.....	83.0	60.4	76.0	+ 0.7	101.0	80.0	26th.....	15th & 17th.....
The Mother Superior.....	The Mother Superior.....	76.0	58.7	67.3	+ 0.4	92.2	54.2	31st.....	11th.....

RAINFALL, JANUARY, 1921.

PLACE.	OBSERVER.	Month.	Normal.	Difference from Normal.	From	Normal.	Difference from Normal.
		Jan. 1921.			1st July, 1920.		
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
<i>Transvaal—</i>							
Barberton.....	W. Grubb.....	2.11	0.12	- 7.01	18.03	21.02	- 3.00
Belfast.....	The Forester.....	2.55	6.41	- 8.86	20.42	21.26	- 0.84
Bethal.....	H. F. Joubert.....	2.25	5.65	- 3.40	18.75	21.07	- 2.32
Ermelo.....	Mrs. S. M. Nicolson..	1.82	5.60	- 3.78	28.12	21.29	+ 6.83
Heidelberg.....	W. A. ter Horst....	4.70	4.73	+ 0.03	18.24	17.64	+ 0.60
Johannesburg (Observatory).....	The Staff.....	4.77	5.44	- 0.67	19.01	17.31	+ 1.70
Klerksdorp (Strath- more).....	C. Scott.....	1.27	4.40	- 3.13	10.25	12.62	- 2.37
Komatipoort.....	B. J. Pothergill....	3.48	5.00	- 1.52	18.35	14.28	+ 4.07
Louis Trichardt.....	P. A. Otto.....	6.03	6.40	- 0.37	—	—	—
Middelburg.....	Dr. Spencer.....	1.35	5.31	- 3.96	10.27	15.00	- 4.73
Nylstroom.....	G. Bakker.....	7.98	4.96	+ 3.02	18.27	14.08	+ 4.19
Pietersburg.....	W. Frankleyne.....	2.36	4.46	- 2.10	18.84	18.08	+ 0.76
Piet Retief.....	J. Werner.....	3.35	8.40	- 5.05	21.87	24.10	- 2.23
Pilgrims Rest.....	J. A. Stirton.....	3.63	8.56	- 4.93	19.21	22.61	- 3.40
Potchefstroom (Ex- perimental Farm).....	The Manager.....	2.21	4.07	- 1.86	9.37	14.77	- 5.40
Pretoria (Meteo- rological Office).....	The Staff.....	3.52	6.33	- 2.81	16.84	18.05	- 1.21
Rooiberg.....	N. H. Munro.....	4.99	6.47	- 1.48	14.90	16.42	- 1.52
Rustenburg.....	S. A. Pollock.....	7.47	5.45	+ 2.02	20.05	16.40	+ 3.65
Wakkerstroom.....	E. le Roux.....	2.00	6.00	- 4.00	—	21.05	- 19.05
Woodbush.....	The Forester.....	14.84	18.38	- 3.54	34.11	43.47	- 9.36
Zeerust.....	H. Dietrich.....	4.00	4.83	- 0.83	11.94	13.61	- 1.67
<i>Swaziland—</i>							
Mbabane.....	Swaziland Police...	0.31	10.00	- 9.69	28.07	31.42	- 3.35
<i>Orange Free State—</i>							
Bloemfontein.....	G. A. Schepers.....	1.08	2.48	- 1.40	7.25	10.11	- 2.86
Bethulle.....	J. J. Wardhaugh...	0.82	2.76	- 1.94	4.34	9.28	- 4.94
Harrismith.....	J. B. Patterson.....	1.89	4.82	- 2.93	16.24	17.96	- 1.72
Kroonstad.....	S. R. Northfield...	2.77	3.00	- 0.23	12.64	15.27	- 2.63
Ladybrand.....	G. Stokes.....	3.48	4.61	- 1.13	13.58	16.59	- 3.01
Lindley.....	J. Collier-Oates...	3.98	4.11	- 0.13	13.17	14.50	- 1.33
<i>Natal—</i>							
Dundee.....	West Thorrold.....	2.23	6.19	- 3.96	16.33	19.51	- 3.18
Durban (Point).....	Capt. D. Black.....	6.15	4.11	+ 2.04	23.80	23.56	+ 0.24
Hiabisa.....	The Gaoler.....	5.38	7.46	- 2.08	23.26	23.30	- 0.04
Howick.....	The Gaoler.....	4.34	5.11	- 0.77	21.76	19.42	+ 2.34
Ladysmith.....	D. A. B. Leathers...	2.47	4.67	- 2.20	12.01	15.93	- 3.92
Pietermaritzburg (Mental Hospital).....	The Staff.....	3.64	5.21	- 1.57	22.66	20.26	+ 2.40
Vryheid.....	The Gaoler.....	1.71	3.03	- 1.32	15.23	25.02	- 9.79
Worcester.....	The Gaoler.....	2.54	3.24	- 0.70	14.32	16.22	- 1.90
<i>Cape—</i>							
Alwal North.....	A. Alcock.....	1.21	2.09	- 0.88	5.10	11.01	- 5.91
Beaufort West.....	The Gaoler.....	0.08	1.14	- 1.06	8.51	4.87	+ 3.64
Bedford.....	T. O. Hall.....	2.70	3.32	- 0.62	18.18	15.66	+ 2.52
Bristow.....	The Gaoler.....	0.10	1.08	- 0.98	2.08	4.43	- 2.35
Calvinia.....	The Gaoler.....	0.13	0.14	- 0.01	5.90	3.59	+ 2.31
Capetown (Royal Observatory).....	The Staff.....	0.77	0.68	+ 0.09	17.35	13.57	+ 3.78
Ceres.....	A. Heald.....	1.65	1.02	+ 0.63	20.30	24.62	- 4.32
Camarcum.....	A. F. Matherbe.....	0.15	1.03	- 0.88	2.30	4.33	- 2.03
Chamwilliam.....	W. J. Downes.....	0.08	0.19	- 0.11	7.47	4.55	+ 2.92
East London.....	A. Downie.....	2.51	3.12	- 0.61	12.35	13.71	- 1.36
Fraserburg.....	The Gaoler.....	0.00	0.74	- 0.74	2.63	2.80	- 0.17
Garies.....	The Gaoler.....	0.00	0.11	- 0.11	4.20	2.85	+ 1.35
Grass-Robert.....	S. E. D. Treadwell..	0.43	1.42	- 0.99	5.26	7.30	- 2.04
Oriskany.....	The Gaoler.....	0.32	1.22	- 0.90	3.42	5.28	- 1.86
Roosboom.....	The Gaoler.....	0.00	1.05	- 1.05	1.47	5.79	- 4.32

RAINFALL, JANUARY, 1921 (continued).

PLACE.	OBSERVER.	Month.	Normal.	Differ- ence from Normal.	From 1st July, 1920.	Normal.	Differ- ence from Normal.
		Jan., 1921.					
<i>Cape—contd.</i>		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Hope Town.....	The Gaoler.....	0·00	1·95	— 1·95	0·67	5·88	— 5·21
Kenhardt.....	The Gaoler.....	0·00	0·68	— 0·68	1·93	2·09	— 0·16
Kimberley.....	J. Acton.....	0·36	2·43	— 2·07	4·85	8·16	— 3·31
Kraysna.....	The Gaoler.....	2·12	1·96	+ 0·16	15·26	17·45	— 2·19
Koistad.....	H. D. Coyte.....	2·64	4·51	— 1·87	12·55	16·27	— 3·72
Kuruman (Abtonia)..	A. T. Sitwell.....	0·62	3·69	— 3·07	3·54	8·80	— 5·26
Mafeking (Convent)..	The Mother Superior	2·16	3·98	— 1·82	11·78	12·80	— 0·52
Mossel Bay (Cape St. Blaise).....	The Lightkeeper....	0·48	1·09	— 0·61	7·25	9·67	— 2·42
Murraysburg.....	A. Cameron.....	0·00	1·18	— 1·18	2·20	4·88	— 2·68
O'okiep.....	J. Burrows.....	0·11	0·23	— 0·10	4·02	3·55	+ 0·47
Philippstown.....	The Gaoler.....	0·00	1·77	— 1·77	1·61	6·47	— 4·86
Piquetberg.....	The Gaoler.....	0·81	0·54	+ 0·27	14·51	11·94	+ 2·57
Port Elizabeth.....	J. E. Allen.....	0·95	1·12	— 0·14	6·73	13·49	— 6·76
Port St. Johns (Cape Hermes).....	The Lightkeeper....	5·04	4·85	+ 0·19	22·59	29·14	— 6·55
Prieska.....	The Gaoler.....	0·00	1·31	— 1·31	0·94	3·80	— 2·86
Queenstown.....	H. Holley.....	1·63	3·33	— 1·70	8·90	11·94	— 3·04
Steytlerville.....	The Gaoler.....	0·70	0·96	— 0·26	5·14	4·76	+ 0·38
Sutherland.....	The Gaoler.....	0·18	0·48	— 0·30	5·33	4·34	+ 0·99
Swellendam.....	The Gaoler.....	1·38	2·57	— 1·19	12·88	18·78	— 5·90
Umtata.....	A. Dixpeck.....	3·50	3·48	+ 0·02	11·99	14·56	— 2·57
Uniondale.....	The Gaoler.....	0·10	0·73	— 0·63	4·97	7·44	— 2·47
Uppington.....	The Gaoler.....	0·05	0·86	— 0·81	0·94	2·86	— 1·92
Victoria West.....	The Gaoler.....	0·00	0·97	— 0·97	1·55	4·10	— 2·55
Vryburg.....	Chas. Butler.....	2·23	4·30	— 2·01	3·04	10·16	— 7·12
Worcester.....	The Gaoler.....	0·16	0·27	— 0·11	6·35	7·04	— 0·69
Wynberg (Convent)..	The Mother Superior	1·02	1·61	— 0·49	32·21	27·87	+ 4·34



UNION OF SOUTH AFRICA

DISTRIBUTION OF RAINFALL

— DECEMBER, 1920. —

REFERENCE

Shading Pattern	Reference Range
Horizontal lines	0.01 to 0.50
Vertical lines	0.51 to 1.00
Diagonal lines	1.01 to 2.00
Dotted pattern	2.01 to 3.00
Cross-hatch pattern	3.01 to 4.50
Solid black	4.51 to 7.00
White	7.01 to 10.00
	over 10.00

when hail and wind wrought havoc with crops, houses, small stock, etc., at various places in the Orange Free State and Transvaal; destructive hailstorms were also experienced on the 23rd, 28th, and 29th at various stations in the Transvaal. A severe hailstorm on the 11th, in the Tyumie valley, wiped out tobacco, beans, and mealies along a narrow belt, whilst the subsequent heavy rain brought the river down suddenly, causing a native to be drowned near Lovedale. The most severe hailstorm of the season at Mbabane occurred on the 13th, at 11.50 a.m. In consequence of these conditions, agricultural reports this month are of the gloomiest description—veld dried up, crops (particularly mealies) burned up or partially destroyed, and even dams and vleis dried up, with rivers down to the normal winter flow. From a few areas come brighter descriptions of harvesting prospects, particularly from Pigeonhole (Zoutpansberg), where the month is described as one of the finest experienced, with crops promising a record harvest, while reports from Rustenburg and Heidelberg are also good. In practically all other parts of the Transvaal prospects for winter feed for cattle are considered very poor, particularly in the south-western Transvaal; at Bellsbank, in the Zoutpansberg, it is considered practically a certainty that there will be a famine amongst the natives. In Swaziland, the native mealie crop is stated to be a complete failure, the crops on the flats and low veld to be dying, and all middle veld crops wanting rain badly. The neighbourhood of Mbabane seems to be an exception, the country there being reported as looking excellent. In the Orange Free State, conditions were fairly good in the north-eastern portion, but drought was severe in the central, southern, and western parts of the province. Rust is reported in wheat and oats in Vrede District. In Natal, conditions were very unfavourable, crops and veld withering up, so that cattle were falling off in condition in some parts. In Zululand, the month was favourable to crops. In the Cape Province, unseasonably cold, wet weather was experienced over the south-west, to the detriment of the fruit crops. Droughty conditions prevailed practically all over the summer-rainfall area, with the result that mealie crops have been spoilt, the veld dried up and parched, and rivers almost ceased flowing even along the usually well-watered south coast. The cumulative rainfall since 1st July, 1920, still shows an excess over the south-west and west of the Cape, the west of the northern Karroo, and the east-central Karroo. Surplus amounts of 2-5 inches are also met with between Durban and Howick. A precipitation in excess of the normal for the period is confined in the Transvaal to a few stations in the south-east, centre, and north-west. In Swaziland, there is an excess of more than 6½ inches at Mbabane. In all other parts of the Union there is a considerable deficit, ranging from 1-7 inches over the Cape, but mostly between 3 and 5 inches; generally 2-3 inches in the Orange Free State; about 3 inches in Natal, but falling to -9.19 inches at Vryheid; usually 2-4 inches over the Transvaal, but amounting to 9.36 inches at Woodbush.

OBSERVERS' NOTES FOR JANUARY, 1921.

TRANSVAAL.

Pietersburg.—A week of misty rain in early portion of month; hot, dry winds from N.N.W. Violent thunderstorms afternoon 30th, accompanied by vivid lightning; house and tree struck in town. Rainfall only local; district crops in bad way.—J. Frankleyne

Strathmore Estate (Klerksdorp).—Very hot, dry month.—C. Scott.

Herberton.—The rainfall has been very deficient during the month, and crops are suffering. The thunderstorm on the 27th was responsible for the death of a native woman in the valley.—Walter Grubb.

Pigeonhole (Zoutpansberg).—One of the finest Januarys we have had here. Crops look splendid, and promise to be a record; rains fell generally during

the night, and very little interruption to work has been the result. Rainfall: 7.88 inches on twenty-one days.—Jno. McCallum.

Mosdene (Waterberg).—A long, dry spell, extending from the 11th to the 28th, adversely affected the younger crops, the light rain on the 22nd being insufficient to do more than destroy the mulch. This was followed by a hail-storm on the 28th, with hailstones from the size of a cherry to a walnut, which destroyed the greater portion of the bean and potato crops and severely damaged mealie plants. Rainfall: 5.59 inches on eleven days.—Ernest E. Galpin.

Wakkerstroom.—Very dry month; crops suffered in some parts very badly. The rain on the 30th did not do much good, as it fell too hard to sink in properly. Cattle are still doing well.—Louis le Roux.

Rustenburg.—Splendid rains fell the beginning of the month, but dry towards middle and end. Rain badly needed. Cattle in good condition; veld good. Crops looking well; fruit crop good. Rivers and streams running strong.—Sergt. H. J. Streatfield.

Krugersdorp.—Good rains fell at the beginning of the month, mostly overnight, and continued for six successive days. On the 22nd a terrific dust-storm, doing a fair amount of damage, was experienced at about 5 p.m., lasting about twenty minutes, the town being completely enveloped in dust. Rainfall: 6.23 inches on twelve days.—G. S. Garnett.

Lichtenburg.—Dry, hot month; poor prospects for mealie farmers, due to drought. Rainfall: 1.57 inch on eleven days.—J. T. Allman.

Nomahasha (Barberton).—15th: Fierce wind; some trees uprooted. Hail for five minutes; half inch stones; fruit spoilt.—Norman Burley.

Davel (Bethal).—28th: Severe hail, doing a lot of damage.—H. A. Wollenberg.

Verkeerdepan (Carolina).—15th: Hurricane blowing; several roofs blown off.—D. E. King.

Sebastian (Ermelo).—Dry, hot weather; veld went off badly; crops also suffered.—G. A. Smits.

Heidelberg.—22nd: Very severe hailstorm, causing great damage to crops and fruit.—J. Daniels.

Modderfontein (Heidelberg).—Crops good.—S. Obree.

Schoonoord (Lichtenburg).—Severe drought. Crops: mealies, only a little sown, and these very dry.—A. Snodgrass.

Klippan (Lichtenburg).—Mealies are reduced by 30 per cent. No grass anywhere for stock; showers mostly over southern portion of farm; northern portions getting less than half. All pans and dams quite empty. Pumpkins, beans, and forage crops destroyed.—P. H. Fischer.

Mimosa (Lichtenburg).—It is terribly dry, and prospects are gloomy; mealie crops almost wholly burned up; farmers trekking for veld; stock in poor condition.—P. M. Prinsloo.

Malmaniocg (Marico).—A very bad month for the farmer, arable and pastoral.—J. C. Gubbins.

Bonnieburn (Potchefstroom).—Crops in a very bad state, about 50 per cent below normal.—N. C. S. McMaster.

Elandsfontein (Potchefstroom).—The rain came in time to save two-thirds of the crops in some places, in others only one-third; poor lookout for the farmers.—P. Davidtz.

Buckingham (Potchefstroom).—Maize crop suffered very badly from hot winds, 13th to 31st.—I. H. Boardman.

Eleazar (Potchefstroom).—30th: Hail did some damage to fruit and towns.—W. J. Jooste.

Lynwood (Pretoria).—22nd: 2.25 inches in two and a half hours, with heavy hail, which destroyed crops. Damage estimated at £100.—F. Berman.

Cyferbult (Rustenburg).—23rd: Verv hot and dry; crops beginning to suffer.—F. Kingsley Hine.

Rooikoppen (Standerton).—Gall-sickness in cattle prevalent.—J. Wilson.

Wolwespruit (Standerton).—Crops suffering from drought.—E. Lampert.

Paardekop (Standerton).—The month was very dry, and the crops are looking bad.—P. B. du Plessis.

Springs (Witwatersrand).—23rd: Crops badly damaged by hail.—A. Dalziel.

Kromdraai (Witwatersrand).—Drought severe; crops practically all failures.—W. Frost.

Klipfontein (Wolmaransstad).—The driest month experienced here; very warm weather, with westerly winds.—S. v. Heerden.

Bellsbank (Zoutpansberg).—Unless rain comes soon, mealie crop will be very bad, and famine amongst natives is almost sure.—H. van Heerden.

SWAZILAND.

Transvalia.—Crops need rain.—H. Coates.

Matapa.—Mealies on flats and all crops in low veld reported to be dying rapidly. Crops on middle veld—mealies, corn, and cotton—want rain.—A. Terrens.

McCreeedy.—Crops looking well, but would be better for a good soaking rain. Cattle fat and healthy.—J. W. Reilly.

Croydon.—All the crops wanting rain badly, and a lot burned off.—Alex. Brown.

Natalia.—No rains of any practical value have fallen during the month, with the result that the veld is exceedingly dry and in places almost barren; the grass generally almost as brown as in winter; the native mealie crops a complete failure. The ranch mealie fields have been planted a third time—almost too late to ripen. The rivers are all abnormally low, even the Great Usutu is gradually falling towards its winter level. Unless good steady rains set in during February, the position will be serious, and the winter grazing exceedingly poor. Even the larger trees show signs of wilting.—Allan W. MacBeth.

Mbabane.—Country in general looking excellent. The severest storm as yet this season passed over Mbabane at 11.50 a.m. on the 13th, accompanied with quite a quantity of hail the size of pigeon eggs; rain registered 1.90 inch during the storm, which lasted one and a half hour.—R. C. S. Markham.

ORANGE FREE STATE.

Modderpoort (Ladybrand).—The heavy rain on the 7th caused considerable damage; seven cattle, a few sheep, and other animals were drowned. There were washaways on the railway.—H. H. Firkins.

Smithskraal (Boshof).—Rainfall quite insufficient; drought still severe in whole district.—K. Leo.

Newlands (Fouresmith).—Drought awful.—J. Lombard.

Stanley Vale (Harrismith).—Earlier part of the month very dry; teff dying from drought; hail stripped mealies, and the oats knocked down flat.—A. E. Atkins.

Klipfontein (Heilbron).—The rain on the 7th caused heavy losses in sheep. On the 22nd there was much rain and terrific wind; stable roof carried bodily away 150 yards; every Kafir hut blown down. Five hundred and eighty sheep were lost on adjoining farm.—E. Wallace.

Newlands (Hoopstad).—22nd: Severe hailstorm; stones as large as guinea-fowl's eggs, killing fowls and damaging mealie crop and fruit.—N. G. Meyer.

Doornkraai (Vredesfort).—22nd: Hail of large size; slight damage to crops.—P. Steyn.

Beeley (Wiesburg).—Drought very severe; crops burned up.—R. Johnston.

Paardekraal (Winburg).—No grass for cattle, which are suffering in consequence. Sheep good condition; no deaths; mealie crop dead; no teff germinated yet; conditions and outlook for winter very serious.—G. S. Lowe.

Jansdeel (Harrismith).—We have had most extraordinary weather: good average rain in the beginning of the month, then setting off to dry and hot weather with no rain; the heat at highest 93 degrees in shade—a record for this part. The crops are looking very well, but want rain badly, otherwise they will become a total failure. With early rain we may still reap average or normal crop, except oats, which are scarce.—J. Uijs.

Sterkstroom (Boshof).—Month was exceedingly warm, with only a few scattered showers over the district; stock in fair condition; the few mealies sown are not promising.—J. B. Moolman.

Zandoog (Frankfort).—Getting dry; rain wanted; crops good.—A. G. Purves.

Springbokvlakte (Vredefort).—In spite of the month's rain (5.48 inches), crops and grass are very poor.—M. E. Brindley.

Rugby (Bethlehem).—The storm of rain early in the morning of the 9th was peculiar. There was one blinding flash of lightning, followed by thunder, and then the rain fell. No further lightning or thunder was observed. All stock in good condition; crops promise to be above the average, though the second hatching of the borer grub is now due and, it is feared, may do considerable damage. All rains have fallen after 4 p.m., with the exception of that on the 9th, and came after days of fierce heat, which caused fear of hail. All rainstorms during the month have followed the same course: rising over the Drakensberg, they have travelled east to west until the Wilge River has been struck, when the storms have followed the river's course, south to north, until meeting the Liebenbergsvlei, when that river's course has been followed north to south—until directly opposite the locality on the Wilge River when rain first fell, when the storms have left the Liebenbergsvlei and crossed country to the Wilge River again, and in doing so crossed this farm, when we got the rains. One storm was observed to complete the above circle three times in succession in one day.—A. C. Glynn-Baker.

Tweelingskop (Bethlehem).—7th: Hail damaged crops.—E. Rupinsberg.

Prospect (Boshof).—Getting dry, although stock keeping well on account of still having a lot of last year's grass, intermingled with green grass.—J. M. Wessels.

L'Esperance (Ladybrand).—Veld almost dried up; crops (mealies, etc.) suffering a good deal.—C. E. Maitin-Casalis.

Alma (Ladybrand).—Very hot month, with incessant strong winds, which dried up the crops in most cases.—H. W. Stockdale.

Morgenrood (Ladybrand).—Terrible month; mealies dying.—B. Jackson.

Woudzicht (Vrede).—Owing to the heavy rains in the beginning of the month, a good deal of damage was done to reservoirs, and also caused rust in wheat and oats.—I. N. Köhler.

Welvaart (Vrede).—Crops fair.—S. W. Beukes.

NATAL.

Lady Smith.—Very welcome rains during first eleven days of the month, followed by an extremely hot dry spell, with only one light shower during the remainder of the month. Country very dry, and crops on the farms in this district are withering up badly. Mealies are being attacked by grub, and unless rain falls very soon, the mealie crop hereabouts will be very poor. Stock still in fair condition, but grass is drying off badly and becoming scarce.—D. A. R. Leathern.

Dundee.—A most trying month for the farming community; crops and veld failing badly.—West Thorrold.

Rongpoort (Klip River).—End of month very dry ; bad outlook for winter crop for feeding.—J. H. Bartholomew.

Edendale (Ladysmith).—Very hot month ; drought very acute in this area, and all early mealies, potatoes, etc., gone in ; late crops still holding ; all stock in good condition.—T. P. Niland.

Mfongosi (Umvoti).—Drought very severe ; crops ruined.—W. E. Jones.

Balbrogie (Klip River).—11th : Hail did a little damage.—J. C. Henderson.

Carwin (Umgeni).—Very hot and dry ; crops suffering.—M. Geerdts.

Hlabisa.—Nice rains fell during the month, and the weather very favourable for crops.—L. Double.

Cape St. Lucia.—Hot weather throughout month ; cattle are falling off in condition.—J. Murphy.

CAPE.

Graaff-Reinet.—Winds light and generally southerly ; very little rain, which is urgently needed.—S. E. D. Treadwell.

Groot Drakenstein.—Cold and almost wintry conditions prevailed up to the middle of the month, and about as bad as it could be for the fruit crop, the high winds and rains doing considerable damage. In the last twenty-three years there have only been two lower means registered, viz., 67.5 degrees and 68.5 degrees in 1901 and 1902 respectively. Sunshine the lowest so far recorded for January, and cloudiness the highest since 1901.—Lionel Baker.

Kokstad.—Very dry.—H. D. Coyte.

Murraysburg.—No rain during the month, and several parts of the district are dry.—A. Cameron.

Mafeking (The Convent).—Rain almost every day for the first two weeks ; very hot for the remainder of the month.—Mother Superior.

Queenstown.—Month of dry, hot winds ; rain badly needed ; veld scorched up.—H. Holley.

Lovedale.—The month opened well for crops after December rains, and continued cool until the 18th. Only one day was hot (92.0 degrees on 11th) before this. A hot spell from 18th to 20th yielded a little compensating rain, but a hotter one from the 24th to 26th was very dry, and the month closed hot and dry. On the 11th there was a terrific storm higher up the Tyumie valley. The hail wiped out tobacco, beans, and mealies along a narrow belt of country, and heavy rain followed, bringing the river down suddenly and drowning a native at a drift near Lovedale.—C. A. Pilson.

Grahamstown.—Owing to lack of rain, conditions resemble those of November, 1920. The veld is dry and parched, and hundreds of mealie fields have been ruined. Unless we get rain in February, the position will be exceedingly serious. Sour "mimosa" is being attacked by a large blue-green caterpillar. Fleas in abundance in stockyards.—The Veterinary Research Officer.

Jansenville.—Excessive heat ; no rain.—Geo. E. Hurter.

Uitenhage.—Hot, dry month ; drought severe ; rivers almost ceased flowing.—Herbert Inggs.

Willowmore.—Typhus is reported from Winterhoek.—Mrs. Beatrice Maude Hemens.

Ceres.—Weather generally very changeable, and cooler than usual ; heavy dews.—A. Heatlie.

Somerset East.—The early summer rains of December were succeeded by a dry January ; mealie crops, half grown, have suffered badly ; mild water restriction again enforced by municipality.—C. Harris.

Riverdale.—Rain is much needed.—Rev. Carl Prozesky.

Eisenberg.—Comparatively mild weather prevailed throughout the month. The maximum temperature recorded was 101.2 degrees on the 3rd : this is the highest maximum temperature recorded during the past year. The minimum

temperature was 47.2 degrees on the 25th; 1.52 inch of rain fell, as against a normal of 0.85 inch.—D. Cuthbert.

Abtonia (Kuruman).—Hot and dry; rain badly wanted; stock still doing well; several cases of anthrax in district.—A. T. Sitwell.

Lisburn (Barkly East).—From the beginning of the month till the 10th we had good rains; the following week we had frost on two nights, killing all vegetable gardens in the vicinity.—O. A. S. Vorster, J.P.

Woodlands (Kingwilliamstown).—Heat excessive; crops burned up; rivers and dams drying up again.—S. P. Landrey.

MARCH WEATHER CHARACTERISTICS.

In the Transvaal the rainy season is now declining, and the precipitation is not so heavy as during the three preceding months. Wet spells, however, with soft rains lasting several days, sometimes occur. Over the remainder of the Union there is a general increase on the February rainfall, the normal rising to a maximum over the Cape northern border and on the north and central Karroo, and to a secondary maximum in the north-east and south-east of the Cape, in the Orange Free State, Zululand, and Swaziland. In Zululand about 6.0 inches; in Swaziland, 5.5 inches; in Basutoland, 5.0 inches; in Natal 4.5 inches; over the Transvaal, Kaffraria, and in the north-east of the Cape Province, 4.0 inches; over the Orange Free State and in the south-east of the Cape, 3.5 inches; over the Cape northern border, 3.0 inches; over the north and east-central Karroo, 2.5 inches; along the south coast, 2.0 inches; over the west-central and south Karroo and the Cape Peninsula, 1.5 inch; and in the south-west of the Cape and along the east coast, less than 1.0 inch may be expected. Thunderstorms are still of frequent occurrence.

Throughout the Union the mean daily temperature is falling. It may be expected to reach about 73 degrees over the northern border of the Cape and the south Karroo; 72 degrees in Natal; 70 degrees over the east-central Karroo; 69 degrees along the west coast and in the south-west of the Cape; 68 degrees along the south coast and in the south-east of the Cape; 67 degrees in the Orange Free State and on the Transvaal high veld, the north Karroo, and the Cape Peninsula; 66 degrees in Kaffraria; 65 degrees over the north-east of the Cape; 64 degrees in Basutoland; and 62 degrees over the west-central Karroo. Hoar-frost with even an occasional killing frost is apt to occur, especially during the last third of the month.

Over the summer-rainfall area there is a general decreased frequency of all winds having an easterly component (that is, from N.N.E. to S.S.E. inclusive), and an increase of those having a westerly component. Although this statement is strictly true for Johannesburg, where the greatest increased frequency is in those from N.N.W., it requires a slight modification with regard to the Kimberley winds, where there is also a diminution of those from due west; whilst at East London the diminution in frequency extends to winds from N., N.N.W., and S.S.W., with, on the other hand, a marked increase of winds from N.E. Over the Cape Peninsula there is, coincident with a considerable decrease of southerly winds, an increase of winds from S.E. and S.S.E., as well as of most winds having a westerly component. Except at Johannesburg, where there is a slight increase in velocity, winds show a decrease in force over the country.

Coincident with the diminution in strength of wind over the Cape Peninsula, there is a tendency to the formation of low-lying fogs over the south-west, but within the summer-rainfall zone the quantity of cloud should be noticeably diminishing, and over the Transvaal and the Cape northern border the number of hours of bright sunshine is about 75 per cent. of the total number possible.

C. STEWART,

Chief Meteorologist.

Pretoria.



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

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MEAN barometric pressure lower than usual over the western half of the Union ; but practically normal in the east and north-east : a mean monthly temperature one degree higher than usual on the whole, but sub-normal over the Orange Free State, Bechuanaland, and central Transvaal ; an alternation of hot and cold spells, with some exceptionally warm days ; " wintry " weather over the west and south-west Cape ; an excess of rainfall over the western half of the Cape, with a deficiency over the east of the Cape, Free State, Transvaal, and greater part of Natal ; frequent thunderstorms, a few hailstorms, and one or two destructive local windstorms, were the most noteworthy features of the weather of February, 1921.

Pressure.—Mean barometric pressure for the month was about 0.05 inch less than usual over the west, south, and centre, and about normal over the north-east and Rhodesia. The equatorial " low " pressure was present practically throughout the month, whilst " high " pressure areas appeared only on the 12th on the south coast, and from 22nd to 24th, moving from south to east. The axis of the low pressure area was practically normal this month.

Temperature.—The mean temperature for the month over the Union was 71.6 degrees, or 1.0 degree higher than usual. This excess was mainly due to the minimum or night temperatures (61.2 degrees) being 1.7 degree above the normal, whilst the day temperatures (81.9 degrees) were only 0.3 degree above the average. The excess in mean monthly temperature was largest over the Cape Province, where (with 72.9 degrees for the month) it was 1.7 degree ; in Natal (74.9 degrees) it was 1.6 degree, and in the Transvaal (70.1 degrees) it was only 0.1 degree above the corresponding normals. Over the Free State, on the other hand, temperature (68.3 degrees) was 0.5 degree lower than usual. These differences were produced by the mean maxima over the Cape Province being 1.1 degree over the average (82.3 degrees), whilst the mean minima (62.4 degrees) were supra-normal to the extent of 2.3 degrees ; over the Transvaal the day temperatures (80.3 degrees) were cooler by 0.4 degree and the night temperatures (60.0 degrees) warmer by 0.7 degree than usual ; in Natal the days were normal, with a mean of 84.4 degrees, but the nights (with 65.4 degrees) were warmer than the average by 3.0 degrees ; in the Free State, on the other hand, the nights (57.1 degrees) were normal, but the days (with a mean temperature of 79.4 degrees) were 1.1 degree cooler than the

average. It will thus be seen that the days were considerably warmer over the Cape, normal over Natal, slightly cooler than usual over the Transvaal, and much cooler in the Free State; whilst the nights were generally warmer, except in the Free State, where they were normal. Considering the individual stations, it is found that the mean monthly temperatures were in excess over the Cape, in Natal, Swaziland, and the east, north, and south of the Transvaal. These stations form a broad belt bounding on the east and south the areas of sub-normal temperature which are found in the central and south-western Transvaal, with Bechuanaland and in the Orange Free State; these latter are separated by a wedge-shaped area of excessive temperature in the south of the Transvaal. Excess of temperature was greatest (two to three degrees) in the centre and south-west of the Cape Province, and least (less than 0.5 degree) along the east coast of the Cape and of Natal. The deficits were commonly one to two degrees, but decreased to less than half a degree in the north-central Transvaal and south of the Free State. Both maxima and minima were above the average over the south-west, the south coast, the northern Karroo, and the south-east, north-east of the Cape and Kaffraria, as well as in Zululand, Swaziland, the eastern and northern Transvaal. On the other hand, both day and night temperatures were below normal over the high veld and the south-west Transvaal and Bechuanaland. Day temperatures were lower and night temperatures higher than the usual in the central Karroo, east and west coast, Natal, the centre, south, and north-east of the Free State, and the central Transvaal, but nights were cooler and days warmer than usual in the south-east Cape, east and north-central portion of the Orange Free State, and south-central portion of the Orange Free State, and south-central Transvaal. The mean warmest station was Komatipoort, with a temperature of 82.2 degrees, and the coolest station Belfast, with 61.4 degrees, a difference of 20.8 degrees. The highest mean day temperature was 95.7 at Komatipoort, closely followed by Clanwilliam with 93.0 degrees, and the lowest night temperature 51.4 degrees at Belfast, Harrismith coming next with 53.5 degrees. Extreme maximum temperature readings were registered from 1st to 3rd, 5th to 11th, and 23rd to 28th, mostly on the 2nd, in the Transvaal and Free State, but over a diversity of dates in the Cape Province and Natal. Extreme minima for the month were recorded on 3rd to 9th, 15th, 17th to 18th, and 23rd to 27th, most widely in the Cape and Orange Free State on the 5th, and on the 25th in Transvaal and Natal. The highest reading was 108.0 degrees on the 26th at Clanwilliam, and the lowest 39.0 degrees on the same date at Belfast, an extreme range of 69 degrees over all stations.

Precipitation during the month was somewhat abnormal in distribution, and in character partaking more of the nature of "winter" rains over the west and south-west than of the usual summer type. Precipitation was in excess of the normal frequently by large amounts over the west, south, centre, and north of the Cape Province, the western portions of the Free State and Transvaal. Surplus amounts were also registered in the north-east of the Orange Free State, in the neighbourhood of Harrismith and Lindley; the eastern portions of the Transvaal high veld, Piet Reef; and the south-central portion of Natal from Durban to Weenen. A sub-normal rainfall, on the other hand, occurred over the northern and eastern Transvaal, as well as the south-east of the high veld, the major portion of Natal, the extreme north and more easterly parts of the Free State, the more easterly parts of the northern Karroo, as well as the north-east and south-east of the Cape, including Kaffraria. The excess amounts in the Cape were commonly from two to three inches, particularly over the Karroo and Bechuanaland (even Namaqualand having an inch more than usual), and reaching plus 5.31 inches at Swellendam.

over the Transvaal and Free State the surplus amounts were inclined to be somewhat lower, about $1\frac{1}{2}$ to $2\frac{1}{2}$ inches, but reaching plus 3.32 inches at Bloemfontein and 3.90 inches at Bethal; in Natal the excess nowhere exceeded one inch, except at Durban, where the excess rose to 6.94 inches. This large excess was due to a heavy fall of 7.34 inches between 5 p.m. on the 11th and 8.30 a.m. on the 12th. Over the eastern Cape, the deficits were mostly less than an inch, but amounting to 3.03 inches at Port St. Johns and 2.16 inches at Umtata, both in the Transkei; in the Orange Free State the deficiencies seem to be less than an inch, as was generally the case in Natal, except Ladysmith and Hlabisa (Zululand), where it was between 1.25 and 1.5 inch. The shortage was generally greater in the Transvaal and Swaziland than in the other Provinces, varying mostly between $1\frac{1}{2}$ to $2\frac{1}{2}$ inches, but exceeding 3 inches at Mbabane. The weather as a whole was close, sultry, and muggy, with thunderstorms in some parts of the Union in every day of the month. As a result of this type of precipitation, the rainfall was unequal in distribution, being largely sporadic, particularly in Natal and the Transvaal, with a marked absence of those steady soaking rains so beneficial to crops. Crop reports are consequently of a rather varied nature, conditions being apparently most promising in the Rustenburg, Standerton, and parts of the Waterberg and Pietersburg Districts of the Transvaal and parts of Natal and the centre of the Free State. Conditions generally have improved considerably over the Cape Province, but are still unsatisfactory over the greater part of Natal, Swaziland, the east of the Free State, as was the greater portion of the low and middle velds of the Transvaal. Taken as a whole, the crops and veld did not promise at all well at the end of the month, having been too adversely affected by the drought of January.

The cumulative rainfall since 1st July last year is in excess of the normal in the west, south-west, south-east, and southern and central Karroos, and the western part of the northern Karroo, at Mbabane in Swaziland, Mafeking and a few stations in the centre and west of the Transvaal, the centre of the Free State, and at Durban (Natal), where it is plus 12.16 inches. Elsewhere there is a deficient rainfall, particularly in the north of Natal, the eastern Transvaal, Transkei, and the east of the Cape, where the shortage in some cases rises to between six and nine inches. The cumulative amounts since the beginning of the current year show a similar distribution of the excess precipitation, but affecting thus favourably a few stations in central Natal and the western Transvaal, whilst rainfall in defect also shows a distribution similar to that since 1st July, 1920. The month as a whole was free from very destructive hailstorms, mainly due to these being unaccompanied by strong winds. Such storms occurred on the 8th, 10th, 11th, and 12th, mostly in the Free State; the worst storm of this nature was reported as occurring on the 8th, about three to four miles south of Greystones (District Standerton). Although the month was unusually calm and free from strong wind, a destructive storm occurred on the afternoon of the 2nd at Willowmore (Cape Province), lasting about twenty minutes from 3.30 p.m. During this time houses, stables, etc., were unroofed, and a number of trees blown down.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), FEBRUARY, 1921.

Place.	Observer.	Month.—Feb., 1921.		Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes.			
		Mean Max.	Mean Min.				Highest.	Date.	Lowest.	Date.
<i>Trompsburg—</i>										
Bedford.....	The Forester.....	71.3	51.4	61.4	62.4	- 1.0	78.8	1st & 2nd.....	39.0	26th.
Barberton.....	Walker Grubb.....	83.8	63.9	73.8	72.4	+ 1.4	90.5	2nd.....	56.0	25th.
Johannesburg (Observatory).....	The Staff.....	74.9	55.4	65.2	64.4	+ 0.8	83.0	6th.....	47.0	24th.
Klerksburg (Strathmore).....	Chas. Scott.....	83.0	59.5	71.2	72.7	- 1.5	91.0	7th.....	54.0	5th & 25th.
Komatipoort.....	B. J. Potbergill.....	93.7	70.7	82.2	79.4	+ 2.8	102.0	2nd.....	65.0	15th & 25th.
Louis Trichardt.....	I. J. de Bruin.....	70.1	62.6	70.8	69.9	+ 0.9	86.0	3rd.....	60.0	17th, 18th, 25th, & 26th.
<i>Nelspruit—</i>										
Nelspruit.....	G. Bakker.....	80.5	61.0	71.0	71.8	- 0.8	87.0	2nd.....	51.0	25th.
Pilgrims Rest.....	J. A. Nairn.....	76.7	57.9	67.3	67.0	+ 0.3	85.5	2nd.....	50.5	25th.
Pietersburg.....	W. Franklynne.....	79.5	59.0	69.2	69.0	+ 0.4	87.0	2nd.....	52.0	25th.
Pochebroom (Exp. Farm).....	The Manager.....	84.4	58.4	71.2	69.8	+ 1.4	96.0	8th.....	52.0	25th & 26th.
Pretoria (Meteorological Office).....	The Staff.....	78.0	59.9	69.4	70.8	- 1.4	85.3	6th.....	51.4	28th.
Piet Retief.....	J. Werner.....	77.3	59.4	68.4	67.1	+ 1.3	85.0	2nd.....	52.0	25th.
Zeerust.....	H. Dietrich.....	80.6	60.8	70.7	72.5	- 2.2	92.0	8th.....	53.0	26th.
<i>Swaziland—</i>										
Masibane.....	Swaziland Police.....	77.5	59.0	68.6	66.8	+ 1.8	85.0	1st.....	54.0	24th.
<i>Orange Free State—</i>										
Bloemfontein.....	G. A. Schepers.....	80.5	59.5	70.0	71.2	- 1.2	90.8	2nd.....	49.3	5th.
Harlemouth.....	The Forester.....	73.5	53.5	63.5	64.0	- 1.1	84.0	2nd & 3rd.....	46.0	26th.
Lindley.....	J. Collister-Oates.....	80.5	56.7	68.6	68.4	+ 0.2	86.0	2nd.....	37.8	15th.
Ladybrand.....	The Forester.....	79.1	56.1	67.6	69.0	- 0.4	88.0	8th.....	47.0	5th.
Bothalia.....	J. J. Wardhaugh.....	83.6	59.8	71.7	71.9	- 0.2	92.0	28th.....	54.0	4th & 5th.
<i>Natal—</i>										
Durban (Point).....	Capt. D. Black.....	83.6	70.4	77.0	76.6	+ 0.4	87.4	11th.....	66.6	25th.
Dundee.....	West Thorrild.....	82.2	59.1	70.6	69.9	+ 0.7	93.0	2nd.....	52.0	24th & 25th.
Rhulisa.....	The Gaoler.....	86.8	68.1	77.4	73.4	+ 4.0	92.0	7th.....	64.0	23rd.
Maritzburg (Mental Hospital).....	The Staff.....	84.0	65.9	74.4	73.4	+ 1.0	99.0	3rd.....	59.5	27th.
<i>Cape—</i>										
Alfred North.....	A. Abcock.....	82.1	57.6	69.8	69.2	+ 0.6	90.0	2nd.....	45.0	5th.
Bedford.....	T. C. Hall.....	84.2	61.2	72.7	70.7	+ 2.0	101.0	1st.....	59.0	30th.
Carrarvon.....	A. P. Malherbe.....	84.0	60.2	72.1	69.4	+ 2.7	96.0	28th.....	52.0	4th & 7th.
Cape Town (Royal Observatory).....	The Staff.....	82.5	63.1	72.8	69.7	+ 3.1	99.0	24th.....	52.2	5th.
Clanwilliam.....	W. F. Downes.....	93.0	64.3	78.6	75.8	+ 2.8	108.0	26th.....	53.0	7th.
East London.....	M. G. Grogan.....	77.3	64.4	70.8	69.5	+ 1.3	84.0	5th & 8th.....	61.0	8th.
Cransh Rietnet.....	S. E. D. Treadwell.....	97.7	65.4	76.6	74.0	+ 2.6	98.8	28th.....	56.3	9th.
Gravel Brakenstein.....	Isaac Baker.....	86.7	62.9	74.8	72.6	+ 2.2	104.4	23rd.....	51.4	6th.
Kokstad.....	K. D. Coyle.....	81.5	58.0	69.0	66.4	+ 2.6	92.3	7th.....	50.3	18th.
Kimberley.....	Jno. Arton.....	86.0	62.4	74.2	75.2	- 1.0	95.0	9th, 26th, 27th, & 28th.....	53.0	5th.
<i>Transvaal—</i>										
Mabaling (Convent).....	The Mother Superior.....	82.8	60.7	71.8	72.9	- 1.1	92.8	8th.....	53.3	26th.
Mosel Bay (Cape St. Blaize).....	The Lightkeeper.....	76.9	66.5	71.7	69.6	+ 2.1	92.0	3th.....	57.0	5th.
Murraysburg.....	A. Cameron.....	84.6	59.6	72.1	69.3	+ 2.8	95.0	10th, 23th, & 28th.....	51.0	4th.
<i>Orange Free State—</i>										
O'Connell's.....	J. Burrows.....	83.7	61.0	72.8	72.2	+ 0.6	95.9	26th.....	49.0	2nd.
Port Elizabeth.....	The Lightkeeper.....	78.9	60.1	72.5	69.8	+ 2.7	103.5	1st.....	60.0	9th & 28rd.
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	77.8	67.6	72.7	72.4	+ 0.3	83.0	21st & 27th.....	63.0	9rd.
Quthobes.....	H. Holley.....	88.4	60.7	73.6	69.9	+ 3.7	98.0	2nd.....	50.0	5th.
St. Mary's.....	Chas. Britler.....	85.0	61.4	78.2	75.2	+ 2.0	95.0	7th & 9th.....	53.0	5th.
St. Mary's (Convent).....	The Mother Superior.....	82.6	62.5	72.0	68.8	+ 3.6	99.2	24th.....	53.5	5th.

RAINFALL, FEBRUARY, 1921.

PLACE.	OBSERVER.	Month. Feb., 1921.	Normal.	Difference from Normal.	From 1st Jan. 1921.	Normal.	Difference from Normal.	From 1st July, 1920.	Normal.	Difference from Normal.
<i>Transvaal—</i>										
Barberton.....	W. Grubb.....	2.40	4.60	- 2.20	4.31	13.81	- 9.30	20.43	28.61	- 6.18
Belhar.....	The Forester.....	6.51	3.80	+ 2.71	9.00	10.21	- 1.15	26.94	25.08	+ 1.88
Bethal.....	H. Joubert.....	8.36	4.46	+ 3.90	10.61	10.01	+ 0.60	25.11	26.53	- 0.42
Chasmoort.....	S. A. Pollock.....	4.70	2.00	+ 2.70	5.07	5.95	- 0.88	13.04	13.11	- 0.07
Ernselo.....	Mrs. S. M. Nicolson.....	2.60	3.89	- 1.29	4.32	9.45	- 5.13	25.62	25.18	+ 0.44
Feddlberg.....	W. A. ter Horst.....	5.29	5.05	+ 0.24	10.05	9.78	+ 0.27	23.53	22.69	+ 0.84
Johannesburg (Observatory).....	The Staff.....	2.63	4.10	- 1.56	7.40	6.63	+ 0.77	21.64	21.32	+ 0.32
Katwatorp (Strechumose).....	C. Scott.....	4.98	3.65	+ 1.33	6.25	8.05	- 1.80	15.23	16.17	- 0.94
Komatipoort.....	H. J. Rothberg.....	2.46	5.14	- 2.68	5.01	10.14	- 5.13	16.81	19.42	- 3.61
Louis Trichardt.....	L. J. de Bruin.....	4.87	6.42	- 1.55	10.90	12.82	- 1.92	21.08	25.88	- 4.80
Middelburg.....	Dr. Spencer.....	4.81	4.33	+ 0.48	6.16	9.64	- 3.48	21.06	23.20	- 2.21
Rysmooen.....	G. Bekker.....	4.25	4.25	+ 0.00	9.45	8.40	+ 1.05	19.74	18.23	+ 0.51
Pietersburg.....	W. Fraekleyne.....	6.87	4.03	+ 2.84	5.21	8.40	- 3.19	16.69	18.01	- 1.32
Piet Zeel.....	J. Werner.....	7.49	7.78	- 0.29	10.32	15.11	- 4.79	28.74	30.75	- 2.01
Phugins Rest.....	J. A. Stifton.....	3.91	6.05	- 2.14	11.12	16.34	- 5.22	26.70	30.30	- 3.60
Polkadroom (Bxp. Farm).....	The Manager.....	2.62	3.83	- 1.21	6.12	7.80	- 1.68	18.28	18.60	- 0.32
Pretoria (Meteorological Office).....	The Staff.....	6.04	5.01	+ 1.03	6.14	11.34	- 5.20	18.06	23.96	- 5.90
Rooberry.....	N. H. Muuro.....	4.64	3.38	+ 1.26	9.63	9.85	- 0.22	19.54	19.80	- 0.26
Rustenburg.....	S. A. Pollock.....	2.61	4.31	- 1.67	10.11	9.76	+ 0.35	22.69	20.71	+ 1.98
Walkerstrom.....	L. de Roux.....	5.65	4.73	+ 0.92	7.65	10.78	- 3.13	52.42	29.78	+ 2.23
Woodbush.....	The Forester.....	18.31	12.40	+ 5.91	33.15	30.78	+ 2.37	56.87	56.87	- 0.00
Zeerust.....	H. Dietrich.....	5.60	4.36	+ 1.24	9.50	9.10	+ 0.40	17.44	18.27	- 0.83
<i>Swaziland—</i>										
Mbabane.....	Swaziland Police.....	4.74	7.83	- 3.09	14.05	17.83	- 3.78	42.81	39.25	+ 3.56
<i>Orange Free State—</i>										
Bloemfontein.....	G. A. Schepers.....	6.62	3.80	+ 2.82	7.70	5.78	+ 1.92	13.87	13.41	+ 0.46
Beitrus.....	J. J. Wardhaugh.....	5.25	3.36	+ 1.89	6.07	6.12	- 0.05	9.50	12.62	- 3.02
Beersmuth.....	J. B. Patterson.....	1.90	4.09	- 2.19	7.25	8.91	- 1.66	21.60	22.04	- 0.44
Kroonstad.....	S. B. Northfield.....	3.65	2.60	+ 1.05	4.07	6.70	- 2.63	14.54	18.07	- 3.53
Ladybrand.....	G. Stokes.....	3.85	4.00	- 0.15	7.13	8.61	- 1.48	17.23	20.59	- 3.36
Lindley.....	J. Collier-Dattee.....	3.85	3.59	+ 0.26	7.78	7.70	+ 0.08	17.62	18.48	- 0.86
<i>Natal—</i>										
Dundee.....	West Thorold.....	4.36	4.70	- 0.34	6.84	10.89	- 4.05	20.89	24.21	- 3.32
Durban.....	Capt. D. Black.....	11.85	4.91	+ 6.94	18.00	9.02	+ 8.98	40.65	28.49	+ 12.16
Hlabisa.....	The Gaoler.....	3.66	5.12	- 1.46	9.04	12.58	- 3.54	26.92	33.42	- 6.50
Kowk.....	The Gaoler.....	4.27	5.05	- 0.78	8.61	10.16	- 1.55	26.03	24.47	+ 1.56
Ladysmith.....	D. A. K. Leatheren.....	3.42	4.68	- 1.26	5.89	9.35	- 3.46	15.43	20.59	- 5.16
Pietermaritzburg (Mental Hospital).....	The Staff.....	5.93	5.06	+ 0.87	8.99	10.27	- 1.28	23.01	26.41	- 3.40
Vryheid.....	The Gaoler.....	3.54	4.36	- 0.82	5.25	12.39	- 7.14	19.37	29.38	- 10.01
Weston.....	The Gaoler.....	4.77	8.94	- 4.17	8.91	9.38	- 0.47	19.06	20.76	- 1.70

RAINFALL, FEBRUARY, 1921 (continued).

PLACE.	OBSERVER.	Month.	Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1920.	Normal.	Difference from Normal.	
		Inches.									Inches.
Cape Province—											
Allval North.....	A. Alcock.....	2.54	3.43	- 0.89	3.75	6.42	- 2.67	7.64	14.44	- 6.80	
Bowfont West.....	The Gaoler.....	5.78	1.36	+ 4.42	5.81	2.40	- 3.41	9.39	5.93	+ 3.36	
Bedford.....	T. C. Hall.....	3.61	3.63	- 0.02	6.31	6.96	- 0.64	16.79	19.19	- 2.40	
Erftstown.....	The Gaoler.....	4.69	1.90	+ 2.79	4.79	2.98	+ 1.81	7.67	6.35	+ 1.32	
Calvina.....	The Gaoler.....	2.25	0.43	+ 1.82	2.33	0.37	+ 1.81	8.14	6.02	+ 2.12	
Cape town (Royal Observatory).	The Staff.....	1.36	0.59	+ 0.77	2.13	1.27	+ 0.86	18.71	14.16	+ 4.55	
Ceres.....	A. Heath.....	2.00	0.60	+ 1.40	3.85	1.02	+ 2.83	32.30	25.22	+ 7.08	
Carrarvon.....	A. P. Malherbe.....	4.03	1.21	+ 2.82	4.18	2.20	+ 1.80	6.53	4.64	+ 1.79	
Uitenhage.....	W. J. Downes.....	1.13	0.20	+ 0.93	1.16	0.48	+ 0.68	8.60	4.84	+ 3.76	
East London.....	A. Downie.....	2.87	3.40	- 0.53	5.33	6.52	- 1.14	15.13	23.11	- 7.98	
Fraserburg.....	The Gaoler.....	3.40	0.89	+ 2.51	3.40	0.24	+ 3.16	5.40	2.90	+ 2.54	
Garies.....	The Gaoler.....	1.20	0.13	+ 1.07	1.20	0.24	+ 0.96	7.35	3.69	+ 3.66	
Grass Valley.....	S. E. D. Treutwel.....	1.99	1.74	+ 0.25	2.45	3.16	- 0.71	6.13	9.04	- 2.91	
Groutown.....	The Gaoler.....	2.09	2.28	- 0.41	3.31	4.10	- 0.79	7.87	7.67	+ 0.20	
Harover.....	The Gaoler.....	1.65	2.06	- 0.43	1.65	3.73	- 2.08	3.12	7.87	- 4.75	
Heidelberg.....	The Gaoler.....	2.55	1.81	+ 0.74	2.55	3.70	- 1.15	3.23	7.69	- 4.47	
Kimberley.....	The Gaoler.....	2.52	1.16	+ 1.36	2.52	1.74	+ 0.78	4.45	3.25	+ 1.20	
Koedoesburg.....	J. Acton.....	4.01	2.00	+ 2.01	4.37	5.09	- 0.72	8.88	10.82	- 1.94	
Koedoesburg.....	The Gaoler.....	4.03	2.21	+ 1.82	6.75	4.17	+ 2.58	19.80	19.66	+ 0.14	
Koedoesburg.....	B. D. Coyse.....	3.95	4.19	- 0.24	6.59	8.76	- 2.17	16.50	20.46	- 3.96	
Koramas (Abentia).....	A. T. Sitwell.....	9.79	2.71	+ 7.08	3.61	6.40	- 2.79	6.73	11.51	- 4.78	
Matieling (Convent).....	The Mother Superior.....	5.71	3.55	+ 2.16	7.87	7.63	+ 0.24	17.49	15.85	+ 1.64	
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	2.97	1.56	+ 1.41	3.45	2.65	+ 0.80	10.22	11.23	- 1.01	
Norriesburg.....	A. Cameron.....	2.07	1.59	+ 0.48	2.07	2.77	- 0.70	4.27	6.47	- 2.20	
O'okie.....	J. Burrows.....	1.45	0.38	+ 1.07	1.56	0.57	+ 0.99	5.47	3.91	+ 1.56	
Philippstown.....	The Gaoler.....	1.70	2.17	- 0.47	1.70	3.34	- 1.64	3.31	8.64	- 5.33	
Phortsluis.....	The Gaoler.....	1.25	0.51	+ 0.74	2.00	1.05	+ 0.95	13.76	12.45	+ 1.31	
Port Elizabeth.....	J. E. Allen.....	2.48	1.20	+ 1.28	3.46	2.32	+ 1.14	9.21	14.09	- 4.88	
Port St. Johns (Cape Herms).....	The Lightkeeper.....	2.71	5.74	- 3.03	7.75	10.50	- 2.75	25.30	34.88	- 9.58	
Port St. Johns.....	The Gaoler.....	2.35	1.50	+ 0.85	2.35	2.81	- 0.46	3.20	5.30	- 2.10	
Port St. Johns.....	H. Holley.....	3.41	3.72	- 0.31	5.04	7.05	- 2.01	12.31	15.06	- 2.75	
Port St. Johns.....	The Gaoler.....	1.84	1.25	+ 0.59	2.54	2.15	+ 0.39	9.98	6.01	+ 3.97	
Port St. Johns.....	The Gaoler.....	3.54	0.68	+ 2.86	3.72	1.16	+ 2.56	8.87	5.02	+ 3.85	
Port St. Johns.....	The Gaoler.....	9.10	2.79	+ 6.31	10.48	5.36	+ 5.12	21.98	21.57	+ 0.41	
Port St. Johns.....	A. Dixpeck.....	1.40	3.65	- 2.25	4.09	7.13	- 3.04	13.43	18.21	- 4.78	
Port St. Johns.....	The Gaoler.....	4.83	1.01	+ 3.82	4.93	1.74	+ 3.19	9.80	8.45	+ 1.35	
Port St. Johns.....	The Gaoler.....	3.80	1.05	+ 2.75	3.85	1.91	+ 1.94	4.74	8.91	- 4.17	
Port St. Johns.....	The Gaoler.....	2.29	1.81	+ 0.48	2.29	0.48	+ 1.81	3.84	5.91	- 2.07	
Port St. Johns.....	C. Butler.....	6.78	8.48	- 1.70	0.05	7.93	- 7.88	9.80	13.84	- 4.04	
Port St. Johns.....	The Gaoler.....	1.60	0.37	+ 1.23	1.76	0.44	+ 1.32	7.95	7.41	+ 0.54	
Port St. Johns.....	The Mother Superior.....	1.42	0.54	+ 0.88	2.44	2.05	+ 0.39	33.63	28.41	+ 5.22	

OBSERVERS' NOTES FOR FEBRUARY, 1921.

TRANSVAAL.

Highlands (Barberton).—Veld getting very dry; creeks very low; crops, if any, likely to be poor.—Mather Smith.

Modderfontein (Heidelberg).—Crops fair, but in want of rain. Cattle diseases nil.—S. C. Obree.

Zandfontein (Rustenburg).—The rain during February has done much to help the crops, but the droughty period during January has made its mark, and the mealie season will not be up to standard.—R. Boon.

Wauikraal (Rustenburg).—Grass splendid; crops looking well.—W. Behrens.

Greystones (Standerton).—8th: Very severe hailstorm, three to four miles south; much damage done.—W. Garnett.

Klipplaatsdrift (Standerton).—The mealie crops are looking fine, but the young teff grass needs rain.—P. Swemmer.

Paardekop (Standerton).—Crops, especially mealies, suffered a great deal during the last three weeks, as there was no rain; crops in general are not too bad.—P. B. du Plessis.

Mallow (Waterberg).—All crops magnificent; veld very rich. All cattle prime; young blue ticks still infecting ears of cattle.—E. Biecard.

Keerom (Waterberg).—Rain still badly needed, as crops are shrivelling up.—D. V. Wolhuter.

Barberton.—A dry month; plenty of cloud, but very little precipitation. Rainfall, 2.40 inches on twelve days.—Walter Grubb.

Pietersburg.—Hot and dry; rainfall quite inadequate. Crops and veld in town and vicinity quite good, but district hopeless. Rainfall, 2.85 inches on six days.—W. Frankleyne.

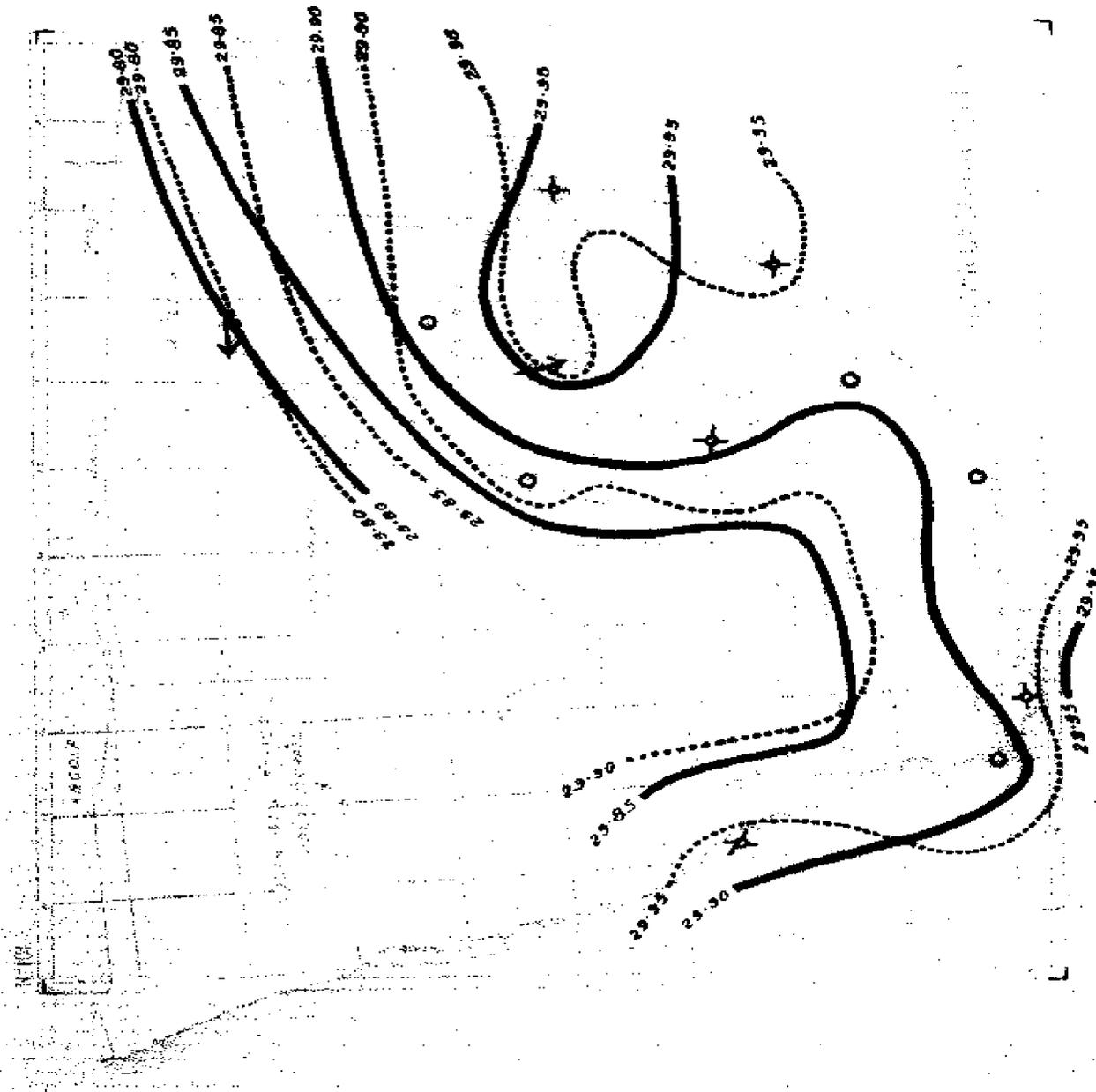
Lichtenburg.—Fine soaking rains from 11th to 15th. Rainfall, 4.29 inches on twelve days.—J. T. Allman.

Krugersdorp.—Weather unsettled, with overcast skies. Hail fell on the 8th for five minutes; size of hail, as large as peas. North-easterly winds prevailed towards the latter end of the month; early mornings somewhat chilly. Rainfall, 2.67 inches on ten days.—George S. Garnett.

Jakkalsfontein (Pietersburg).—The rainfall was scattered and patchy. Crops fair, though a certain number of failures through want of rain are reported. Most of these are from the native districts, and poor soil and shallow ploughing have much to do with them. Overcast, cloudy mornings, with mist and fog, were prevalent during the middle and latter parts of the month. Rainfall, 1.97 inch on seven days.—J. C. Palmer.

Pigeonhole (Pietersburg).—Good seasonable weather, only the dry January has caused a loss in the nut crop that this good February has failed to pull out altogether. Rainfall, 9.14 inches on twenty-three days.—Jno. W. McCallum.

Mosdene (Waterberg).—The latter half of the month very dry, and the days hot and calm. The ground hard and baked, and the crops (even kaffir corn) beginning to wilt. The slight showers from 18th to 20th merely caused the surface crust of the soil to bake; quick-grass and other succulent grasses badly wilted. A pest of army worm also appeared about the 16th in one or two places in the vicinity. Rainfall, 3.09 inches on seven days.—Ernest E. Galpin.



February, 1921. Prevailing Winds and Mean Atmospheric Pressure at 8.20 a.m.
 The dotted lines indicate the normal distribution for February.

Wakkerstroom.—At the beginning of the month the crops were suffering badly from drought. The rains towards the middle of the month did much to revive, though in some cases crops of mealies were spoilt. Rainfall, 5.05 inches on twelve days.—Louis le Roux.

Rustenburg.—Steady rains fell during month; country looking green; cattle in good condition; crops generally fair, although cotton in most places young on account of late rains. Rainfall, 2.64 inches on ten days.—Sergt. H. J. Streatfield.

Middelburg.—In the first week rain seemed imminent every day, but held off until the 8th. Since then there has been much threatening of rain, but, with the exception of three or four good falls, only very light showers fell. Rain has, however, fallen on many of the threatening days elsewhere in the district. An early winter may be predicted, and, from the shortage of rain this summer, probably a severe winter. Rainfall, 4.81 inches on seventeen days.—Dr. H. A. Spencer.

Cyferburg (Rustenburg).—Soft, soaking rains, very beneficial to crops. Rainfall, 2.75 inches on nine days.—J. A. Putto.

SWAZILAND.

Natalia (Ranching and Development Co., Ltd.).—The lack of rain this season can now be classified as a severe drought. Many crops are ruined for the second time, and it is now too late for a third planting. The veld is dry and exceedingly poor, whilst the rivers are lower than they have been for many years. The rains of the middle of the month hardly improved the grazing, and have had no effect on the rivers. Unless we get a heavy downpour during March and April, the situation will prove serious to stock owners as well as to agriculturists. Rainfall, 1.24 inch on six days.—Allan W. Macbeth.

Matapa.—Heavy rain is badly needed. Crops are dying in this district. Good rains have fallen north and east of Bremersdorp.—A. T. Torrens.

Transvalia.—Crops suffering from want of rain.—J. H. Coates.

ORANGE FREE STATE.

Stompkop (Bethlehem).—Drought becoming very severe now; cattle and crops suffering heavily. Rainfall, 3.18 inches on seven days.—C. P. v. d. Merwe.

Katdoornput (Bloemfontein).—All dams full, and veld coming on beautifully. Rainfall, 5.03 inches on eight days.—C. Mulke.

Hamelfontein (Edenburg).—Veld in good condition; stock fat. Rainfall, 4.17 inches on ten days.—Morison & Birrell.

Verwagting (Frankfort).—The total rainfall registered gives the impression that things are flourishing. Unfortunately, it is quite the contrary. The rain falls in terrific showers, lasting perhaps half or three-quarters of an hour, and all the water simply runs off, leaving the ground quite hard. Rainfall, 2.40 inches on five days.—C. M. Field.

Jansdeel (Harrismith).—The weather has remained dry and very hot; everything is feeling the want of rain. Rainfall, 1.73 inch on nine days.—J. J. Uijs.

Stanleyvale (Harrismith).—Very nice warm days, with cool evenings. Crops in need of a nice slow, soaking rain; stock doing well; hay very short. Rainfall, 2.25 inches on ten days.—G. C. Atkins.

Bietfontein (Heilbron).—Things are very dry and burnt. Rainfall, 0.80 inch on four days.—E. Wallace.

Hoffontein (Kroonstad).—Rainfall, 3.50 inches on twelve days, mostly local showers. Though of some aid to the crops, not of consequence to improve general conditions of ground; the effects of no rain during the last week can already be seen.—G. W. Muller.

Imperani (Ficksburg).—The rain during the month fell mostly in showers, at times only over a small part of the plantation. The rain on the 22nd was the only soaking rain experienced; all the other rains were only showers. The rain has helped the grass along, and the veld is now nice and green. What is required is a three days' soaking rain; as it is, the outlook for winter is not too bright for cattle.—George Anderson.

NATAL.

Nottingham Road.—Very little rain, compared with last year; stock doing well. Rainfall, 3.91 inches on fifteen days.—Miss E. J. Smythe.

Hlabisa.—Fair rains, but country looking dry; weather good and excellent. Rainfall, 3.66 inches on nine days.—L. Double.

Estcourt.—8th: Three head of cattle killed by lightning on town lands. 9th: Little Bushmans River in flood. Little Bushmans River to top of banks on evening of 17th. Grazing saved by rains, and crops improving; more rain still needed. Rainfall, 5.13 inches on twelve days.—A. A. McLean.

Cape St. Lucia.—Very hot weather and light winds throughout the month. Malaria is bad in this location. Rainfall, 3.20 inches on fourteen days.—J. Murphy.

Ladysmith.—Very sultry weather, with great promise of rain at times, but comparatively light rainfall. Heavy rains reported in vicinity of Spionkop and Bergville, and great improvement noticeable in grass and crops thereabouts. Still very dry in and around Ladysmith, and grass and crops very poor. Rainfall, 3.42 inches on thirteen days.—D. A. R. Leathern.

Newcastle (The Academy).—Very hot and oppressive in the mornings, and rain frequently in the afternoon. Rainfall, 3.92 inches on eleven days.—The Mother Superior.

Stanger.—A most trying month, with almost continuously high temperatures. North winds prevailed, with high evaporation, making life almost unbearable. Rainfall, 1.88 inch on seven days.—A. J. S. Maritz.

Dundee.—Rain during middle of month has revived the country generally; mealie crops looking fair, but mostly flowered too soon. The last week of the month has been very like autumn weather. Rainfall, 4.56 inches on eight days.—West Thorold.

Edendale (Klip River).—Lovely weather during month; good rain badly needed now to save mealie crops that promise well. All stock in excellent condition; no blue-tongue or horse-sickness yet. Rainfall, 5.30 inches on eleven days.—T. W. Niland.

Rhebuck Hill (Entonjanens).—Very dry; conditions unfavourable for crops. Rainfall, 2.25 inches on four days.—K. W. Young.

Rong Poort (Weenen).—Dry at end of month; grass withered up, and rain badly needed. Rainfall, 4.22 inches on eleven days.—J. H. Bartholomew.

Tevreden (Entonjanens).—Dry, and crops suffering. Rainfall, 2.49 inches on four days.—J. J. Martens.

Summerford (Ixopo).—One of the driest and hottest Februarys in memory. Rainfall, 3.56 inches on eight days.—D. Campbell.

CAPE.

Lovedale.—A very hot month : the first three days with the 31st January formed something like a record, four days in succession above 100 degrees. The 28th also showed a maximum of 100 degrees, and in between these were eleven days with 90 degrees or over. The mean maximum for the month, mean minimum, and absolute minimum were all the highest for the last eight years, and are all four or five degrees above the average. Rainfall, 2.41 inches on ten days.—Charles A. Pilson.

Carnarvon.—Heavy rains, more so in district, where parts have had up to seven inches. Weather hot and close during last week of month, promising more rain. Rainfall, 4.03 inches on seven days.—A. P. Malherbe.

Graaff-Reinet.—Winds moderate and variable ; very warm and depressive ; nice rains, but more badly wanted. Rainfall, 1.99 inch on eight days.—S. E. D. Treadwell.

Groot Drakenstein.—Temperature 2.2 degrees above the average, though the month opened very cool. A warm spell set in from the 23rd to 28th ; night temperatures unusually high on 26th and 27th. Sunshine very low, and cloudiness much in excess of average. Vineyards scorched during last few days. Distant thunder and lightning occurred on several days during month. Rainfall, 1.24 inch on five days. Rainfall slightly over double the average.—Lionel Baker.

Murraysburg.—Heavy rain reported from several parts of this district. Rainfall, 2.07 inches on seven days.—A. Cameron.

O'okiep.—Unusual features ; wintry weather from 2nd to 4th, unprecedented for forty years. Rainfall, 1.45 inches on seven days.—J. Burrows.

Queenstown.—Rain fell on eleven days, when 3.41 inches were recorded ; greatest fall, 1.68 inch on 18th. Month of heavy dews ; mornings dull, misty, and overcast. Veld looking splendid.—H. Holley.

Riversdale.—Nature looks refreshed ; prospects for late harvest are good. Rainfall, 3.65 inches on ten days.—Rev. Carl Prozesky.

Willowmore.—A terrible storm occurred on the afternoon of the 2nd, beginning at 3.30 p.m. and lasting about twenty minutes. During that time houses and stables, etc., were unroofed, and numbers of trees blown down. Glorious rains in town and district ; dams full, and drought broken. Rainfall, 4.42 inches on ten days.—Mrs. Beatrice Maud Hemens.

Commando Kraal (Uitenhage).—Hot unpleasant nights have been the rule during the last half of the month. This is quite uncommon in these parts, where, no matter how hot the day, there is always a cool breeze at night. The oldest inhabitants cannot remember such a spell of hot nights. Rainfall, 1.51 inch on nine days.—Major J. Kreft.

Jansenville.—Cloudy and overcast for greater part of month, accompanied by rain. Heat oppressive at times ; wind practically nil. Rainfall, 2.04 inches on nine days.—G. E. Hurter.

Abtonia (Kuruman).—Veld good ; stock doing well, but rain needed to keep things going. Rainfall, 3.19 inches on eight days.—A. T. Sitwell.

Uitenhage.—Hot weather ; high saturation relieved by thunderstorms ; veld very green at latter part of month, but no floods in rivers. Rainfall, 2.87 inches on eleven days.—Herbert Inggs.

Capetown.—Changeable weather experienced during month. Up to the 10th there had been very little real summer weather, and in place of the heat there had been rain (more like June than February), followed by a heat wave. From 16th to 24th cooler weather prevailed, again followed by a heat wave.—A. Russel Fraser.

Great Fish Point (Bathurst).—The atmosphere has been very close and sultry throughout the month. Owing to the thunderstorms, the country is nice and green. Rainfall, 2.23 inches on six days.—H. W. Mantle.

Brakfontein (Victoria West).—Rainfall during the month was all in the form of thundershowers. That on the 11th was very heavy, and was accompanied by hail, not large; the whole amount (1.20 inch) fell within an hour.—A. L. Jack.

River Glen (Cradock).—Veld improving, but we require a lot more rain; stock in good condition.—W. R. Solomons.

Vruchtbaar (Wellington).—The first week "winter rains," which did considerable damage to the grape crop. The last two weeks, excessive heat.—P. J. Gillie.

Bloemhof (Graaff-Reinet).—Veld conditions medium; crops poor.—A. E. Murray.

WEATHER CHARACTERISTICS FOR THE MONTH OF APRIL.

Along the western and southern coasts, and in the south-west of the Cape Province, the rains are now increasing; but over the other portions of the Union the decreasing precipitation indicates the advent of autumn and the approach of the dry season. The heaviest rainfall should occur over the Cape Peninsula, where the normal for the month is about 3.0 inches; then in order come Natal, the south coast, the south-east of the Cape, and Basutoland with 2.5 inches; Kaffraria, the Cape south-western and north-eastern districts, and the Orange Free State with 2.0 inches; the Transvaal, the Cape northern borders, and the northern Karroo with 1.5 inch; and the southern and central and east-central Karroo and the west coast with 1.0 inch.

The mean daily air temperature is now about 70 degrees on the Transvaal low veld; 68 degrees in Natal; 65 degrees in the Cape south-eastern districts; 64 degrees along the west coast and over the southern Karroo; 63 degrees over the Cape and south-western districts; 62 degrees over the Cape Peninsula; 61 degrees along the south coast and over the Transvaal high veld; 60 degrees in the Orange Free State; 59 degrees in Basutoland and over the Cape north-eastern districts; 58 degrees on the north and 57 degrees on the central Karroo. Light frosts may be expected.

In the Transvaal about 78 per cent., over the Cape northern borders 77 per cent., and over the south-west of the Cape 61 per cent. of the total possible hours of bright sunshine should be enjoyed.

Over the northern border of the Cape Province north-north-westerly, and over the south-east of the Cape north-easterly and south-westerly winds prevail; over the Transvaal there is a decrease in frequency and force of the winds from south-east round by east to north-north-west, with an increase in frequency of stronger winds from other points of the compass; over the Cape Peninsula southerly winds prevail, but with much diminished force.

C. STEWART,

Chief Meteorologist.

Pretoria.



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

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MEAN barometric pressure lower than usual in the west, south, centre, and east of the Union, but practically normal over Rhodesia and the Transvaal; a warm spell of short duration at the beginning, preceding a continuous period of cloudy weather, with cool days and mild nights; frequent spells of steady, soaking rains, intermingled with light thunderstorms, causing an excess of precipitation over the country except in part of the west coastal area and the south-west of the Cape and the Natal coast; frequent showers of small hail, with one or two destructive storms of larger hail or wind—such were the most striking features of the weather of March, 1921.

Pressure.—As shown on the accompanying mean isobaric map, pressure was lower than usual over the west, south, centre, and east of the Union, particularly in the west, but almost normal over Rhodesia and the Transvaal. The equatorial low pressure was prominent from 1st to 7th, 9th to 11th, 24th to 27th, and on 30th and 31st. On the 14th to 17th a “low” passed along the coast from west to south and east. High pressure areas passed along the south of the Union, from south-east to east from 12th to 14th, from south west to south-east and east from 17th to 22nd; and along the south on the 23rd and 29th.

Temperature.—Mean temperature over the Union during March was 68·8 degrees or 0·8 degree higher than usual, the days being on the average half a degree colder and the nights 2·1 degrees warmer than usual. Considering the Provinces separately, the monthly temperature over the Cape (69·9 degrees) was 1 degree, over the Transvaal (67·9 degrees) 0·7 degree, over Natal (72·2 degrees) 0·6 degree, and over the Orange Free State (65·2 degrees) 0·5 degree in excess of the corresponding normals. The greatest deficit in the day temperatures was 1·4 degree in Natal, compared with the average (82·4 degrees) for the month; the mean maximum over the Free State was 1·1 degree less than the normal of 76·6; in the Transvaal, the days were 0·6 degree cooler than usual, whilst the smallest deficit was 0·2 degree in the Cape, compared with the average maximum of 80·2 degrees. Nights were everywhere warmer than usual by amounts averaging between 2·6 degrees in Natal and 2·0 degrees in the Cape Province. At individual stations the temperature for the month was below normal in the extreme north, centre, and south-west of the Transvaal.

in Bechuanaland, the north-east of the Free State, Natal (exclusive of Zululand), part of the north-east and of the northern Karroo in the Cape. The deficit was greatest (2.3 degrees) at Mafeking and least (0.7 degree) at Carnarvon, in the Cape Province; elsewhere it was mostly between 0.5 degree and one degree. The excesses were greatest (2-3 degrees) in the west and south-west of the Cape, the eastern Transvaal, and Swaziland. Both maxima and minima were above the average over the west and south-west of the Cape, along the south and south-east coasts, in part of Kaffraria, Zululand, centre and east of the Free State, the eastern and south-eastern Transvaal, also in the neighbourhood of Pietersburg. In the extreme north of the Transvaal, at Louis Trichardt, both days and nights were, on the other hand, slightly cooler. With these exceptions, the mean maxima alone were sub-normal, the mean deficiency being about 2 degrees, but increasing to 4.5 degrees at Dundee, in Natal, and 4 degrees at Pretoria and Klerksdorp in the Transvaal. The highest temperatures were recorded mostly on the first seven days of the month, over the Transvaal, Orange Free State, Natal, and about one-half of the Cape; over the remaining portion the warmest days occurred later, viz., on 9th, 13th, 14th, 16th, 18th, and 20th. The lowest readings were registered from 13th to 16th, 18th to 21st, 23rd to 25th, 27th, 28th, and 31st, most widely on the 13th. The mean warmest station was Komatipoort, with a temperature of 79.0 degrees, whilst the coolest stations were Belfast, on the high veld of the Transvaal, and Harrismith, in the Orange Free State, with a mean of 60.3 degrees for March, a difference of 18.7 degrees. The highest mean maximum was 89.9 at Komatipoort, and the lowest mean minimum (49.5 degrees) at Belfast. Temperatures exceeding 100 degrees F. were noted at Clanwilliam (101.0 degrees on 13th and 20th) and at Komatipoort on the 5th, when 103.0 degrees were registered. The extreme minimum for the month was 38.0 degrees at Belfast on the 16th. There was thus an extreme range of 65.0 degrees during the month over the Union.

Precipitation during the month was considerably—about $2\frac{3}{4}$ inches—in excess of the average. The surplus was greatest over the Transvaal, where it averaged about $4\frac{1}{2}$ inches more than usual; in the Orange Free State the rainfall exceeded the normal by roughly $2\frac{3}{4}$ inches; in the Cape by approximately 2 inches, and in Natal by about $1\frac{1}{2}$ inch. Small shortages averaging about a third of an inch, however, occurred over the southern half of the west coastal area, the south-west, parts of the east central Karroo, of Gordonia, and the coast of Natal, where Durban showed a deficit of 1.95 inch. The excess varied commonly between 3 and 6 inches over the greater part of the Transvaal, Swaziland, the Transkei, and north-east of the Cape; decreased to plus 2 to 3 inches in the south-west Transvaal, Bechuanaland, portion of the Orange Free State, and parts of the Karroos; it decreased to 1 to 2 inches in Natal, the greater portion of the northern Karroo, and part of the southern Karroo; to less than an inch over Namaqualand and the east of the south coast; finally, precipitation fell below the average over the south-western portion of the Cape, Natal coast, and Gordonia. The greatest excess was 8.37 inches at Potchefstroom. Rain occurred in some part of the Union every day of the month, frequently in continued spells of three and up to seven days, usually of steady, soaking rains, but with occasional heavy thunderstorms. The net result of these abundant rains seems to have been to allay anxiety as to the winter pasture for cattle, ensure a good supply of water from springs, dams, etc., during winter, and in some cases materially improve growing crops, improve the prospects for winter crops, whilst all stock are in excellent condition. On the other hand, certain crops that were about to be harvested suffered

from the superabundance of water (e.g., hay, monkey-nuts), whilst in the Rustenburg District cotton crops in low-lying lands died out, tobacco was drowned, and red rust appeared also in the wheat crops in Kingwilliamstown District. Insect pests have also made their appearance, e.g. boll-worm in cotton in Rustenburg, locusts in the Carnarvon and Murraysburg Districts of the Cape: black and green caterpillars are doing damage in Swaziland, and outworms and moths in the Fauresmith District, Orange Free State. Rivers were running frequently, and some lands, particularly those of black turf, were under water for days, so that harvesting of hay, etc., was delayed. Some heavy falls of rain and occasionally hail occurred. The most destructive of these latter appears to have been that on the 17th at Cedara (Natal), when hailstones 1 inch to $1\frac{1}{2}$ inch in diameter covered the ground to an average depth of 4 inches, and owing to the high wind lay in drifts to a depth of 18 inches. This storm practically destroyed all growing crops. On the 27th, about 3 p.m., a storm of wind and rain was experienced fourteen miles from Pilgrims Rest, at the Vaalhoek Mine, which wholly or partially destroyed offices, store, quarters, and three houses, causing damage estimated at £3000. No lives were lost, but four white people were injured. A thunderstorm with heavy south-west wind at O'okiep on the 20th uprooted trees and unroofed buildings. A severe frost on the night of the 12th is reported to have killed all vegetables at Kilocullen (Barkly East). Apart from damage, the most unsatisfactory reports come from parts of Natal, where our observer at Cape St. Lucia reports considerable damage to mealie crops owing to intense heat; at Ladysmith, although the country is greener than for some time past, the grass is very short, so that winter feed for stock is likely to be scarce; whilst at Wellington, in the Cape Province, although the rainfall was small, the cold, damp atmosphere was unfavourable for fruit-drying and raisin-making. The cumulative rainfall since the 1st July of last year is mostly considerably above normal over the Transvaal, the centre and north-east of the Orange Free State, the central and coastal portions of Natal, the central, south, and west parts of the northern Karroo, the central and southern Karroos, the west and south-west of the Cape, and the middle parts of the Transkei. The most extensive areas over which there is a shortage extend from Bloemhof in the south-west Transvaal and Bechuanaland to Prieska and Hopetown in the northern border of the Cape; along the south and south-east coastal areas as far as Port St. Johns, with Zululand, and the north, east, and south of Natal. The aggregate precipitation since the commencement of the current year is less than usual over much more limited areas, which include the more easterly and south-easterly parts of the Transvaal, the north and east of Natal, the northern border between Kuruman and Hopetown, the south-east portion of the northern Karroo, and part of the north-east of the Cape, as well as the south-east coastal area. Elsewhere it is above the average by amounts varying between a few tenths to 7 inches.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), MARCH, 1921.

PLACB.	OBSERVER.	Month.—Mar., 1921.		Normal Monthly Temperature.	Difference from Normal.	Extremes.		Date.
		Mean Max.	Mean Min.			Highest.	Lowest.	
		° F.	° F.			° F.	° F.	
<i>Trompsburg</i> —								
Belfast.....	The Forester.....	71.1	49.5	59.8	+ 0.5	81.0	38.0	7th..... 15th.
Batherton.....	W. Grubb.....	82.8	62.4	72.0	+ 2.0	95.0	56.0	15th & 16th.
Bloemhof.....	A. Adamson.....	81.3	59.9	70.6	+ 1.7	95.0	52.0	5th..... 20th.
Erniele.....	Mrs. S. M. Nicolson.....	75.9	52.3	64.0	+ 2.4	87.0	45.0	2nd & 5th..... 15th.
Johannesburg (Observatory).....	The Staff.....	71.3	54.4	62.2	+ 0.5	84.0	44.8	3rd..... 13th.
Klerksdorp (Strathmore).....	Chas. Scott.....	78.1	58.8	69.5	+ 1.1	89.0	53.0	3rd & 6th..... 13th & 24th.
Komatipoort.....	H. J. Evans.....	89.9	68.0	77.0	+ 2.0	103.0	61.0	5th..... 15th.
Louis Trichardt.....	I. J. de Bruin.....	76.9	59.7	68.3	- 0.6	87.0	52.0	18th..... 16th.
Middelburg.....	Dr. H. A. Spencer.....	77.5	54.4	66.0	+ 0.4	87.0	48.0	4th & 7th..... 15th.
Nyström.....	G. Bekker.....	79.0	58.8	68.9	+ 0.5	89.0	52.0	5th & 6th..... 21st.
Pilgrims Rest.....	E. M. Skeet.....	76.5	56.3	66.4	+ 1.1	84.0	50.5	16th..... 15th.
Pietersburg.....	J. Franklyn.....	78.4	58.4	67.0	+ 1.4	86.0	48.0	3rd & 7th..... 15th.
Potchefstroom (Exp. Farm).....	The Manager.....	79.2	56.4	67.8	+ 1.0	92.5	51.0	2nd..... 18th & 15th.
Pretoria (Meteorological Office).....	The Staff.....	76.0	58.5	67.2	- 0.6	86.4	52.3	5th..... 13th.
Plet Bekkef.....	J. Werner.....	75.9	57.3	65.2	+ 1.4	89.0	49.5	4th..... 15th & 16th.
Zeerust.....	H. Dietrich.....	78.8	58.8	68.8	- 0.6	90.0	52.0	5th..... 24th.
<i>Swaziland</i> —								
Mbabane.....	Swaziland Police.....	70.8	58.0	64.0	+ 2.8	87.0	48.0	7th..... 15th.
<i>Orange Free State</i> —								
Bheemfontein.....	G. A. Schepers.....	78.3	57.6	66.7	+ 1.3	86.0	47.0	2nd..... 13th.
Bethulle.....	J. J. Wardhaugh.....	79.3	56.7	68.0	+ 1.2	91.4	46.2	1st..... 13th.
Hartsmith.....	The Forester.....	69.2	51.4	61.0	- 0.7	80.0	44.0	2nd..... 15th.
Indley.....	J. Collister-Oates.....	75.1	55.2	65.3	- 0.1	87.5	44.5	4th..... 23rd.
Ladybrand.....	The Forester.....	75.4	53.3	64.4	+ 0.8	87.0	44.0	2nd..... 13th.
<i>Natal</i> —								
Durban (Point).....	A. O. Goulding.....	82.0	60.1	75.6	- 0.4	94.0	62.2	7th..... 19th.
Dunder.....	West Thorold.....	77.8	57.0	68.0	+ 1.2	88.0	50.0	2nd..... 14th.
Habasa.....	The Gaoler.....	83.7	66.5	75.1	+ 5.1	94.0	59.0	4th..... 19th.
Maritzburg (Mental Hospital).....	The Superintendent.....	80.4	60.7	71.4	+ 0.8	91.2	51.2	6th..... 23rd.
<i>Cape</i> —								
Alwal North.....	Alex. Atcock.....	78.0	54.8	66.4	+ 0.9	89.5	46.0	3rd..... 23rd.
Bedford.....	F. C. Hall.....	78.1	58.1	68.1	+ 1.3	96.0	44.5	6th..... 13th.
Camasvan.....	A. P. Malherbe.....	60.2	57.4	68.8	- 0.1	92.0	47.0	3rd..... 16th.
Capetown (Foyal Observatory).....	The Staff.....	79.4	60.8	68.0	+ 2.1	98.5	52.4	13th..... 27th.
Chanyillam.....	W. J. Downes.....	92.1	60.1	73.8	+ 2.3	101.0	46.0	13th & 20th..... 18th.
East London.....	M. G. Grogan.....	78.3	64.2	68.7	+ 2.5	86.0	60.0	16th..... 18th.
Gradt-Reinet.....	S. E. D. Treadwell.....	82.4	61.1	71.8	+ 2.0	96.0	48.0	4th..... 19th.
Good Drakenstein.....	Lionel Baker.....	84.0	60.0	69.4	+ 2.0	98.1	48.8	13th..... 25th.
Kokstad.....	H. D. Coyle.....	75.0	53.6	64.3	+ 0.7	89.0	43.7	6th..... 13th.
Kimberley.....	J. Acton.....	83.4	60.8	72.1	+ 0.1	95.0	52.0	1st..... 18th.
Mafeking (Convent).....	The Mother Superior.....	79.0	58.2	68.6	+ 2.3	90.1	53.0	5th..... 21st & 24th.
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	74.1	64.3	68.6	+ 0.6	81.0	55.0	14th..... 16th.
Marryburg.....	A. Camaron.....	79.5	55.7	66.4	+ 1.2	94.0	44.0	3rd..... 19th.
Quthley.....	J. Burrows.....	84.8	61.4	73.2	+ 3.2	94.8	46.9	3rd..... 31st.
Port Elizabeth.....	J. E. Allen.....	76.2	64.5	69.0	+ 1.4	90.0	56.0	14th..... 18th.
Port St. Johns (Cape Hornes).....	The Lightkeeper.....	78.0	67.5	72.3	+ 1.2	84.0	61.0	9th..... 19th.
Queenstown.....	H. Holley.....	78.6	57.0	67.9	- 0.2	94.0	45.0	1st..... 13th.
Vryburg.....	Chas. Butler.....	80.9	58.4	69.6	+ 1.2	94.0	50.0	3rd..... 20th.
Wynberg (Convent).....	The Mother Superior.....	78.0	60.0	67.2	+ 1.8	91.5	53.2	13th..... 28th.

RAINFALL, MARCH, 1921.

PLACE.	OBSERVER.	Month.		Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1920.	Normal.	Difference from Normal.	
		Inches.	Mar., 1921.									
Trompsburg												
Bechtelen.....	Walter Grubb.....	8.72	3.73	17.54	- 4.81	13.23	17.54	- 4.81	23.15	30.34	- 7.19	
Bechuanaland.....	The Forester.....	6.81	4.45	14.66	+ 2.96	15.87	14.66	+ 2.96	33.75	29.51	+ 4.24	
Bethal.....	H. F. Joubert.....	7.36	2.90	12.91	+ 4.40	17.97	12.91	+ 4.40	32.47	28.43	+ 4.04	
Bloemfontein.....	A. Adamson.....	5.85	2.90	11.09	+ 2.86	11.09	11.09	+ 2.86	15.76	16.70	- 0.94	
Claremont.....	S. A. Pollock.....	5.97	2.90	8.61	+ 3.31	11.04	8.61	+ 3.31	19.01	15.77	+ 3.24	
Erzulo.....	Mrs. Nicolson.....	4.41	3.63	13.08	+ 0.78	8.73	13.08	+ 0.78	30.03	28.81	+ 1.22	
Heidelberg.....	S. A. Pollock.....	10.85	5.61	17.74	+ 4.74	17.74	17.74	+ 4.74	31.22	25.82	+ 5.40	
Heidelberg.....	W. ter Horst.....	7.69	3.13	13.07	+ 4.56	15.09	13.07	+ 4.56	29.33	24.76	+ 4.57	
Johannesburg (Observatory).....	The Staff.....	7.69	3.44	13.07	+ 4.25	15.09	13.07	+ 4.25	29.33	24.76	+ 4.57	
Klerksdorp (Strathmore).....	Chas. Scott.....	8.88	3.05	11.10	+ 5.83	15.13	11.10	+ 5.83	24.11	19.22	+ 4.89	
Komatiport.....	H. J. Evans.....	8.08	4.08	14.22	+ 3.98	13.07	14.22	+ 3.98	23.87	23.60	+ 0.27	
Louis Trichardt.....	I. J. de Bruin.....	9.19	3.93	10.15	+ 5.86	20.00	10.15	+ 5.86	30.27	29.21	+ 1.06	
Middelburg.....	G. Spencer.....	7.29	3.38	13.45	+ 3.91	13.45	13.45	+ 3.91	26.37	26.07	+ 1.70	
Nylsvlei.....	U. Bakker.....	9.54	3.02	12.23	+ 6.52	13.49	12.23	+ 6.52	29.38	22.26	+ 7.03	
Pretoria.....	W. Franklyn.....	7.80	3.18	10.67	+ 5.02	12.41	10.67	+ 5.02	17.4	37.70	- 20.10	
Phel. Baidel.....	J. Werner.....	9.01	3.83	13.99	+ 5.13	19.28	13.99	+ 5.13	37.75	34.63	+ 3.12	
Phugus Rest.....	E. M. Skea.....	11.74	6.24	22.58	+ 5.80	22.88	22.58	+ 5.80	38.44	36.63	+ 1.81	
Pretoria (Exp. Farm).....	The Manager.....	10.38	2.51	16.41	+ 8.37	17.00	16.41	+ 8.37	24.16	21.11	+ 3.05	
Pretoria (Meteorological Office).....	The Staff.....	8.60	3.63	14.97	+ 4.87	14.64	14.97	+ 4.87	27.46	27.59	- 0.13	
Rooiberg.....	N. H. Munro.....	6.29	2.54	13.39	+ 3.75	16.92	13.39	+ 3.75	25.83	22.34	+ 3.49	
Rustenburg.....	S. A. Pollock.....	8.74	3.63	13.30	+ 5.11	18.85	13.30	+ 5.11	31.43	24.34	+ 7.09	
Wakkerstroom.....	L. le Roux.....	5.97	3.44	14.37	+ 2.83	13.92	14.37	+ 2.83	69.09	29.42	+ 3.44	
Woodbush.....	The Forester.....	17.57	10.08	41.46	+ 6.89	50.72	41.46	+ 6.89	24.91	66.65	- 41.74	
Zeerust.....	H. Dietrich.....	7.47	3.33	12.52	+ 4.14	16.97	12.52	+ 4.14	24.91	21.60	+ 3.31	
Swaziland												
Mbabane.....	Swaziland Police.....	14.07	6.40	24.23	+ 7.67	28.12	24.23	+ 7.67	56.88	45.65	+ 11.23	
Orange Free State												
Bethulle.....	J. J. Wardhaugh.....	4.52	2.92	9.04	+ 1.60	10.59	9.04	+ 1.60	14.11	15.54	- 1.43	
Bloemfontein.....	G. A. Scheepers.....	3.78	2.74	8.52	+ 1.04	11.48	8.52	+ 1.04	17.65	16.15	+ 1.50	
Barramath.....	The Forester.....	3.81	3.26	12.17	+ 0.55	11.06	12.17	+ 0.55	25.41	25.80	- 0.39	
Kroonstad.....	S. R. Northfield.....	5.49	2.95	8.75	+ 3.44	10.16	8.75	+ 3.44	29.03	20.12	+ 8.91	
Ladybrand.....	The Forester.....	6.98	3.06	11.07	+ 3.02	13.21	11.07	+ 3.02	23.31	23.65	- 0.34	
Landley.....	J. Collister-Oates.....	5.27	2.96	10.66	+ 2.31	13.05	10.66	+ 2.31	22.29	21.14	+ 1.15	
Natal												
Dundee.....	West Thorold.....	4.65	3.69	14.58	+ 0.96	11.49	14.58	+ 0.96	25.54	27.90	- 2.36	
Durban (Pointe).....	A. G. Goulding.....	3.90	5.85	14.87	- 1.95	21.60	14.87	- 1.95	44.35	34.84	+ 9.51	
Hiobias.....	The Gaoler.....	10.31	4.33	16.91	+ 5.98	19.35	16.91	+ 5.98	37.23	37.75	- 0.52	
Howick.....	The Gaoler.....	5.72	4.19	14.35	+ 1.53	14.33	14.35	+ 1.53	31.75	28.60	+ 3.15	
Lady Smith.....	D. A. R. Lestern.....	4.10	4.10	13.45	+ 0.00	9.99	13.45	+ 0.00	19.53	24.69	- 5.16	
Pietermaritzburg (Mental Hospital).....	The Staff.....	6.71	4.81	15.08	+ 1.90	16.70	15.08	+ 1.90	34.72	30.22	+ 4.50	
Vryheid.....	The Gaoler.....	5.01	3.69	16.08	+ 1.32	10.28	16.08	+ 1.32	24.88	33.07	- 8.19	
Wesnes.....	The Gaoler.....	6.06	2.60	12.04	+ 3.80	14.97	12.04	+ 3.80	25.75	23.62	+ 2.13	

RAINFALL, MARCH, 1921 (continued).

PLACE	OBSERVER.	Month.	Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1920.	Normal.	Difference from Normal.
		Inches. Mar., 1921.								
<i>Cape Province—</i>										
Allival North.....	A. Alcock.	5.52	8.22	+ 2.80	9.27	9.64	- 0.37	13.16	17.66	- 4.50
Bonafont West.....	The Gaoler.	4.38	1.58	+ 2.80	10.19	3.98	- 6.21	13.67	7.51	+ 6.16
Bedford.....	T. C. Hall.	5.23	8.84	+ 1.89	11.54	10.79	- 0.75	22.07	28.03	- 5.96
Britstown.....	The Gaoler.	4.49	2.05	+ 2.44	9.28	5.03	+ 4.25	12.16	8.40	+ 3.76
Calvinia.....	The Gaoler.	2.20	0.66	+ 1.54	4.58	1.23	+ 3.35	10.34	4.68	+ 5.66
Capetown (Royal Observatory).....	The Staff.	0.28	0.95	- 0.67	2.41	2.22	+ 0.19	18.99	15.11	+ 3.88
Ceres.....	A. Hoatle.	0.82	1.05	- 0.24	4.67	2.65	+ 1.99	33.12	25.45	+ 7.67
Carnarvon.....	A. P. Malherbe.	2.80	1.52	+ 1.28	6.98	3.81	+ 3.17	9.13	6.06	+ 3.07
Clanwilliam.....	W. J. Downes.	4.50	0.27	+ 4.23	1.26	0.75	+ 0.51	8.70	5.11	+ 3.59
East London.....	A. Downie.	3.41	3.46	- 0.05	9.88	9.98	- 0.10	10.63	26.57	- 6.94
Fraserburg.....	The Gaoler.	3.41	1.05	+ 2.36	6.81	2.68	+ 4.13	9.44	4.74	+ 4.70
Gales.....	The Gaoler.	0.40	0.13	+ 0.27	1.60	0.37	+ 1.23	5.80	3.12	+ 2.68
Graaff-Reinet.....	S. E. D. Troadwell.	4.20	2.13	+ 2.07	6.65	5.29	+ 1.36	11.55	11.17	+ 0.38
Griquatown.....	The Gaoler.	2.86	2.43	+ 0.43	6.16	6.53	- 0.37	8.93	10.10	- 1.12
Great Drakenstein.....	Lionel Baker.	0.86	1.30	- 0.44	3.61	3.09	+ 0.52	24.90	21.79	+ 3.11
Haarlem.....	The Gaoler.	3.07	2.32	+ 0.75	4.72	6.05	- 1.33	6.19	10.19	- 3.90
Hopetown.....	The Gaoler.	3.65	2.64	+ 1.01	6.20	6.49	- 0.29	6.87	10.33	- 3.46
Kenhardt.....	The Gaoler.	2.29	1.08	+ 1.21	4.81	2.82	+ 1.99	6.74	4.33	+ 2.41
Kimberley.....	J. Acton.	3.61	2.83	+ 0.78	7.08	7.92	- 0.84	11.97	13.65	- 1.68
Kaymas.....	The Gaoler.	2.47	2.49	- 0.02	9.42	6.06	+ 3.36	22.56	22.15	+ 0.41
Koksstad.....	H. D. Coyte.	0.95	3.45	- 2.50	13.74	12.15	+ 1.59	23.45	23.01	+ 0.44
Kuruman (Abnank).....	A. T. Sitwell.	5.10	2.69	+ 2.41	8.91	9.09	- 0.18	11.83	14.20	- 2.37
Mafeking (Convent).....	The Mother Superior.	11.02	3.23	+ 7.79	18.89	10.76	+ 8.13	28.51	19.08	+ 9.43
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.	1.86	1.43	+ 0.43	5.31	4.08	+ 1.23	12.08	12.06	+ 0.02
Murrayburg.....	A. Cameron.	3.38	2.03	+ 1.35	4.45	4.80	- 0.35	6.65	8.50	- 1.85
O'Kley.....	J. Burrows.	1.20	0.49	+ 0.71	2.86	1.00	+ 1.86	6.77	4.34	+ 2.43
Phalgotown.....	The Gaoler.	3.63	2.47	+ 1.16	5.33	6.41	- 1.08	9.94	11.11	- 1.17
Piquetberg.....	The Gaoler.	0.36	0.55	- 0.19	2.42	1.90	+ 0.52	16.12	13.00	+ 3.12
Port Elizabeth.....	J. E. Allen.	2.32	1.07	+ 1.25	5.78	3.99	+ 1.79	11.53	16.36	- 4.83
Port St. Johns.....	The Lightkeeper.	9.05	5.16	+ 3.89	16.80	15.75	+ 1.05	34.35	40.04	- 5.69
Prizeka.....	The Gaoler.	2.07	2.06	+ 0.01	4.42	4.87	- 0.45	5.86	7.36	- 1.50
Queenstown.....	H. Holley.	0.70	2.78	- 2.08	11.74	9.83	+ 1.91	19.01	18.44	+ 0.57
Steylerville.....	The Gaoler.	1.84	0.91	+ 0.93	3.88	3.71	+ 0.17	8.32	7.57	+ 0.75
Swakland.....	The Gaoler.	2.36	2.98	- 0.62	5.53	2.07	+ 3.46	10.68	5.93	+ 4.75
Swindan.....	The Gaoler.	0.01	3.25	- 3.24	12.84	8.29	+ 4.55	24.34	24.50	- 0.16
Uitenhage.....	A. Dixbeck.	2.44	1.39	+ 1.05	14.00	10.98	+ 3.02	22.49	21.46	+ 1.03
Upington.....	The Gaoler.	1.12	1.63	- 0.51	4.97	3.13	+ 1.84	12.24	9.84	+ 2.40
Victoria West.....	The Gaoler.	3.30	1.84	+ 1.46	5.69	3.54	+ 2.15	6.86	5.54	+ 1.32
Vryburg.....	The Gaoler.	5.02	3.41	+ 1.61	14.67	11.39	+ 3.28	7.14	7.75	- 0.61
Worcester.....	C. Butler.	0.63	0.51	+ 0.12	3.07	1.15	+ 1.92	15.42	17.25	- 1.83
Wynberg (Convent).....	The Mother Superior.	0.33	1.50	- 1.17	2.77	3.55	- 0.78	33.16	29.91	+ 3.25

OBSERVERS' NOTES FOR MARCH, 1921.

TRANSVAAL.

Middelburg.—The sky has been threatening rain throughout the month, and though showers mostly fell, on three occasions unusually heavy falls of rain were registered. The month has been cool throughout, even cold of evenings, and it is evident that summer is at an end. Rainfall of 2 inches or over is rare here, only having been recorded five times in seventeen years, and only on one other occasion was a like amount recorded as on the 11th (2.76 inches) in March, 1911, when 2.78 inches was recorded in one day. Rainfall for month, 7.29 inches on fourteen days.—Dr. H. A. Spencer.

Mosdene (Waterberg).—The first week of the month very dry, forcing crops into early maturity, corresponding almost exactly with the drought in March, 1920. The drought was broken by excessive rains, heavier in the neighbourhood than at this station. The latter half of the month was very favourable. The Nijl River is the fullest it has been since the 1917 floods. Rainfall: 4.13 inches on nine days.—E. A. Galpin.

Messina (Zoutpansberg).—This is the highest rainfall (6.81 inches on seven days) recorded for the month of March.—W. W. B. McNeil.

Pigeonhole (Zoutpansberg).—The weather was most unseasonable, with the dry planting period, and owing to wet reaping much damage has been done to the monkey-nut crops, which is a big industry here. Rainfall: 14.37 inches on twenty days.—Jno. W. McCallum.

Lichtenburg.—Splendid rains last two months, which will replenish springs and ensure winter veld. Mealie crop has recovered considerably. Rainfall: 7.40 inches on seventeen days.—J. T. Allman.

Cyferbult (Rustenburg).—Abnormally heavy rainfall, veld good; cattle in good condition; "bollworm" severe in cotton.—J. A. Putto.

Rustenburg.—Very wet month; cattle in good condition; abundance of grazing, and veld splendid. The crops, however, are suffering from the continued rains. A great amount of tobacco has been drowned, and in some places red rust has appeared. In low-lying cotton lands the plants have died. Mealie crops looking splendid; good prospects for winter crops; large area is being put under wheat. Citrus crops, although not so numerous as other years, looking well, and fruit is of fine quality. Roads and drifts throughout district are badly washed out; rivers and fountains are all strengthened from recent rains.—Sgt. H. J. Streatfield.

Wakkerstroom.—The beautiful rains during the month, though they hindered a speedy harvesting of crops, will go a long way to promote the growth of grass, etc., as fodder for live stock during the winter. Cattle are in good condition. Rainfall: 5.97 inches on fifteen days.—Louis le Roux.

Barberton.—A week of unusually hot weather at the beginning of the month was succeeded by a series of showers—occasionally very heavy, with thunder and lightning—lasting through the rest of the month. The rain, though very beneficial generally, came too late for a good deal of the mealie crops. Rainfall: 8.72 inches on sixteen days.—Walter Grubb.

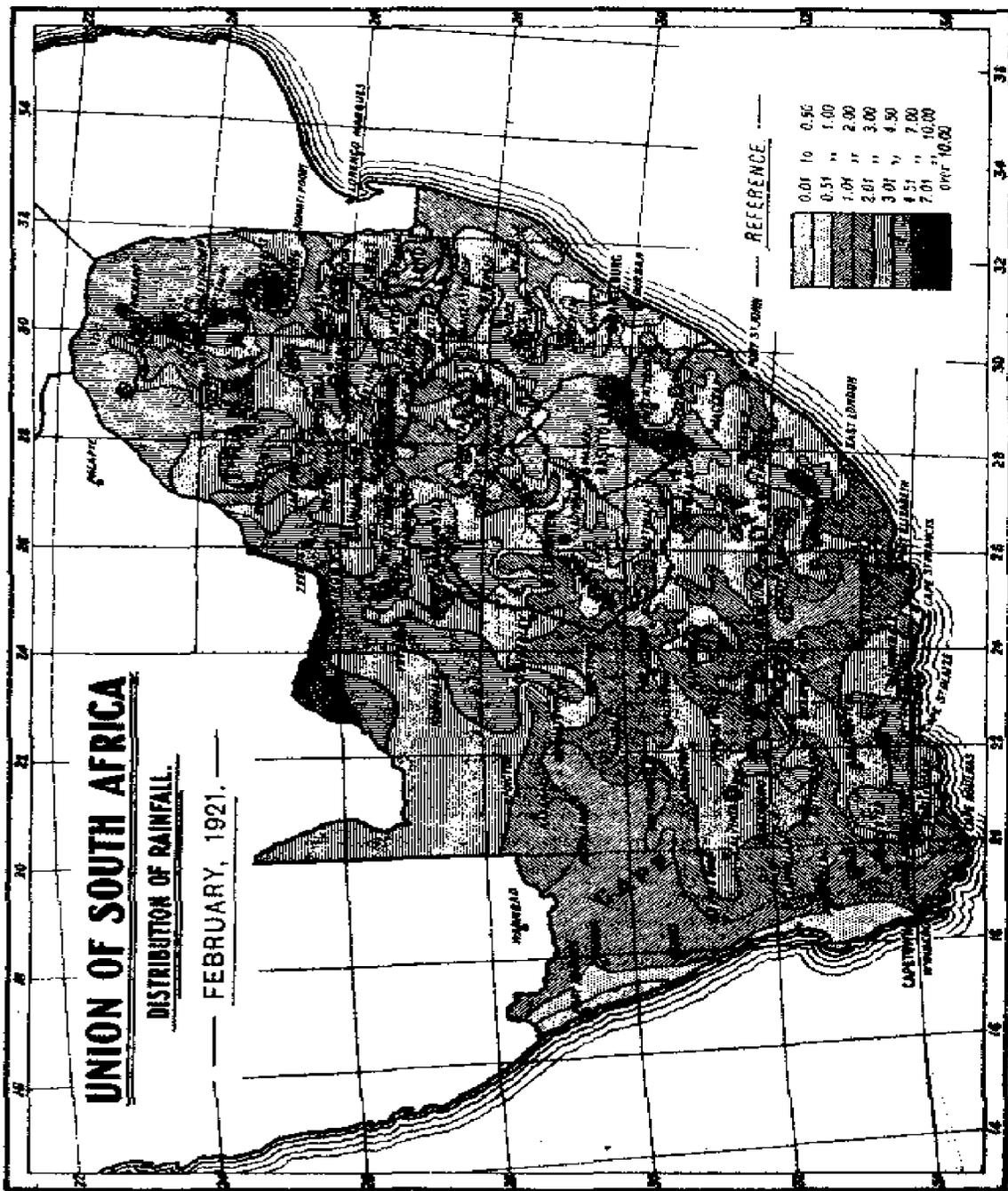
Klerksdorp.—Exceptional rainfall: 8.88 inches on seventeen days.—C. Scott.

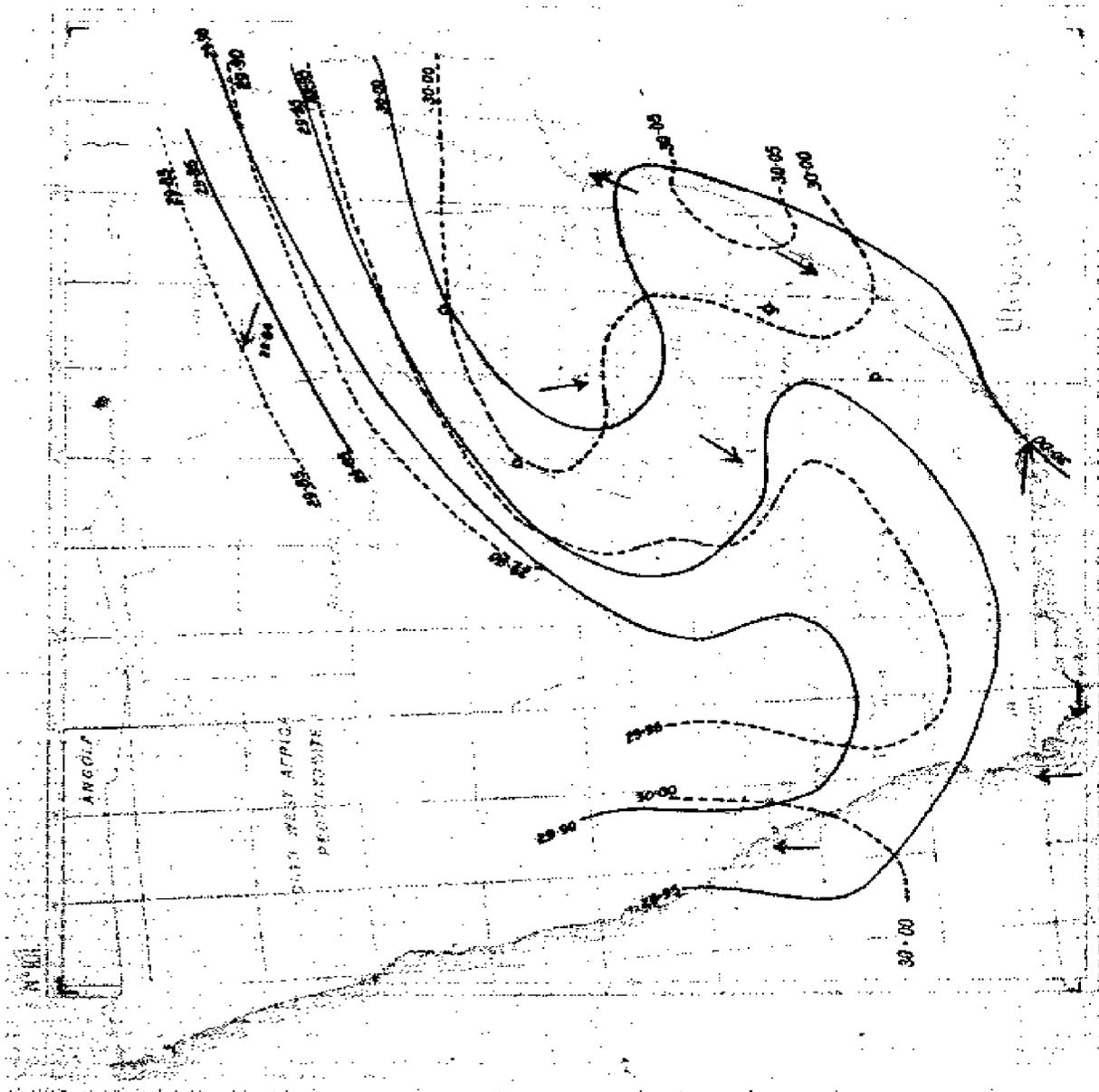
Pietersburg.—Splendid rains throughout month; crops saved; winter grass assured. Rainfall: 7.20 inches on ten days.—J. Frankleyne.

UNION OF SOUTH AFRICA

DISTRIBUTION OF RAINFALL.

FEBRUARY, 1921.





March, 1921. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.

The dotted lines indicate the normal distribution for March.

Pilgrims Rest.—On the 27th, at about 3 p.m., a cyclone, accompanied by rain, struck a portion of our Vaalhoek Mine, fourteen miles down the Blyde River, and north of us here. The offices, store, single quarters, and one house were completely wrecked, and two houses partially destroyed; estimated damage, about £3000. No lives were lost, but four white persons were injured. Rainfall: 11.74 inches on twenty days.—E. M. Skea.

Ermelo.—1st: A great deal of rain fell in the eastern Transvaal, but very little fell actually in Ermelo. 2nd: The approach of winter is very evident, but fortunately no frost yet. Ermelo had a very small proportion of rain compared to the great rains that fell Davel way and towards the Vaal. A few miles from Ermelo the country was under water on the 24th, and every rill a raging torrent, whereas I only registered 0.03 inch. Rainfall: 4.41 inches on thirteen days.—Mrs. S. M. Nicolson.

Krugersdorp.—Good rains for seven successive days, 7th to 13th. Early mornings slightly colder, with heavy dews at night. Heavy storm on 27th: 0.66 inch fell in thirty minutes, accompanied by hail about $\frac{3}{8}$ inch in diameter, lasting just over seven minutes. Weather remained damp during latter end of month. Rainfall: 5.16 inches on seventeen days.—George S. Garnett.

Highlands (Barberton).—Rains too late for some of the crops; Kaffir crops poor.—Mather Smith.

Modderfontein (Heidelberg).—Teff grass getting very ripe; grounds too wet—rains so prevalent; cattle in good condition.—S. C. Obree.

Blaauw-wildebeestput (Lichtenburg).—Crops now require a month of hot weather.—C. Hull.

Elandsfontein (Potchefstroom).—Outlook for winter crops and grazing bright.—P. J. Davidtz.

Delmas (Pretoria).—Dams were broken with these continual rains. Teff grass cannot be cut, as lands are so wet that they cannot be entered.—C. J. Loedolff.

Bushy Park (Pretoria).—Mealie crops good.—C. Park.

Paardekop (Standerton).—This has been an exceptionally heavy rainy month, but it came too late for the crops, consequently mealie crop is not too good; rain interfered with hay-cutting.—F. B. du Plessis.

SWAZILAND.

Kubuta.—Stock in excellent condition. Rainfall: 5.48 inches on twelve days.—Ivan H. Pierce.

Natalia (Swaziland Ranching and Dev. Co.).—Excellent, well-distributed rain during the month has removed a load of anxiety from our shoulders. The drought which has prevailed since November was broken with a fall of 0.74 inch on the 7th, since when steady showers have fallen every two or three days. The veld has assumed an entirely different aspect, the grass making good headway, and generally everything is green once more. The Uttsendegwa started flowing on the 30th, for the first time this season. An army of black and green caterpillars are doing extensive damage to the grass. They were first seen on the Usutu River, and are now all over the ranch, stripping the blades off the grass as they go. Rainfall: 7.22 inches on ten days.—Allan W. MacBeth.

Transvaal.—Crops bad owing to lateness of rain.—J. H. Coates.
Mafuteni.—A good growing month on the whole, crops overtaking the previous droughty periods.—H. S. Parry.

ORANGE FREE STATE.

Deelfontein (Fouresmith).—Crops are doing badly, and pests are numerous. Cutworm and moths are the most severe. Sickness amongst animals is conspicuous by its absence. Rainfall: 3.02 inches on eight days.—E. van Aswegen.

Jansdeel (Harrismith).—Things are looking up again, and stock is in good condition, and should go well into the winter. Rainfall: 2.59 inches on fourteen days.—J. J. Uijts.

Woudzicht (Vrede).—Most of the rains were steady, soaking rains, keeping on for two or three days, with east wind. It did good for mealies, but was bad for all hay crops. Rainfall: 6.89 inches on sixteen days.—J. N. Köhler.

Prospect (Vrede).—The month began very dry, and farmers felt very anxious. The plentiful rains changed everything, and increased the crop. Hay and forage crops, however, suffered much from the continued rains. The veld is very good, and all kinds of stock look well. Rainfall: 7.18 inches on twelve days.—Thomas Pitcairn.

Holfontein (Kroonstad).—Winds mostly easterly: temperature fairly constant; crops in good condition. Rainfall: 7.15 inches on eighteen days.—G. M. G. Müller.

NATAL.

Cape St. Lucia.—A very hot month, with light winds; sun doing serious damage to mealie crops; stock are in good condition. Rainfall: 8.83 inches on thirteen days.—J. Murphy.

Cedara (School of Agriculture).—At 2 p.m. on the 17th, a hailstorm of exceptional violence occurred on the farm. The storm passed over the Zwartkop and moved in a south-westerly direction. The wind attained a velocity of forty-eight miles an hour, and then dropped to forty miles an hour, maintaining this velocity for fully five minutes. Hailstones fell in great quantity, the average diameter being 1 inch, a few specimens measuring $1\frac{1}{4}$ inch in diameter: these were driven with great force by the wind, and practically destroyed all the growing crops. The hailstones covered the land to a depth of four inches, but in places drifted to a depth of eighteen inches. The storm lasted thirty minutes, a precipitation of 2 inches being registered. The storm-cloud was approximately three miles wide, and reached its greatest intensity on the farm. There was heavy thunder and vivid lightning. Adjoining farms suffered damage. Rainfall: 7.60 inches on twenty days.—The Principal.

Howick.—On the 17th, heavy damage to crops by severe hailstorm south of district. Rainfall: 5.72 inches on eighteen days.—H. Ellis.

Newcastle (St. Dominic's Academy).—The month, on the whole, was fine, and frequently rain fell in the afternoons after oppressive mornings. Rainfall: 6.46 inches on fifteen days.—The Mother Superior.

Nottingham Road.—Dull wet days; green winter food looks well. Owing to the wet, harvesting is backward. Rainfall: 4.55 inches on twenty-two days.—Miss E. Smythe.

Stanger.—Trying days, but fairly cool evenings. Rainfall: 5.27 inches on ten days.—A. J. S. Maritz.

Ladysmith.—Several good rains fell during the month, and the country is now looking much greener than it has done for some time past. The grass, however, is very short, and unless more rains fall, winter feed for stock will be very scarce. Rainfall: 4.10 inches on thirteen days.—D. A. R. Leathern.

Dundee.—A good growing month. Rainfall: 4.65 inches on thirteen days.—West Thorrold.

Hlabisa.—Good rains fell during the month. Rainfall: 10.31 inches on seventeen days.—L. Double.

Edendale (Klip River).—All stock and crops splendid; prospects for coming winter are excellent; no blue-tongue or horse-sickness in this area so far. Rainfall: 6.05 inches on thirteen days.—T. N. Niland.

Rongpoort (Klip River).—Fine growing month for crops, and grass improving for winter; very mild weather. Rainfall: 5.83 inches on thirteen days.—J. H. Bartholomew.

CAPE.

Abtonia (Kuruman).—The veld in the whole district is exceptionally good. Stock doing well. Rainfall: 5.10 inches on thirteen days.—A. T. Sitwell.

Kingwilliamstown.—The country is looking beautiful, and there is every indication of good grain crops. The wheat downwards towards Debe Nek is getting rust badly, due to too much rain which has fallen of late, principally this month. Rainfall: 5.06 inches on fourteen days.—L. Clayton.

Rietfontein (Akwat North).—Very wet month; veld is very good, ploughing being carried on extensively; most of the rains were local showers. Rainfall: 5.18 inches on twenty days.—A. G. Smith.

Jansenville.—Rain very easily forthcoming, and of a soft, steady nature; no thunderstorms; thunder and lightning very slight; no wind, except occasional gusts; heat much abated. Rainfall: 2.16 inches on ten days.—G. E. Hurter.

Somerset East.—There have been good showers throughout the month, with the result that the veld is in a remarkably good condition. Rainfall: 4.35 inches on fifteen days.—C. Harris.

Ceres.—Weather generally typical of the month; heavy dews. Rainfall: 0.82 inch on four days.—A. Heatlie.

Lovedale.—A warm initial week, with the mercury up to 104 degrees on the 4th, and hence temperatures running higher than usual for the month, especially the mean minimum—3 degrees above average. The month was a most excellent one for the farmer, with rain on seventeen days, totalling 3.99 inches, seldom violent, nor was it accompanied by hail.—C. A. Pilson.

Carnarvon.—Country looking fine after splendid rains. Many swarms of locusts have made their appearance. Rainfall: 2.80 inches on seven days.—A. P. Malherbe.

Murraysburg.—The veld is looking at its best, but the locusts have made their appearance at several farms in the district. Rainfall: 2.38 inches on ten days.—A. Cameron.

Graaff-Reinet.—Winds variable and moderate; a warm, damp month; rains nicely spread over the month; no heavy floods; river running frequently; veld recovering, and looking green. Rainfall: 4.20 inches on fourteen days.—S. E. D. Treadwell.

Mafeking (The Convent).—The rainfall of 11.02 inches on nineteen days is the highest recorded since March, 1914.—The Mother Superior.

Queenstown.—Heavy dews; mornings overcast and dull. Rainfall: 6.70 inches on eighteen days.—H. Holley.

O'okiep.—Violent thunderstorm on 20th, with hurricane of south-westerly wind; trees uprooted and buildings unroofed; rainfall registered 1.14 inch in thirty minutes. Rainfall: 1.30 inch on five days.—J. Burrows.

Vruchtbaar (Wellington).—Although the rainfall was low, the month was very cold and damp, and bad for fruit-drying and raisin-making.—P. J. Gillie.

Adam Station (Umzimkulu).—Mealie crop very promising in most places; natives will have mealies to spare.—T. James.

Kilcullen (Barkly East).—On the night of the 12th, a most severe frost, killing all vegetables. Veld is most beautiful, and stock in prime condition.—A. O. S. Vorster, J.P.

Logoging (Mafeking).—Grass four to five feet high; country looks beautiful; cattle in splendid condition.—S. Daly.

MAY WEATHER CHARACTERISTICS.

Over the Cape Peninsula precipitation is now increasing rapidly, the average over this area being about five inches. Rainfall is now at its maximum: about 1.5 inch along the west coast, whilst along the south coast there is a slight increase over the preceding month.

In all parts of the Union the rainfall seldom exceeds an inch, with the exception of those areas previously mentioned, together with Swaziland and Zululand, so that, generally speaking, the month of May may be described as sunny and dry.

The mean daily temperatures are still decreasing rapidly, particularly over the Karroo, the Orange Free State, and Basutoland. Over the high veld and the Karroo radiation frosts occur, and killing frosts may be expected. The highest mean temperatures now occur over Natal, where the average is 61 degrees, the southern coastal districts following with 60 degrees: the western, south-western, and south-eastern districts with 59 degrees; the south-west of the Cape Province and the southern and east-central Karroo with 58 degrees; Kaffraria and the Cape northern border with 57 degrees; the Transvaal with 54 degrees; the west-central Karroo with 53 degrees; Basutoland, the northern Karroo, and the north-east of the Cape with 52 degrees; and the Orange Free State with 51 degrees.

In the south-east of the Cape Province there is a decrease of winds from all directions having an easterly component, and of south and south-west winds, but an increase of northerly and all winds having westerly components, particularly of those from N.W., although those from W.S.W. have a slight excess over the other directions. Over the Cape Peninsula, north-westerly and southerly are about equally frequent, while over the northern border there is a marked increase of winds from S. and E.N.E., together with a decrease of all winds from N. round by W. to W.S.W., as well as of S.E. winds. The winds from S. are slightly in excess of those from E.N.E.; these constitute the principal directions during the month. On the high veld, on the other hand, the only directions showing an increased frequency are those between N. and W.N.W. and from S., all others showing a diminution in frequency; N.N.W. is the prevalent direction.

C. STEWART,
Chief Meteorologist.

Pretoria.



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

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MEAN pressure about normal, except in the west, where it was higher than usual; days one to four degrees cooler and nights half a degree to one degree warmer than the average; precipitation greater than usual over practically the whole of the Cape Province, Swaziland, and central Transvaal, but deficient elsewhere; some killing local frosts and destructive hailstorms were the most noteworthy features of the weather of April, 1921.

Pressure.—Mean barometric pressure was practically normal for the month of April, 1921, except in the west, where it was slightly higher than usual. There was a fairly regular succession of "highs" and "lows" throughout the month along the coasts, but the equatorial "low pressure" was entirely absent. "Highs" were present on each day of the month. "Lows" moved from south-west to south on 3rd-4th, from west to south on 8th-9th, 18th-19th, 29th-30th, from south on 12th, [21st-22nd, from west to south and east on 25th-27th. Rain was reported each day of the month, and snow on mountains in the neighbourhood of Kilcullen (Barkly East Division).

Temperature. The mean monthly temperature over the Union was 62.6 degrees, or 0.2 degree less than usual. As in the preceding month, the day temperature (74.2 degrees) was lower than usual by 1.2 degrees, but this was almost counterbalanced by the night temperature (51.1 degrees) being 0.8 degree higher than normal. Considering each province separately, the days were sub-normal to the greatest extent in Natal, where the mean maximum temperature (76.4 degrees) was 3.5 degrees less than usual, whilst the nights, with a mean of 56.8 degrees, were 2.6 degrees warmer than usual. The mean daily range was thus reduced by 5.1 degrees, the monthly temperature being 0.4 degree less than the average. Over the Transvaal, the mean monthly temperature was the same as usual (62.3 degrees). The mean daily range, however, was reduced by 2.4 degrees owing to the days being 1.2 degree cooler and the nights warmer by an equal amount. In the Free State, the temperature of the month (58.2 degrees) was 0.6 degree below normal. This was mainly due to the days, with 69.9 degrees, being 1.8 degree cooler, whilst the nights, with 48.4 degrees, were only 0.5 degree warmer than the corresponding average. Over the Cape Province, as over the Transvaal, the temperature of the month was practically normal, the days, with a mean of 74.5 degrees, were 0.8 degree below and the nights (52.3 degrees) 0.7 degree above the corresponding normals. Considering individual stations, it is found that the

temperature during the month was below the average in Natal, the northern three-quarters of Bechuanaland, the major portion of the Free State, and almost the whole of the interior of the Cape Province and Transkei, as well as the south-east coastal areas. The deficit was most commonly between 0.5 degree and 1.0 degree, but exceeded 2 degrees in the greater part of Natal, and at Pietersburg, in the northern Transvaal, and Queenstown, in the north-east of the Cape Province. On the other hand, temperature was higher than usual in Zululand, the more south-easterly, southerly, and south-westerly portions of the Transvaal, at Bloemfontein in the Free State, Kimberley, Port St. Johns, and Murraysburg, as well as the west and south-west of the Cape Province. The excess was two degrees or over at Potchefstroom and Zeerust in the south west of the Transvaal and Clanwilliam in the Cape, but amounted only to a few tenths of a degree at most of the other stations in the areas mentioned. Both days and nights were warmer than usual over the west of the Cape, the south of the Cape Peninsula, the neighbourhood of Mossel Bay on the south coast, at Kimberley, Zeerust, Potchefstroom, Johannesburg, Ermelo, and Barberton. On the other hand, the mean maxima and minima were both lower than usual in the south of Natal, the neighbourhood of Port Elizabeth and Queenstown in the Cape, Ladybrand in the east of the Orange Free State, and at Komatipoort, Belfast, Louis Trichardt, and Nylstroom in the Transvaal. Elsewhere the day temperature was below and the night temperature above the average. The deficiency in day temperatures was greatest, 4-5½ degrees in Natal, the northerly central portion of the Transvaal, the northern Karroo, and parts of the north-east and south-east of the Cape Province. The excess in day temperature was largest, 2-3½ degrees in the west and south-west of the Cape. Night temperatures were higher than usual, mostly by 1-1½ degree, but exceeding 3 degrees at Bedford in the south-east of the Cape, and Port St. Johns in the Transkei, Piet Retief in the south-east of the Transvaal, but rising to 4.9 degrees at Barberton. Where deficits occurred they were mostly about one degree, but varying between 0.1 degree and 1.9 degree. The mean warmest station was Komatipoort, with a temperature of 72.6 degrees, Durban being next with 70.1 degrees; the mean coldest station was Belfast with 54.2 degrees, a difference of 18.4 degrees. The highest mean maximum was 87.0 degrees at Clanwilliam (Cape Province), and the lowest mean minimum 41.1 degrees at Belfast (Transvaal Province). The highest temperatures were recorded mostly between the 1st and 6th of the month, although other warm spells were experienced on 13th-14th, 16th, 20th, 22nd, and 27th. As is to be expected with falling temperature, the coldest period was towards the end of the month, from 24th to 29th, minima being registered most widely on 24th-25th and 28th. The highest temperature recorded during April was 101.0 degrees at Clanwilliam on the 18th, closely followed by 100.0 degrees at Groot Drakenstein on the same day; the lowest temperature recorded was 23.0 degrees on the 25th at Belfast. There was thus an extreme range of 78 degrees during the month. Frosts were of wide occurrence between the 24th and 29th, causing damage to standing crops, although in a number of localities the moist condition of the soil tended to lessen their severity.

Precipitation during the month was above the average in the Cape Province, particularly over the northern Karroo, the north-east and south-east of the Cape Province, and south of the Orange Free State, where it was commonly from 2.3 inches in excess. Over the central, west central portions, and the extreme north of the Transvaal there were small surplus amounts varying from about 0.2 to 1.7 inch. In the Cape Province, the excess decreased to about half an inch along the south coast and to 1¼ to 2 inches in the south-east. Over the greater portion of the west coastal area, however, as well as in the

south-west, the surplus over the interior decreased to deficits of about half an inch. A shortage was also common to Natal, by far the major portion of the Free State, Bechuanaland, and the west, south, east, and north of the Transvaal, forming an almost complete circle round the central area, having a small excess. Over Natal the deficits varied between half an inch and 2 inches; in the Orange Free State the shortage was small except in the north and east-central areas, where it amounted to about 1 to $1\frac{1}{2}$ inch; over the major portion of the Transvaal and the south of Bechuanaland the deficits were generally under an inch, but rising to about $1\frac{1}{2}$ inch in the more easterly and north-westerly and south-westerly parts, as also in the northerly portion of Bechuanaland. Precipitation occurred on every day of the month in one part or another of the Union. Over the Transvaal the rains occurred at intervals of practically a week, being noted on 1st, 6th to 9th, 14th to 16th, 22nd, and 23rd, and 29th to 30th; the distribution as to time intervals was similar over the Orange Free State, Natal, and the Cape, although not on the same dates. The cumulative seasonal rainfall since 1st July, 1920, is generally above the average over the Cape by 2-4 inches, but rising to 6-8 inches in the central Karroo and south-west portion of the northern Karroo. Along the south coast there was a deficit, however, varying from 0.24 inch at Mossel Bay to 4.96 inches at East London. Another broad belt of deficient rainfall partially encircled Basutoland and the Free State, from Kokstad in the Transkei to Vryburg in Bechuanaland. Here the shortage varied from 0.14 inch at Hopetown to 3.70 inches at Philipstown, being generally between one and two inches. Over the centre and south of the Free State there is an excess ranging from a few hundredths of an inch to almost two inches, with a deficiency in the north and east of a third of an inch to 1.30 inch. An excess of precipitation of 1.9 inches has been experienced in the centre and south of Natal, but large deficits of 6-10 inches in the north and west, with a small shortage of about an inch in Zululand. Over the Transvaal there has been a surplus rainfall of 3-5 inches, except in the east, where relatively small deficits have been recorded amounting to about $2\frac{1}{2}$ inches at Barberton. The cumulative rainfall since the beginning of the calendar year is above the average commonly by 2-4 inches or more over the Cape Province, except in the Cape Peninsula, where there is a deficit of about one-quarter to two inches; a similar shortage is exhibited by the neighbourhood of Philipstown. Over the north, south, and west of Natal, the centre and east of the Transvaal, as well as the east of the Free State, there is also a deficiency in the precipitation, ranging in amount from a few tenths in the south of Natal, through 1-2 inches in the Transvaal and Free State, to $7\frac{3}{4}$ inches at Vryheid. Elsewhere there is an excess usually of 1-2 inches, but rising to 5-6 inches in the west, north, and south-east Transvaal and at Durban (Natal). These late rains have kept the veld green and made pasture plentiful, whilst frost, which was of fairly common occurrence from 23rd to the end of the month, caused some damage, principally to young mealies, pumpkins, and potatoes, and the tips of cotton plants (the last in the Waterberg District). Stock generally are reported in good condition, although three-day sickness in cattle is reported from Nottingham Road (Natal). The continued wet weather proved unfavourable to harvesting operations in some districts, and checked the growth of teff and other pasture grasses. The veld for winter grazing is reported as short on most farms in the Wepener District (Orange Free State). A good deal of damage has been caused by insects to the cotton crop in the Rustenburg District. Ploughing operations are being carried out in a number of districts. Light hailstorms were frequent in the Orange Free State, with occasional heavy storms, causing damage to tobacco, etc., in the Transvaal and north of the Cape.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), APRIL, 1921.

PLACE.	OBSERVER.	Month.—April, 1921.		Normal Monthly Temperature.	Difference from Normal.	Highest.	Date.	Extremes.	
		Mean Max.	Mean Min.					Lowest.	Date.
<i>Transvaal—</i>									
Bellart.....	The Forester.....	67.4	41.1	55.9	- 1.7	75.0	4th.....	23.0	25th.
Barberton.....	Walter Grubb.....	77.7	59.2	67.0	+ 1.4	88.0	27th.....	43.0	25th.
Bloemfont.	A. Adamson.....	78.0	51.2	62.0	+ 2.6	85.0	5th & 16th.....	30.0	24th.
Ernulo.....	Mrs. S. M. Nicolson.....	72.4	44.4	57.3	+ 1.1	80.0	5th.....	30.0	25th.
Johannesburg (Observatory).....	The Staff.....	68.5	49.6	58.8	+ 0.2	73.7	13th.....	39.0	24th.
Klerksdorp (Strathmore).....	Chas. Scott.....	75.9	48.7	63.1	- 0.8	82.0	10th.....	32.0	24th.
Komatipoort.....	H. J. Evans.....	84.6	60.6	72.6	- 0.4	91.0	5th & 27th.....	43.0	25th.
Louis Trichardt.....	Town Clerk.....	73.9	52.2	63.0	+ 1.2	80.0	1st.....	39.0	27th & 28th.
Middelburg.....	Dr. H. A. Spencer.....	74.9	40.0	60.4	+ 0.1	82.0	5th.....	32.0	24th.
Nylstroom.....	G. Bakker.....	76.1	50.4	64.5	+ 1.3	81.0	5th, 6th, & 17th.....	39.0	25th.
Pieterma Rest.....	F. M. Skea.....	72.8	49.4	61.6	- 0.5	80.0	4th & 14th.....	32.5	25th.
Pietersburg.....	J. Franklyn.....	72.2	49.8	63.3	- 2.3	80.0	17th.....	38.0	25th.
Potchefstroom (Exp. Farm).....	The Manager.....	77.7	47.3	60.5	+ 2.0	83.5	5th.....	34.0	24th.
Pretoria (Meteorological Office).....	The Staff.....	73.1	50.8	62.9	- 0.0	79.1	6th.....	37.9	25th.
Preb. Beauf.	J. Werner.....	72.2	51.3	60.7	+ 1.1	81.3	4th.....	38.0	25th.
Zeerust.....	H. Dietrich.....	77.4	48.9	63.7	- 0.5	86.0	6th.....	36.0	25th.
<i>Swaziland—</i>									
Mbabane.....	Swaziland Police.....	71.0	53.1	62.5	- 0.5	80.0	27th.....	39.0	25th.
<i>Orange Free State—</i>									
Bloemfontein.....	G. A. Schepers.....	71.5	48.4	59.9	+ 0.1	77.9	18th.....	34.9	28th.
Bethulle.....	J. J. Wardhaugh.....	71.4	47.8	60.0	- 0.4	79.1	4th.....	31.0	24th.
Harrismith.....	The Forester.....	66.1	44.4	55.2	- 0.8	74.0	4th.....	31.0	24th.
Lindley.....	J. Collister-Oates.....	72.1	44.0	58.8	- 0.8	78.5	5th.....	31.0	25th, 26th, & 27th.
Ladybrand.....	The Forester.....	70.6	44.8	59.2	- 1.5	78.0	3rd & 16th.....	32.0	24th.
<i>Natal—</i>									
Durban (Point).....	Port Captain.....	77.0	63.2	72.4	- 2.3	83.0	5th.....	53.2	26th.
Dundee.....	West Thormid.....	74.3	48.4	63.9	- 2.5	83.0	4th.....	33.0	26th.
Riobisa.....	The Gaoler.....	78.6	60.8	69.6	+ 0.1	83.0	27th.....	32.0	24th.
Maritzburg (Mental Hospital).....	The Staff.....	75.7	55.9	67.5	- 2.4	89.0	4th.....	41.8	25th.
<i>Cape—</i>									
Alfwal North.....	A. Alcock.....	70.2	46.8	59.0	- 0.5	74.5	3rd & 19th.....	33.5	25th.
Bedford.....	T. C. Hall.....	71.3	54.6	63.2	- 0.2	89.0	3rd.....	35.5	29th.
Cape Town.....	A. P. Mallerbe.....	71.4	47.8	60.2	- 0.6	82.0	2nd & 3rd.....	31.0	24th.
Cape Town (Royal Observatory).....	The Staff.....	74.3	58.4	63.1	+ 0.7	93.9	18th.....	39.8	27th.
Claremont.....	W. J. Downes.....	87.0	51.9	67.2	+ 2.2	101.0	18th.....	38.0	25th.
East London.....	M. G. Grogan.....	72.9	56.9	66.2	- 1.3	86.0	22nd.....	46.0	28th & 29th.
Geoff. Beauf.	S. E. D. Froadwell.....	73.8	53.2	64.1	- 0.6	90.8	3rd.....	38.4	28th.
Groot Drakenstein.....	Lionel Baker.....	77.0	51.9	64.4	+ 0.4	100.0	3rd.....	39.2	28th.
Kroonstad.....	H. D. Coyle.....	69.5	46.4	59.4	- 1.4	82.2	4th.....	30.0	25th.
Kimberley.....	J. Acton.....	77.0	51.5	63.6	+ 0.6	84.0	5th, 10th, & 19th.....	37.0	24th.
Matieling (Conveng).....	Mother Superior.....	77.1	49.0	63.5	- 0.5	82.2	5th.....	35.0	24th.
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	71.0	58.8	64.4	+ 1.0	89.0	3rd.....	51.0	28th.
Murraysburg.....	A. Cameron.....	73.1	47.7	60.2	+ 0.2	83.0	2nd & 3rd.....	34.0	26th.
O'okiep.....	J. Burrows.....	77.4	54.9	65.8	+ 0.4	86.3	2nd.....	37.9	23rd.
Port Elizabeth.....	The Lightkeeper.....	72.8	57.1	65.5	- 0.8	95.0	3rd.....	47.0	28th.
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	74.9	62.4	68.4	+ 0.2	82.0	20th.....	54.0	25th.
Queenstown.....	H. Holley.....	70.5	48.0	61.9	- 2.7	84.0	3rd.....	34.0	28th & 29th.
Vryburg.....	Chas. Butler.....	78.3	48.1	63.2	+ 0.0	84.0	6th & 16th.....	34.0	25th.
Wynberg (Convent).....	Mother Superior.....	75.1	54.2	62.8	+ 1.8	92.5	3rd & 14th.....	43.8	28th.

RAINFALL, APRIL, 1921.

PLACE.	OBSERVER.	Month. April, 1921.	Normal.	Difference from Normal.	From 1st Jan. 1921.	Normal.	Difference from Normal.	From 1st July, 1920.	Normal.	Difference from Normal.
<i>Transvaal—</i>										
Barberton.....	W. Grubb.....	Inches, 1.02	Inches, 2.24	Inches, - 1.22	Inches, 14.25	Inches, 19.78	Inches, - 5.53	Inches, 30.17	Inches, 32.58	Inches, - 2.41
Belfast.....	The Forester.....	2.32	1.84	+ 0.48	18.19	16.50	+ 1.69	36.07	31.35	+ 4.72
Bethal.....	H. F. Joubert.....	3.41	1.23	+ 0.18	19.88	14.14	+ 5.24	33.88	29.66	+ 4.22
Bloemhof.....	A. Adamsen.....	1.19	1.27	- 0.08	12.28	11.65	+ 0.63	16.95	17.07	- 0.12
Claremont.....	S. A. Polles.....	0.13	1.60	- 1.67	11.17	10.41	+ 0.70	19.14	17.57	+ 1.57
Ermelo.....	Mrs. S. M. Nicolson.....	0.61	1.38	- 0.77	9.34	11.46	- 5.12	30.64	30.19	+ 0.45
<i>Haarlemsberg—</i>										
Heidelberg.....	W. ter Horst.....	0.52	1.32	- 0.80	18.26	14.25	+ 4.03	31.74	27.14	+ 4.60
Johannesburg (Observatory).....	The Staff.....	0.72	1.23	- 0.51	15.81	14.30	+ 1.51	30.05	25.09	+ 4.06
Klerksdorp (Stratimore).....	C. Scott.....	0.71	1.87	- 1.16	15.84	12.97	+ 2.87	24.83	21.09	+ 3.73
Konakpoort.....	H. J. Evans.....	1.32	1.73	- 0.41	14.89	15.05	- 1.56	23.19	25.23	- 0.64
Louis Trichardt.....	Town Clerk.....	2.08	1.83	+ 0.85	22.77	17.98	+ 4.70	32.95	31.04	+ 1.91
Middelburg.....	Dr. H. A. Spruener.....	0.91	1.46	- 0.55	14.36	14.48	- 0.12	29.28	28.13	+ 1.15
Nylstroom.....	G. Bakker.....	3.00	1.32	+ 1.68	21.90	13.55	+ 8.44	32.28	23.57	+ 8.71
Pietersburg.....	J. Franklynne.....	0.05	1.27	- 1.22	12.46	11.94	+ 0.52	23.91	21.46	+ 2.45
Piet Retief.....	J. Werner.....	0.04	1.67	- 0.73	20.17	14.78	+ 5.44	33.69	29.94	+ 3.75
Pilgrims Rest.....	E. M. Siva.....	0.73	2.37	- 1.64	23.50	24.05	- 1.36	39.17	39.00	+ 0.17
Pratoria (Meteorological Office).....	The Staff.....	1.70	1.52	+ 0.18	16.34	16.49	- 0.15	29.16	29.11	+ 0.05
Potchefstroom (Exp. Farm).....	The Manager.....	0.88	1.79	- 0.91	17.38	12.20	+ 5.18	24.54	22.96	+ 1.58
Rooiberg.....	N. H. Munro.....	1.31	0.85	+ 0.46	17.23	13.24	+ 3.99	27.14	23.19	+ 3.95
Rustenburg.....	S. A. Polles.....	1.31	0.91	+ 0.40	20.16	14.30	+ 5.86	32.74	25.25	+ 7.49
Wakkerstroom.....	L. le Roux.....	0.96	1.76	- 0.80	14.88	16.13	- 1.25	26.34	31.18	- 4.84
Woodbush.....	The Forester.....	4.10	3.31	+ 0.79	54.82	44.77	+ 10.05	74.09	60.86	+ 13.23
Zeevaal.....	H. Dietrich.....	0.73	1.38	- 0.65	17.70	13.99	+ 3.80	23.64	22.98	+ 0.66
<i>Swaziland—</i>										
Mbabane.....	Swaziland Police.....	3.75	2.84	+ 0.92	31.88	27.07	+ 4.81	60.64	48.49	+ 12.15
<i>Orange Free State—</i>										
Bethule.....	J. J. Wardhaugh.....	4.87	1.45	+ 3.42	15.46	10.49	+ 4.97	18.68	16.99	+ 1.69
Bloemfontein.....	G. A. Scheepers.....	2.05	2.05	- 0.01	13.53	10.58	+ 2.95	19.70	18.21	+ 1.49
Barrismith.....	The Forester.....	0.35	1.73	- 1.41	11.41	13.93	- 2.52	25.76	27.06	- 1.30
Kroonstad.....	S. R. Northfield.....	0.87	1.14	- 0.27	11.03	9.89	+ 1.14	20.90	21.26	- 0.36
Ladybrand.....	The Forester.....	2.08	2.18	- 0.10	15.29	13.85	+ 1.44	25.39	25.83	- 0.44
Lindley.....	J. Collister-Oates.....	0.82	1.91	- 1.09	13.87	12.57	+ 1.30	23.11	23.05	+ 0.06
<i>Natal—</i>										
Dundee.....	West Thorold.....	1.29	2.33	- 1.04	12.78	16.91	- 4.13	26.83	30.23	- 3.40
Durban (Point).....	Port Captain.....	2.06	3.90	- 0.94	24.86	18.77	+ 6.09	47.51	38.24	+ 9.27
Hiabisa.....	The Gaoler.....	2.59	3.69	- 0.90	21.94	20.00	+ 1.94	39.82	40.84	- 1.02
Howick.....	The Gaoler.....	1.52	2.08	- 0.56	15.85	16.43	- 0.58	33.27	30.74	+ 2.53
Ladymanth.....	D. A. B. Leatheren.....	0.30	1.63	- 1.33	10.20	15.08	- 4.79	19.83	26.32	- 6.49
Martzburg (Mental Hospital).....	The Staff.....	1.55	2.07	- 0.72	17.05	17.15	- 0.10	36.07	32.39	+ 3.68
Vryheid.....	The Gaoler.....	0.91	2.81	- 1.90	11.17	18.89	- 7.72	25.29	35.88	- 10.59
Wenuen.....	The Gaoler.....	0.78	1.86	- 1.08	15.75	13.90	+ 1.85	28.53	25.48	+ 3.05

RAINFALL, APRIL, 1921 (continued).

PLACES.	OBSERVER.	Month,		Normal.	Difference from Normal.	From 1st Jan., 1921.		Normal.	Difference from Normal.	From 1st July, 1920.		Normal.	Difference from Normal.
		April, 1921.	Inches.			Inches.	Inches.			Inches.	Inches.		
Cape Allwal North.....	A. Alcock.....	4.60	1.77	1.41	+ 2.83	13.87	11.41	17.76	+ 2.40	19.49	1.07	1.07	1.07
Beaufort West.....	The Gaoler.....	2.48	0.81	1.61	+ 1.61	12.67	4.82	7.85	+ 7.85	8.35	7.80	8.35	7.80
Bedford.....	T. C. Ball.....	4.74	2.41	2.33	+ 2.33	16.28	13.20	20.75	+ 3.08	25.44	1.31	25.44	1.31
Britstown.....	The Gaoler.....	0.87	1.71	0.96	+ 0.96	11.95	6.74	14.83	+ 5.21	10.11	4.72	10.11	4.72
Calvinia.....	The Gaoler.....	0.87	0.98	0.41	- 0.41	5.45	2.21	11.21	+ 3.24	5.06	5.55	5.06	5.55
Cape town (Royal Observatory).....	The Staff.....	1.50	1.09	0.49	- 0.49	3.91	4.21	20.49	- 0.30	17.10	3.89	17.10	3.89
Ceres.....	A. Healdie.....	3.51	3.33	0.38	+ 0.38	8.18	5.81	36.08	+ 2.37	28.58	8.05	28.58	8.05
Carnarvon.....	A. P. Malherbe.....	2.27	0.92	1.35	+ 1.35	9.25	4.73	11.40	+ 4.52	6.98	5.98	6.98	5.98
Clanwilliam.....	W. J. Downes.....	4.83	2.85	0.50	- 0.50	1.48	1.47	8.92	+ 0.01	5.88	5.00	5.88	5.00
East London.....	A. Downie.....	3.04	0.50	2.18	+ 2.18	14.71	12.88	24.46	+ 1.88	29.42	4.06	29.42	4.06
Fraserburg.....	The Gaoler.....	0.32	0.52	0.30	+ 0.30	1.82	3.54	12.48	+ 6.31	5.00	6.88	5.00	6.88
Gezles.....	The Gaoler.....	3.39	1.08	2.31	+ 2.31	10.04	6.37	14.94	+ 3.07	3.04	2.38	3.04	2.38
Graaff-Reinet.....	S. B. D. Freadwell.....	2.74	2.08	0.24	- 0.24	6.35	6.07	27.34	+ 0.28	24.77	2.09	24.77	2.09
Groot Drakenstein.....	L. Baker.....	1.46	1.69	0.23	- 0.23	7.62	8.22	10.41	+ 0.60	11.79	1.35	11.79	1.35
Griquatown.....	The Gaoler.....	3.98	1.50	1.88	+ 1.88	8.10	7.55	9.57	+ 0.55	4.97	2.28	4.97	2.28
Hannover.....	The Gaoler.....	4.46	0.64	3.32	+ 3.32	10.66	7.54	11.33	+ 3.12	11.47	0.14	11.47	0.14
Hopetown.....	The Gaoler.....	0.51	1.56	0.13	- 0.13	5.32	3.46	7.25	+ 1.86	4.97	2.98	4.97	2.98
Kimberley.....	The Gaoler.....	1.56	2.19	1.10	+ 1.10	9.54	8.85	13.53	+ 0.66	15.21	1.68	15.21	1.68
Knyasa.....	The Gaoler.....	3.23	2.19	1.10	+ 1.10	12.71	8.85	25.85	+ 3.86	24.34	1.51	24.34	1.51
Kokstad.....	H. D. Coyte.....	1.89	1.58	0.31	- 0.31	15.43	13.73	25.34	+ 1.70	25.40	0.15	25.40	0.15
Kuruman (Abonia).....	A. T. Sittwell.....	2.27	1.25	1.02	+ 1.02	11.18	10.34	14.10	+ 0.84	15.45	1.35	15.45	1.35
Mafeking (Convent).....	Mother Superior.....	0.29	1.92	0.63	+ 0.63	19.18	12.68	23.80	+ 6.50	21.00	7.80	21.00	7.80
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	2.08	1.74	0.34	+ 0.34	7.39	5.82	14.40	+ 1.57	14.40	0.24	14.40	0.24
Murraysburg.....	A. Cameron.....	3.76	1.06	2.70	+ 2.70	8.21	5.86	10.41	+ 2.35	9.66	0.85	9.66	0.85
Oxley.....	J. Burrows.....	0.79	0.67	0.12	+ 0.12	3.65	1.07	7.96	+ 1.98	5.01	2.55	5.01	2.55
Phillips town.....	The Gaoler.....	1.77	1.30	0.47	+ 0.47	7.10	7.71	8.71	- 0.61	12.41	3.70	12.41	3.70
Piquetberg.....	The Gaoler.....	2.02	1.72	0.30	+ 0.30	4.44	3.32	18.14	+ 1.12	14.72	3.42	14.72	3.42
Port Elizabeth.....	J. Allen.....	2.37	3.80	1.28	+ 1.28	8.15	6.04	13.90	+ 2.21	18.31	4.41	18.31	4.41
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	6.17	3.80	2.38	+ 2.38	21.97	19.64	30.82	+ 2.33	43.98	4.41	43.98	4.41
Priska.....	The Gaoler.....	1.92	1.42	0.50	+ 0.50	0.34	0.29	7.28	+ 0.05	20.04	1.50	20.04	1.50
Queenstown.....	H. Holby.....	3.06	1.60	1.46	+ 1.46	14.80	11.43	32.07	+ 3.37	28.04	3.03	28.04	3.03
Steytierville.....	The Gaoler.....	1.98	0.80	1.18	+ 1.18	5.86	4.01	10.30	+ 1.85	8.37	1.93	8.37	1.93
Sutherland.....	The Gaoler.....	1.00	1.02	0.07	+ 0.07	6.02	3.09	11.77	+ 3.63	6.95	4.62	6.95	4.62
Swellendam.....	The Gaoler.....	3.07	1.93	0.85	+ 0.85	15.51	11.08	23.01	+ 5.43	27.29	0.72	27.29	0.72
Umtata.....	A. Dixpeck.....	2.47	1.93	0.54	+ 0.54	10.47	12.31	24.96	+ 4.16	23.39	1.57	23.39	1.57
Uniondale.....	The Gaoler.....	1.95	1.23	0.59	+ 0.59	9.19	4.36	14.06	+ 4.83	11.07	2.99	11.07	2.99
Upington.....	The Gaoler.....	3.55	1.03	2.52	+ 2.52	6.02	4.38	7.81	+ 1.64	6.38	1.43	6.38	1.43
Victoria West.....	The Gaoler.....	0.87	1.61	0.84	+ 0.84	9.14	5.05	10.69	+ 3.49	8.78	1.91	8.78	1.91
Vryburg.....	C. Butler.....	0.71	1.14	0.43	+ 0.43	15.34	12.80	16.09	+ 2.44	18.76	2.67	18.76	2.67
Wanzenburg.....	The Gaoler.....	2.20	3.78	1.49	+ 1.49	3.78	2.20	9.29	+ 1.49	9.06	0.23	9.06	0.23
Wynberg (Convent).....	The Mother Superior.....	2.20	3.28	1.08	+ 1.08	4.97	6.93	36.16	+ 1.86	33.09	2.97	33.09	2.97

OBSERVERS' NOTES FOR APRIL, 1921.

TRANSVAAL.

Mosdene (Waterberg).—Remarkable for the light frosts experienced on the 25th, 26th, and 27th, when potato plants were frosted down and the tips of cotton plants nipped by frost. This is a month earlier than expected. During the past six years no crops have previously been touched by frost before the 21st May. Rainfall: 0.73 inch on three days.—Ernest E. Galpin.

Krugersdorp.—The month opened with bright weather, and somewhat chilly mornings. The rainfall, although comparatively low, was welcome; crops fairly good; rainfall: 1.48 inch on seven days.—A. G. Wannenburg.

Jakhalsfontein (Zoutpansberg).—Cloudy, overcast mornings, clearing up during the forenoon, have been frequent throughout the month. Rainfall: 0.14 inch on two days.—James C. Palmer.

Pietersburg.—Brilliant days, genial weather; three days of sharp frost. Rainfall: 0.05 inch on two days.—J. Frankleyne.

Ermelo.—The weather has been exceptionally fine during the month. Bright days, heavy dews, and heavy deposits from mists have been a leading feature of the month. Heavy frost did not occur till the night of the 24th–25th. Many parts of the eastern Transvaal have experienced exceptionally heavy rains, but little fell in Ermelo. Winter is coming on fast now, and in a few weeks will be with us in earnest. The frost brought horse sickness to a sudden end for this season. Rainfall: 0.61 inch on three days.—Mrs. S. M. Nicolson.

Wakkerstroom.—Winter beginning to set in; heavy frost on the 25th (27.4 degrees F.), but after that much warmer during the nights. Farmers prophesy a heavy fall of snow and a wet winter. Stock mostly in good condition. Farmers are well prepared for the winter as regards fodder for live stock. Rainfall: 0.96 inch on five days.—Louis le Roux.

Barberton.—The showers have been accompanied by unusually heavy thunder and lightning, otherwise the weather conditions have been normal. Rainfall: 1.02 inch on five days.—Walter Grubb.

Lichtenburg.—Genial weather; cattle in good condition; no killing frosts yet, which will allow late mealies to ripen. Rainfall: 2.34 inches on three days.—J. T. Allman.

Middelburg.—The weather has been mild, with only two frosty nights. Rain has threatened often, but fell on only six occasions. The country is still looking green, and stock in good condition. Water supplies are still at summer height. Rainfall: 0.91 inch on six days.—Dr. H. A. Spencer.

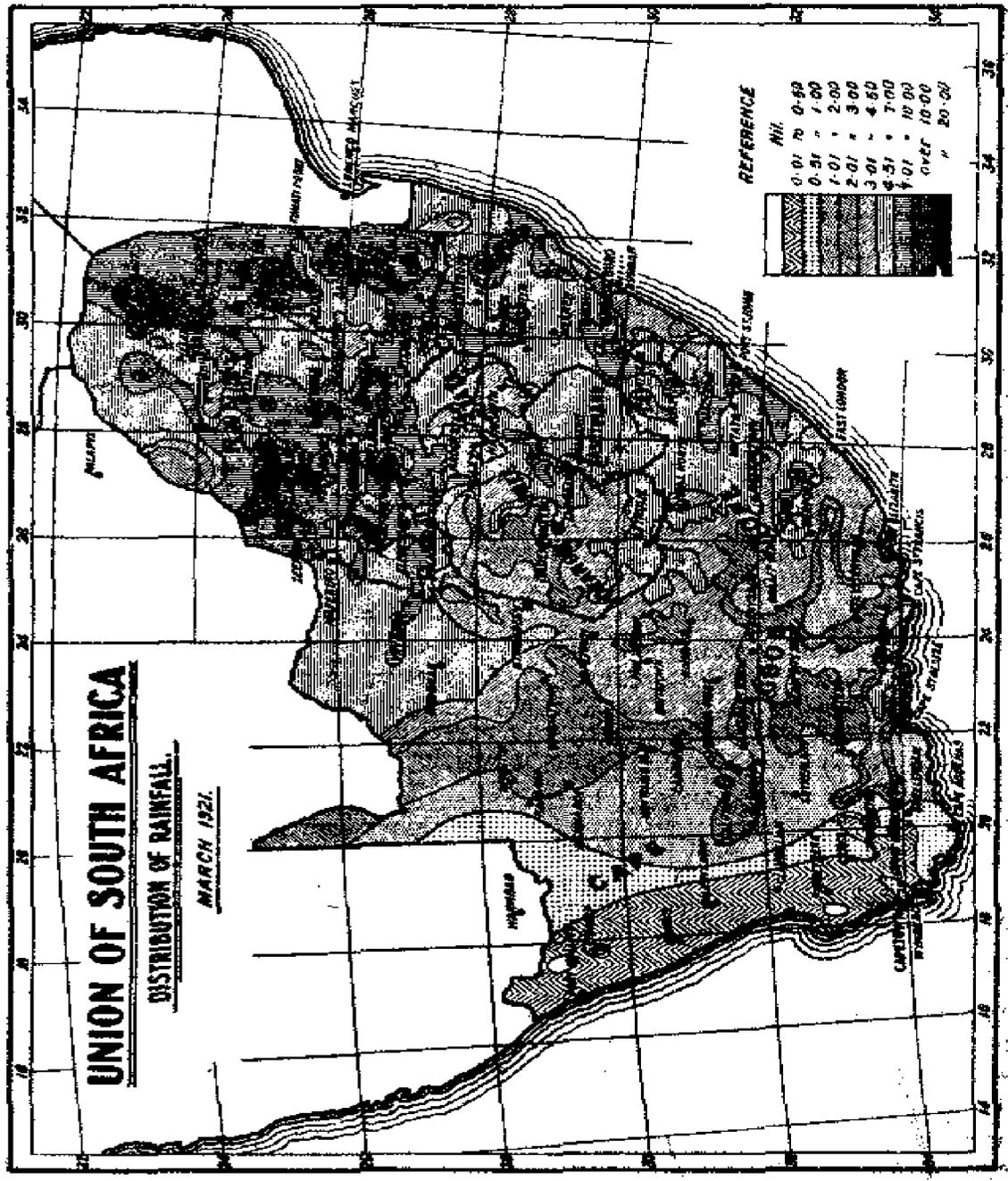
Rustenburg.—Veldt still green and plentiful; unusual rain for the month; cattle in splendid condition; roads very bad throughout district. Weather has been mild; rivers and streams running strong; crops fair. A great amount of damage has been done to cotton crop through insects; in some places the first crop was a failure. Rainfall: 1.31 inch on six days.—Sergt. H. J. Streatfield.

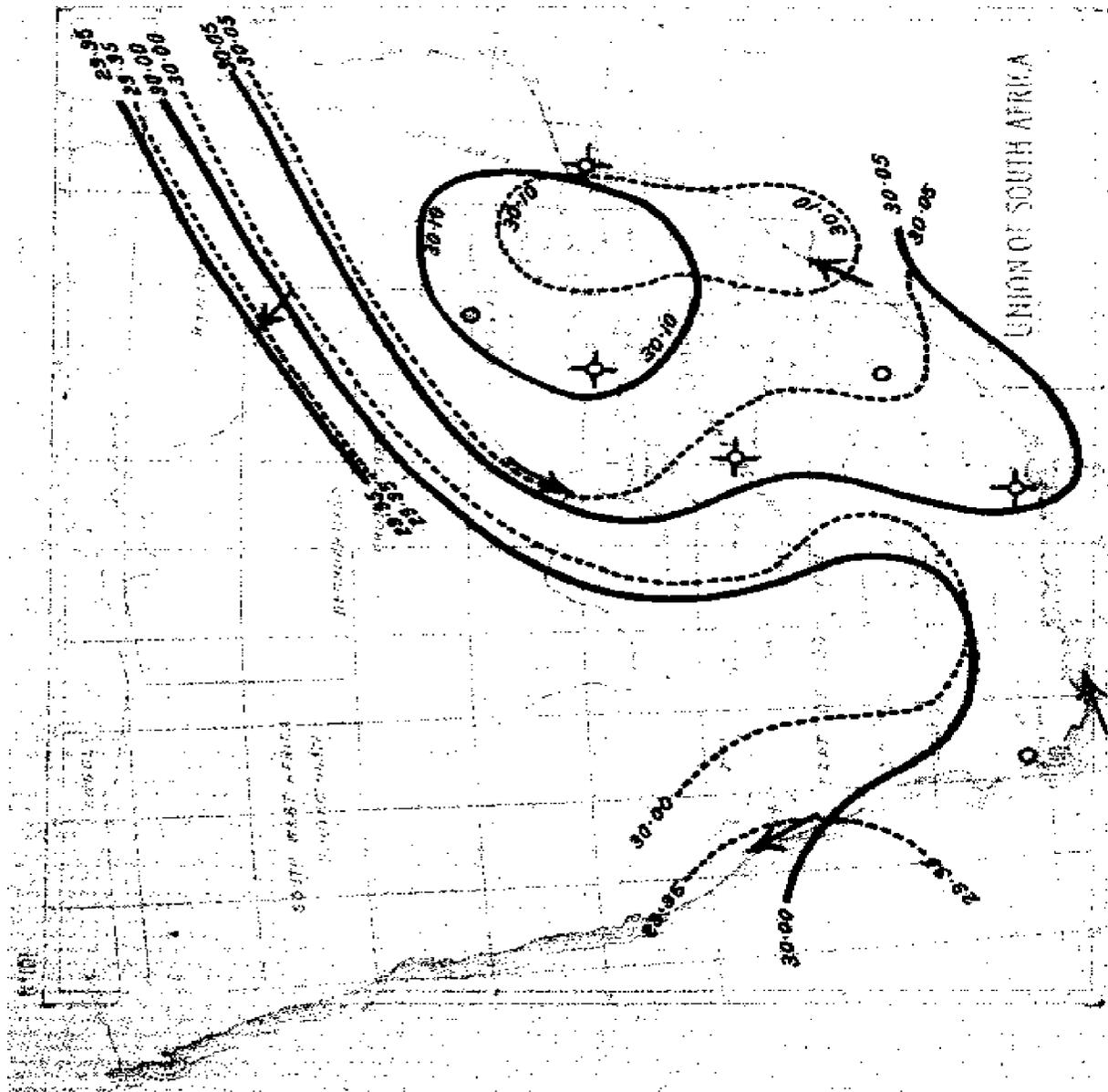
Louis Trichardt.—A little frost on the night of the 27th in low-lying places; Mealie crops ripening fairly good; area cultivated under normal. Rainfall: 2.68 inches on six days.—The Town Clerk.

UNION OF SOUTH AFRICA

DISTRIBUTION OF RAINFALL.

MARCH 1921.





April, 1921. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
 The dotted lines indicate the normal distribution for April.

Strehla (Middelburg).—Fairly heavy frost on 24th, but on account of moisture in ground it did not cut badly. Rainfall: 0.63 inch on three days.—Herbert Smith.

Riverside (Middelburg).—25th: first frost, very little damage done. Rainfall: 0.55 inch on three days.—R. Hartman.

Blesbokspruit (Piet Relief).—24th: first frost; 29th: hail in afternoon, damaging tobacco crop. Rainfall: 1.81 inch on seven days.—V. L. Mansvelt.

Eleazar (Potchefstroom).—23rd: first frost seriously affected mealies, killing most young ones. Rainfall: 0.66 inch on four days.—W. Jooste.

Zandfontein (Rustenburg).—Weather conditions have rendered crops at most safe from frost. Maize and kaffir corn crops are much better than was expected earlier; no cattle diseases. Rainfall: 1.22 inch on five days.—R. Boon.

Weltevreden (Standerton).—A very mild month; crops and stock looking well. Rainfall: 1.0 inch on five days.—D. Lane.

► *Gembokspoort (Waterberg)*.—On 24th frost damaged young plants in garden. Rainfall: 1.87 inch on five days.—P. J. Steynberg.

SWAZILAND.

Natalia (Swaziland Ranching and Dev. Co., Ltd.).—The rainfall this month has again been abnormal, the fall being 1.30 inch as against 0.18 inch during last April. Grazing and the veld generally is looking well, and, in spite of the drought this summer, is quite normal. Wintry weather has now set in, and the nights generally are chilly. Heavy dew and a thick ground mist now keep the grass green, the relative humidity being about 89 per cent.—Allen W. Macbeth.

ORANGE FREE STATE.

Sterkstroom (Boshof).—In parts of district, veld is still poor and dry. So far frosts have been slight, and the weather has been lovely, with cold nights and warm days. Rainfall: 0.90 inch on four days.—J. B. Moolman.

Kruidfontein (Edenburg).—On the 29th a very severe frost killed all potatoes, pumpkins, etc.—Rainfall: 1.79 inch on five days.—W. A. Stilwell.

Kroon (Fouresmith).—Veld and stock are looking well. Rainfall: 1.95 inch on ten days.—C. J. Grobbelaar.

Yaxham (Ladybrand).—24th: frost cut pumpkins. Rainfall: 1.97 inch on seven days.—C. B. Cowper-Johnson.

Woudzicht (Vrede).—Weather very favourable for all kinds of crops until frost started. A severe frost on the 25th killed pumpkins, mealies, etc. Rainfall: 0.84 inch on three days.—J. N. Köhler.

Prospect (Vrede).—The month has on the whole been mild; frost on 25th and 26th killed pumpkins, etc., on low-lying lands. The veld is good, and all classes of stock look well. Rainfall: 0.53 inch on four days.—T. Pitcairn.

Mon Repos (Wepener).—Prospects for crops, wheat, and rye very promising; veld for winter grazing short on most farms. Rainfall: 2.17 inches on nine days.—Major E. M. Hardiman.

Paardekraal (Winburg).—Frosts on 25th and 26th did very little damage; all stock good; teff crop short and light, owing to too much moisture last month; veld still short, with very little grass in seed. Rainfall: 2.67 inches on six days.—G. S. Lowe.

Holfontein (Kroonstad).—Fairly even temperature, with slight frosts on the 24th, 25th, and 26th. Rainfall: 1.0 inch on seven days.—G. W. Muller.

NATAL.

Roseleigh (Ladysmith).—24th: sharp frost did lots of damage, as crops are so late. Rainfall: 0.28 inch on two days.—C. W. Coventry.

Rongpoort (Ladysmith).—First frost on 25th, not very sharp; a lot of dull, threatening weather during month. Rainfall: 1.41 inch on six days.—J. H. Bartholomew.

Hlabisa.—Lovely weather experienced during the month; country again becoming dry. Rainfall: 2.59 inches on six days.—L. Double.

Cedara (School of Agriculture).—On the whole, fine weather prevailed; frosts on vlei lands towards the end of month. Rainfall: 1.41 inch on sixteen days.—The Principal.

Stanger.—Particularly hot for April. Rainfall: 2.0 inches on four days.—A. J. S. Maritz.

Ladysmith.—Practically no rain during month, and grass and crops very poor; frost reported from various parts of district on 25th. Rainfall: 0.30 inch on four days.—D. A. R. Leathern.

Nottingham Road.—Bad harvesting weather, and a heavy frost on the 25th (26 degrees F.) took any standing crops; three-day sickness in cattle; other stock healthy. Rainfall: 1.10 inch on twelve days.—Miss E. Smythe.

Newcastle (The Convent).—The month on the whole has been fine, there only being a few cold days and very little rain. Rainfall: 2.81 inches on four days.—The Mother Superior.

CAPE.

Graaff-Reinet.—Beautiful soaking rains; a cold snap during the last week, with early frosts in the district. Rainfall: 3.39 inches on ten days.—S. E. D. Treadwell.

Dunbrody (Uitenhage).—The Sundays River Valley looks splendid. Tons of lucerne lie damaged through wet weather; late mealies risk being frozen. Average rainfall for thirty-six years, 1.47 inch. Rainfall: 3.02 inches on eleven days.—Rev. I. Lallemand.

Ceres.—Weather generally typical of the month, mostly fine, with heavy dews. Rainfall: 3.51 inches on five days.—A. Heatlie.

Mafeking (The Convent).—Only two light showers of rain during the month. Heavy dews were frequent. Rainfall: 0.29 inch on two days.—The Mother Superior.

Sydney-on-Vaal.—Unusually late rains; dry land mealies not quite matured, but excellent crops of immature mealies available for ensilage. Rainfall: 1.35 inch on seven days.—J. G. Richards.

Groot Drakenstein.—Temperature and rainfall both about normal; the minimum, 39·2 degrees on the 28th, the lowest yet recorded in April; only one previous reading below 40 degrees, viz., 39·8 degrees in 1914. Rainfall: 2·74 inches on seven days.—Lionel Baker.

Queenstown.—Month of heavy dews, nice showers, and cold winds; hoar frost occurred on two days, the first on 28th; veld looking splendid. Rainfall: 3·06 inches on eleven days.—H. Holley.

Kimberley.—Frost on morning of 24th. Rainfall: 1·56 inch on nine days.—Jno. Acton.

Murraysburg.—Very good rains have fallen all over the district, and the farmers are busy ploughing. Rainfall: 3·76 inches on nine days.—A. Cameron.

Rietfontein (Aliwal North).—Heaviest rainfall recorded for twenty-five years; veld in splendid condition; ploughing extensively carried on. Rainfall: 3·95 inches on ten days.—A. G. Smith.

Darling (Malmesbury).—There has been little to report lately owing to the conditions having been normal and seasonable right through from last July. We have never had better weather conditions—rains just when required. Rainfall: 1·17 inch on six days.—P. E. Drake.

Riversdale.—Ploughing in full swing; oat and barley bands are already green; forage is very scarce in the district. Rainfall: 2·19 inches on nine days.—Rev. Carl Prozesky.

Lovedale.—Splendid rains: this amount, 5·71 inches on twelve days, is the highest recorded for the month of April from 1880 to the present year.—Charles A. Pilon.

Kilcullen (Barkly East).—The month was very promising; rainfall was general throughout the district, and as the ground is now soaked, the drought is something of the past. The weather changed on the 23rd, owing to a fall of snow on the mountain and severe frosts at night; stock, large and small, in prime condition. Rainfall: 3·35 inches on six days.—O. A. S. Vorster, J.P.

Barnardsdale (Uniondale).—Veld exceptionally good. Rainfall: 3·41 inches on six days; no prevalent diseases.—G. J. Barnardt.

Woolhope (Kounga).—Mealie crops excellent and above normal; rather too muddy for potato crop, inclined to rot in ground; tefl and other hay crops excellent; all stock healthy and fat; first cold snap (slight frost), 27th. Rainfall: 6·24 inches on twelve days.—F. Cronwright, J.P.

Salmonsfontein (Herbert).—Heavy hailstorm, size of fowls' eggs; much damage done to veld. Rainfall: 1·74 inch on four days.—J. J. Scholtz.

JUNE WEATHER CHARACTERISTICS.

June is a dry, sunny month, and over no part of the Union, except the western, southern, and south-eastern coasts, and in the extreme south-west of the Cape Province, does the rainfall exceed 1 inch. On the high veld and Karroo it is not infrequently quite rainless.

The rainfall in the Cape Peninsula is, however, still increasing, approximating 6 inches, whilst over the adjoining south-western districts the monthly maximum of 3·5 inches is reached. Along the west coast there is a slight decrease, but both there and along the south coast the variation from the May rainfall is inconsiderable. Thunderstorms are now at their minimum

The mean air temperatures continue to decrease rapidly, the days—except on the northern Karroo and in the Transvaal—being the coldest of the year. The Transvaal low veld is now the warmest part of the Union, with a mean temperature of about 59·5 degrees, and Basutoland the coldest, with 45·5 degrees. Between these are Natal and the south coast with a normal of 57 degrees, the Cape Peninsula with 56 degrees, the south-eastern districts of the Cape with 55 degrees, the west coast with 54 degrees, Kaffraria with 53 degrees, the north-eastern districts and the east-central Karroo with 53·5 degrees, the southern Karroo with 51·5 degrees, the northern borders with 51 degrees, the west-central Karroo with 50 degrees, the Transvaal high veld with 49·4 degrees, and the Orange Free State, northern Karroo, and Cape north-eastern districts with 46 degrees. Sharp night frosts are a characteristic of the high veld during this month, and killing frosts may be experienced.

The prevailing winds over the Cape Peninsula are from N.W. and S., both directions, however, showing a decrease in frequency compared with the preceding month. Over the northern borders of the Cape the prevalent direction has changed to S.S.E. from S. during May, thus causing a considerable increase in the number of S.S.E. winds, and a corresponding diminution in those from S. Over this area, moreover, there is a lower percentage of winds from those points of the compass from W.N.W. round by N. to E.N.E., as well as S. and S.W., but an increased percentage of winds from all other directions. Notwithstanding a considerable diminution in the frequency of north-westerly (W.N.W.—N.N.W.) winds, and a slight increase in all other directions (except S.W. and S.S.W.), the prevailing wind over the high veld continues to blow from a north-north-westerly direction. Over the Cape south-eastern districts the prevalent direction is W.N.W., as a consequence of a falling-off in frequency of north-easterly and south-easterly winds, together with an actual increase of those from north-westerly directions.

C. STEWART,

Chief Meteorologist.

Pretoria.



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. II.

MAY, 1921.

No. 5.

The weather of May was exceptionally dry and warm over the winter-rainfall and south coastal areas, together with the more inland parts of the northern Karroo and the east of the Cape, including the Transkei; cool and cloudy with an excess of rainfall over the Transvaal, Orange Free State, and Natal during the first fortnight; succeeded by an almost general cold, sunny, dry spell, with frequent widespread frosts till the end of the month.

Pressure.—Mean barometric pressure, as will be seen from the accompanying map, was higher than usual over the south-west, centre, and south of the Cape, but slightly lower over the east and the Transvaal. The most striking feature in connection with pressure distribution was the marked absence of "lows" along the south coast, anticyclonic conditions affecting the whole or part of the Union all through the month. One consequence of these conditions was the abnormally low precipitation over the winter-rainfall area, e.g. the Royal Observatory (Cape Peninsula) registered only 0.34 inch on two days, the smallest amount since the year 1844. On the other hand, cloudy weather with rain was reported from the Transvaal and eastern portions of the country during the first ten days. Low-pressure areas made their appearance only on the 4th over the west, on the 12th over the south, and on the 14th on the south, moving to the east and north-east on the 15th.

Temperature.—The mean temperature of the month of May was 56.6 degrees, or 0.6 degree less than usual. This difference was due to the day temperature (68.8 degrees) being 1.7 degree less than usual, whilst the night temperature (44.3 degrees) was half a degree in excess of normal. A subnormal mean temperature for May was common to the Transvaal, Natal, and Free State, but only portions of the Cape Province. The shortages were 1.5 degree over the Transvaal, 1.4 degree over Natal, and 1.2 degree over the Orange Free State, whilst the Cape stations were on the mean 0.6 degree in excess of the average. In the Orange Free State both day and night temperatures were below the average by 1.5 degree and 1.0 degree respectively; in the Transvaal and Natal the days were cooler than usual by 3.3 degrees and 3.1 degrees respectively, whilst the nights in both areas were 0.4 degree warmer than usual. Over the Cape Province both days and nights were in excess of the average by 0.1 degree and 1.2 degree respectively. The mean temperature

for the month was subnormal over the Transvaal, Orange Free State, and Natal as well as the north-east and south-east of the Cape and Kaffraria. The deficits were commonly about 1.5 degree, increasing to 2-3 degrees in the central and north-western Transvaal, Swaziland, the east of the Orange Free State, and the east of the Cape Province. The only exception to the general deficiency in the Transvaal was the extreme south-west, where Bloemhof was 0.3 degree in excess; in the Orange Free State, Harrismith was normal, and Hlabisa (Zululand) was 0.6 degree above normal. Except at Mafeking, where there was a deficiency in mean temperature of 2.6 degrees, and the areas previously noted, the Cape stations were warmer than usual, particularly in the west (including Namaqualand) and south-west, where the excess was usually about $2\frac{1}{2}$ degrees, increasing to 4.8 degrees at Clanwilliam; the coast stations were mostly about 1 degree warmer than usual, except at Port Elizabeth, where there was a shortage of 1.1 degree. The mean maximum or day temperatures were below the average at individual stations all over the Transvaal and Swaziland by amounts ranging from 1.3 degree to 7.5 degrees; over Natal by 0.3 degree to 5.4 degrees; the Free State by 1.2 degrees; the north-east, south-east, central Karroo, Kaffraria, and Bechuanaland in the Cape Province by amounts varying between 0.8 degree at Vryburg and 5.8 degrees at Bedford. With these exceptions the mean maxima were higher than usual, commonly by about 2 degrees over the interior, but increasing to 4-5 degrees in the south-west and rising to 10.2 degrees at Clanwilliam. The mean minima or night temperatures were below the corresponding averages, mostly by a few tenths in the north, south-east, and south-central parts of the Transvaal; by 2.7 degrees in Swaziland; by 0.1 degree to more than 4.0 degrees in the Free State; by 1.3 degree in the southern parts of Natal, and usually by a few tenths in the more easterly parts of the Cape Province and Mafeking (Bechuanaland). Elsewhere the nights were warmer than usual, by 0.6 degree to 3.2 degrees in the Transvaal; by 1.6 degree at Harrismith in the north-east of the Free State; by 1.5 degree to 4.0 degrees in the north of Natal and Zululand; and by 0.3 degree to 4.4 degrees in the Cape Province, except at Clanwilliam, where the mean minimum was slightly more than half a degree lower than usual. The mean warmest station was Hlabisa (Zululand) with 67 degrees, and the mean coolest Belfast, in the Transvaal high veld, with 47.2 degrees, a difference of 19.8 degrees. The highest mean day temperature was 84.9 degrees at Clanwilliam, and the lowest mean night temperature 33.3 degrees at Belfast. The highest temperatures of the month were recorded at different stations on seventeen days of the month, viz. 1st, 2nd, 4th to 6th, 8th to 15th, 17th to 19th, and on 27th, but most widely on 10th, 14th, and 15th. The lowest temperatures were registered on eleven days, viz. 15th, 16th, 19th, 21st to 24th, and 28th to 31st, but principally on 22nd and 31st. The extremes for the month were 93 degrees on 4th and 11th at Clanwilliam and 21 degrees on the 31st at Belfast, an extreme range of 72 degrees. Some severe frosts were experienced during the month, particularly from the 22nd to 31st, causing damage to late crops; these were mostly confined to the Transvaal, Orange Free State, and the north and east of the Cape Province. Taken as a whole, conditions seem to have been favourable to the ripening of mealies and promised a good lambing season.

Precipitation during the month was considerably below normal over the west and south-west; a serious deficit was also experienced over the southern Karroo, the south coast, Transkei, the north-east and south-east of the Cape, as well as over a belt in the more north-easterly part of the northern Karroo extending from Hanover through Philipstown, Hopetown, Griquatown, north to Kuruman. These two areas are separated by a curious belt of supranormal precipitation extending from Upington south-east to Port Elizabeth, thence

north-west through Fraserburg and north through Kenhardt back to Upington. A subnormal rainfall was also experienced in the north-central and eastern parts of the Free State, Zululand, and the extreme north of Natal, a comparatively narrow belt in the south-east of the Transvaal, between Standerton and Barberton, and the west of the Transvaal in the neighbourhood of Zeerust. Elsewhere the rainfall was in excess of the average, mostly by amounts between 0.25 and 1.00 inch. These amounts were exceeded, however, in the north and north-west of the Transvaal, Swaziland, the north and centre of the Free State and the neighbourhood of Howick in Natal. The two largest excesses were 3.12 inches at Woodbush (Transvaal) and 2.11 inches at Bloemfontein (Orange Free State). The deficiencies were mostly between a few tenths and half an inch, but increased to several inches over the south west and the Cape Peninsula, where the shortage amounted to 5.59 inches at Ceres and 5.35 inches at Wynberg. As an indication of the unusual dryness of the month, it may be mentioned that the amount recorded this month at the Royal Observatory (0.34 inch) was equalled (since 1841) only by May, 1844, when a similar amount was registered. In consequence of this unusual drought in the west, but little ploughing has been carried out, whilst the grass and young crops have suffered severely. Rains over the Transvaal fell mostly between the 1st and 7th, but over more limited areas from 8th to 13th and on the 19th, continuing, however, over the Zoutpansberg in the north on 21st and 22nd, and in the Barberton Division on 27th. Showers with a little hail in places were also fairly general over the Orange Free State during the first eight days. In Natal rains were general during the first fortnight, except in the Mtunzini and Lower Umfolosi Divisions, where showers occurred at intervals throughout the month. In the Cape Province light showers were confined to the 14th only over the Cape Peninsula, greater portion of the south-west and the west coast divisions; over the east, central, and northern Karroos, Bechuanaland, and the north-east, occasional showers occurred during the first ten days; over Basutoland during the first fortnight; along the south coast, over the southern Karroo, and the south-east mainly between the 8th and 28th, and throughout the month in Kaffraria; over the west-central Karroo and the northern border a few scattered showers or nil during the month. Just as the month has been exceptionally dry over the west and south-west, so in various parts of the Transvaal, Swaziland, etc., the month was among the wettest on record, the most notable exception in recent years being May, 1911. As a consequence of the late rains and more particularly of the mildness of the season, the veld is still in excellent condition, and stock are mostly in good condition, whilst the lambing season promises well in the Bloemfontein District of the Free State. In the Pretoria District a number of early peaches were in blossom at the end of April and in practically full bloom in May. In some districts, however, e.g. Ermelo (Transvaal Province) and Harrismith and Winburg (Orange Free State), cattle are falling off in condition, owing to shortness of grass, but sheep continue to do well. A large number of horses died of horse-sickness in the bushveld, while a few cases of horse-sickness and blue-tongue are reported from Heilbron. The cumulative rainfall since 1st July of last year is mostly considerably in excess of the normal; commonly by 2-4 inches in the Transvaal, but rising to 5-7 inches in the north-west, west, and extreme south-east, the maximum excess being 9.54 inches at Nylstroom. In the Free State the excess is from 1-3½ inches, and in the south of Natal between 1 and 8 inches. In the Cape Province the surplus rainfall varies between three-quarters and one and a half inch in the eastern portion and in the west coastal areas, and mostly from 2-5 inches over the central portions, rising to more than 8 inches at Beaufort West and 8½ inches at Mafeking. A subnormal rainfall has been experienced during this period over the Cape Peninsula and part of the south-west, the

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), MAY, 1921.

Place.	Observer.	Month.—May, 1921.		Mean Monthly Temperature.	Difference from Normal.	Highest.	Date.	Lowest.	Date.	
		Mean Max.	Mean Min.							
Tyuananai—										
Bedford.....	The Forester.....	61.0	39.3	47.2	—	67.0	10th.....	21.0	31st.	
Barberton.....	Walker Grubb.....	73.0	51.5	62.2	—	82.0	1st.....	42.0	22nd.	
Bluebird.....	A. Adamsen.....	69.7	41.2	55.4	—	77.0	14th.....	30.0	22nd.	
Ernie.....	Mrs. S. M. Nicolson.....	65.0	37.1	51.0	—	71.0	10th.....	24.0	22nd.	
Johannesburg (Observatory).....	The Staff.....	61.2	43.8	52.5	—	67.5	14th.....	35.2	25th.	
Klerksdorp (Strathmore).....	Chas. Scott.....	68.2	39.7	54.0	—	74.0	19th.....	27.0	21st.	
Komatiapoort.....	H. J. Evans.....	80.4	53.4	66.9	—	82.0	1st & 15th.....	38.0	23rd.	
Lesie Yichardt.....	L. J. de Bruin.....	71.5	47.4	59.4	—	87.0	17th.....	35.0	23rd.	
Middelburg.....	Dr. R. A. Spence.....	68.0	37.4	52.7	—	74.0	10th.....	24.0	31st.	
Nylstroom.....	G. Rakker.....	69.7	43.4	56.6	—	76.0	15th.....	33.0	24th & 31st.	
Pagrus Keet.....	E. M. Steas.....	67.3	43.1	55.2	—	77.5	2nd.....	30.5	23rd.	
Potchesburg.....	J. Franklynne.....	60.1	44.3	52.2	—	74.0	1st.....	35.0	24th.	
Potchesburg (Exp. Farm).....	The Manager.....	69.4	38.4	54.0	—	78.0	15th.....	26.0	21st.	
Preterita (Meteorological Office).....	The Staff.....	67.8	43.8	55.8	—	74.0	15th.....	33.1	31st.	
Plat Beldel.....	J. Werner.....	66.0	44.7	55.4	—	74.0	15th.....	32.0	22nd.	
Standerton.....	M. Yerkison.....	66.2	36.9	50.6	—	70.2	10th.....	21.5	21st.	
Zeerust.....	H. Dietrich.....	68.0	40.0	54.0	—	75.6	15th.....	28.0	31st.	
Sueziland—										
Mbabane.....	Swaziland Police.....	65.1	46.3	55.7	—	74.0	1st.....	36.0	22nd.	
Cyprus Free State—										
Bloemfontein.....	G. A. Schepers.....	63.9	40.2	52.0	—	70.6	14th.....	29.1	31st.	
Bethville.....	J. J. Wardhaugh.....	65.0	38.0	51.8	—	68.0	9th & 10th.....	28.0	22nd & 30th.	
Harrismith.....	J. B. Patterson.....	60.8	37.4	49.1	—	71.0	1st.....	21.2	21st.	
Isidyle.....	J. Collister-Oates.....	65.6	35.5	50.6	—	68.0	6th, 11th, 15th, & 18th.....	20.0	30th.	
Ladybrand.....	G. Stokes.....	63.6	37.8	50.7	—	68.0	1st.....	48.0	19th.	
Natal—										
Durban (Point).....	A. G. Gouding.....	75.4	55.2	65.8	—	82.2	1st.....	31.0	30th.	
Dundee.....	West Trotter.....	68.0	42.4	55.2	—	80.0	4th.....	52.0	21st.	
Hiلاس.....	The Gaoler.....	70.6	57.4	64.0	—	82.5	1st.....	35.8	22nd.	
Machabery (Mental Hospital).....	The Staff.....	71.3	47.0	59.2	—	79.5	2nd.....	28.0	31st.	
Cape—										
Albani North.....	A. Alcock.....	64.2	36.1	50.2	—	78.0	2nd.....	30.0	24th & 29th.	
Beiters.....	T. C. Hall.....	65.6	45.4	55.6	—	72.0	5th.....	30.0	24th & 29th.	
Carrara.....	A. P. Malherbe.....	67.7	41.1	54.4	—	83.2	10th.....	29.0	30th.	
Cape Town (Royal Observatory).....	The Staff.....	71.3	58.4	62.4	—	83.2	4th.....	41.7	28th.	
Chakwillem.....	W. J. Downes.....	84.0	46.2	66.0	—	93.0	4th & 11th.....	34.0	21st.	
East London.....	Port Captain.....	71.3	48.7	62.5	—	70.0	27th.....	47.0	22nd.	
Grass-Reniet.....	A. E. J. Treadwell.....	71.0	47.7	59.4	—	81.7	12th.....	39.3	29th.	
Groot Brakenstein.....	Lionel Baker.....	74.9	48.3	61.6	—	88.3	4th.....	30.8	30th.	
Kohstad.....	H. D. Coyle.....	68.8	38.7	51.2	—	72.2	6th.....	26.8	22nd.	
Kimberley.....	J. Aston.....	71.0	44.1	57.6	—	77.0	10th.....	33.0	30th & 31st.	
Mafeking (Convent).....	Mother Superior.....	70.2	41.8	56.0	—	76.1	14th.....	31.0	31st.	
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	68.9	55.0	62.4	—	85.0	12th.....	49.0	16th.	
Murraysburg.....	A. Cameron.....	65.8	37.5	51.4	—	72.0	5th & 11th.....	27.0	30th & 31st.	
O'Glen.....	J. Burrows.....	79.3	53.9	66.8	—	79.5	11th.....	44.5	15th.	
Port Elizabeth.....	The Lightkeeper.....	67.4	34.8	51.1	—	82.0	12th.....	47.0	22nd.	
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	72.4	50.2	61.3	—	80.0	14th.....	52.0	16th.	
Queenstown.....	H. Enley.....	65.7	39.0	52.8	—	73.0	14th.....	29.0	22nd.	
Qysburg.....	Chas. Butler.....	70.6	38.0	54.3	—	77.0	1st & 14th.....	36.0	22nd & 31st.	
Wynberg (Convent).....	Mother Superior.....	71.4	32.2	61.8	—	86.5	5th.....	46.5	16th.	

RAINFALL, MAY, 1921.

PLACE.	OBSERVER.	Month.		Normal.	Difference from Normal.	From 1st Jan., 1921.		Normal.	Difference from Normal.	From 1st July, 1920.		Normal.	Difference from Normal.
		Inches.	Inches.			Inches.	Inches.			Inches.	Inches.		
Tyvesdale—													
Barborton.....	W. Grubb.....	0.87	1.08	1.08	-	16.12	20.81	20.81	-	5.69	81.04	33.61	- 2.87
Belfast.....	The Forester.....	1.61	0.54	0.54	+	19.70	17.04	17.04	+	2.66	37.68	31.89	+ 5.79
Bethal.....	H. F. Joubert.....	1.23	0.69	0.69	+	20.61	14.83	14.83	+	5.78	35.11	30.35	+ 4.76
Bloemhof.....	A. Adamson.....	1.23	0.65	0.65	+	13.51	12.30	12.30	+	1.21	18.18	18.62	- 0.44
Claremont.....	S. A. Polke.....	2.59	0.55	0.55	+	13.76	10.06	10.06	+	3.70	21.73	18.12	+ 3.61
Ernslo.....	Mrs. S. M. Nicolson.....	0.44	0.43	0.43	-	9.78	14.94	14.94	-	5.16	31.08	30.67	+ 0.41
Haerterburg.....	S. A. Polke.....	1.80	2.10	2.10	-	0.80	28.35	28.35	+	0.80	40.02	40.02
Kaatsberg.....	W. ter Horst.....	0.90	0.55	0.55	+	10.16	14.78	14.78	+	4.38	32.64	27.69	+ 4.95
Jobannesburg (Observatory).....	The Staff.....	1.15	0.64	0.64	+	16.96	14.94	14.94	+	2.02	31.20	26.63	+ 4.57
Klerksdorp (Strathmore).....	C. Scott.....	1.24	0.68	0.68	+	17.08	13.65	13.65	+	3.43	26.06	21.77	+ 4.29
Koningspoort.....	H. J. Evans.....	1.07	0.88	0.88	+	15.46	16.83	16.83	-	1.37	26.20	26.11	+ 0.15
Louis Trichardt.....	I. J. de Bruin.....	1.90	0.89	0.89	+	24.67	18.87	18.87	+	5.80	34.86	31.93	+ 2.92
Middelburg.....	Dr. H. A. Spencer.....	1.49	0.52	0.52	+	15.85	15.00	15.00	+	0.85	30.77	28.65	+ 2.12
Nykatroom.....	G. Bakker.....	1.06	0.23	0.23	+	28.05	13.78	13.78	+	14.27	38.34	23.80	+ 14.54
Pieterburg.....	W. Frankleyne.....	1.06	0.22	0.22	+	14.12	12.16	12.16	+	1.96	25.60	21.68	+ 3.92
Piet Retief.....	J. Werner.....	0.74	0.57	0.57	+	20.91	13.30	13.30	+	7.61	39.43	30.51	+ 8.92
Pilgrims Rest.....	E. M. Skea.....	1.57	1.17	1.17	+	25.16	26.12	26.12	-	0.96	40.74	40.51	+ 0.23
Pochekatoom (Exp. Farm).....	The Manager.....	1.64	0.72	0.72	+	18.92	12.92	12.92	+	6.00	26.08	23.62	+ 2.46
Pretoria (Meteorological Office).....	The Staff.....	0.68	0.61	0.61	+	17.02	17.00	17.00	+	0.02	29.84	29.62	+ 0.22
Rooiberg.....	N. H. Munro.....	2.24	0.67	0.67	+	19.47	13.91	13.91	+	5.56	29.35	23.86	+ 5.49
Rustenburg.....	S. A. Polke.....	0.70	0.50	0.50	+	20.86	14.80	14.80	+	6.06	38.41	25.75	+ 12.66
Walkerstrom.....	L. le Roux.....	0.82	0.81	0.81	+	16.70	10.94	10.94	+	5.76	31.89	31.89
Woodbush.....	The Forester.....	4.86	1.74	1.74	+	59.68	46.61	46.61	+	13.07	78.06	71.60	+ 6.46
Standeron.....	M. Ferguson.....	0.62	0.68	0.68	-	0.68	15.38	15.38	+	0.68	30.21	30.21
Zeerust.....	H. Dietrich.....	0.38	1.00	1.00	-	18.08	14.90	14.90	+	3.18	26.92	23.98	+ 2.94
Sectelsand—													
Mbabane.....	Swaziland Police.....	3.07	1.32	1.32	+	34.95	28.89	28.89	+	6.06	68.71	49.81	+ 18.90
Orange Free State—													
Bethulle.....	J. J. Wardhaugh.....	1.20	0.89	0.89	+	16.76	11.38	11.38	+	5.38	20.88	17.88	+ 3.00
Bloemfontein.....	G. A. Scheyers.....	2.91	0.50	0.50	+	16.44	11.38	11.38	+	5.06	22.61	19.01	+ 3.60
Barysmikh.....	The Forester.....	0.59	0.94	0.94	-	12.00	14.87	14.87	-	2.87	28.35	28.00	+ 0.35
Kroonstad.....	S. R. Northfield.....	2.11	0.50	0.50	+	13.14	10.39	10.39	+	2.75	23.01	21.76	+ 1.25
Ladybrand.....	The Forester.....	1.34	1.16	1.16	+	16.63	13.63	13.63	+	3.00	26.73	27.01	- 0.28
Landsey.....	J. Colliater-Gaoler.....	1.60	1.12	1.12	+	14.87	13.69	13.69	+	1.18	24.11	24.17	- 0.06
Natal—													
Dundee.....	West Thorrild.....	1.14	0.86	0.86	+	13.92	17.77	17.77	-	3.85	27.97	31.09	- 3.12
Durban (Point).....	A. G. Goulding.....	1.35	2.40	2.40	-	26.21	21.17	21.17	+	5.04	48.56	40.64	+ 7.92
Hiabisa.....	The Gaoler.....	1.26	1.66	1.66	-	23.20	21.60	21.60	+	1.64	41.08	32.50	+ 8.58
Howick.....	The Gaoler.....	1.90	0.80	0.80	+	17.84	17.23	17.23	+	0.61	35.25	31.54	+ 3.71
Ladysmith.....	D. A. E. Leatham.....	0.95	0.77	0.77	+	11.24	15.36	15.36	-	4.12	20.78	27.09	- 6.31
Pietermaritzburg (Mental Hospital).....	The Staff.....	1.46	1.19	1.19	+	18.51	18.34	18.34	+	0.17	37.53	33.48	+ 4.05
Vryheid.....	The Gaoler.....	0.18	0.81	0.81	-	11.36	19.70	19.70	-	8.34	25.47	36.69	- 11.22
Weneh.....	The Gaoler.....	0.78	0.61	0.61	+	16.53	14.54	14.54	+	1.99	27.31	26.12	+ 1.19

RAINFALL, MAY, 1921 (continued).

PLACE.	OBSERVER.	Month.		Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1920.	Normal.	Difference from Normal.
		Inches.	May, 1921.								
Cape--											
Alwal North.....	A. Aleock.....	0.68	1.08	1.08	- 0.40	14.66	12.49	+ 2.06	18.44	20.51	- 2.07
Bessifoot West.....	The Gaoler.....	0.88	0.76	0.76	+ 0.23	13.65	5.67	+ 5.08	17.18	9.10	+ 8.08
Bedford.....	T. C. Hall.....	1.08	1.59	1.59	- 0.52	17.34	14.78	+ 2.56	27.81	27.02	+ 0.79
Britishtown.....	The Gaoler.....	1.00	0.75	0.75	+ 0.25	12.95	7.49	+ 5.46	15.83	10.86	+ 4.97
Carlina.....	The Gaoler.....	0.40	1.08	1.08	- 0.68	5.85	3.29	+ 2.56	11.61	6.74	+ 4.87
Cape town (Royal Observatory).....	The Staff.....	0.34	3.99	3.99	- 3.65	4.25	8.20	- 3.95	20.83	21.09	+ 0.26
Ceyna.....	A. Hentle.....	0.47	6.06	6.06	- 5.59	8.65	13.87	- 5.22	37.10	34.64	+ 2.46
Carnarvon.....	A. P. Malherbe.....	1.78	0.88	0.88	+ 1.10	11.03	5.41	+ 5.62	13.16	7.66	+ 5.50
Clanwilliam.....	W. J. Downes.....	0.03	1.88	1.88	- 1.35	1.51	2.85	- 1.34	8.95	7.21	+ 1.74
East London.....	A. Dewule.....	0.96	2.42	2.42	- 1.40	15.67	15.25	+ 0.42	25.42	31.84	- 6.42
Fraserburg.....	The Gaoler.....	0.82	0.64	0.64	+ 0.18	10.67	4.18	+ 6.49	13.30	6.24	+ 7.06
Garies.....	The Gaoler.....	0.90	0.72	0.72	+ 0.18	1.92	7.61	- 5.69	6.02	4.36	+ 1.66
Grassf. Raines.....	S. E. D. Treadwell.....	0.25	1.10	1.10	- 0.85	10.29	7.47	+ 2.82	15.19	18.36	- 3.17
Groot Drakenstein.....	L. Baker.....	0.68	4.99	4.99	- 4.10	7.18	11.06	- 3.88	29.17	29.76	- 0.59
Gringolown.....	The Gaoler.....	0.76	0.83	0.83	- 0.07	8.88	0.05	+ 8.83	11.20	12.62	- 1.42
Hanover.....	The Gaoler.....	0.65	1.00	1.00	- 0.35	8.76	8.55	+ 0.20	10.22	12.69	- 2.47
Hepperton.....	The Gaoler.....	0.74	0.91	0.91	+ 0.04	10.66	8.45	+ 2.21	11.33	12.58	- 1.25
Kaibard.....	The Gaoler.....	0.74	0.40	0.40	+ 0.34	6.06	3.86	+ 2.20	7.99	5.37	+ 2.62
Kimberley.....	J. Acton.....	0.85	0.78	0.78	+ 0.07	10.42	10.21	+ 0.21	14.41	15.94	- 1.53
Kayena.....	The Gaoler.....	1.57	2.32	2.32	- 0.75	14.28	11.17	+ 3.11	27.42	28.66	- 1.24
Kokstad.....	H. D. Coyte.....	0.47	0.43	0.43	+ 0.04	15.90	14.83	+ 1.07	26.81	23.04	+ 3.77
Karuman (Abontis).....	A. T. Sitwell.....	1.13	0.46	0.46	+ 0.67	11.61	13.02	- 1.41	14.62	16.13	- 1.51
Maikling (Convent).....	Mother Superior.....	0.45	1.64	1.64	- 1.19	20.81	13.14	+ 7.67	29.93	21.46	+ 8.47
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	0.90	1.02	1.02	- 0.12	7.84	7.46	+ 0.38	14.61	16.04	- 1.43
Murray'sburg.....	A. Cameron.....	0.11	1.08	1.08	- 0.97	3.76	2.75	+ 1.01	7.67	10.58	- 2.91
O'okie.....	J. Burrows.....	0.68	0.95	0.95	- 0.27	7.78	8.66	- 0.88	9.89	6.09	+ 3.80
Paullstown.....	The Gaoler.....	0.13	3.01	3.01	- 2.88	4.57	0.33	+ 4.24	18.27	17.73	+ 0.54
Piquetberg.....	The Gaoler.....	2.33	2.35	2.35	+ 0.02	10.48	8.19	+ 2.29	16.23	20.56	- 4.33
Port Elizabeth.....	J. P. Allan.....	0.97	2.97	2.97	- 2.00	22.94	22.61	+ 0.33	40.49	46.90	- 6.41
Port St. John (Cape Hermes).....	The Lightkeeper.....	1.24	0.66	0.66	+ 0.58	7.58	6.05	+ 1.53	8.52	9.44	- 0.92
Priska.....	The Gaoler.....	0.31	0.76	0.76	- 0.45	15.11	12.19	+ 2.92	22.35	20.90	+ 1.45
Queenstown.....	H. Holley.....	0.68	0.68	0.68	+ 0.00	6.54	5.09	+ 1.45	10.93	8.95	+ 1.98
Stydersburg.....	The Gaoler.....	0.82	3.25	3.25	- 2.43	0.94	4.34	- 3.40	12.09	3.20	+ 8.89
Sutherland.....	The Gaoler.....	1.57	1.19	1.19	+ 0.38	18.08	14.27	+ 3.81	29.58	30.49	- 0.91
Swellendam.....	The Gaoler.....	1.16	1.31	1.31	- 0.15	17.68	18.62	- 0.94	28.12	24.70	+ 3.42
Umtata.....	A. Ditzel.....	0.44	1.36	1.36	- 0.92	9.63	5.72	+ 3.91	14.50	12.43	+ 2.07
Uphams.....	The Gaoler.....	0.97	0.91	0.91	+ 0.06	10.11	6.56	+ 3.55	6.44	6.62	- 0.18
Upington.....	The Gaoler.....	0.93	0.60	0.60	+ 0.33	10.27	13.56	- 3.29	11.96	9.69	+ 2.27
Victoria West.....	C. Butler.....	0.90	0.60	0.60	+ 0.30	10.27	13.56	- 3.29	17.08	19.42	- 2.34
Vryburg.....	The Gaoler.....	0.63	1.71	1.71	- 1.08	3.78	4.00	- 0.22	9.49	10.77	- 1.28
Worcester.....	The Gaoler.....	0.54	5.89	5.89	- 5.35	5.61	12.72	- 7.11	38.70	38.08	+ 0.62
Wyndberg (Convent).....	The Mother Superior.....	0.54	5.89	5.89	- 5.35	5.61	12.72	- 7.11	38.70	38.08	+ 0.62

northern half of Natal and Zululand, and east and north-central portions of the Free State, the neighbourhood of Barberton (Transvaal), and over a broad belt in the Cape Province bordering the south-west of the Transvaal, the Orange Free State, and Basutoland (i.e. from Vryburg south to Prieska, thence south-east to Hanover and east to Kokstad). These deficits are mostly between 1 and 2 inches, but vary from 0.06 inch at Lindley in the Free State to more than 11 inches at Vryheid in Natal, in which Colony the shortage is greatest. The total rainfall since the commencement of the current year is much more seriously below the average over the south-west and the Cape Peninsula, where it is commonly over 3 inches, but reaching 7 inches at Wynberg; the north-western portion of Natal is similarly affected, mostly to an extent of 3-4 inches, but exceeding 8 inches at Vryheid; there is also a shortage of approximately 3 inches in the north-east of the Free State and of 5-6 inches in the south-east Transvaal, decreasing to about 1 inch in the more easterly portions. Elsewhere the rainfall is in excess, mostly by 2-5 inches, but rising to 6-9 inches in the northern and western Transvaal, the maximum surplus amount being 13.17 inches at Woodbush (Transvaal Province).

OBSERVERS' NOTES FOR MAY, 1921.

TRANSVAAL.

Standerton.—The outstanding feature during the first half of the month was the extraordinary amount of cloud with a very light rainfall. The latter half of the month was typical of the weather usually experienced in winter on the high veld: clear, cloudless days, moderately warm, with sharp frosts at night. Coming as it has at this time of the year, this weather is favourable to agriculture, as it enables the farmers to reap their mealie crop to perfection. Lightning was observed on the evening of the 8th, 9th, and 19th, but no thunder heard. The wind during the whole month was variable, rarely rising to a moderate breeze, and often falling at times to a calm. Rainfall: 0.52 inch on eight days.—M. Ferguson.

Pieterburg.—Drizzling rains early portion of month. Heavy mist early mornings; calm, brilliant days. Heavy frost from 22nd. Rainfall: 1.66 inch on six days.—W. Frankleyne.

Middelburg.—Rain, in unusual amount, fell during the early part of the month, ushering in cold wintry weather. Rainfall: 1.49 inch on eight days.—Dr. H. A. Spencer.

Ermelo.—The first twelve days were damp and cloudy, but otherwise the weather was seasonable and pleasant. Little or no wind, warm, pleasant days, and chilly nights. A little rain fell in the earlier part of the month, but, unfortunately, not sufficient to meet our requirements, and we have a long, dry, dusty winter before us. Stock is in fairly low condition. The maize crop ripened well, and the yield promises to be good. Rainfall: 0.44 inch on five days.—Mrs. S. M. Nicolson.

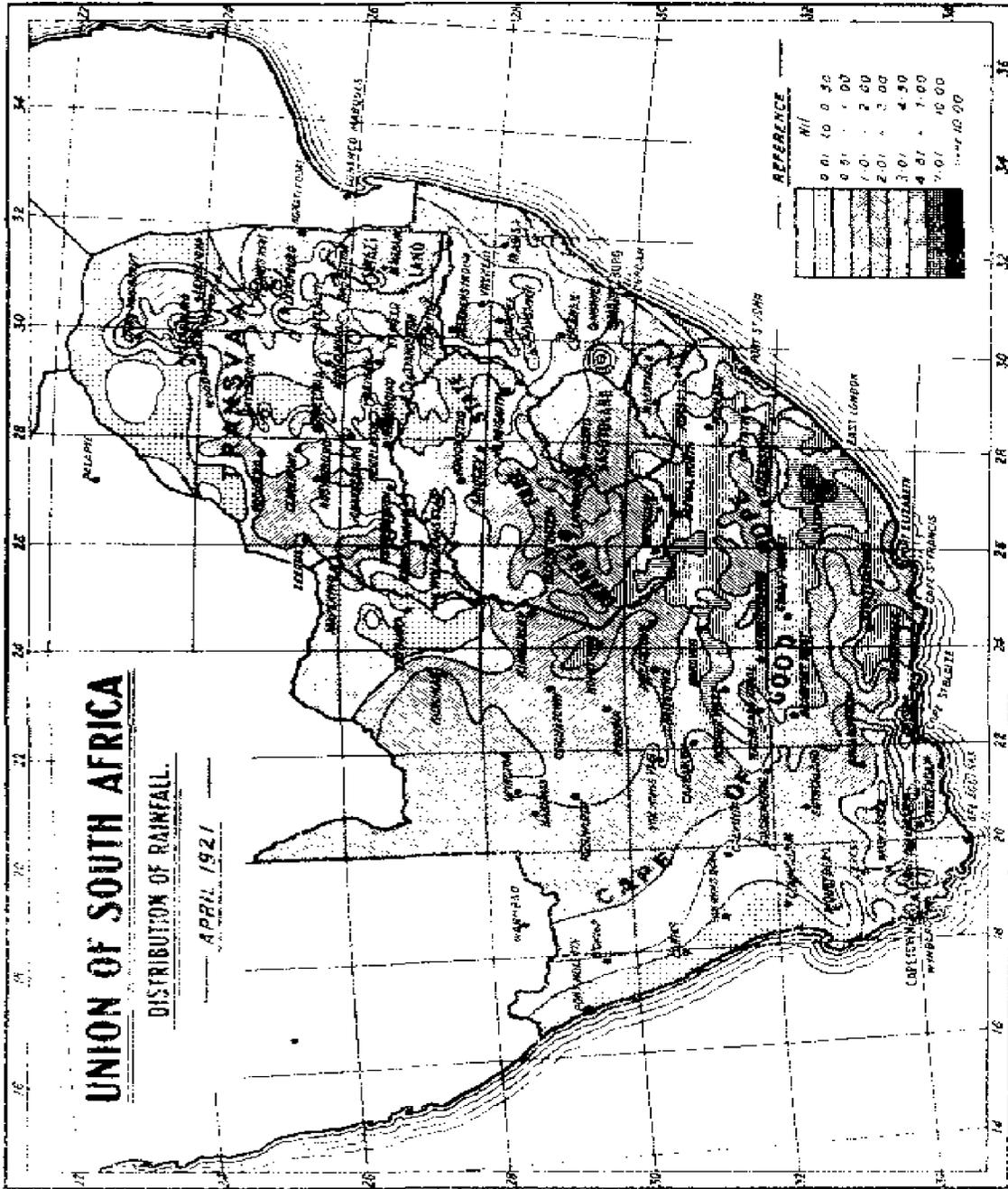
Barberton.—The weather has been about normal during the month. Rainfall: 0.87 inch on six days.—Walter Grubb.

Rustenburg.—The weather was mild during the beginning of the month, with rains up to the 19th, when it gradually became cooler and frosts general throughout district. Large numbers of horses have died from horse-sickness in bushveld this season. Veld still plentiful, and cattle are in good condition. A large area is being prepared and sown with wheat this season. Rainfall: 0.70 inch on five days.—Sergeant H. J. Streatfield.

UNION OF SOUTH AFRICA

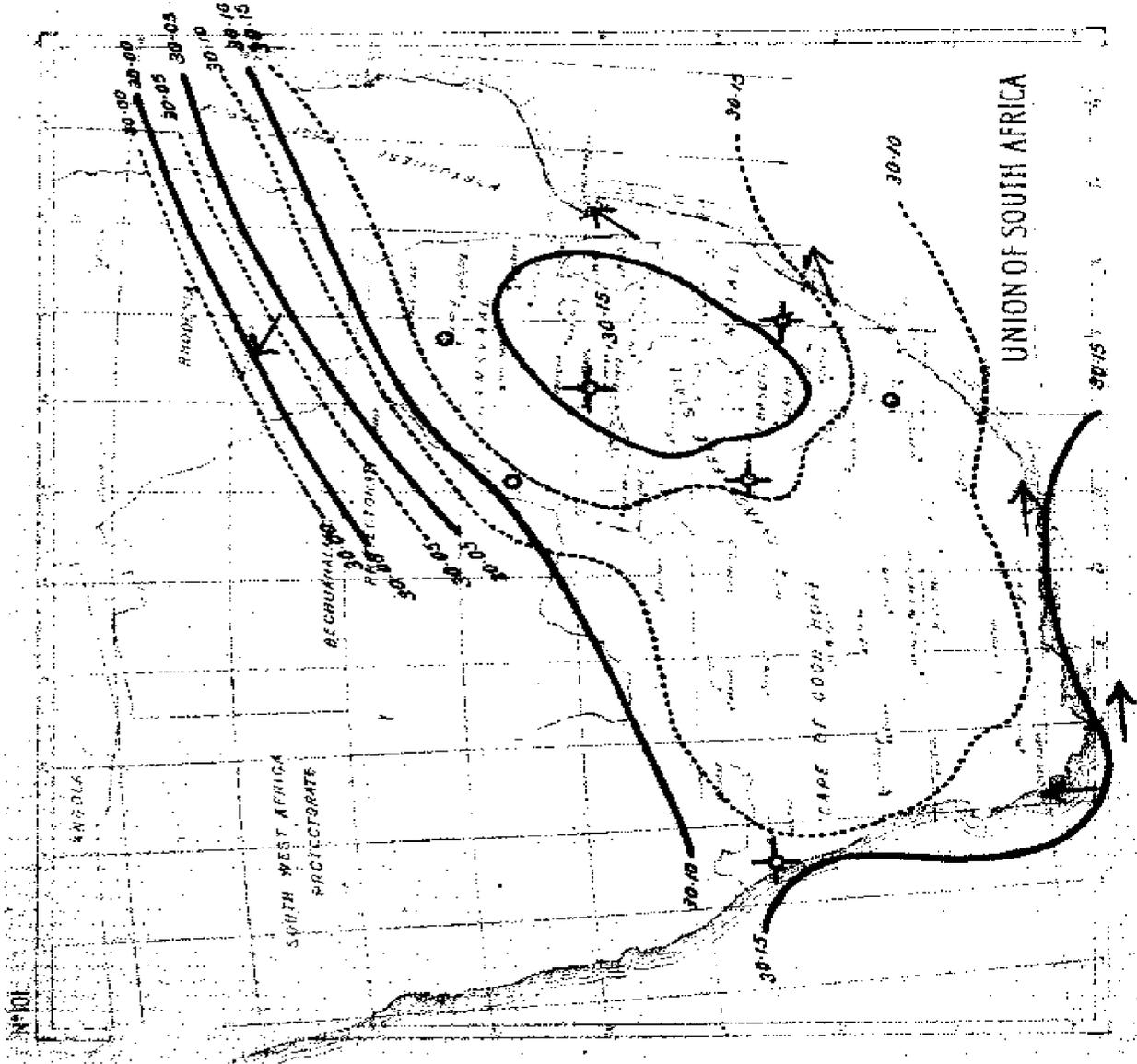
DISTRIBUTION OF RAINFALL

APRIL 1921



REFERENCE

Pattern	Reference
Dotted	0.01 to 0.50
Horizontal lines	0.51 to 1.00
Diagonal lines	1.01 to 2.00
Cross-hatch	2.01 to 3.00
Vertical lines	3.01 to 4.50
Stippled	4.51 to 7.00
Solid black	7.01 to 10.00



May, 1901. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
 The dotted lines indicate the normal distribution for May.

Wakkerstroom.—Winter has now set in properly, though there is rather an absence of the strong continuous west winds usually experienced about this time. Stock are mostly in good condition. Rainfall: 0.82 inch on six days.—Louis le Roux.

Mosdene (Waterberg).—During the last four years this is the first occasion that rain has fallen during May. Rainfall: 1.03 inch on five days.—Ernest E. Galpin.

Krugersdorp.—The weather at the beginning of the month was somewhat unsettled, and intermittent showers fell on the 4th and the three following days. Bright weather followed, with north-easterly winds and dust occasionally, the air in the early mornings being very nippy and frosty. Rainfall: 0.55 inch on five days.—A. G. Wannenburg.

Jakhalsfontein (Pietersburg).—Overcast, heavy weather, with mist turning to light rain during the earlier part of the month. The latter part cold at night with warm sunny days. Occasional touches of frost at night. Rainfall: 1.12 inch on five days.—James C. Palmer.

Waaikraal (Rustenburg).—Frost came late in the month, yet killed a lot of the late crops. Rainfall: 1.29 inch on four days.—W. Behrens.

Klipplaatdrift (Standerton).—Heavy frosts have fallen during the month but no damage to crops. Rainfall: 0.91 inch on three days.—P. Swemmer.

Weltevreden (Standerton).—So far a mild winter; stock looking well; farmers hoping present condition of weather continues in order to dry the mealie cobs. Rainfall: 0.91 inch on four days.—D. Lane.

SWAZILAND.

Kubuta.—Excellent grazing. Promises good winter. Rainfall: 1.81 inches on six days.—Ivan H. Pierce.

Mbabane (Agricultural Farm).—Early part of month to 15th cloudy and showery; latter half fine weather with a few cloudy days. Rainfall: 0.55 inch on nine days.—C. K. Mariller.

Natalia (Swaziland Ranching and Dev. Co.).—The conditions this month, generally, have been typical of May weather. The rainfall recorded is slightly in excess of the average for the last five years, which includes an abnormal fall of 1.31 inch in May, 1919. The relative humidity for the first half of the month reached 90 per cent., but during the latter two weeks fell to 88 and 86 per cent. respectively. Grazing is still very good. The nights generally were chilly, the absolute minimum for the month being 38.5 degrees on the 23rd. Rainfall: 0.58 inch on two days.—Allan W. Macbeth.

ORANGE FREE STATE.

Hoffontein (Kroonstad).—Rain fell during the first week. Winds easterly. Weather bright. First frost on 17th. Severe hailstorm locally on 3rd. Other hailstorms in neighbourhood during days previous. Rainfall: 2.66 inches on six days.—G. W. Müller.

Katdoornput (Bloemfontein).—Veld in splendid condition for sheep; should be a record lambing season. Rainfall: 2.41 inches on four days.—C. Mukce.

Jansdeel (Harrismith).—The weather has been cloudy daily, but very little rain has fallen. On the 4th a nice shower fell which will do a lot of good to winter crops, which to date show a good stand. Rainfall: 0.21 inch on four days.—J. J. Uija.

Stanley Vale (Harrismith).—Heavy frosts from the middle of the month onwards. Very heavy winds, mostly west. Crops drying up fast now. Stock dropping off in condition on account of short grass. Rainfall: 0.38 inch on three days.—G. C. Atkins.

Dew Drop (Heilbron).—Frost began on the 14th. Very few cases of horse-sickness and blue-tongue occurred. Crops (mealie) fair, although considered to be below normal. Some late mealies damaged by frost. Rainfall: 0.80 inch on four days.—W. Leonard.

Woudzicht (Vrede).—The month was favourable for crops and stock; the mealies getting nicely dry owing to the warm days and frosty nights. Rainfall: 0.70 inch on four days.—J. W. Köhler.

Paardekraal (Winburg).—A fine month. Not at all cold. First frost in open 15th and 16th and every morning since. Grass very short and cattle falling off in consequence. Sheep excellent—no deaths. Winter-feed crop good. Ground still moist. Rainfall: 0.80 inch on six days.—G. S. Lowe.

NATAL.

Cape St. Lucia.—Cold winds during latter half of month. Veld looking well and stock in good condition. Rainfall: 5.87 inches on thirteen days.—J. Murphy.

Ladysmith.—Very little rain during month and country is very dry and dusty. Several frosts during month in low-lying lands. Rainfall: 0.95 inch on five days.—D. A. R. Leathern.

Newcastle (The Academy).—The month on the whole has been very fine, the early mornings being cold and the weather changing again towards sunset. Rainfall: 0.80 inch on six days.—The Mother Superior.

Cedara (School of Agriculture).—Rain early part of month. Occasional mists middle of month. Frosts end of month. Frosts occurred daily on vlei lands since and including 16th May. Rainfall: 2.35 inches on thirteen days.—The Principal.

Nottingham Road.—Very wet and mild the first part of the month. Normal towards the end. Veld very dry. Grain and root crops very good. Rainfall: 1.73 inch on nine days.—Miss E. Smythe.

Hlabisa.—Weather nice and seasonable. Rainfall: 1.26 inch on five days.—L. Double.

Richmond (Illovo).—Slight frosts during the month and rather heavy dews every evening. Rainfall: 0.06 inch on one day.—P. R. Melchior.

Rong Poort (Ladysmith).—Pleasant month, rather cloudy. Slight frosts towards end of the month. Rainfall: 0.40 inch on four days.—J. H. Bartholomew.

CAPE.

Murraysburg.—Mild weather during the month. The locusts have done a lot of damage on some farms in the district. Rainfall: 0.90 inch on six days.—A. Cameron.

Carnarvon.—A month of brilliant weather after the first week's rain. Rainfall: 1.78 inch on six days.—A. P. Malherbe.

Riversdale.—A good soaking rain is much needed in this district. Rainfall: 0.95 inch on six days.—Rev. C. Prozesky.

O'okiep.—Winter rains delayed and farming interests suffering. Rainfall: 0.11 inch on two days.—J. Burrows.

Groot Drakenstein.—The month was remarkable for the lowest rainfall on record (twenty-nine years) and for the almost perfect weather conditions which prevailed otherwise. Rain is very badly needed in the neighbouring grain districts. Previous driest year 1908 with 1.20 inch. Rainfall: 0.83 inch on one day.—L. Baker.

Ceres.—Rainfall the lowest recorded for this month since records started in 1878. Weather generally very fine, with heavy dews and frosts on twelve mornings. Rainfall: 0.47 inch on one day.—A. Heatlie.

The Towers (Malmesbury).—The driest month of May on record here. Hardly any ploughing done. Young grass and crops suffering severely. Rainfall: 0.37 inch on two days.—F. J. Duckitt.

Port Alfred.—Veld and stock in excellent condition. Rainfall: 2.35 inches on eight days.—W. H. Pascoe.

Vruchtbaar (Wellington).—Lowest rainfall for May on record. The next was May, 1919, with 1.60 inch. Very little ploughing comparatively has been done. Rainfall: 0.50 inch on two days.—P. J. Cillie.

Willowmore.—The Russian Thistle (*Salsola kala*) has taken such a hold that it has been proclaimed a noxious weed by both Municipal and Divisional Councils. Owing to the unusual rainfall, more land has been placed under cultivation than probably ever before in this district. Rainfall: 0.57 inch on four days.—W. F. Hemens.

Graaff-Reinet.—Northerly winds prevailing during the month and very cold at times. Light rains and much dew. Rainfall: 0.26 inch on six days.—S. E. D. Treadwell.

Mafeking (Convent).—Mild weather during month. Frequent heavy dews. Rainfall: 1.13 inch on four days.—Mother Superior.

Queenstown.—Month cold, with hoar frost on twelve mornings. Dry month. Rainfall: 0.31 inch on five days.—H. Holley

Elsenburg.—Only 0.49 inch of rain fell; the normal for the month being 3.96 inches. The total rainfall for the period January–May, 1921, is 4.78 inches, the normal for the same period being 8.87 inches. The rainfall for this month is the lowest experienced during May since 1892. As a result of this low rainfall, ploughing and seeding operations in this area have been greatly delayed. During the month only very light winds were experienced.—D. Cuthbert.

Abtonia (Kuruman).—Frost reported from various low-lying parts of district. Weather exceptionally mild. Rainfall: 0.43 inch on one day.—A. T. Sitwell.

Lovedale.—Rainfall 0.60 inch more than average. Total for first five months of year 15.70 inches, as against an average of 12 inches. Temperature on whole low, maximum never above 80 degrees, 5 degrees below average, but practically no frost yet. Rainfall: 2.10 inches on seven days.—Charles A. Pilson.

JULY WEATHER CHARACTERISTICS.

Over the Cape Peninsula the rainfall is at its maximum during the month of July, when about 6.5 inches usually fall. In the adjoining south-western districts and along the west coast the amount of precipitation varies but little from that of the preceding month, but along the south coast there may be quite an appreciable diminution, and probably 1.5 inch will not be exceeded.

Over almost all other parts of the Union the minimum for the year should be reached; the month may, indeed, be quite rainless, with sunny, warm days and cold, cloudless nights.

With the sun on its return journey the day temperature should slightly increase, except in the south-west of the Cape, where the rainfall exercises an influence. The nights are, however, colder, and the result is a general decrease in the mean air temperature as compared with June. The normal mean temperature is about 59 degrees over the Transvaal low veld; 57 degrees along the south coast; 56 degrees in the south-eastern districts; 55 degrees over the Cape Peninsula; 53 degrees along the west coast, in Kaffraria, over the east-central Karroo and the south-west of the Cape, and in Natal; 51 degrees over the southern Karroo; 50 degrees over the west-central Karroo and the Cape northern borders; 49 degrees over the Transvaal high veld; 47 degrees over the Cape north-eastern districts; 46 degrees in the Orange Free State and Basutoland; and 45 degrees on the northern Karroo. Frosts are frequent.

Over the Cape Peninsula there is an increased frequency of winds from those points of the compass lying between N. and W.N.W., N.W. being still the prevalent direction; but a decrease in all other directions except S.W.

The south-east of the Cape Province shows an increase of north-easterly, north-westerly, and south-westerly breezes, but a decrease in those from other directions. The principal wind over this part of the country has shifted to N.W. from W.N.W. during the preceding month. In the north of the Cape the frequency table shows an increase of winds from points lying between W.N.W. and E.N.E., also of southerly and south-westerly winds, with a decrease of south-easterly breezes; the prevalent wind now blows from E.N.E. Although there is an increased frequency of easterly breezes over the Transvaal, affecting all points between N. and S.E., together with a decrease in those from all other directions, the prevalent direction remains the same as during June, viz. N.N.W. over this part of the high veld.

C. STEWART,

Chief Meteorologist.

Pretoria.



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. II.

JUNE, 1921.

No. 6.

MEAN barometric pressure considerably less than usual (—0.10 inch to 0.25 inch) all over the Union; mean temperature less than one degree warmer than usual; exceptionally heavy rains and strong north-westerly winds rising to the force of a gale on several days over the west and south-west; stormy and dusty over the rest of the country; sharp frosts of almost daily occurrence, with occasional falls of snow at the higher stations and on mountain tops, were the outstanding features of the weather of June.

Pressure.—The mean distribution of pressure during the month is shown graphically on the accompanying map. From this it will be seen that pressure for the month was considerably lower than usual, being 0.10 to 0.15 inch below normal over the country as a whole, the deficit increasing to 0.25 inch in the extreme south at Cape Agulhas. Although the anticyclone in the north-east was in evidence each day of the month, it was much less intense than usual. On the other hand, a series of low-pressure areas of considerable intensity appeared on the south-west coast, particularly between the 5th and 6th, 8th and 10th, 17th and 29th, causing strong N.W. winds and heavy precipitation over the Cape Peninsula and south-west, resulting in floods, particularly in the Hex River Valley. The barometric reading at Cape Agulhas was exceptionally low: 29.48 inches on the evening of the 29th. "Low" pressure areas passed along the south coast on the following dates: from S.W. to S. on 4th to 6th (very intense), S.W. to S.E. on 8th to 12th and 15th to 17th, S. to S.E. on 20th to 22nd, along the south coast on 26th and 29th to 30th. These depressions affected a much larger area than usual on the west and south, and were productive of an exceptional frequency of westerly and north-westerly winds over the interior, with gales and heavy precipitation on the west and south coasts, and heavy seas on these same coasts. Over the rest of the country the weather was mostly fine, but windy, with almost nightly frosts of greater severity than usual.

Temperature.—The mean temperature of all stations was 53.7 degrees, or 0.5 degree higher than usual, the days, with a mean of 67.6 degrees, being 0.5 degree, and the nights (39.8 degrees) 0.7 degree higher than the corresponding normals. Considering the Provinces separately, the temperature of the month was higher than usual over Natal (60.9 degrees), Transvaal (53.2 degrees), and

Cape (54.4 degrees) by 1.2 degree, 0.9 degree, and 0.4 degree respectively ; but in the Orange Free State (46.2 degrees) there was a deficit of 0.4 degree. The mean maxima were higher than usual in the Transvaal (69.8 degrees) and Natal (74.3 degrees) by 1.8 degree and 0.3 degree respectively ; but lower than usual in the Free State (61.2 degrees) and Cape Province (65.8 degrees), the respective deficits being about equal, viz., 0.5 degree and 0.4 degree. Night temperature was above normal over Natal (47.5 degrees), Cape Province (43.1 degrees), and the Transvaal (36.6 degrees) by 2.2 degrees, 1.2 degree, and 0.1 degree respectively ; on the other hand, the nights in the Free State (31.1 degrees) were cooler than usual by 0.3 degree. At individual stations the month was mostly warmer than usual, particularly in the east of the Transvaal (including Swaziland), the inland parts of Natal, the south-east coast, and at Clanwilliam (west coastal area) and the east-central Karroo, where the excess in temperature varied commonly from 2-4 degrees, but exceeding 5 degrees at Pilgrims Rest. in the Transvaal. Over the major portion of the rest of the Transvaal, the north-east and south of the Free State, the south coastal area of the Cape, the north-east and northern border of the same Province and the Transkei, the excess was mostly a few tenths, but rising to 1.7 degree at Harrismith (Free State) and 1.0 degree at Johannesburg. The areas affected by a deficient temperature were the west of the Transvaal, Bechuanaland, Namaqualand, the south-west, the ore inland portions of the Cape Province, with the central portion of the south-east and north-east districts. The deficits were commonly from 1-2 degrees, but ranging from 0.5 degree at Bloemfontein (Orange Free State) and Murraysburg (Cape Province) to 2.4 degrees at O'okiep (Namaqualand). Day temperatures were in excess except over the south-west and interior of the Cape Province, Namaqualand, at Durban (Natal), the north and east of the Free State, and at Pretoria and Pietersburg, in the Transvaal. The excesses over the Transvaal increased, generally, from west to east, the day temperatures being normal at Zeerust, but rising to plus 5.7 degrees at Barberton ; elsewhere these maximum temperatures were mostly a few tenths above the average, except along the coast belt, where they were generally 1-2 degrees in excess, rising to 2.2 degrees at Clanwilliam and 5.6 degrees at East London. In these two last cases, the larger amounts seem to have been due to the occurrence of Föhn-like winds raising the temperature considerably above that at surrounding stations. The deficiency in day temperatures was mostly under 1 degree, but rose to about 2 degrees in the south-west and 3-4 degrees in more inland portions of the north-east, south-east of the Cape, as well as the northern Karroo, being greatest (5.1 degrees) at O'okiep, Namaqualand. Night temperatures were sub-normal in the west of the Transvaal, the northern border of the Cape, and at Durban by 1-3 degrees. The deficit decreased, however, to less than a degree in the extreme south-west of the Transvaal, the centre of the Orange Free State, and the south-east coastal districts of the Cape ; it was large, however, in the north and east of the Free State, being 4.1 degrees at Lindley and 2.2 degrees at Ladybrand. Elsewhere the minimum temperatures were higher than the corresponding averages mostly by 1-2 degrees, but rising to 2.9 degrees at Barberton (Transvaal), 4.3 degrees at Harrismith, 5.0 degrees at Dundee (Natal), to over 5 degrees at Port St. Johns and Graaff-Reinet in the Cape Province. The mean warmest station was Komatipoort (Transvaal), with a temperature of 66.0 degrees for the month, and the mean coldest, Lindley, in the Free State, with 44.6 degrees, a difference of 21.4 degrees. The highest mean maximum was 83.4 degrees at Komatipoort, and the lowest mean minimum, 25.7 degrees, at Lindley, a range of 57.7 degrees. The warmest period affecting the greatest number of stations was from the 25th to the end of the month, particularly the 27th, although extreme maxima for the month were registered on thirteen other days. The

lowest temperatures were registered most commonly between the 23rd and 25th, although these occurred on nine other days, particularly the 14th, in the Cape. The highest temperature this month was 93.0 degrees on the 11th and 12th at Koraatipoort (Transvaal Province), and the lowest, 15.8 degrees, at Lindley (Orange Free State), an extreme range of 77.2 degrees over all stations. Severe frosts and cold, piercing winds were prevalent throughout the month, particularly on the 23rd, causing considerable damage to gardens, citrus and other trees in the Pretoria District.

Precipitation during June was in excess of the normal over the major portion of the Cape south and west of a line drawn from Ookiep, in Namaqualand, through Prieska, Britstown, Hanover, and Bedford, to Port Elizabeth. The only exceptions in this area were Graaff-Reinet and Uniendale, where there were deficits of 0.57 inch and 0.15 inch respectively, no rain having fallen at Graaff-Reinet. The surplus amounts from Calvinia southwards were unusually large in places, ranging from 3.48 inches at the Royal Observatory (Cape Peninsula), through 10 inches at Wynberg and Groot Drakenstein, to 22.26 inches at Ceres. Floods were, consequently, common to this area, including the Hex River Valley: railway traffic was disorganized for several days. These heavy rains were associated with a series of intense low pressure areas which affected the south-west and south coasts from 4th to 6th, 8th to 12th, 15th to 17th, 20th to 22nd, 25th, 29th, & 30th. On several of these dates pressure at Cape Agulhas fell unusually low--to 29.5 inches. In consequence of the exceptionally dry nature of the preceding month, and the too wet conditions prevailing during June, causing the soil to be waterlogged and delaying ploughing operations, it is anticipated that fully 5 per cent. less land than usual will be put under cultivation. The untimely rains along the south coast spoiled lucerne crops that were being reaped in the Ditshege District. With the exception of the area of excess rainfall indicated above, the rainfall over the rest of the country was either "nil," or so small in quantity as to be negligible; all stations had a precipitation less than normal except Middelburg, in the Transvaal, where there was a small excess of 0.14 inch. The dry weather there was favourable to the gathering of the meadow crops, etc., which are expected to be practically normal in the districts of Rustenburg and Standerton. On the other hand, the persistent strong, dry, northerly to north-westerly winds dried up the veld to such an extent that practically no green areas are any longer visible, even on the coastal areas of Natal. Stock continue to be reported free from disease. In the Rustenburg District larger areas than usual have been put under wheat, oats, barley, etc., but the cotton crop there has suffered considerably from insects, and is below the average. The cumulative rainfall since the 1st of July, 1920, is mostly well above the average over the greater part of the Cape Province, the Free State, and Transvaal, an excess of 5-7 inches being common over the various Provinces, with the exception of the Free State. The maximum excesses are 24.72 inches at Ceres, in the Cape Province; 15.23 inches at Mbabane, Swaziland; 9.35 inches at Nylstroom, in the Transvaal; 7.23 inches at Durban, Natal; and 3.33 inches at Bloemfontein, in the Orange Free State. A semi-circular belt of deficient rainfall in the Cape Province borders the west and south of the Free State, extending from Kokstad, in Kaffraria, through Hanover, Prieska, Kuruman, to Vryburg: here the shortage is mostly from 2-4 inches. Precipitation was also sub-normal along the coast from Mossel Bay to Port St. Johns, increasing from 1.26 inch at the former station to 8.14 inches at the latter. Relatively small deficits of 0.2 inch to 1.8 inch are also found in the north-central and eastern portions of the Orange Free State; in the northern half of Natal and in Zululand the deficits vary from 2 to 11 inches; in the Transvaal the only deficiency of any amount is

RAINFALL, JUNE, 1921.

PLACE.	OBSERVER.	Month. June, 1921.	Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1920.	Normal.	Difference from Normal.
Transvaal—										
Barberton.....	W. Grubb.....	0.00	0.18	- 0.18	15.12	20.84	- 5.82	31.04	33.74	- 2.70
Bethal.....	The Forester.....	0.00	0.11	- 0.11	19.70	17.15	+ 2.55	37.58	32.00	+ 5.58
Bethal.....	H. F. Joubert.....	0.20	0.04	+ 0.16	20.81	14.87	+ 5.94	35.31	30.35	+ 4.92
Bicombos.....	A. Adamson.....	0.00	0.20	- 0.20	13.51	12.50	+ 1.01	18.18	18.92	- 0.64
Charamoni.....	S. A. Polloc.....	0.00	0.01	- 0.01	13.75	10.97	+ 2.78	21.73	18.13	+ 3.60
Orange Free State—										
Beaufort.....	S. A. Polloc.....	0.00	0.34	- 0.34	29.84	26.69	+ 3.15	43.81	40.36	+ 3.45
Bloemfontein.....	W. ter Horst.....	0.00	0.04	- 0.04	19.16	14.82	+ 4.34	32.64	27.73	+ 4.91
Bloemfontein.....	The Staff.....	0.00	0.06	- 0.06	16.96	15.00	+ 1.96	31.20	26.69	+ 4.51
Brammingspoort.....	C. Scott.....	0.01	0.13	- 0.11	17.06	13.77	+ 3.29	26.07	21.80	+ 4.27
Comrades.....	H. J. Evans.....	0.00	0.16	- 0.16	15.46	16.99	- 1.53	26.26	26.27	- 0.01
Comrades.....	I. J. de Bruin.....	0.00	0.43	- 0.43	24.67	19.30	+ 5.37	34.85	32.36	+ 2.49
Comrades.....	Dr. H. A. Spencer.....	0.07	0.02	+ 0.05	15.92	15.08	+ 0.83	30.84	28.74	+ 2.10
Comrades.....	G. Bakker.....	0.00	0.19	- 0.19	23.05	13.97	+ 9.08	33.34	23.00	+ 10.34
Comrades.....	W. Franklyn.....	0.00	0.01	- 0.01	14.12	12.17	+ 1.95	25.60	21.63	+ 3.97
Comrades.....	J. Werner.....	0.03	0.11	- 0.08	20.94	15.41	+ 5.53	30.46	30.62	- 0.16
Comrades.....	R. M. Skae.....	0.00	0.31	- 0.31	23.16	20.43	+ 2.73	40.74	40.48	+ 0.26
Comrades.....	The Staff.....	0.02	0.06	- 0.04	17.04	17.66	- 0.62	29.86	29.08	+ 0.78
Comrades.....	The Manager.....	0.00	0.07	- 0.07	18.32	12.89	+ 5.43	26.08	23.60	+ 2.48
Comrades.....	Robberg.....	0.01	0.03	- 0.02	19.48	17.04	+ 2.44	33.39	23.83	+ 9.56
Comrades.....	N. H. Munro.....	0.00	0.11	- 0.11	20.86	19.91	+ 0.95	33.14	25.86	+ 7.28
Comrades.....	S. A. Polloc.....	0.05	0.05	- 0.00	15.43	15.43	0.00	30.26	30.26	0.00
Comrades.....	M. Ferguson.....	0.03	0.14	- 0.11	15.73	17.08	- 1.35	78.95	32.13	+ 46.82
Comrades.....	L. le Roux.....	0.00	0.39	- 0.39	38.08	46.90	- 8.82	71.99	71.99	0.00
Comrades.....	The Forester.....	0.00	0.07	- 0.07	13.08	14.97	- 1.89	26.92	24.05	+ 2.87
Comrades.....	H. Dietrich.....	0.00	0.37	- 0.37	34.35	28.76	+ 5.59	63.71	50.18	+ 13.53
Comrades.....	Swanland Police.....	0.00	0.37	- 0.37	34.35	28.76	+ 5.59	63.71	50.18	+ 13.53
Orange Free State—										
Bethal.....	J. J. Wardhaugh.....	0.00	0.58	- 0.58	19.35	11.96	+ 7.39	20.37	18.16	+ 2.21
Bloemfontein.....	G. A. Schepers.....	0.03	0.19	- 0.16	13.03	11.59	+ 1.44	22.61	19.22	+ 3.39
Brammingspoort.....	The Forester.....	0.00	0.29	- 0.29	13.11	10.68	+ 2.43	23.91	22.05	+ 1.86
Brammingspoort.....	R. R. Northfield.....	0.08	0.33	- 0.25	16.71	13.36	+ 3.35	26.81	27.34	- 0.53
Brammingspoort.....	The Forester.....	0.01	0.17	- 0.16	14.88	13.86	+ 1.02	24.12	24.34	- 0.22
Brammingspoort.....	J. Coddister-Opies.....	0.00	0.18	- 0.18	13.92	17.95	- 4.03	27.97	31.27	- 3.30
Natal—										
Dundee.....	West Theronold.....	0.13	1.12	- 0.99	26.34	22.29	+ 4.05	48.99	41.76	+ 7.23
Dundee.....	The Post (Capt. An.....)	0.31	0.78	- 0.47	23.51	23.39	+ 0.12	41.30	43.23	- 1.93
Dundee.....	The Gaele.....	0.09	0.50	- 0.41	17.33	17.72	- 0.39	35.35	32.61	+ 2.74
Dundee.....	The Gaele.....	0.04	0.22	- 0.18	11.28	16.07	- 4.79	20.52	27.31	- 6.79
Dundee.....	D. A. B. Joubert.....	0.09	0.32	- 0.23	18.60	18.65	- 0.05	37.62	33.80	+ 3.82
Dundee.....	The Staff.....	0.01	0.20	- 0.19	11.36	19.90	- 8.54	25.48	30.89	- 5.41
Dundee.....	The Gaele.....	0.00	0.25	- 0.25	16.53	14.79	+ 1.74	27.31	26.37	+ 0.94

RAINFALL, JUNE, 1921 (continued).

PLACE.	OBSERVER.	Month.	Normal.	Difference	From 1st Jan., 1921.	Normal.	Difference	From 1st July, 1920.	Normal.	Difference
		Inches.		from Normal.			Inches.			from Normal.
Cape—										
Alwal North.....	A. Alcock.....	0.05	0.63	- 0.58	14.00	13.42	+ 1.43	18.49	21.14	- 2.65
Beaufort West.....	The Gaoler.....	0.60	0.36	+ 0.24	14.25	5.93	+ 8.32	17.73	9.46	+ 8.27
Bedford.....	T. C. Hall.....	1.13	0.95	+ 0.18	18.47	15.73	+ 2.74	28.04	27.97	+ 0.07
Bristow.....	The Gaoler.....	0.88	0.40	+ 0.48	13.83	7.98	+ 5.85	16.71	11.35	+ 5.36
Calcutta.....	The Gaoler.....	4.74	1.00	+ 3.74	10.38	4.23	+ 6.15	16.33	7.74	+ 8.59
Cape Town (Royal Observatory).....	The Staff.....	7.93	4.45	+ 3.48	12.18	12.65	- 0.47	28.76	25.54	+ 3.22
Ceres.....	A. Heatlie.....	28.91	6.65	+ 22.26	37.56	18.32	+ 19.24	66.01	41.29	+ 24.72
Carnarvon.....	A. F. Malherbe.....	0.61	0.36	+ 0.25	11.44	5.77	+ 5.67	13.79	8.02	+ 5.77
Clanwilliam.....	W. J. Downes.....	6.53	1.38	+ 5.15	8.04	4.23	+ 3.81	15.48	8.59	+ 6.89
East London.....	A. Downie.....	0.09	1.54	- 1.45	15.76	16.73	- 1.07	25.51	33.38	- 7.87
Fraserburg.....	The Gaoler.....	1.22	0.40	+ 0.82	11.80	4.58	+ 7.22	14.52	0.64	+ 13.88
Garies.....	The Gaoler.....	3.79	0.81	+ 2.98	5.61	2.45	+ 3.16	9.81	5.20	+ 4.61
Graaf-Reinet.....	S. B. D. Treadwell.....	0.00	0.57	- 0.57	10.29	8.04	+ 2.25	15.19	13.92	+ 1.27
Groot Drakenstein.....	L. Bekar.....	16.74	5.85	+ 10.89	23.92	16.91	+ 7.01	41.91	35.61	+ 6.30
Griquatown.....	The Gaoler.....	0.00	0.46	- 0.46	8.38	9.51	- 1.13	11.20	13.08	- 1.88
Hanover.....	The Gaoler.....	0.60	0.53	+ 0.07	9.35	9.08	+ 0.27	10.82	12.22	- 1.40
Hopetown.....	The Gaoler.....	0.00	0.40	- 0.40	10.60	8.85	+ 1.75	11.33	12.78	- 1.45
Kemhard.....	The Gaoler.....	0.20	0.27	- 0.07	6.26	4.13	+ 2.13	8.19	5.04	+ 3.15
Kimberley.....	J. Acton.....	0.00	2.13	- 2.13	10.42	10.53	- 0.11	14.41	16.26	- 1.85
Knyema.....	The Gaoler.....	2.49	0.50	+ 1.99	16.77	13.30	+ 3.47	20.91	27.14	- 6.23
Kokstad.....	H. D. Coyte.....	0.17	0.30	- 0.13	16.07	15.38	+ 0.69	25.98	27.14	- 1.16
Kuruman (Abonias).....	A. T. Sitwell.....	0.60	0.30	+ 0.30	11.51	11.32	+ 0.19	14.53	16.43	- 1.90
Making (Convent).....	Mother Superior.....	0.02	0.03	- 0.01	29.33	13.19	+ 16.14	29.95	21.51	+ 8.44
Mossel Bay (Cape St. Ristize).....	The Lightkeeper.....	1.46	1.20	+ 0.26	9.30	8.75	+ 0.55	16.07	17.83	- 1.76
Murraysburg.....	A. Cameron.....	0.88	0.45	+ 0.43	9.99	7.34	+ 2.65	12.19	11.04	+ 1.15
O'okiep.....	J. Burrows.....	4.30	1.02	+ 3.28	8.06	3.77	+ 4.29	11.97	7.11	+ 4.86
Philippstown.....	The Gaoler.....	0.27	0.58	- 0.31	8.05	9.24	- 1.19	9.86	13.94	- 4.08
Piquetberg.....	The Gaoler.....	9.57	3.01	+ 6.56	13.14	9.34	+ 3.80	27.84	20.74	+ 7.10
Port Elizabeth.....	J. V. Allen.....	2.23	1.67	+ 0.56	12.71	9.86	+ 2.85	18.46	22.28	- 3.82
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	0.66	1.79	- 1.13	23.60	24.40	- 0.80	40.55	48.69	- 8.14
Precks.....	The Gaoler.....	0.41	0.28	+ 0.13	7.99	7.23	+ 0.76	8.93	9.72	- 0.79
Queenstown.....	H. Holley.....	0.19	0.61	- 0.42	15.50	12.80	+ 2.70	22.57	21.41	+ 1.16
Steylerville.....	The Gaoler.....	0.75	0.31	+ 0.44	7.29	5.40	+ 1.89	11.73	9.26	+ 2.47
Sutherland.....	The Gaoler.....	5.45	1.02	+ 4.43	12.30	5.36	+ 6.94	17.54	0.29	+ 16.25
Swellendam.....	The Gaoler.....	4.04	2.16	+ 1.88	22.12	16.43	+ 5.69	33.62	32.64	+ 0.98
Umtata.....	A. Dixpeck.....	0.00	1.04	- 1.04	17.63	14.06	+ 3.57	26.12	25.74	+ 0.38
Uniondale.....	The Gaoler.....	1.10	1.15	- 0.05	10.72	6.87	+ 3.85	15.40	13.55	+ 1.85
Uptington.....	The Gaoler.....	0.06	0.11	- 0.05	8.61	5.03	+ 3.58	9.50	7.03	+ 2.47
Victoria West.....	The Gaoler.....	0.66	0.45	+ 0.21	10.77	7.01	+ 3.76	12.32	10.14	+ 2.18
Vryburg.....	C. Buider.....	0.00	0.27	- 0.27	16.27	13.83	+ 2.44	17.02	19.09	- 2.07
Worcester.....	The Gaoler.....	7.11	1.80	+ 5.31	10.89	5.90	+ 4.99	16.40	12.67	+ 3.73
Wynberg (Convent).....	The Mother Superior.....	18.39	8.04	+ 10.35	23.90	20.76	+ 3.14	55.00	47.12	+ 7.88

that of 2.70 inches at Barberton. The total quantities since the beginning of the current year show almost exactly the same relationship to the averages as for the longer period. The areas having less precipitation than usual are more limited in extent; those in the Cape being confined to the neighbourhood of Kimberley, Griquatown, and Philipstown in the interior, and to the Royal Observatory (Capetown), East London, and Port St. Johns on the coast. In Natal the deficits continue in the north and west, whilst there has been a small falling off at Maritzburg also; in the Transvaal, sub-normal amounts are practically confined to the east, in the neighbourhood of Barberton, Pilgrims Rest, and Barberton.

Snow is reported as having fallen about the 22nd in the neighbourhood of and on mountains surrounding Graaff-Reinet, Murraysburg, and Grootfontein, while slight flurries of fine snow occurred at Grootfontein itself. Snow, sleet, and hail (the last unusually large) occurred on Table Mountain (Capetown), in conjunction with continual rain, mist, and wind. Malarial influenza is reported as prevalent at Mafuteni (Swaziland).

OBSERVERS' NOTES FOR JUNE, 1921.

TRANSVAAL.

Witbank (Middelburg).—Cold, windy, and dusty weather, with some frost at times, with ice and white frost on ground in moist places. Rainfall: 0.08 inch on one day.—Mrs. F. J. Eadie.

Rustenburg.—Dry month; genial weather; frosts general throughout district. Farmers and natives busy reaping mealies and kaffir corn; an average crop is anticipated. Large areas have been sown with wheat, oats, and barley, etc; this season, in places, crops are looking very promising. Damage has been caused by insects to cotton crop, which is now below average. Grazing plentiful, and cattle are still keeping in good condition. Peach trees are in places in full bloom. Rainfall: Nil.—H. J. Streatfield (Sgt.).

Mosdene (Waterberg).—An unusually windy month for June, the winds mostly coming up after 8.30 a.m. The mildest June we have had for three years; last year a temperature of 12 degrees F. was recorded on the grass at night. Rainfall: Nil.—Ernest E. Galpin.

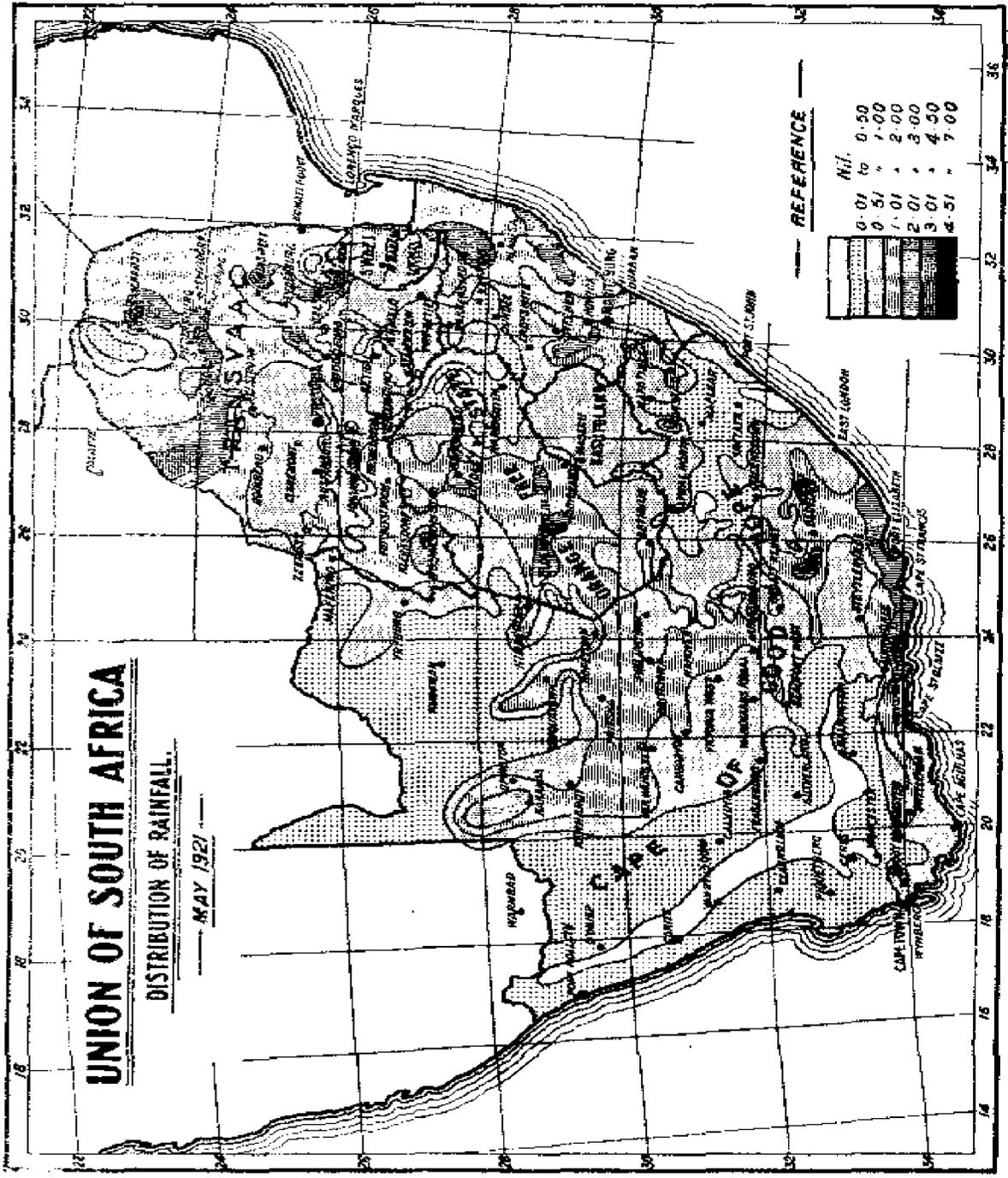
Krugersdorp.—The weather during the month was very unpleasant: wind and dust every second or third day. The veld is very dry. Heavy frost on the 23rd, the day following being very cold and windy. Rainfall: Nil.—C. Innes.

Barberton.—A very mild month. Rainfall: Nil.—Walter Grubb.

Standerton.—With the exception of a light shower that fell on the morning of the 7th (0.05 inch), the month has been rainless. Generally speaking, the weather was clear and cloudless; but occasionally a strong wind of a cold, piercing nature would spring up during the forenoon, accompanied by dust, and continuing until evening. The rise and fall of temperature was both sudden and rapid. The veld is drying up rapidly, and stock is beginning to feel the pinch. Hay and forage, however, appear to be plentiful and cheap. The mealie crop has been harvested in good condition, and would appear not far short of an average crop.—M. Ferguson.

Pietersburg.—Heavy frosts; cold, southerly winds in afternoons; occasional misty mornings. Rainfall: Nil.—W. Frankleyne.

Crocodile Poort (Barberton).—Weather calm; cold at nights, and misty mornings. Rainfall: Nil.—W. Reading.



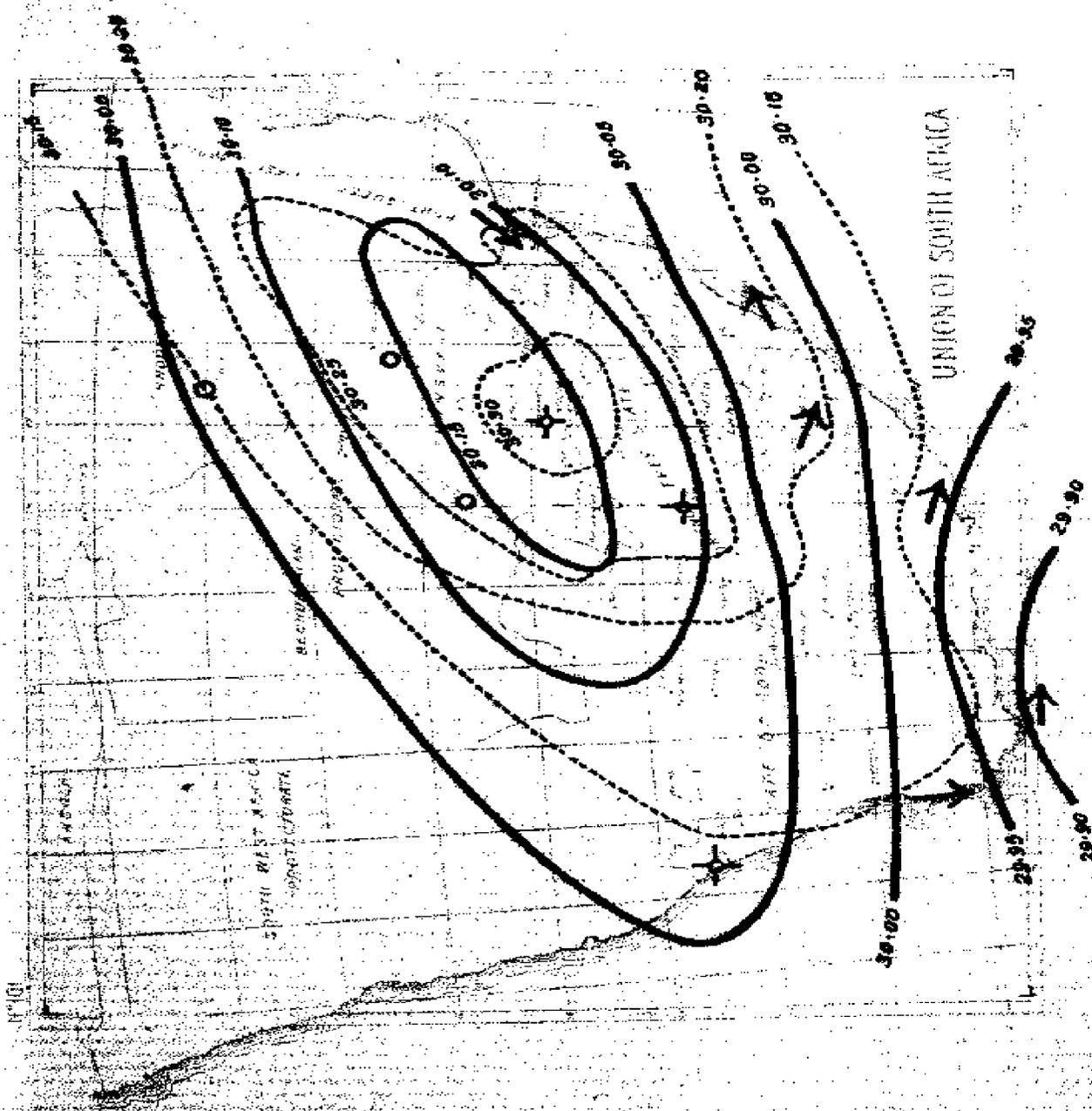
UNION OF SOUTH AFRICA

DISTRIBUTION OF RAINFALL.

— MAY 1921 —

REFERENCE

Shading Pattern	Nil.
(White)	0.01 to 0.50
(Horizontal lines)	0.51 to 1.00
(Vertical lines)	1.01 to 2.00
(Diagonal lines /)	2.01 to 3.00
(Diagonal lines \)	3.01 to 4.50
(Cross-hatch)	4.51 to 7.00



June 1991. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
 The dotted lines indicate the normal distribution for June.

Klippan No. 272 (Lichtenburg).—From nine years' records and experience I cannot remember a June so windy. My water supply, which depends on windmills, has always become exhausted by June, but this year the incessant N. and N.W. and then S. and E. winds have caused the supply to overflow. Rainfall: Nil.—P. N. Fischer.

Haselmere (Rustenburg).—High winds frequent. Killing frost very late in this particular neighbourhood. Rainfall: Nil.—F. K. Hine.

Klipplaatsdrift (Standerton).—Very strong continuous winds. Crops (mealie) are very fair this year. Stock keeping very well so far. Rainfall: Nil.—P. Swemmer.

SWAZILAND.

Mafuteni.—No rain during month; no frost registered yet on ground; lowest temperature, 40 degrees F.; grazing still good.—H. S. Parry.

Croydon.—Grass very scarce end of month, and cattle suffering. Rainfall: 0.02 inch on one day.—Alex. Brown.

Natalia.—The month has been the warmest June experienced for six years, the mean for the month, 66 degrees, being on an average 4.3 degrees higher than the four years previous to 1920; in 1920, an exceptionally vigorous winter, the mean registered for June was 6.1 degrees less than this year. The disagreeable hot winds usually experienced in late August and September prevailed most noticeably during the first three weeks. Vegetation and grazing suffered in consequence, the grass rapidly dying out. No rain of any practical value was registered. Rainfall: 0.02 inch on one day.—Allan W. Macbeth.

ORANGE FREE STATE.

Overdene (Ficksburg).—Very dry and cold. Rainfall: 0.07 inch on two days.—H. Thorrold.

Roadside (Vrede).—Heavy winds for the first fourteen days; heavy frost at night. Rainfall: Nil.—W. B. Fry.

Paardekraal (Winburg).—Frosts every morning, except on 15th and 29th; much more wind than usual during the month. Rainfall: 0.05 inch on two days.—G. S. Lowe.

Hofontein.—Night frosts, with fairly even temperature during the day. Rainfall: Nil.—G. W. Müller.

Kroonstad.—Wind unusual in strength for this time of year, consequently dust was very frequent. Weather droughty. Rainfall: Nil.—S. R. Northfield.

NATAL.

Kloofend (Alexandra).—Rainfall: 0.07 inch on three days; otherwise very dry and cold.—J. D. Cruickshank.

Durban.—Generally fine weather throughout; very little rain. Strong winds on two days only; hot winds for few hours on 28th, p.m., and 29th, a.m. No fog, but generally hazy during early part of day. Rainfall: 0.13 inch on four days.—A. G. Goulding.

Hlabisa.—Strong winds are very early this year, and the country is somewhat parched and dry. Rainfall: 0.31 inch on three days.—L. Double.

Dundee.—A most objectionable month for June, with an unusual amount of wind from N.W., making the already dry country more parched. Rainfall: Nil.—West Thorrold.

Cape St. Lucia.—Strong N. and N.W. winds during month; veld drying up. Rainfall: 0.80 inch on seven days.—J. Murphy.

Port Shepstone.—A very dry month, and not a green patch of grass to be seen. Rainfall: 0.06 inch on two days.—E. K. Andreasen.

Ladysmith. A very dry month, with exceptionally strong winds coming from the west; country very dry and bare. Rainfall: 0.04 inch on one day.—D. A. R. Leathern.

Nottingham Road.—Very mild; warm sunny days; high winds. Stock of all kinds healthy. Rainfall: 0.09 inch on three days.—E. Smythe (Miss).

Newcastle. Slight rains during the nights of 7th and 15th, of very little consequence (amounts not measurable); winds very frequent during the month, especially in the evenings; weather inclined to be warm during day. Rainfall: Nil.—I. Robbins.

Newcastle (Convent).—Windy days were of frequent occurrence during the month. The early mornings were cold and frosty.—The Mother Superior.

CAPE.

Graaff-Reinet.—Strong northerly winds; very little rain, but some snow in the district: snow on the surrounding hills on the 22nd; much variation in temperature: the minimum was 60.8 degrees on the 5th and 30.5 degrees on the 14th. Rainfall: Nil.—S. E. D. Treadwell.

Bedford.—The month has been abnormal; high winds and gales almost constant, whereas these are not expected till a month later. The frosts, too, have been exceptionally heavy. Rainfall: 1.13 inch on eleven days.—T. C. Hall.

Groot Drakenstein.—After the driest May on record, we had the wettest month ever experienced in twenty-nine years. The previous heaviest rainfall for any month was 12.25 inches in August, 1899. Serious floods occurred, and all land is waterlogged; but I have not heard of any serious damage in this neighbourhood. Smallest amount of sunshine yet recorded, and highest percentage of cloud (7.7). Previous highest, 6.9, in June, 1902. Month opened unusually warm, but in spite of this the days were about 2 degrees cooler than usual, and the nights about 1 degree warmer. Rainfall: 16.74 inches on twenty-one days.—Lionel Baker.

Mafeking (Convent).—Weather generally mild during month. Only one really cold day. Rainfall: 0.02 inch on one day.—The Mother Superior.

Queenstown.—Rainfall on five days, when 0.19 inch was recorded. Strong N.W. and W. winds during month; snow on hills on 22nd; veld looking very dry.—H. Holley.

Kokstad.—Frequent high, warm winds; severe gales, especially on 6th, when many trees were blown down in town and neighbourhood, including "Adam Kok's Tree" at Old Laager, planted over fifty years ago. Some buildings in town were also damaged. Rainfall: 0.17 inch on two days.—H. D. Coyte.

Murraysburg.—Severe cold weather during month; heavy falls of snow in the district. Rainfall: 0.88 inch on six days.—A. Cameron.

Darling.—After a dry May, we have had the wettest June ever experienced, 10.29 inches on twenty-three days, and only four days since it commenced (on the 4th) without water in the gauge. At this time of the year rain is good,

but coming in such quantities and continuance is putting ploughing operations dangerously late, and some considerable damage has occurred in washaways in cultivated lands.—P. H. Drake.

Ceres.—Rainfall: 28.91 inches on twenty-one days, and highest ever recorded for any month.—A. Heatlie.

Kingwilliamstown.—The month was very exceptional, as we do not, as a rule, get such a lot of wind; it was chilly at times; the mornings fine, with light winds, which increased during the day. Rainfall: 0.28 inch on four days.—L. Clayton.

Lovedale.—Little frost till 14th, when the unusually low figure of 26 degrees in the screen was reached. Much wind, more than usual for June, from N.W. and W. Very little rain. Rainfall: 0.47 inch on five days.—C. A. Pilson.

Stutterheim.—Unusual amount of wind for June. Grass exceptionally long; dangerous veld fires will undoubtedly occur. Stock in good condition. Rain needed. Rainfall: 0.21 inch on six days.—F. C. Bousfield.

Grootfontein School of Agriculture (Middelburg).—The heavy rainstorms at the Cape affected weather here apparently, in causing strong prevailing N.W. winds with overcast sky. Atmosphere felt damp instead of dry, as usual in winter here. Snowstorms occurred in mountains round about, while at this station we had slight flurries of fine snow. Rainfall: 0.63 inch on two days.—The Principal.

Commando Kraal (Uitenhage).—A very windy month. The untimely rains spoilt many lucerne crops that were being reaped. Rainfall: 0.66 inch on five days.—J. Kreft (Major).

Jansenville.—The month has been remarkable for the numerous N.W. winds. Rainfall: 0.81 inch on three days.—E. H. Egan.

Table Mountain.—Hurricane winds, thick and continued mist; heavy and continued rains, with snow, sleet, and hail, the hail being remarkable for the size of the stones. Rainfall: 18.66 inches on twenty-four days.—H. Paeker.

Abtonia (Kuruman).—All stock doing well; grass still green in sheltered spots; some sharp frosts down the Kuruman River, which lies low. Rainfall: Nil.—A. T. Sitwell.

O'okiep.—Exceptional frequency of rain; country thoroughly saturated. Records from 1876 afford only one other example of 4 inches of rain in one month, viz., July, 1878, 4.33 inches. Rainfall: 4.30 inches on thirteen days.—J. Burrows.

Riversdale.—The veld and seed lands are fresh and promising after all these showers. Rainfall: 2.56 inches on sixteen days.—Rev. Carl Prozesky.

Rietfontein (Aliwal North).—The characteristic feature of the month was very high N.W. and W. winds nearly every day, and a large amount of overcast skies. Windiest June recorded at this station. Rainfall: 0.31 inch on five days.—A. J. Smith.

Cape St. Francis.—At 6.20 on the evening of the 30th, the lightning struck the lighthouse, blowing out two large panes of glass in the lantern windows, and breaking five other large ones. Brass ventilators were wrenched out; all bell wires burnt; bells fused; telephone burnt out and useless; all windows in tower smashed, to the extent of 105 panes of glass; centre tube cracked, and plaster torn off the walls where the bell wires were fastened. As far as I know, there was no damage done to outlying farms, only the lighthouse being struck. Rainfall: 8.48 inches on twelve days.—H. Stokes.

Cape Agulhas.—Heavy squalls, with rain and hail from 6.29 p.m. to 6.40 p.m. on the 30th; vivid lightning and heavy thunder. Rainfall: 7.26 inches on fifteen days.—The Lightkeeper.

Vruchtbaar (Wellington).—This was the heaviest rainfall in June or any other month for the last twenty years; very little sowing and ploughing was done. Rainfall: 11.62 inches on seventeen days.—P. J. Cillie.

Belgravia (Malmesbury).—Owing to the exceptional wet weather, the crops have suffered considerably, and it is anticipated that fully 5 per cent. less will be sown this year owing to the drought of May and floody weather of June. Rainfall: 5.03 inches on fifteen days.—G. J. Slabber.

Dwingfontein (Cradock).—It is very dry, but cattle still in good condition; crops fairly good, and no prevailing diseases. Rainfall: 0.27 inch on one day.—H. P. van Heerden.

Kalkoenkrantz (Sterkstroom).—Crops very much damaged by strong winds; cattle still in fairly good condition. Rainfall: 0.33 inch on three days.—J. C. Botha.

AUGUST WEATHER CHARACTERISTICS.

Along the west coast and over the Cape Peninsula the rainfall during the month of August is decreasing, but in the south-western districts the precipitation usually exceeds that of the previous month. The general tendency over the remainder of the Union is towards an increase, although the month may be quite rainless inland. The normal rainfall is about 6.0 inches over the Cape Peninsula; 3.0 inches in the Cape south-western districts; 2.0 inches along the south coast; 1.5 inch in the south-east of the Cape, along the west coast, and in Zululand; 1.0 inch in Natal, Basutoland, in the Cape north-eastern districts, and Kaffraria; and less than an inch in other parts of the Union.

The mean temperature of the air is now increasing rapidly where sunny days and cloudless skies preponderate, and slowly along the coastal districts. A mean of about 64 degrees should be reached on the Transvaal low veld; while the normal in Natal is 61 degrees; in the south-east of the Cape and along the south coast 58 degrees; over the east-central Karroo 56 degrees; in the Cape Peninsula, on the southern Karroo, and over the northern borders 55 degrees; in the Transvaal and over the Cape south-western districts and along the west coast 54 degrees; on the west-central Karroo 53 degrees; in the Cape north-eastern districts and Basutoland 51 degrees; and in the Orange Free State and on the northern Karroo 50 degrees. Frosts are still of frequent occurrence.

Compared with July, there is a marked increase in frequency over the Transvaal of north and north-westerly winds, but a decrease in all other directions; N.N.W. is still the prevailing wind. In the south-east of the Cape Province, on the other hand, there is a decrease in frequency of north-westerly winds, but an increase of all others, particularly those from N.E., which constitutes the prevalent direction. In the north of the Cape Province the principal wind is still from E.N.E.; over this area there is a decrease in frequency of southerly and south-westerly and north-westerly winds, but an increase of breezes from directions between N. and S.E. Over the Cape Peninsula, north-westerly are still the dominant winds, notwithstanding a falling-off in their frequency and an increase in those from the south.

With a general increase in the wind-force and velocity, and continued dry weather over the interior, duststorms are apt to be of frequent occurrence at this period.

C. STEWART,
Chief Meteorologist.

Pretoria.



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE

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JULY 1921

Weather Report

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JULY, 1921.

MEAN barometric pressure higher than usual in the west, south, and centre of the country; a marked absence of the usual low-pressure areas affecting the south coast; bright, sunny days, with cold winds, causing large deficits in the mean maximum temperatures; cold nights, with practically continuous radiation frosts; an excess of rainfall limited to the winter rainfall area and south coast stations; with a practically continuous drought over the greater part of the summer rainfall area; some falls of snow: such were the leading features of the weather of July, 1921, over the Union of South Africa.

Pressure.—Anticyclonic conditions prevailed throughout the month, there being a marked absence of the usual succession of low-pressure areas which generally affect the south coast during this month. Although the position of the core of the anticyclone over the land varied throughout the month, the accompanying map shows that the net result was that anticyclonic conditions were more intense than usual in the west, south, and centre, the mean pressure there being about a tenth of an inch higher than usual. On only two occasions did "low pressure areas" appear on the south coast, viz., on 3rd to 4th and on 17th, although there were indications of the approach of another on the last day of the month.

Temperature.—The mean temperature over the Union during July was 49.5 degrees, or 3.0 degrees less than usual. Both days and nights were colder than usual, the former, with a mean of 63.5 degrees, being 3.5 degrees and the latter, with a mean of 35.6 degrees, being 2.5 degrees lower than the corresponding normals. A similar state of affairs prevailed over each of the provinces, the deficit in the mean temperature for the month being greatest (4.7 degrees) in the Orange Free State, where the temperature of the month was only 42.2 degrees, as against a normal of 46.9 degrees; in Natal, where the mean was 54.9 degrees, there was a deficit of 4.0 degrees; over the Cape Province,

the mean of 50·6 degrees was 2·8 degrees less than the normal; whilst the departure over the Transvaal was 2·6 degrees below the monthly average of 51·6 degrees. In Natal, the days were exceptionally cold, the mean maximum being only 68·2 degrees, as against the normal of 75·0 degrees; the night temperature there (41·7 degrees), on the other hand, was only 1·2 degree lower than usual. On the other hand, in the Free State, deficiency in monthly temperature was due to the nights, with a mean of 26·5 degrees, being 5·1 degrees, and the days, with 57·9 degrees, being 4·3 degrees, lower than the corresponding average. In the Cape Province the days, with a mean of 62·6 degrees, were 3·4 degrees, and the nights (38·6 degrees) 2·1 degrees cooler than usual. Over the Transvaal the deficiency was almost equally divided between the day and night temperatures, the former (64·9 degrees) being subnormal to the extent of 2·8 degrees, and the latter (33·2 degrees) to the almost equal amount of 2·4 degrees. Except at East London (Cape) and Barberton (Eastern Transvaal), where the mean maximum temperature was 0·1 degree higher than usual, the days were colder than usual, mostly by 1 to 3 degrees over the Cape Province; by 2 to 3 degrees over the Transvaal; by 2 to 4 degrees over the Free State and 4 to 6 degrees in Natal. Although these may be regarded as the more common amounts, the deficits exceeded 5 degrees at Pietersburg in the Transvaal; reached 6·7 degrees at Bedford, in the south-east of the Cape, and 6·8 degrees at Harrismith, in the Orange Free State, being greatest, however, (9·5 degrees) at Dundee, in Natal. With the exceptions of Pietersburg in the Transvaal and Graaff-Reinet and Port St. Johns in the Cape Province, where there were excesses, the night temperatures were also lower than usual, varying from between 0·4 degree at Pretoria and 4·8 degrees at Belfast in the Transvaal; between 1·1 degree at Mossel Bay and 4·6 degrees at Kimberley in the Cape; 2·4 degrees at Harrismith and 6·6 degrees at Lindley in the Free State; and slightly exceeding 1 degree in Natal. The mean warmest station was Port St. Johns (62·6 degrees), and the mean coldest Belfast, with a temperature of 41·6 degrees, a difference of 21 degrees. The highest mean maximum was 78·7 degrees at Komatipoort and the lowest mean minimum 22·8 degrees at Lindley, yielding a mean monthly range of 55·9 degrees. The highest temperatures of the month were recorded principally on the 17th and 4th, but maxima also occurred on 1st, 4th to 7th, 12th to 13th, 16th to 19th, and on 31st. The lowest temperatures were most widely noted on the 7th, but were also registered on 2nd to 3rd, 6th to 8th, 20th to 21st, 23rd, 26th, 28th to 31st. The extremes for the month were 91 degrees at East London on the 18th, and 12·5 degrees at Lindley on the 6th, an extreme range of 78·5 degrees over the Union. Ground Frosts were of practically daily occurrence, being particularly severe towards the end of the month.

Precipitation during the month occurred mostly from 1st to 11th, 17th to 20th, and 24th to 27th, principally over the south-west (including the Cape Peninsula), west and south coasts; light showers of a local character fell during the first and third weeks over the southern Karroo, portions of the central Karroo, the south-western portion of the northern Karroo, and parts of the south-east and Kaffraria. Scattered showers fell over portions of Natal and Zululand during the second half of the month. Precipitation over the Transvaal was confined to portions of the Barberton, Lydenburg, and Zoutpansberg districts, whilst no rainfall was reported from the Orange Free State, the remaining portions of the Cape, and the greater part of Natal. An excess of rainfall was confined to the west of a line from O'okiep through Calvinia and Sutherland to the shores of False Bay, although small surplus amounts were registered at the coastal stations between Knysna and East London, as also at Maritzburg (Natal) and Louis Trichardt, in the northern Transvaal. With

these exceptions, the rainfall was below normal or entirely wanting. The largest excesses were 4.29 inches at Ceres and 3.20 inches at Groot Drakenstein, both in the south-west of the Cape.

The accumulated rainfall since the beginning of the present year is considerably in excess of the average, except over a few detached areas, particularly the western half of Natal, north-east of the Free State, the east of the Transvaal, portions of the northern border of the Cape between Kuruman, Kimberley, and Griquatown, and the neighbourhoods of Hanover and Philipstown and Port St. Johns. The excesses in the Cape vary from 23.33 inches at Ceres to less than a quarter of an inch at the Royal Observatory; in Natal, from 3.87 inches at Durban to 0.12 inch at Howick; in the Orange Free State, between 4.29 inches at Bloemfontein and 0.66 inch at Lindley; in the Transvaal, between 12.56 inches at Woodbush and 0.78 inch at Middelburg. The deficits are small in the Cape Province: from 0.10 inch at Kuruman to 1.85 inch at Port St. Johns; in Natal, from half a tenth at Pietermaritzburg to almost 9 inches at Vryheid; in the Free State, over 3 inches in the neighbourhood of Harrismith, and in the Transvaal from 0.29 inch at Pretoria to 6½ inches at Barberton. The excesses, however, are most commonly between two and five inches over the various provinces.

In consequence of the rains over the south-west Cape at the beginning of the month, following on the exceptional precipitation during June, the land became water-logged to such an extent that much less ploughing than usual is likely to be carried out in the Malmesbury District. Crops already planted are backward, the earliest sown being the only ones that are showing a normal growth. The indications in this area point to good late grass, similar to last year, whilst crops already planted should turn out well. In the neighbourhood of Cape St. Francis, the heavy rains have enabled farmers to get busy ploughing; the veld is getting green, and light rains have improved the veld in the neighbourhood of St. Lucia Point. At Maidstone (Lower Tugela), the cane and crops are reported dying owing to severe drought. In Rustenburg District crops are looking well, but with some rust in oats. At Rietfontein (Aliwal North) the crops are drying up, and are being affected by the heavy frosts. Taken on the whole, both large and small stock are doing well, there still being an abundance of grazing (old grass) in most parts; the veld is reported as still green in sheltered spots in the Kuruman District. Over some areas, however, the veld is beginning to look bare and dry, and consequently cattle are falling off in condition, partly also in consequence of the cold nights. These unfavourable reports emanate from Standerton, Croydon (Swaziland), Ladysmith (Natal), Ngomi, Hlabisa, Queenstown, and Cathcart; whilst at Karree Grange (Hay Division) the merinos are reported as not looking well, although other stock are in good condition. The mealie crop is reported as very good at Klipplaats Drift (Standerton), but only fair at North Cliff (Cathcart). Heavy frosts damaged orange trees and blue gums at Sterkwater (Piet Retief), and that on the 7th killed thirty acres of bananas at Kloofend (Alexandria), as well as damaging a lot more.

Influenza was still rife at Standerton, with a few cases of pneumonia. Snow fell over a large area in the south-east of the Cape Colony on the 5th and 6th, mainly at the higher stations lying between Queenstown, the Amatolo Mountains, and Bedford; outside of this area snow occurred at Victoria West on the 4th, Rust-en-Vrede (Oudtshoorn) on the 5th, the district of Graaff-Reinet on the 4th and 5th, at Rietbron (Willowmore) on the 5th, on the Langebergen (Heidelberg District) during the second week of the month, and at Nqamakwe on the 9th. Hail was reported as occurring at Capetown on the 4th, in connection with a thunderstorm, and at Cape St. Francis at the beginning of the month, causing considerable damage at both places.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS). JULY, 1921.

PLACE.	OBSERVER.	Month.—July, 1921.		Normal Monthly Temperature.	Difference from Normal.	Extremes.		Date.
		Mean Max.	Mean Min.			Highest.	Lowest.	
<i>Transvaal—</i>								
Bethlehem.....	The Forester.....	58.6	24.5	44.8	- 3.2	65.0	10.0	30th & 31st.
Barberton.....	Walker Grubb.....	71.5	46.1	50.4	- 0.4	82.0	39.0	7th.
Bloemhof.....	A. Adanson.....	63.8	29.5	49.0	- 2.4	74.0	21.0	2nd & 29th.
Ervenkops.....	Mrs S. M. Nicolson.....	—	—	—	—	—	—	—
Johannesburg (Observatory).....	The Staff.....	57.4	37.2	50.4	- 3.1	65.0	30.0	7th.
Klerksdorp (Strathmore).....	Chas. Scott.....	63.0	27.9	50.2	- 4.8	72.0	19.0	25th.
Komatipoort.....	H. J. Evans.....	78.7	46.1	62.9	- 0.5	88.0	36.0	20th.
Louis Trichardt.....	L. J. de Bruin.....	66.4	38.9	53.7	- 3.1	79.0	29.0	7th.
Middelburg.....	Dr. H. A. Spener.....	64.8	25.8	48.2	- 2.9	72.0	18.0	6th.
Nylstroom.....	G. Bakker.....	66.7	31.9	52.5	- 3.2	73.0	25.0	7th.
Pieter's Rest.....	F. M. Koen.....	65.5	34.2	51.8	- 2.0	75.5	21.0	31st.
Pietersburg.....	G. Ross.....	63.8	30.3	50.9	- 2.6	72.0	20.0	8th.
Potchefstroom (Exp. Farm).....	The Manager.....	65.4	27.3	49.0	- 2.6	73.5	17.0	28th.
Pretoria (Meteorological Office).....	The Staff.....	64.9	31.3	51.4	- 2.1	71.9	20.9	7th.
Piet Retief.....	J. Werner.....	63.9	30.5	53.1	- 2.0	78.5	21.5	7th.
Mauderston.....	M. Ferguson.....	60.7	23.4	44.0	- 2.6	68.5	12.8	2nd.
Zeerust.....	H. Dietrich.....	63.7	30.1	50.4	- 3.4	72.6	21.1	26th.
<i>Natal—</i>								
Mbabane.....	Swaziand Police.....	64.1	40.5	55.5	- 3.2	75.0	30.0	7th.
<i>Orange Free State—</i>								
Bloemfontein.....	G. A. Schreppers.....	58.5	27.9	42.2	- 1.4	69.3	16.0	2nd.
Bethulie.....	J. J. Wardhaugh.....	58.2	30.3	44.2	- 2.8	70.0	20.5	29th.
Harrismith.....	The Forester.....	55.1	28.4	46.1	- 4.6	68.0	18.0	7th.
Indley.....	J. Collister-Oates.....	60.1	22.8	41.4	- 5.6	68.2	12.5	6th.
Ladybrand.....	The Forester.....	58.0	27.0	45.8	- 4.3	67.0	18.0	6th.
<i>Natal—</i>								
Durban (Point).....	The Port Captain.....	71.2	—	64.6	- 3.8	89.4	23.0	7th.
Dendee.....	West Thorold.....	64.9	33.1	54.3	- 3.8	75.0	28.0	2nd.
Hlabisa.....	The Gauler.....	71.4	50.8	63.9	- 2.8	82.0	46.0	6th.
Martinsburg (Mental Hospital).....	The Staff.....	68.2	41.2	58.6	- 3.9	81.0	32.2	7th.
<i>Cape—</i>								
Altwal North.....	A. Alcock.....	58.6	26.7	46.4	- 3.8	71.0	16.0	7th.
Bedford.....	T. C. Hall.....	60.7	38.1	54.5	- 15.1	78.0	28.0	2nd.
Carnarvon.....	A. P. Malherbe.....	56.9	28.8	42.8	- 4.2	70.0	21.0	2nd, 7th, & 26th.
Cape town (Royal Observatory).....	The Staff.....	61.6	45.1	58.4	- 1.4	77.0	25.4	20th.
Glenwilliam.....	W. J. Downes.....	70.6	39.5	54.2	- 0.8	85.0	32.0	28th.
East London.....	The Port Captain.....	70.4	46.2	60.0	- 1.7	91.0	38.0	3rd.
Graaf-Reinet.....	S. E. D. Freadwell.....	65.1	30.9	52.5	- 0.6	78.3	29.0	7th.
Groot Drakenstein.....	Lionel Baker.....	62.1	40.8	54.0	- 2.6	77.4	32.8	23rd.
Konstad.....	H. D. Coyte.....	61.3	30.3	48.0	- 3.1	74.0	19.9	7th.
Kimberley.....	Jno. Acton.....	64.4	31.9	48.2	- 2.1	76.0	24.0	7th.
Makings (Convent).....	The Mother Superior.....	66.1	32.8	53.6	- 4.2	75.0	20.0	6th.
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	63.5	38.4	57.9	- 1.9	77.0	41.0	6th.
<i>Transvaal—</i>								
Murraysburg.....	A. Cameron.....	56.9	27.7	42.0	- 3.9	70.0	16.0	21st.
Quthob.....	J. Betrows.....	58.8	41.5	50.2	- 3.0	70.4	30.4	20th.
Port Elizabeth.....	The Lightkeeper.....	64.9	47.0	58.0	- 2.8	78.0	41.0	6th & 7th.
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	70.9	54.3	61.5	+ 1.1	88.0	46.0	6th.
Queenstown.....	H. Holley.....	59.9	33.0	51.4	- 5.0	73.0	22.0	21st & 30th.
Vryburg.....	Chas. Butler.....	63.9	23.3	48.9	- 4.3	72.0	17.0	2nd, 26th, & 29th.
Wynberg (Convent).....	The Mother Superior.....	62.2	44.3	53.2	- 2.8	71.0	30.0	21st.

RAINFALL, JULY, 1921.

PLACE.	OBSERVER.	Month.		Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.
		Inches.	July, 1921.					
<i>Tyansvaal—</i>								
Barberton.....	W. Grubb.....	0.00	15.12	0.64	-	15.12	21.58	6.46
Beitost.....	The Forester.....	0.00	19.70	0.28	-	19.70	17.43	2.27
Bethal.....	H. F. Joubert.....	0.00	20.81	0.18	-	20.81	16.06	5.76
Bloemfontein.....	A. Adairson.....	0.00	13.51	0.21	-	13.51	12.71	0.80
Charamont.....	S. A. Pollock.....	0.00	18.70	0.05	-	18.70	11.02	7.68
Ermelo.....	Mrs. S. M. Nicolson.....	0.00	9.78	0.21	-	9.78	16.20	6.42
Kaobetsburg.....	S.A. Pollock.....	0.43	80.27	0.35	-	80.27	27.47	53.80
Johannesburg (Observatory).....	The Staff.....	0.00	0.34	0.34	-	16.96	15.34	1.62
Heldberg.....	W. ter Horst.....	0.00	0.34	0.34	-	19.16	15.16	4.00
Klacksdorp (Strathmore).....	Chas. Scott.....	0.00	0.21	0.21	-	17.00	13.86	3.14
Komatiaport.....	H. J. Evans.....	0.00	0.36	0.36	-	15.16	17.35	2.19
Louis Trichardt.....	L. J. de Bruin.....	0.79	0.66	0.13	+	25.46	19.00	6.46
Middelburg.....	Dr. H. A. Spencer.....	0.00	0.05	0.05	-	15.92	15.14	0.78
Nyctroom.....	G. Bakker.....	0.00	0.21	0.21	-	23.05	14.18	8.87
Pietarsburg.....	G. Bove.....	0.00	0.29	0.29	-	34.12	12.46	21.66
Piet Betel.....	J. Werner.....	0.00	0.34	0.34	-	20.94	15.75	5.19
Pilgrim's Rest.....	E. M. Skees.....	0.12	0.44	0.32	-	25.29	26.87	1.58
Pretoria (Meteorological Office).....	The Staff.....	0.00	0.27	0.27	-	17.04	17.33	0.29
Potchefstroom (Exp. Farm).....	The Manager.....	0.00	0.18	0.18	-	18.92	13.17	5.75
Rooiberg.....	N. H. Munro.....	0.00	0.30	0.30	-	14.33	14.33	0.00
Rustenburg.....	S. A. Pollock.....	0.00	0.51	0.51	-	20.86	15.42	5.44
Standerton.....	M. Ferguson.....	0.00	0.29	0.29	-	15.72	15.72	0.00
Wakkerstroom.....	Louis Le Roux.....	0.00	0.40	0.40	-	17.48	17.48	0.00
Woodbush.....	The Forester.....	0.00	1.12	0.32	-	60.58	48.02	12.56
Zeerust.....	H. Dieffrich.....	0.00	0.27	0.27	-	18.08	15.24	2.84
<i>Swaziland—</i>								
Mbabane.....	Swaziland Police.....	0.00	0.71	0.71	-	34.95	29.47	5.48
<i>Orange Free State—</i>								
Bethlehem.....	J. J. Wardhaugh.....	0.03	0.38	0.35	-	16.88	12.34	4.54
Bloemfontein.....	G. A. Scheper.....	0.00	0.56	0.56	-	16.44	12.15	4.29
Harrismith.....	The Forester.....	0.00	0.18	0.18	-	12.03	15.24	3.21
Kroonstad.....	S. R. Northfield.....	0.00	0.37	0.37	-	13.14	11.05	2.09
Ladybrand.....	The Forester.....	0.00	0.44	0.44	-	16.71	15.80	0.91
Lindley.....	J. Collier-Ones.....	0.00	0.36	0.36	-	14.86	14.22	0.64
<i>Natal—</i>								
Dundee.....	West Thorold.....	0.00	0.17	0.17	-	13.92	18.12	4.20
Durban (Point).....	The Fort Captain.....	0.58	0.76	0.18	-	26.92	23.05	3.87
Hiabin.....	The Gaoler.....	0.29	0.62	0.33	-	23.80	23.01	0.79
Howick.....	The Gaoler.....	0.00	0.08	0.08	-	18.01	17.89	0.12
Ladysmith.....	D. A. H. Lestham.....	0.00	0.09	0.09	-	11.28	16.15	4.87
Pietermaritzburg (Mental Hospital).....	The Staff.....	0.15	0.11	0.01	+	18.75	18.80	0.05
Vryheid.....	The Gaoler.....	0.00	0.29	0.29	-	36.20	20.19	16.01
Weenen.....	The Gaoler.....	0.00	0.10	0.10	-	16.53	14.89	1.64

RAINFALL, JULY, 1921 (continued).

PLACE.	OBSERVER.	Month.	Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.
		Inches.					
Cape—							
Allwal North.....	A. Alcock.....	0.00	0.42	- 0.42	14.00	13.54	+ 1.06
Beaufort West.....	The Gaoler.....	0.00	0.24	- 0.24	14.25	14.01	+ 8.08
Beaufort.....	T. C. Hall.....	0.24	0.82	- 0.58	18.73	18.55	+ 2.76
Britstown.....	The Gaoler.....	0.00	0.21	- 0.21	13.83	8.19	+ 5.64
Calvinda.....	The Gaoler.....	1.72	0.83	- 0.83	12.81	5.12	+ 7.19
Capetown (Royal Observatory).....	The Staff.....	4.25	3.55	- 0.70	16.43	16.20	+ 0.23
Ceres.....	A. Hebble.....	10.03	5.74	- 4.29	47.59	24.26	+ 23.33
Catharvon.....	A. P. Malherbe.....	0.03	0.10	- 0.16	11.07	5.95	+ 5.71
Charwilliam.....	W. J. Downes.....	2.46	1.25	- 1.21	10.50	5.48	+ 5.02
East London.....	A. Downie.....	1.51	1.09	- 0.42	17.27	17.88	- 0.61
Fraserburg.....	The Gaoler.....	0.21	0.26	- 0.05	12.10	4.81	+ 7.26
Garcia.....	The Gaoler.....	0.53	0.81	- 0.28	6.14	3.26	+ 2.88
Graaf-Reinet.....	S. E. D. Treadwell.....	0.19	0.44	- 0.25	10.48	8.18	+ 2.60
Groot Brakenstein.....	L. Baker.....	8.22	5.02	- 3.20	82.14	21.03	+ 10.21
Griquatown.....	The Gaoler.....	0.00	0.17	- 0.17	8.38	9.68	- 1.30
Hanover.....	The Gaoler.....	0.00	0.37	- 0.37	9.35	9.45	- 0.10
Hopetown.....	The Gaoler.....	0.00	0.25	- 0.25	10.66	9.10	+ 1.56
Kanabard.....	The Gaoler.....	0.00	0.14	- 0.14	6.26	4.27	+ 1.99
Klimberley.....	J. Acton.....	0.00	0.25	- 0.25	10.42	19.78	- 0.36
Kaynas.....	The Gaoler.....	3.15	2.22	- 0.93	19.92	15.32	+ 4.40
Kokstad.....	H. D. Coyle.....	0.20	0.20	- 0.00	16.07	15.58	+ 0.49
Kirruuan (Abtokia).....	A. T. Sitwell.....	0.00	0.39	- 0.39	11.61	11.71	- 0.10
Maeling (Convent).....	Mother Superior.....	0.02	0.37	- 0.35	20.35	13.55	+ 6.79
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	1.14	1.18	- 0.04	10.49	9.93	+ 0.56
Murraysburg.....	A. Cameron.....	0.16	0.29	- 0.13	10.15	7.63	+ 2.52
O'okiep.....	J. Burrows.....	0.88	0.84	- 0.04	8.94	4.61	+ 4.33
Phillipstown.....	The Gaoler.....	0.00	0.22	- 0.22	8.05	9.46	- 1.41
Piquashier.....	The Gaoler.....	3.94	2.70	- 1.26	18.10	12.04	+ 6.06
Port Elizabeth.....	J. E. Allen.....	2.13	1.86	- 0.27	14.84	11.72	+ 3.12
Port St. Johns (Cape Renne).....	The Lightkeeper.....	0.42	0.33	- 0.09	23.38	25.23	- 1.85
Priestons.....	The Gaoler.....	0.06	0.17	- 0.15	8.01	7.40	+ 0.61
Queenstown.....	E. Holley.....	0.06	0.53	- 0.47	15.36	13.33	+ 2.03
Steyderville.....	The Gaoler.....	0.09	0.16	- 0.07	7.88	5.50	+ 1.82
Scholarstad.....	The Gaoler.....	1.94	0.82	- 1.12	14.33	8.18	+ 6.15
Swellendam.....	The Gaoler.....	1.79	2.05	- 0.26	23.91	18.61	+ 5.40
Umtata.....	A. Dwyer.....	0.07	0.53	- 0.46	17.70	15.19	+ 2.51
Uplandale.....	The Gaoler.....	0.94	0.95	- 0.01	11.67	7.82	+ 3.85
Victoria West.....	The Gaoler.....	0.60	0.10	- 0.50	8.61	5.13	+ 3.48
Wynburg.....	The Gaoler.....	0.05	0.25	- 0.20	10.82	7.26	+ 3.56
Wynberg.....	C. Butler.....	2.82	0.15	- 2.67	16.27	18.98	- 2.30
Wynberg (Convent).....	The Gaoler.....	0.00	1.75	- 1.07	13.71	7.65	+ 3.06
Wynberg (Convent).....	The Mother Superior.....	7.08	7.21	- 0.13	30.96	27.97	+ 3.01

OBSERVERS' NOTES FOR JULY, 1921.

TRANSVAAL.

Barberton.—Typical winter weather, cool nights, bright sunny days. Rainfall: Nil.—Walter Grubb.

Klerksdorp.—Severe frosts towards end of month. Rainfall: Nil.—Chas. Scott.

Middelburg.—Cold winds from S.E. have obtained, with genial, bright weather by day and very cold nights, with frosts by night, have obtained steadily throughout the month. White frosts have been present almost every morning upon the ground. The number of frosty nights is the highest recorded during the past eighteen years. It may be said that the month has been unusually cold. Rainfall: Nil.—Dr. H. A. Spencer.

Standerton.—No rain fell during the month, and the sky generally was clear. If at times clouds appeared, they were soon dispersed, and there were no days without sunshine. But in spite of the great amount of sunshine, the weather on the whole was severe. Sharp frosts at night, and cold, biting winds, accompanied by dust, were common during the day. Influenza still rife in the district, and the dreaded pneumonia has claimed a few victims. The veldt is becoming very bare, and stock are beginning to look in poor condition. Early rains are hoped for.—M. Ferguson.

Messina.—Very pleasant cool month, with moderate ranges of temperature, yet lowest average temperature registered for July since 1915. Rainfall: 0.19 inch on three days.—P. O. B. Frost.

Krugersdorp.—The weather for month was pleasant, except on three days, when north to north-easterly winds, with dust, prevailed. The mornings were somewhat chilly, with heavy frosts. Rainfall: Nil.—C. G. Innes.

Rustenburg.—Very dry month, with heavy frosts and cold nights latter part of month. Crops looking good, but some rust appearing in the oats. Wheat, of which a large area has been sown, splendid throughout district. Cattle dropping off in condition on account of cold nights. Veld splendid, and abundance of grazing; fountains and rivers still running strong. Rainfall: Nil.—Sergt. H. J. Streatfield.

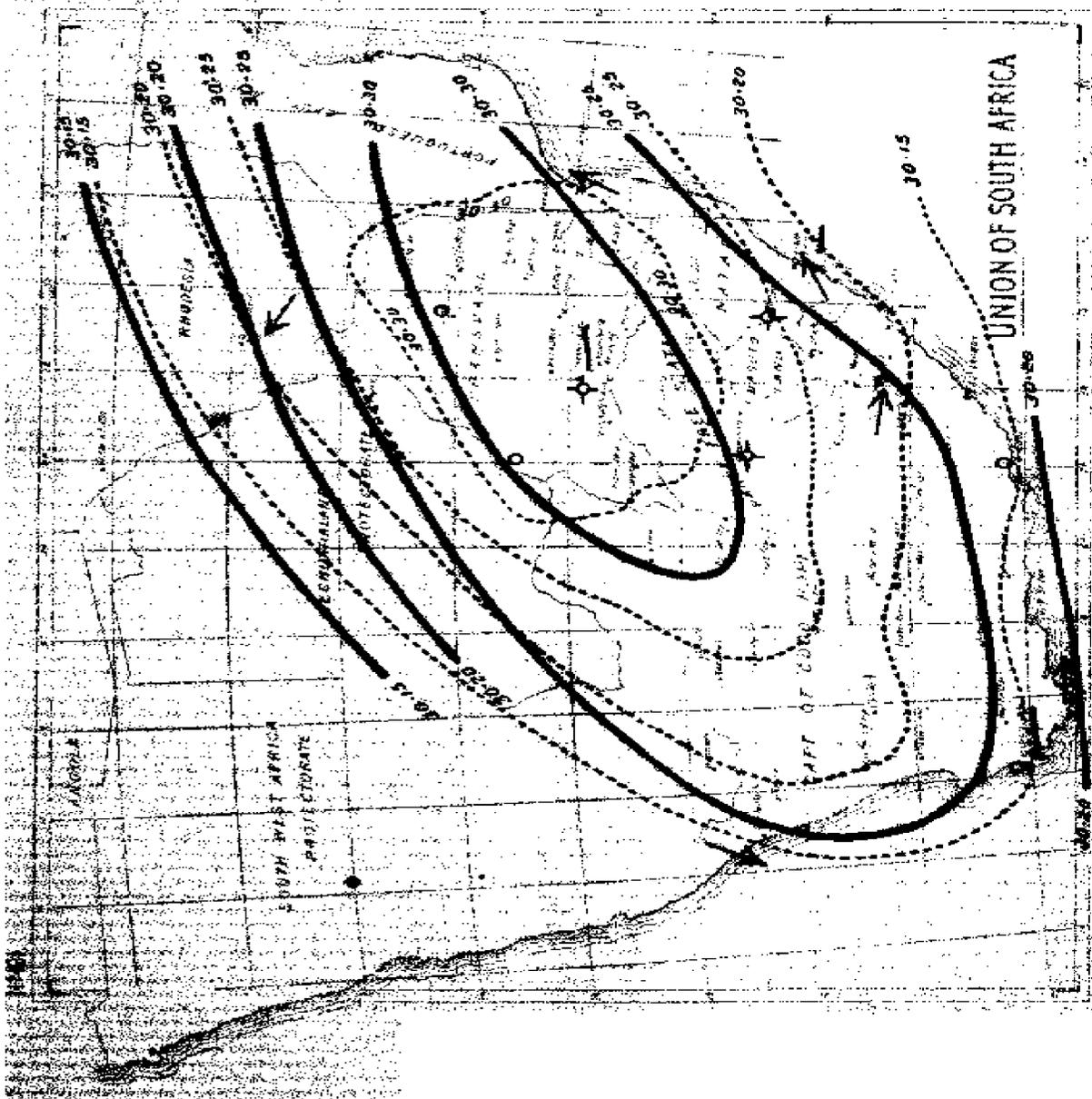
Lichtenburg.—A month of frosts, cold nights, and cloudless skies. Rainfall: Nil.—J. T. Allman.

Mosdene (Waterberg).—An unusually large number of frosty nights, though the extreme minimum temperature (24.0 degrees on the 7th) has not been as low as in 1919 and 1920. Rainfall: Nil.—Ernest E. Galpin.

Wakkerstroom.—The winter has been rather severe. Though there were a few very fine days, the nights have been cold. There were five misty mornings. It is unusual that at the time of observation (8.30 a.m.) not a breath of wind can be noticed, whereas an hour or so afterwards it blows with almost hurricane force. Rainfall: Nil.—Louis le Roux.

Klipplaatsdrift (Standerton).—The mealie crop in the neighbourhood has been a very good one indeed; might have been better, but for worms during the growing season. Rainfall: Nil.—P. Swemmer.

Sterkwater (Piet Retief).—Heavy frosts and windy days throughout the month; orange and blue gum trees damaged by the former. Rainfall: Nil.—M. Olmesdahl.



July, 1951. Prevailing Winds and Mean Atmospheric Pressure at 8.50 a.m.
 The dotted line indicates the normal distribution for July.

SWAZILAND.

Croydon.—Grass very dry; cattle suffering for want of grass. Rainfall: Nil.—Alex. Brown.

ORANGE FREE STATE.

Populierbank (Bethlehem).—Extremely cold weather prevailed during the whole of the month; heavy frosts and thick ice day after day. Rainfall: Nil.—Malcolm and Thorrold.

Shannon (Bloemfontein).—A cold month, clear skies, and bright sunshine. Ground quite moist a few inches below surface. Rainfall: Nil.—J. G. Hatchard.

Korfshoek (Harrismith).—Month characterized by sharp, cutting, variable winds; heavy frosts over night; Elands River frozen over, an incident which the "oldest inhabitant" has never seen before. Rainfall: Nil.—W. H. L. Galloway.

Dewdrop (Heilbron).—The month has been very cold on the whole; cold winds during the day, and heavy frosts during the night; stock on the whole still in good condition. Rainfall: Nil.—W. M. Leonard.

Zastron (Rouxville).—No rain fell during the month. The month was very cold and windy, with exceptionally sharp frosts.—W. Lacey.

Prospect (Vrede).—Generally there have been severe frosts at night throughout the month, but the days have been warmer and less windy than in June. Mealie thrashing has progressed slowly in the neighbourhood. Stock are running in lands and doing well. Rainfall: Nil.—T. Pitcairn.

Hofontein (Kroonstad).—Sharp frosts during night, fairly warm during day. Winds variable and increasing in velocity during the day. General weather conditions very even during the month. Rainfall: Nil.—G. W. Müller.

Kroonstad.—Easterly winds prevailed during the month. Drought continuing; water in river plentiful; very severe frosts on several occasions. Rainfall: Nil.—S. R. Northfield.

NATAL.

Nottingham Road.—High winds; everything very dry, and no signs of anything springing. Rainfall: 0.19 inch on five days.—Miss E. Smythe.

Dundee.—A very cold and dry month. Rainfall: Nil.—W. Thorrold.

Hlabisa.—The veld is looking very parched, and rain is urgently needed. Rainfall: 0.29 inch on two days.—L. Double.

Cape St. Lucia.—Moderate and fresh gales, with cold winds during the greater part of the month. The light rains have had good effect on the veldt, and stock are in good condition. Rainfall: 3.01 inches on ten days.—J. Murphy.

Howick.—Weather practically the whole month bright and sunny. Rainfall: 0.08 inch on two days.—F. Nichols.

Ladysmith.—With the exception of a few windy days during the early part of the month, the weather has been very fine, but extremely dry, and rain is badly needed. Grass is scarce, and stock are in poor condition. Rainfall: Nil.—D. A. R. Leathern.

Cedara (Experimental Farm).—Exceptionally cold month. Rainfall: 0.16 inch on four days.—The Principal.

Ngomi.—The surrounding country is very dry, more so than last year. Rainfall: 0.97 inch on two days.—J. Tustin.

Durban.—Generally fine weather. Moderate to strong gales for a few hours on seven days, mostly from S.W.; early mornings generally hazy, remainder of day clear; no fog or mist; no thunder or lightning. Rainfall: 0.58 inch on five days.—A. G. Goulding.

Kloofend (Alexandria).—On the morning of the 7th July we had a heavy white frost in the valleys—the sharpest frost we have had for twenty years; it killed thirty acres of bananas, and damaged a lot more. Rainfall: 0.79 inch on five days.—J. D. Cruickshank.

Maidstone (Lower Tugela).—Frost every morning; drought very severe, cane and crops dying. Rainfall: 0.08 inch on one day.—G. E. Beater.

CAPE.

Elsenburg (Stellenbosch).—The maximum temperature for the month was 75.6 degrees on the 12th, and the minimum temperature 36.3 degrees on the 21st. Rainfall: 4.75 inches on eleven days, the average being 4.04 inches. The total rainfall recorded for the period January to July, 1921, is 20.48 inches, the average for the same period being 17.46 inches. Except during the first week, normal weather prevailed during the month, cold mornings being followed on most days by bright weather. Strong northerly winds were in evidence during the beginning and middle of the month, and a strong south-easterly gale blew on the 31st. In general, crops are in a very backward state of growth; the earliest sown crops are the only ones that are exhibiting a normal winter growth. A marked feature during the month was the high atmospheric pressure: on two days it was above normal.—D. Cuthbert.

Lovedale.—Marked periods of gradual fall and rise in atmospheric pressure: (1) 2nd to 8th, (2) 11th to 21st, (3) 21st to 28th. Rain fell in small quantities in each of these cycles, just after the lowest point was passed. Snow fell on mountains, especially on the 5th, when it came very low down on the hills. Rainfall: 0.66 on five days.—C. A. Pilson.

Grootfontein (Middelburg).—The weather for July has been rather warmer than usual, and the changes in temperature very trying. The warm weather is perhaps responsible for blossom buds already developing on fruit trees. Rainfall: Nil.—E. J. van Meerten.

Rietfontein (Aliwal North).—Exceptionally cold month, with cold winds; crops drying up, and affected by heavy frosts. Rainfall: Nil.—A. G. Smith.

Cape St. Francis.—The heavy hailstorms at the beginning of the month destroyed everything in the lighthouse gardens, and the heavy rain swamped out the whole garden. The springs are running very strong. The farmers around here are now busy ploughing; veld getting nice and green. Rainfall: 4.60 inches on thirteen days.—H. E. Stokes.

Somerset East.—Strong winds and unusually heavy snowfalls during the first fortnight; frequent and severe frosts throughout rest of month. Rainfall: 0.49 inch on four days.—C. Harris.

Capetown.—The month began wet and stormy, and on the morning of the 4th a thunderstorm with lightning and hail broke over the city and suburbs, doing considerable damage. After some fine days rain fell on 17th to 19th, with a high barometer—said to be an unusual occurrence. Rain again fell from the 24th to 26th. The last few days were calm and bright, but cold in the shade. The month closed dull and foggy, with a falling barometer and every appearance of rain.—A. Russell Fraser.

Darling (Malmesbury).—Owing to the continuance of rains and the water-logged condition of lands in some parts of the district, quite a good deal of

ploughing will be unable to be done this year at all. There is every indication of a very good late grass season, same as last year, and crops which have been put in should turn out well. Rainfall: 4.43 inches on seventeen days.—P. H. Drake.

Jansenville.—Very cold nights; many nights of frost; clear, sharp days with plenty of sunshine. Rainfall: 0.21 inch on two days.—E. H. Egan.

Abtonia (Kuruman).—Both small and large stock still doing well; veld good; green grass still found in sheltered spots; winter on the whole mild, with exception of cold snaps, with south and south-easterly winds. Rainfall: Nil.—A. T. Sitwell.

Ceres.—Weather generally less tempestuous than is usual for July. Frost on thirteen days. Rainfall 10.03 inches on fifteen days.—A. Heatlie.

Carnarvon.—Coldest July we have had for years. Rainfall: 0.03 inch on one day.—A. P. Malherbe.

Graaff-Reinet.—A cold, dry month, with a few mild days from the 11th to 19th. Rainfall: 0.19 inch on three days.—S. E. D. Treadwell.

Groot Drakenstein.—The month opened very wet, this rain following on last month's exceptional fall caused the land to become waterlogged. The weather throughout was cold, both day and night temperatures being low. On four occasions the day temperatures failed to reach 50 degrees from the 30th June to 7th July. This has only occurred four times previously during the period 1899-1920. Rainfall: 8.22 inches on fourteen days.—Lionel Baker.

Kokstad.—The coldest July recorded by me in fifteen years. Rainfall: 0.20 inch on one day.—H. D. Coyte.

Murraysburg.—Very cold weather during the whole month. Rainfall: 0.16 inch on two days.—A. Cameron.

Queenstown.—Dry month; rain wanted badly for crops and veld; strong north-westerly and westerly winds, with dust. Hoar-frost on fourteen mornings; light snowstorm on the 6th; high barometer on 21st; snow on hills. Rainfall: 0.06 inch on three days.—H. Holley.

North Cliff (Cathcart).—End of month exceptionally cold; no rain; getting very dry; mealie crops fair. Rainfall: 0.07 inch on two days.—Sinclair Arnold.

Springfield (Steynsburg).—In my opinion this has been the coldest winter since the snow in 1902. I have been here over twenty-five years. Rainfall: Nil.—R. Wilkie.

Karree Grange (Hay).—No rain; veld good, but merino sheep are not looking well; other stock good. We have had a bitterly cold month. Rainfall: Nil.—R. Mann.

Dwingfontein (Cradock).—It is dry, but stock in good condition; plenty of old grass; no prevailing diseases. Rainfall: Nil.—H. P. van Heerden.

WEATHER CHARACTERISTICS FOR THE MONTH OF SEPTEMBER.

With the advent of September there is generally a diminution in the rainfall along the western coast of the Union and an increase over the eastern districts. In the northern part of the Cape Province the minimum monthly rainfall is reached, whilst the Transvaal and the Orange Free State may anticipate the commencement of the rainy season. The heaviest rains are usually experienced over the Cape Peninsula, the normal there being approximately 3.5 inches. The south-eastern and coastal districts and the eastern Transvaal

receive about 2 inches ; while the rainfall over the western Transvaal, Orange Free State, and the remainder of the Cape Province will probably not exceed an inch. Occasional although infrequent thunderstorms may occur.

There will be a general rise in temperatures, the normals ranging from about 66 degrees in Natal and the eastern Transvaal, through 60 degrees on the Transvaal high veld, and 58 degrees in the Orange Free State, to 55 degrees in Basutoland and on the northern Karroo. Frosts may, nevertheless, reasonably be expected, although their frequency and intensity will be rapidly diminishing.

The prevailing winds during this month are light southerly over the Cape Peninsula, with frequent calms ; south-westerly over the south-eastern districts ; south-south-easterly over the northern borders of the Cape Province, although south-westerly breezes are almost equally frequent ; north-north-westerly and northerly over the high veld of the Transvaal. Compared with last month, there is a decrease of north-westerly and northerly winds over the Cape Peninsula, with an increase of all directions between west and south-south-east, but more particularly of south winds ; in the south-east littoral there is a falling-off of breezes from those directions between west and north-north-east, but an increase in all others, especially of those from south-west. The most marked contrast is found between the winds at Johannesburg and those at Kimberley ; at the former place there is an increase of winds from all points between south-east round by east to north-north-west, particularly of those from north, but a decrease of all others, more especially of those from south, south-south-west and north-west ; at Kimberley the reverse obtains, viz., a diminution in frequency of winds between north-north-west and east-south-east, chiefly of those from north-west, and an increase of all others, principally between west-south-west and south-south-west. The wind force increases generally, except over the south-west of the Cape Province.

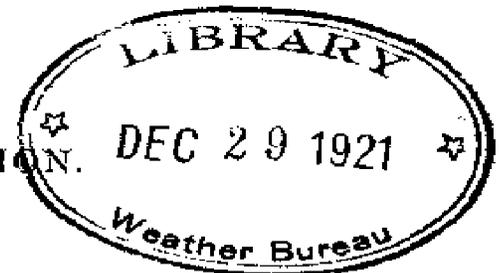
C. STEWART,
Chief Meteorologist.

Pretoria.



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.



MONTHLY WEATHER REPORT

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PERSISTENT anticyclonic conditions, with few depressions; an excess of rainfall over portions of the Cape Peninsula, the south-west, and the west of the south coastal area; absolute drought over the greater part of the Transvaal, the Free State, the north and west of Natal, and the interior of the Cape Province; temperature higher than last month, but still below normal; severe frosts during the first half of the month, moderating during the last fortnight, but persistent in many places; slight showers of snow over parts of the Cape Province and the east of the Free State; some strong cold winds and duststorms over the interior, with occasional hot northerly winds in Natal—such were the characteristics of the weather during August, 1921.

Pressure.—The distribution of pressure, as shown on the accompanying map, was practically normal, but slightly higher in the west and south, and slightly lower in the east. Anticyclonic conditions were persistent throughout the month, the core being most over the east and north-east, but occasionally over the south-west and south. Comparatively few low-pressure areas impinged on the coast; the dates of their occurrence were as follows: on the 1st, 15th, and 17th over the south; on the 8th and 9th, over the south and south-east; and on the 25th and 26th, over the south-west and south. The lowest readings (29.73 in.) occurred on the south coast with the low pressure area on the 17th, when strong west and north-westerly winds with rain were experienced over the south-west and south of the Cape Province; the low-pressure on the 26th was followed by strong westerly winds in the south-west and south. Taken as a whole, bright sunny days with cold frosty nights prevailed over the Transvaal, Free State, central and south-east Cape and Natal, whilst the normal conditions of cloudy, unsettled weather and occasional rains, but with many clear intervals, were experienced on the west, south-west, and south coastal areas.

Temperature.—The mean temperature during August was 54.6 degrees, or

1.3 degree lower than the normal. This deficiency in mean temperature was mainly due to the nights (39.6 degrees) being 2.0 degrees, whilst the days (69.7 degrees) were only 0.6 degree, colder than usual. Subnormal mean temperatures were common to all the Provinces, including Swaziland, and, with the exception of Natal, were mainly due to exceptionally cold nights. The mean deficit was greatest (2.0 degrees) in Natal, where the temperature for the month was only 60.7 degrees, as against a normal of 62.7 degrees. Over the Transvaal the temperature for the month (54.4 degrees) was 1.8 degree less than usual, the mean maximum (71.9 degrees) being 0.6 degree, and the mean minimum (37.1 degrees) 2.9 degrees lower than the corresponding averages; in the Free State the months' temperature (51.0 degrees) was 1.6 degree below normal, the mean day temperature (66.1 degrees) being 0.9 degree and the mean night temperature (32.7 degrees) 2.3 degrees less than usual; over the Cape Province the deficiency of 0.7 degree in the mean monthly temperature (54.8 degrees) was entirely due to the nights, with 41.7 degrees, being 1.4 degree lower than the average, the days, with a mean of 67.9 degrees, being normal. At the individual stations, temperature for the month was above the average at only a few stations in the Transkei and south-east, at Graaff-Reinet and Clanwilliam in the Cape Province, and Harrismith (O.F.S.). The excess was mostly about 2 degrees, but varied from 0.2 degree at Harrismith to 2.8 degrees at Graaff-Reinet. Elsewhere the month's temperatures were below normal—commonly by 1 to 3 degrees over the Transvaal, but ranging from 0.4 degree at Standerton and Barberton to 4.4 degrees at Louis Trichardt; by about 2 to 2½ degrees in the Free State; by 1 to 3 degrees in Natal, and commonly between 1 and 2 degrees in the Cape Province, but by between 2 and 3 degrees in the south-west, rising to 3.7 degrees at Mafeking. The day temperatures were mostly below the average, usually by amounts between 1 and 2 degrees in the Transvaal and Cape Province, and by less than 1 degree in the Orange Free State; the deficits were greater however, 2 to 4 degrees, in the south-west and parts of the south and south-east of the Cape Province, Zululand, and the south of Natal, the west of the Transvaal, and the north of Bechuanaland. Mean maximum temperatures were, however, slightly (less than 1 degree) in excess over the east and centre of the Transvaal; the excesses were greater (2 to 4 degrees), however, over parts of the west, centre, and south-east of the Cape Province, as well as the interior of Kaffraria and the northern border, being greatest (4.3 degrees) at Clanwilliam. Night temperatures were below normal all over the Transvaal, the greater portion of the Free State, Natal, and Cape Province. The exceptional stations were situated in the east-central Karroo, the Transkei, and part of the south-east of the Cape Province; these surplus amounts ranged from 0.1 degree at Bedford to 4.5 degrees at Port St. Johns. Exceptionally low mean minima were obtained at Nylstroom, Louis Trichardt, and Belfast, in the Transvaal, and at Mafeking, in Bechuanaland, where they were 5 to 7 degrees lower than usual. The highest temperatures of the month were recorded most widely on the 17th to 18th, and 23rd to 25th, and on the 31st, but also on 2nd, 9th, 15th, 16th, 21st, 22nd, 27th, and 30th. The lowest temperatures were registered between 1st and 7th, 9th and 15th, 19th, 20th, and 27th to 30th, but most widely between the 3rd and 5th. The warmest station was Komatipoort, with a mean temperature of 65.8 degrees, and the coldest Belfast (Transvaal), with 47.0 degrees—a difference of 18.8 degrees. The highest mean maximum (83.0 degrees) and the lowest mean minimum (28.0 degrees) are also found associated with Komatipoort and Belfast respectively. The extreme temperature readings were 95.0 degrees at Komatipoort on the 9th, and 15.7 degrees on the 4th at Standerton (Transvaal), yielding an extreme range of 79.3 degrees during the month. *Frosts*, frequently of considerable severity, were of practically daily occurrence.

Precipitation was most frequent and in greatest quantity over part of the south-west Cape and the Cape Peninsula, where rain fell on twelve to fifteen days of the month; fairly frequent showers occurred along the south and west coasts, and were more local and lighter over the southern Karroo, portions of the east-central and northern Karroos, and the south-east, whilst almost negligible amounts were recorded over the north-east Kaffraria and Gordonia. Absolute drought prevailed over the greater part of the Transvaal, of the Orange Free State, and of Natal, as well as the west-central Karroo, the northern border, Bechuanaland, as well as at most stations in the east-central and northern Karroos, the north-east, and Kaffraria. In the Transvaal some light local showers occurred on the 4th, 11th, 12th, 19th, and 21st to 26th, at a few stations in the districts of Barberton, Lydenburg, and Zoutpansberg, as also in Swaziland. In Natal occasional showers fell in the south and east, mainly between Howick and the coast, whilst slight showers of snow fell between the 9th and 10th, in parts of the districts of Bethlehem, Bethulie, Heilbron, Philippolis, Thaba Nchu, and Jacobsdal. Snow was also reported in the Cape Province from De Hoop (Uniondale) on the 2nd, O'okiep (Namaqualand) on the 9th, when it fell from 8.15 a.m. to 9.15 a.m., a most unusual occurrence; at Wolmado (Hanover) and Heydon (Middelburg) on the 10th; Barnardsdale (Uniondale) on the 11th and 26th; and on the latter date at Pearston and Kluitjes Kraal (Tulbagh).

An excess of precipitation was confined to parts of the south-west Cape, the Cape Peninsula, and the south coastal area between Swellendam and Mossel Bay; elsewhere in the Union the rainfall was either sub-normal or totally wanting, as already stated.

The accumulated rainfall since the beginning of the year is generally above the normal in the Transvaal, Free State, and Cape Province, and isolated parts of Natal. The exceptional areas are the east of the Transvaal, between Pilgrims Rest and Barberton, also the neighbourhood of Pretoria; the north-east of the Free State; the west and south of Natal, extending to more easterly parts of the Transkei; the south-east coast of the Cape between East London and Port St. Johns, and a limited extent of the Cape between Kuruman and Hanover. The surplus amounts in the Transvaal vary from less than half an inch at Middelburg to almost 12 inches at Woodbush; in the Free State, from half an inch at Ladybrand to 4.75 inches at Bethulie; in Natal, from 0.93 inch at Weenen to 2.80 inches at Durban (Hlabisa, in Zululand, is 0.62 inch above normal); in the Cape Province, the excesses are commonly from 2 to 4 inches, but ranging from about one-third of an inch at Aliwal North to practically 26 inches at Ceres in the south-west. The deficiency in rainfall in the Transvaal varies between 0.63 inch at Pretoria and 6.67 inches at Barberton; at Harrismith, in the Free State, it is 3.86 inches, but rises in Natal to 5.62 inches at Ladysmith and 9.56 inches at Vryheid, although it sinks to 0.34 inch at Howick; over the south-east coast the deficits are from 2½ to 3½ inches; but in that portion of the Cape lying to the west and south-west of the Orange Free State, the shortage ranges from a few tenths to 1.68 inch at Philipstown. The seasonal rainfall from the 1st July is in excess of the average over a limited portion in the south-west of the Cape, extending from Calvinia to Mossel Bay, thence westwards to the Cape Peninsula and northwards through Piquetberg and Clanwilliam back to Calvinia. With this exception, the rainfall over the Union is everywhere less than usual, mostly by amounts between half an inch and 1 inch. The largest excess is 6.86 inches at Ceres.

In consequence of the continued drought and frequent severe frosts, the veld, generally speaking, is now very dry and bare, whilst new green grass was reported only in the neighbourhood of Ngomi Forest. Consequently, cattle are beginning to fall off in condition in many districts, and artificial feeding

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), AUGUST, 1921.

PLACE.	OBSERVER.	Month.—Aug., 1921.		Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes.		Date.	Date.
		Mean Max.	Mean Min.				Highest.	Lowest.		
		° F.	° F.				° F.	° F.		
<i>Travels.</i>										
Belfast.....	The Forester.....	66.1	28.0	47.0	49.5	—	73.0	17.0	22nd.	4th.
Barbenton.....	W. Grubb.....	78.1	49.8	63.0	63.1	—	89.0	15.0	18th.	14th.
Bloomhof.....	A. Adanson.....	72.3	51.5	53.4	52.9	—	92.0	22.0	7th, 23rd.	3rd, 5th, 6th.
Ernelo.....	Mrs. S. M. Nicolson.....	70.2	32.0	51.4	52.5	—	78.0	21.0	23rd.	1st & 2nd.
Johannesburg (Observatory).....	The Staff.....	64.8	42.1	53.4	53.6	—	73.5	25.9	18th.	10th.
Klerksdorp (Strathmore).....	Chas. Scott.....	72.3	33.7	53.0	55.5	—	81.0	23.0	23rd.	30th.
Komalipoort.....	E. J. Evans.....	83.0	48.7	65.8	67.1	—	95.0	40.0	9th.	1st & 4th.
Louis Trichardt.....	L. J. de Bruin.....	72.1	39.2	55.6	60.0	—	81.0	22.0	23rd.	15th.
Middelburg.....	Dr. H. A. Spencer.....	72.1	31.6	51.8	53.8	—	82.0	20.0	24th.	3rd.
Nyistrona.....	G. Bakker.....	73.3	35.4	54.4	58.0	—	81.0	27.0	18th.	5th.
Pilgrims Rest.....	E. M. Skea.....	71.2	37.9	54.6	55.0	—	82.5	27.5	18th.	1st.
Pretoria.....	W. J. Franklyn.....	69.1	39.1	54.2	57.0	—	78.5	30.0	18th.	4th.
Potcheitroom (Exp. Farm).....	The Manager.....	73.5	33.0	53.2	53.8	—	82.0	20.5	16th & 23rd.	4th.
Pretoria (Meteorological Office).....	The Staff.....	74.0	30.0	56.5	56.7	—	80.0	30.0	24th.	3rd.
Piet Retief.....	J. Werner.....	68.7	41.8	55.8	54.9	—	81.5	31.0	1st.	3rd.
Stangeren.....	M. Ferguson.....	69.5	29.6	49.6	50.0	—	77.0	15.7	24th.	4th.
Zeerust.....	H. Dietrich.....	71.8	34.7	53.2	56.6	—	81.5	24.4	24th.	5th.
<i>Starboard.</i>										
Mbulane.....	Swaziland Police.....	69.1	44.5	57.0	58.0	—	82.0	37.0	18th.	13th, 14th, & 15th.
<i>Orange Free State.</i>										
Bloemfontein.....	G. A. Schepers.....	69.3	33.5	49.9	51.0	—	77.2	21.9	17th.	3rd.
Beitulle.....	J. J. Wardhaugh.....	63.2	32.8	49.5	52.0	—	78.0	21.2	17th & 24th.	10th.
Harrismith.....	The Forester.....	63.5	35.0	49.2	49.0	—	72.0	24.0	22nd.	4th & 5th.
Indley.....	J. Collister-Oates.....	68.3	29.0	49.1	51.0	—	77.5	17.0	24th.	3rd.
Ladybrand.....	The Forester.....	66.2	32.3	49.2	51.2	—	76.0	21.0	23rd & 25th.	3rd, 5th, & 10th.
<i>Natal.</i>										
Durban (Point).....	The Port Captain.....	71.5	36.1	63.8	65.0	—	81.3	27.0	2nd.	3rd.
Dundee.....	West Therrold.....	73.2	38.3	55.8	56.9	—	83.0	27.0	17th.	9th, 27th, & 28th.
Hlabisa.....	The Gacher.....	75.0	32.8	63.9	65.6	—	85.0	49.0	15th.	3rd.
Mentzburg (Mental Hospital).....	The Staff.....	73.0	46.0	59.5	62.4	—	88.2	35.5	17th.	3rd.
<i>Cape.</i>										
Aliwal North.....	A. Azeal.....	68.9	31.0	49.0	50.9	—	73.0	20.5	3rd.	4th.
Bedford.....	L. C. Hall.....	64.0	43.1	55.6	57.0	—	85.0	30.5	17th.	5th.
Capetown.....	A. P. Mallicre.....	65.8	31.8	48.8	51.2	—	80.1	21.0	31st.	2nd.
Capetown (Royal Observatory).....	The Staff.....	59.9	40.0	53.0	53.6	—	72.0	39.0	24th.	10th.
Clanwilliam.....	W. J. Downes.....	74.6	41.3	58.0	55.8	—	88.0	34.0	30th.	1th, 19th, & 20th.
East London.....	The Port Captain.....	72.5	50.4	61.4	60.0	+	85.0	44.0	27th.	20th.
Graverefont.....	S. E. D. Treadwell.....	72.5	41.1	58.9	55.5	+	88.0	32.0	23rd.	5th & 6th.
Groot Drakenstein.....	Lionel Baker.....	62.3	42.2	52.2	54.4	—	76.0	30.0	30th.	19th.
Kokstad.....	H. D. Coyte.....	68.2	35.7	49.8	49.8	—	81.0	24.2	17th.	6th.
Kimberley.....	J. Acton.....	71.0	37.3	54.0	55.5	—	84.0	28.0	23rd, 24th, & 31st.	4th.
Matieling (Corrent).....	The Mother Superior.....	71.0	38.1	56.0	59.7	—	82.0	21.5	24th.	10th.
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	63.6	50.0	56.8	58.0	—	74.0	44.0	24th & 25th.	27th.
Murraysburg.....	A. Cameron.....	69.7	30.9	48.3	48.4	—	79.0	21.0	31st.	4th, 7th, 28th, & 29th.
O'okief.....	J. Burrows.....	63.6	41.7	52.6	53.8	—	82.2	32.4	31st.	7th.
Port Elizabeth.....	The Lightkeeper.....	65.7	49.5	57.6	59.3	—	86.0	43.0	17th.	20th & 24th.
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	70.5	55.8	63.2	61.6	+	82.0	52.0	17th.	10th, 14th, 20th, & 30th.
Queensdown.....	H. Holley.....	67.1	37.2	52.2	58.4	—	80.0	25.0	31st.	30th.
Vryburg.....	G. P. Botha.....	73.3	31.5	51.5	52.7	—	84.0	18.0	22nd.	5th.

RAINFALL, AUGUST, 1921.

PLACE.	OBSERVER.	Month.	Normal.	Difference	From 1st Jan., 1921.	Normal.	Difference	From 1st July, 1921.	Normal.	Difference	
		Inches.		from Normal.			Inches.			from Normal.	Inches.
<i>Transvaal—</i>											
Barberton.....	W. Grubb.....	0.04	0.21	- 0.23	15.12	21.79	- 6.67	0.00	0.85	- 0.85	
Belfast.....	The Forester.....	0.00	0.28	- 0.28	19.70	17.71	+ 1.99	0.00	0.56	- 0.56	
Bethal.....	H. F. Jonbert.....	0.40	0.48	- 0.08	20.81	19.53	+ 1.28	0.00	0.60	- 0.60	
Bloemhof.....	A. Adanson.....	0.19	0.19	- 0.00	13.51	12.90	+ 0.61	0.00	0.40	- 0.40	
Charmont.....	S. A. Polke.....	0.00	0.30	- 0.30	13.76	11.32	+ 2.44	0.00	0.35	- 0.35	
Erniebe.....	Mrs. S. M. Nicolson.....	0.00	0.37	- 0.37	9.78	15.57	- 5.79	0.00	0.68	- 0.68	
Huayataburg.....	S. A. Polke.....	0.00	0.20	- 0.20	30.27	27.07	+ 3.20	0.00	0.98	- 0.98	
Heidelberg.....	W. ter Horst.....	0.00	0.31	- 0.31	19.16	15.50	+ 3.66	0.00	0.68	- 0.68	
Johannesburg (Observatory).....	The Staff.....	0.00	0.27	- 0.27	16.06	15.61	+ 0.45	0.00	0.61	- 0.61	
Klerksdorp (Strathmore).....	C. Scott.....	0.00	0.18	- 0.18	17.09	14.16	+ 2.93	0.00	0.39	- 0.39	
Komatipoort.....	H. J. Evans.....	0.11	0.21	- 0.10	15.57	17.56	- 1.99	0.11	0.57	- 0.46	
Lonia Trichard.....	I. J. de Bruin.....	0.00	0.18	- 0.18	25.46	20.14	+ 5.32	0.00	0.81	- 0.81	
Middelburg.....	Dr. H. A. Spencer.....	0.00	0.34	- 0.34	13.92	15.48	- 1.56	0.00	0.39	- 0.39	
Nylstroom.....	G. Rakker.....	0.00	0.21	- 0.21	23.05	14.47	+ 8.58	0.00	0.45	- 0.45	
Pieterburg.....	W. Franklynne.....	0.00	0.15	- 0.15	14.12	12.61	+ 1.51	0.00	0.44	- 0.44	
Piet Retief.....	J. Wernet.....	0.01	0.43	- 0.42	20.95	16.18	+ 4.77	0.01	0.77	- 0.76	
Wartins Rest.....	E. M. Skea.....	0.00	0.42	- 0.42	25.28	27.24	- 1.96	0.00	0.86	- 0.86	
Pretoria (Meteorological Office).....	The Staff.....	0.00	0.34	- 0.34	17.04	17.67	- 0.63	0.00	0.61	- 0.61	
Potchefstroom (Exp. Farm).....	The Manager.....	0.00	0.21	- 0.21	18.92	18.38	+ 0.54	0.00	0.39	- 0.39	
Rooiberg.....	N. H. Munro.....	0.00	0.53	- 0.53	19.48	14.80	+ 4.68	0.00	0.92	- 0.92	
Roosendrup.....	S. A. Polke.....	0.00	0.21	- 0.21	20.86	15.63	+ 5.23	0.00	0.72	- 0.72	
Standerton.....	M. Ferguson.....	0.00	0.51	- 0.51	15.73	18.15	- 2.42	0.00	0.80	- 0.80	
Wakkerstroom.....	L. le Roux.....	0.00	0.67	- 0.67	69.58	48.77	+ 20.81	0.00	1.07	- 1.07	
Woodbush.....	The Forester.....	0.00	0.75	- 0.75	18.08	15.41	+ 2.67	0.00	1.37	- 1.37	
Zeerust.....	H. Dietrich.....	0.00	0.17	- 0.17	18.08	15.41	+ 2.67	0.00	0.44	- 0.44	
<i>Swaziland—</i>											
Mobane.....	Swaziland Police.....	0.49	0.64	- 0.15	35.44	30.11	+ 5.33	0.49	1.35	- 0.86	
<i>Orange Free State—</i>											
Bethulie.....	J. J. Wachter.....	0.07	0.46	- 0.39	16.05	12.80	+ 3.25	0.10	0.84	- 0.74	
Bloemfontein.....	G. A. Schepers.....	0.00	0.21	- 0.21	16.41	12.56	+ 3.85	0.00	0.77	- 0.77	
Harrismith.....	The Forester.....	0.00	0.05	- 0.05	12.03	15.80	- 3.77	0.00	0.83	- 0.83	
Kroonstad.....	S. R. Northfield.....	0.00	1.00	- 1.00	13.14	12.05	+ 1.09	0.00	1.37	- 1.37	
Ladybrand.....	The Forester.....	0.00	0.11	- 0.11	16.71	16.21	+ 0.50	0.00	0.85	- 0.85	
Lindley.....	J. Odell-Oates.....	0.60	0.38	- 0.38	14.88	14.50	+ 0.38	0.00	0.74	- 0.74	
<i>Natal—</i>											
Dundee.....	West Throrold.....	0.00	0.71	- 0.71	13.92	18.83	- 4.91	0.00	0.88	- 0.88	
Durban (P.O.).....	The Port Captain.....	0.14	1.21	- 1.07	27.06	24.26	+ 2.80	0.72	1.97	- 1.25	
Hiabas.....	The Gaoler.....	0.92	1.00	- 0.08	24.72	24.10	+ 0.62	1.21	1.71	- 0.50	
Howick.....	The Gaoler.....	0.38	0.84	- 0.46	18.39	18.73	- 0.34	0.46	1.00	- 0.54	
Isidjasmith.....	D. A. K. Leathern.....	0.00	0.71	- 0.71	11.28	16.90	- 5.62	0.00	0.83	- 0.83	
Pietermaritzburg (Mental Hospitl).....	The Staff.....	0.45	0.94	- 0.49	19.20	18.74	+ 0.46	0.00	1.08	- 1.08	
Vryheid.....	The Gaoler.....	0.00	0.73	- 0.73	11.95	20.92	- 9.97	0.00	1.02	- 1.02	
Wentzen.....	The Gaoler.....	0.00	0.71	- 0.71	16.53	15.60	+ 0.93	0.00	0.81	- 0.81	

RAINFALL, AUGUST, 1921 (continued).

PLACE.	OBSERVER.	Month.		Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Aug., 1921.	Inches.								
Cape—											
Allwal North.....	A. Alcock.....	Inches.	0.03	Inches.	0.70	Inches.	14.63	Inches.	0.36	Inches.	1.12
Beaufort West.....	The Gaoler.....		0.08		0.24		14.33		7.84		0.48
Bedford.....	T. G. Hall.....		0.65		0.42		19.30		1.74		1.00
Britstown.....	The Gaoler.....		0.12		0.06		18.95		10.58		0.27
Carwins.....	The Gaoler.....		0.09		0.17		13.00		7.02		0.72
Capefown (Royal Observatory).....	The Staff.....		4.04		0.01		20.47		0.84		1.31
Ceres.....	A. Hoedle.....		8.44		2.57		56.03		25.90		6.80
Carnarvon.....	A. P. Hallerbe.....		0.00		0.31		11.67		5.40		0.47
Clanwilliam.....	W. J. Downes.....		0.68		0.17		11.15		4.55		0.71
East London.....	A. Downie.....		0.24		1.85		17.51		2.46		1.45
Fraserburg.....	The Gaoler.....		0.05		0.28		12.15		6.98		0.33
Garies.....	The Gaoler.....		0.90		0.11		7.01		2.09		0.17
Graaff-Reinet.....	S. E. D. Treadwell.....		0.06		0.52		10.54		1.48		0.77
Groot Drakenstels.....	L. Baker.....		4.81		0.20		36.95		10.01		3.00
Grapsstown.....	The Gaoler.....		0.00		0.15		8.38		1.45		0.32
Hanover.....	The Gaoler.....		0.01		0.29		9.39		0.39		0.66
Hopetown.....	The Gaoler.....		0.00		0.24		10.66		1.32		0.19
Kenhardt.....	The Gaoler.....		0.00		0.12		6.26		1.87		0.26
Kimberley.....	J. Acton.....		0.00		0.18		10.42		0.34		0.43
Knyana.....	The Gaoler.....		1.42		1.25		21.34		3.15		0.32
Kokstad.....	H. D. Coyko.....		0.12		0.52		16.19		0.03		0.84
Kuruman (Abtonia).....	A. T. Stilwell.....		0.00		0.09		11.61		0.19		0.38
Maifeking (Convent).....	Mother Superlex.....		0.00		0.15		20.35		1.64		0.52
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....		2.40		0.08		12.98		1.51		3.08
Murraysburg.....	A. Cameron.....		0.00		0.40		10.15		2.12		0.30
O'okiep.....	J. Burrows.....		0.88		0.13		9.82		4.20		0.53
Phillipstown.....	The Gaoler.....		0.02		0.27		8.07		1.08		0.04
Port Elizabeth.....	The Gaoler.....		2.85		0.10		26.85		0.96		0.40
Port St. Johns (Cape Hermes).....	J. K. Allen.....		1.16		1.02		16.00		2.10		1.16
Prasanna.....	The Lightkeeper.....		0.53		1.68		23.61		3.63		0.75
Queenstown.....	The Gaoler.....		0.00		0.17		8.01		0.44		2.33
Steylerville.....	H. Epfley.....		0.07		0.51		15.43		1.49		0.32
Swakopmund.....	The Gaoler.....		0.13		0.35		7.51		1.47		0.42
Swakopmund.....	The Gaoler.....		0.48		0.48		14.71		7.67		0.63
Swakopmund.....	The Gaoler.....		2.48		0.01		26.39		4.41		0.28
Uxeltate.....	A. Dirpeck.....		0.02		0.75		17.72		1.76		1.21
Uitenhage.....	The Gaoler.....		0.59		0.77		12.26		4.31		0.78
Uprington.....	The Gaoler.....		0.02		0.05		8.63		3.08		0.15
Victoria West.....	The Gaoler.....		0.00		0.27		10.82		3.29		0.17
Vryburg.....	C. Ruller.....		0.00		0.26		16.27		2.03		0.41
Worcester.....	The Gaoler.....		1.35		0.24		15.06		5.82		0.83
Wynberg (Convent).....	The Mother Superior.....		7.40		0.15		38.38		2.80		0.28
South-West Africa—											
Tsunelb.....	Ing. Schetter.....		0.00		0.00		16.05		0.47		0.06
Fransfontein.....	H. Janson.....		0.01		0.02		8.07		8.52		0.01
Waterberg.....	D. Hahn.....		0.00		0.00		24.43		1.81		0.02
Viesies.....	Wisselmay.....		0.00		0.08		5.97		0.48		0.00
Windhoek.....	Observatory.....		0.00		0.00		12.37		0.34		0.11
Blancfontein.....	Baroni Zeebeek.....		0.00		0.00		4.45		0.07		0.01
Keetmanshoop.....	The Magistrate.....		0.00		0.00		4.20		0.07		0.01
Heilbrunn.....	Pater Pretsch.....		0.04		0.00		3.82		0.80		0.08

has been adopted at Heilbron (O.F.S.) and apparently elsewhere, e.g. Standerton (Transvaal). On the other hand, there would appear to be a few favoured areas, e.g. Doornkloof, in the Zoutpansberg, where the veld is stated to be in good condition and cattle fat; at Klipplaatsdrift (Standerton) stock are stated to be so far doing well; at Dwingfontein (Cradock) and Karree Grange (Hay) cattle are reported as in good condition, though small stock at the latter place are not looking well; at Cromdale (Aberdeen) stock are in fair condition. As a result of the warmer conditions prevailing during August, fruit trees, particularly peaches, are in full blossom both on the high and middle veld (on the low veld they were in bloom during the previous month). Heavy frosts, however, damaged the early fruit at Pietersburg and Ermelo. Navel oranges were in bloom at Doornkloof, in the Zoutpansberg Division. Vegetation, as a whole, would appear to have been retarded by the low temperatures prevailing during the month, crops generally being backward. From Heilbron (O.F.S.) comes the statement that the crops garnered are fair to indifferent, and the mealie crop at Commando Drift (Hoopstad Division) averaged only 50 per cent. In the Drakenstein district, vegetation is reported backward, the oaks being about a month later than usual, and apricots and plums just starting to bloom. In the neighbourhood of Port Elizabeth, on the other hand, the surrounding is described as a picture with flourishing grain crops, and spring is stated to be well advanced at Somerset East. At Hillcrest the continued drought has seriously affected the water supply, whilst the Klip River at Ladysmith has almost ceased to run. A considerable amount of sickness is stated to be prevalent amongst the natives in the Pietersburg District, owing to the variability of the weather. The only instances of disease amongst stock are two cases of anthrax and one suspect case at Heilbron (O.F.S.).

OBSERVERS' NOTES FOR AUGUST, 1921.

TRANSVAAL.

Barberton.—Warm, sunny days, with cool nights, have prevailed during the month. The country is now very dry, and there is very little grass available for the cattle. Rainfall: Nil.—Walter Grubb.

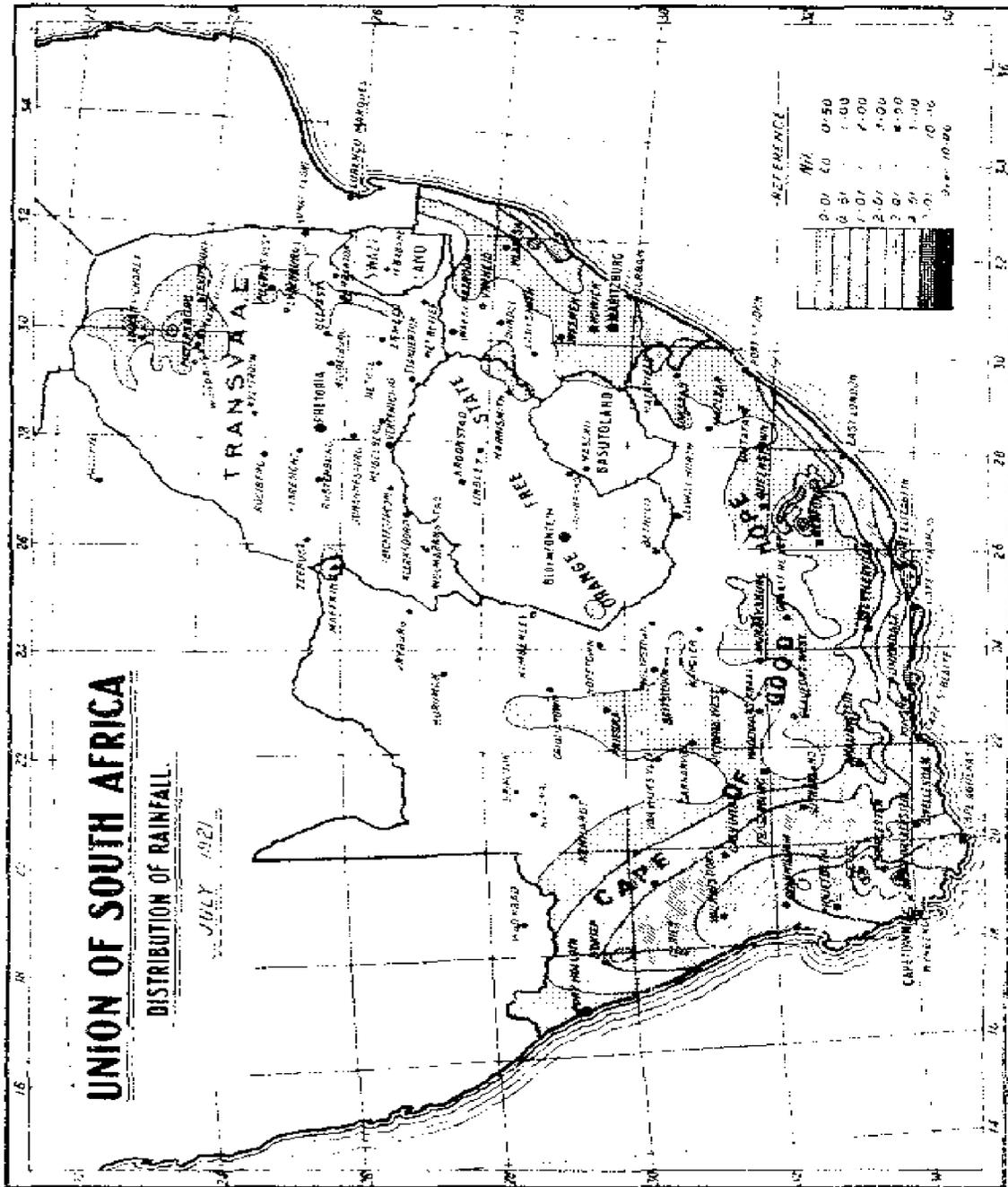
Middelburg.—Warm days and cold nights have obtained during the month; more frosts and a lower mean minimum temperature than the average, though since the first week of August the frosts have not been heavy. Fruit trees are now everywhere in bloom upon the middle and high veld—a month ago and more upon the low veld—and spring has evidently arrived. Rainfall: Nil.—Dr. H. A. Spencer.

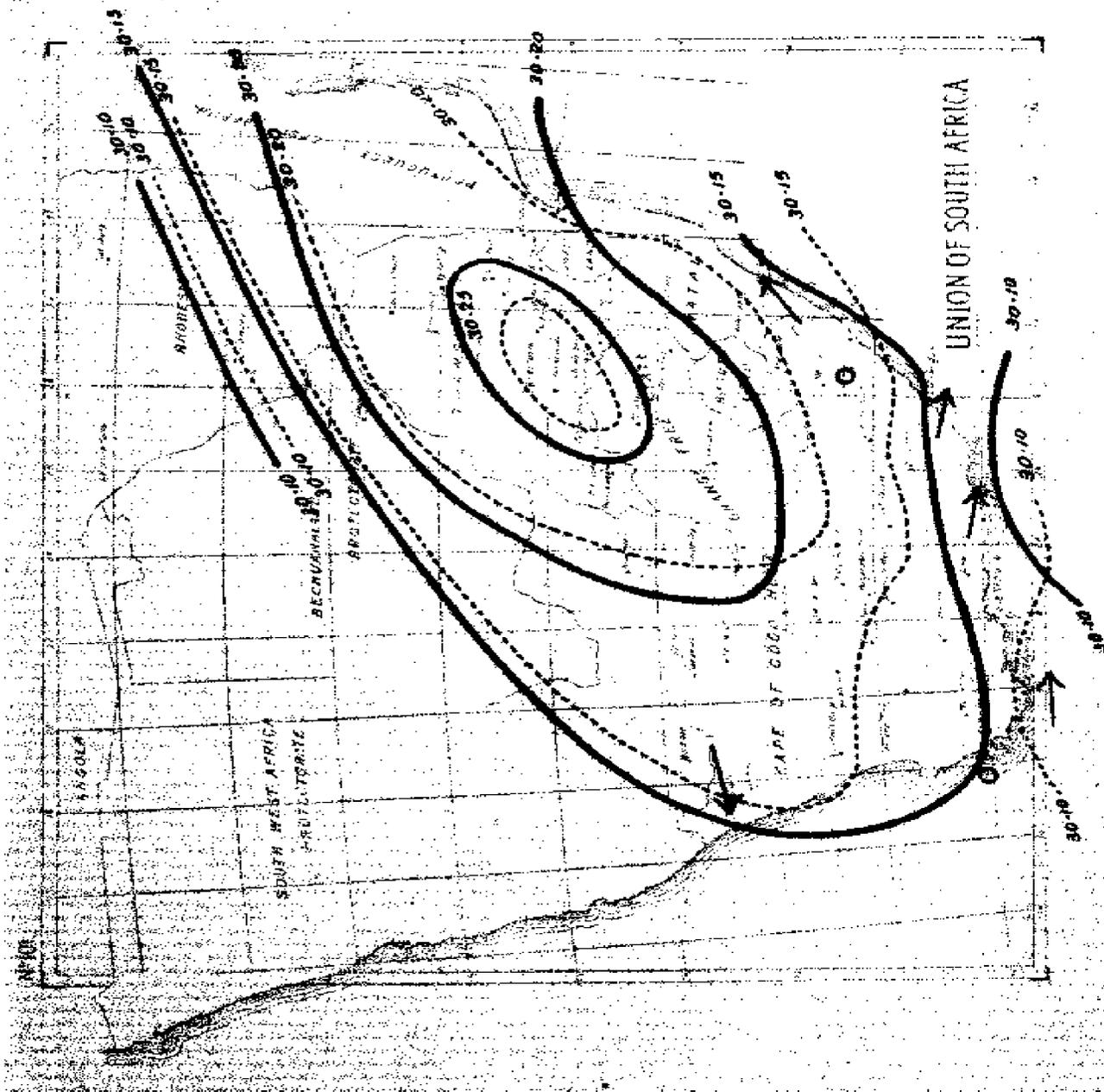
Piet Retief.—The country around here at present is in a very dry state. Rainfall: 0·01 inch on one day.—J. Werner.

Rustenburg.—Very dry month; veld bare; cattle falling off in condition; crops looking well; fruit trees in full bloom, and good crop anticipated. Rivers and streams: still a good supply of water, and running strong. Rainfall: Nil.—Sergt. H. J. Streetfield.

Wakkerstroom.—The month has been considerably warmer; some very fine days were experienced. Peach trees in full blossom; heavy frost on 28th; willows looking nice and green. Rainfall: Nil.—Louis le Roux.

Mosdene (Naboomspruit).—An unusual number of frosty nights, and great extremes between day and night temperatures, the extreme maximum tempera-





August, 1981. Prevailing Winds and Mean Barometric Pressure at 8.30 a.m.
 The dotted lines indicate the normal distribution for August.

ture being 82.4 degrees on the 18th, and the extreme minimum 27.6 degrees on the 1st, whilst the mean difference for the month was 39.0 degrees. The maximum difference during any one day was 49.0 degrees on the 22nd. Rainfall: Nil.—Ernest E. Galpin.

Krugerdsorp.—Dusty and changeable weather, with northerly and southerly winds; frosty and cold nippy mornings were the main feature. The minimum temperature dropped to 23 degrees on the 10th, being the coldest experienced during the last five years. Fruit trees blossoming; veld very dry; on the 20th heavy fog early morning, with overcast sky; a few drops of rain at 5 p.m. on 30th. Rainfall: Nil.—George S. Garnett.

Pietersburg.—Uncommonly heavy frosts throughout the month, damaging early fruit; two days of strong wind, bitterly cold; dust storms frequent. Rainfall: Nil.—W. J. Frankleyne.

Jakhalsfontein (Pietersburg).—Warm days with hot dry winds prevalent throughout the month; sudden changes of weather frequent, and cold nights almost continuous; a considerable amount of sickness amongst the natives through the marked changes of weather. Rainfall: Nil.—James C. Palmer.

Ermelo.—Wind, dust, and drought; hard frost at the end of the month has destroyed much of the fruit blooms. The milder nights had pushed the trees on, and many were in full bloom. Rainfall: Nil.—Mrs. S. M. Nicolson.

Standerton.—Nightly frosts, and cold winds accompanied with dust during the day, were experienced throughout the month; but towards the end the weather became more settled, and there was a decided increase in temperature. The veld is now at its worst, and frequent grass fires add to the dismal appearance of the landscape. Stock, where not fed by their owners, are in very poor condition, but on the whole there appears to be an absence of sickness. Rainfall: Nil.—M. Ferguson.

Honingnestkrantz (Pretoria).—Crops suffering from excessive frost. Rainfall: Nil.—H. Ellis.

Klipplaatsdrift (Standerton).—Stock so far are doing well. Rainfall: Nil.—P. Swemmer.

Doornkloof (Zoutpansberg).—Veld in good condition and cattle fat; navel orange trees in blossom. Rainfall: Nil.—S. M. Ralston.

Pietersburg (Zoutpansberg).—White frosts nearly every morning this month up to 29th—this is very abnormal. Only three or four windy days, also unusual. Rainfall: Nil.—C. Hicks.

SWAZILAND.

Mbabane.—Country very dry, and grazing very poor. Rainfall: 0.49 inch on three days.—R. C. S. Markham.

Transvalia.—Drought severe; cattle in very poor condition. Rainfall: Nil.—H. Coates.

ORANGE FREE STATE.

Doornplaas (Bloemfontein).—August no rain; a very changeable month, with cold west and south-west winds; very heavy frosts, severest experienced here yet during July-August.—C. G. Oertel.

Koudekraal (Edenburg).—During this month severe cold winds were prevalent, with heavy frosts during night-time. The crops are, generally speaking, very slow on account of the cold weather. Rainfall: Nil.—J. H. Hauch.

Heilbron.—Stock in poor condition; artificial feeding resorted to generally. Two cases of anthrax have occurred, and one case of suspected anthrax. Garnering of crops almost completed; yields fair to indifferent. Rainfall: Nil.—P. A. du P. Naudé.

Deredrop (Heilbron).—Veld is dry, and stock is falling off in condition; rain is much needed. Rainfall: Nil. W. M. Leonard.

Commando Drift (Hoopstad).—Most of the month was bitterly cold. The mealie crop only averaged 50 per cent. Rainfall: Nil.—F. Treeby.

Hoffontein (Kroonstad).—Temperature slowly increasing during daytime, with regular night frosts up to 18th, after which only one cold snap on night of the 28th. Winds variable, increasing in strength during the day. Rainfall: Nil.—G. W. Muller.

Modderpoort (Ladybrand).—9th: Slight snow. Rainfall: Nil.—E. Goody.

Bethulie.—9th: A little snow. Rainfall: 0.07 inch on one day.—J. J. Wardhaugh.

Ladybrand.—A little snow. Rainfall: Nil.—Geo. Stokes.

NATAL.

Durban (Point).—Generally fine weather; winds far above the average for the time of the year; large amount of dew. Rainfall: 0.14 inch on four days. A. G. Goulding.

Hlabisa.—Veld very dry and parched; heavy rains are needed. Rainfall: 0.92 inch on five days.—L. Double.

Cape St. Lucia.—Strong northerly winds during month; hot winds from 10 a.m. to 2 p.m. on 1st. Country looking dry, and cattle falling off in condition. Rainfall: 0.64 inch on six days.—J. Murphy.

Nottingham Road.—What promised to be an early spring is spoiled by drought and late frosts. Just enough grass for sheep. Rainfall: 0.05 inch on three days.—Miss E. Smythe.

Vryheid.—Bright sunny days, followed by windy nights; no indications of rain up to the present. Rainfall: Nil. C. A. Meyer.

Umbogintwini.—Lot of wind; rain is very much needed. Rainfall: 0.32 inch on four days.—J. P. Lyle.

Port Shepstone.—Strong north-easterly and south-westerly winds during latter part of month, and the country looks parched and dry. Rainfall: 0.45 inch on four days.—E. K. Andreassen.

Ladysmith.—Clear, dry weather still continuing; stock in very poor condition; rain badly needed; Klip River has almost stopped running. Rainfall: Nil. D. A. R. Leathern.

Cedara (School of Agriculture).—Lower temperature than in August, 1920; unusual amount of frost; warm winds towards end of month. Rainfall: 0.34 inch on five days.—The Principal.

Howick.—Rather dry month; rain badly needed; weather very much warmer. Rainfall: 0.38 inch on three days.—F. Nichols.

Newcastle (The Academy).—Chilly in mornings and evenings; some days rather windy. Rainfall: Nil.—The Mother Superior.

Ngomi.—The surrounding country is very dry; by all appearance, more so than last year. The little green grass that is showing is only around the forest. Rainfall: 1.84 inch on four days.—J. Tustin.

Hillorest.—The continued drought has reached the limit with regard to water supply in this district. Hot winds have been prevalent; rain is badly needed. Rainfall: 0.69 inch on three days.—Arthur J. Arnfield.

Doornhoek (Newcastle).—Nice warm month, with exception of about four windy days. Rainfall: Nil.—J. Browning.

Roseleigh (Ladysmith).—No rain during month; severe frosts, and several dust storms.—K. J. de Jongh.

CAPE.

Groot Constantia.—Very cold and wet month. Rainfall: 6.93 inches on fifteen days.—A. G. van Reenen.

Groot Drakenstein.—A cold month; rainfall slightly below average, but spread over a large number of days; vegetation backward; oaks about a month later than usual; apricots and plums just starting to blossom. Rainfall: 4.81 inches on fifteen days.—Lionel Baker.

Ceres.—Weather generally less windy than usual, with frost on ten mornings. Rainfall: 8.44 inch on thirteen days. A. Heatlie.

O'okiep.—Snow fell on the 9th—rare occurrence. Rainfall: 0.88 inch on five days.—J. Burrows.

Darling (Malmesbury).—Nice seasonable month, and all conditions favourable. Rainfall: 3.03 inches on fifteen days.—P. H. Drake.

Commando Kraal (Uitenhage).—Wind and dust. Rainfall: 0.35 inch on one day. Major J. Kreft.

Emerald Hill Convent (Port Elizabeth).—High north-west winds; frequent rains; surrounding country a picture with flourishing grain crops. Rainfall: 2.39 inches on twelve days.—The Mother Superior.

Graaff-Reinet.—Winds moderate, and chiefly from the north and north-west. Much variation in temperature; several warm, windy days, with dust. Rainfall: 0.06 inch on two days.—S. E. D. Treadwell.

Somerset East.—After an exceptionally cold July, a very mild August, with spring well advanced. Rainfall: 0.61 inch on four days.—C. Harris.

Murraysburg.—The first part of the month very cold. For years I have not seen locusts in the village, but at present they are numerous all over the district. Rainfall: Nil.—A. Cameron.

Lovedale.—Frost on seven days; north-westerly winds on seven days, which is below the usual figure, and it was seldom persistent. Cold wind from west on nine days, and temperature generally 1 to 2 degrees below average. Rainfall: 0.35 inch on five days—below average.—Charles A. Pilson.

Kingwilliamstown.—This has been a very bad month for us: no rain, and no indication of any. Wind nearly every other day, with dust; very dry, and spring approaching very fast. Rainfall: 0.21 inch on three days.—L. Clayton.

Queenstown.—A month of drought, strong westerly winds, with dust. Hoar frost on ten mornings. Rain wanted badly for crops and veld. Rainfall: 0.07 inch on one day.—H. Holley.

Rietfontein (Aliwal North).—Exceptionally cold August; very dry; crops suffering. Rainfall: Nil.—A. G. Smith.

Kokstad.—Frosts more frequent than usual; very dry. Rainfall: 0.12 inch on one day.—H. D. Coyte.

Mafeking (The Convent).—Warm weather for the first week; a sudden drop of 22 degrees in the maximum temperature on the 9th. From the 12th the usual August weather prevailed, except for the fewness of dust-storms. Rainfall: Nil.—The Mother Superior.

Abtonia (Kuruman).—A few flakes of snow at 8.30 a.m. on 9th. Rainfall: Nil.—A. T. Sitwell.

Cromdale (Aberdeen).—Stock in fair condition. Rainfall: Nil.—J. N. Cruickshank.

Dwingfontein (Craddock).—It is dry, but cattle still in good condition; no disease; cereal crop very poor. Rainfall: Nil.—H. P. van Heerden, J.P.

Karree Grange (Hay).—Veld dry; cattle in good condition, though small stock not looking well. Rainfall: 0.01 inch.—R. Mann.

OCTOBER WEATHER CHARACTERISTICS.

The month of October marks the firm establishment of the inland rainy season and a general increase in the intensity of precipitation throughout the Union. In the south-west of the Cape and over the Peninsula, however, the tendency is in the opposite direction, while over the southern and western coastal districts there should be but little change from the preceding month. The heaviest rainfall should now be experienced in Zululand, Swaziland, and Natal, where the normals are about 3.5 inches. The Cape Peninsula receives an average of about 3 inches; Basutoland, the Transvaal eastern border, and the south-eastern coastal districts, 2.5 inches; the south coast and south-west of the Cape Province, 2.0 inches; the Transvaal high veld, Orange Free State, and east-central Karroo, 1.5 inch; and the remainder of the Union less than 1 inch. A mean monthly air temperature of 68 degrees occurs in Natal, and 67 degrees in the eastern Transvaal and the northern borders of the Cape Province. The normal in Kaffraria is about 61 degrees, in the Cape coastal districts 62 degrees, on the Peninsula 60 degrees, and in the south-west 61 degrees. On the high veld the mean temperature should range from 63 degrees in the Transvaal and Orange Free State to 60 degrees in Basutoland and on the northern Karroo. Frosts are unusual. Of the total possible number of hours of bright sunshine, about 80 per cent. should be enjoyed over the northern borders of the Cape Province, 58 per cent. in the south-eastern districts, 61 per cent. on the Peninsula, and 65 per cent. in the Transvaal. During this month the winds over the east and interior of the country attain their maximum velocity, whilst over the south-west they are also increasing in force. Compared with the previous month, there is a general decrease in frequency at all stations of those winds blowing between north and north-west, and a general increase of southerly and south-south-westerly breezes; and of north-easterly winds in addition over the summer rainfall area. The prevailing wind directions are south-south-west at Kimberley, north at Johannesburg, north-east at East London, and southerly at Capetown.

During October destructive hailstorms are of frequent occurrence, affecting wide areas.

C. STEWART,
Chief Meteorologist.

Pretoria.



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

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PRESSURE higher than usual over the west and centre of the Union ; temperature slightly higher than usual over the Cape, but subnormal elsewhere ; alternations of warm and cold periods ; occasional strong winds ; an excess of precipitation over the southern portions of the Transvaal, Natal, and north-east of the Free State, the south coast and east of Transkei ; a heavy snowstorm between 7th and 9th, and some late killing frosts, characterized the weather of September, 1921.

Pressure.—Although the average isobars of the transition month of September show the formation of a low-pressure area over the interior, the mean isobars for September, 1921, point to persistent anticyclonic conditions throughout the month. As shown on the accompanying pressure map, the mean isobar of 30.15 in. covered the greater part of the Union from north-east to south-west, whilst the only indication of the usual equatorial low is a slight bend southwards of the north side of this isobar. Thus, although there is but little departure from the general run of the isobars over Rhodesia, the Transvaal, and Natal, pressure was about a tenth of an inch higher than the usual over the Free State and centre and south of the Cape. The 24th was the only day on which the equatorial low was at all well marked.

A high-pressure area was present every day, and only four low pressures occurred during the month, viz., on 2nd to 3rd, 6th to 7th, 23rd to 25th over south and east, and on the 19th on the south. The low pressure of the 6th and 7th was succeeded by high pressure of considerable intensity, the pressure at Cape Agulhas on the 8th reading 30.65 in. The brisk circulation in the rear of the low and front of this high was the immediate cause of the snowstorm on the 7th to 9th, which affected a wide area in Natal, Transvaal, the Free State, and parts of the Cape from Table Mountain to the Transkei. The thirty-six hours' fall at Dundee (Natal) is stated to have exceeded that of 31st May to 1st June, 1905 (*vide* "Observers' Notes").

Temperature.—Regarded as a whole, the mean temperature over the Union (60.0 degrees) was 0.6 degree lower than the normal, due principally to the

nights (46.0 degrees) being 1.0 degree colder than usual, whilst the days, with a mean of 73.9 degrees, were only 0.3 degree lower than the average. Taking the Provinces separately, the Transvaal, with a mean monthly temperature of 60.6 degrees, showed the largest deficit (1.6 degree); Natal, with 64.2 degrees, comes next, this temperature being 1.4 degree short of the normal; over the Free State there was a deficiency of 0.9 degree compared with the average (57.2 degrees); in the Cape Province, however, the temperature of the month (59.4 degrees) was 0.4 degree in excess of the normal. These differences in the case of the Transvaal and Free State were due to both days and nights being colder than usual: thus the mean maximum over the Transvaal (76.3 degrees) was 1.1 degree and the mean minimum (45.0 degrees) 2.1 degrees lower than the corresponding averages; in the Orange Free State the mean maximum (71.2 degrees) was 0.5 degrees and the mean minimum (41.5 degrees) 1.3 degree respectively below the corresponding normals. In Natal the mean maximum (75.2 degrees) was subnormal to the extent of 3.0 degrees, but the mean minimum (53.1 degrees) was supranormal by 0.2 degree. In the Cape Province these conditions were reversed, the days, with a mean of 72.5 degrees, being 0.9 degree higher, and the nights, with 45.3 degrees, being 0.2 degree lower than usual. A consideration of the individual stations shows that, with the exception of the Cape Peninsula, parts of the south-west, north-east, Kaffraria, and the northern border and the neighbourhood of Port Elizabeth, the mean monthly temperature was above normal by 1.0 to 3.0 degrees over the interior and west, and the excess decreasing to a few tenths of a degree in the east. Small excesses were also experienced in the south and east of the Free State and Bechuanaland, whilst a surplus of about a degree was registered in Zululand and Barberton in the eastern Transvaal. The deficits in the Cape Province were mostly of a few tenths of a degree, but increasing to 2.2 degrees at Vryburg (Bechuanaland); in the Free State, the shortages varied from 1 to 2½ degrees; in Natal, from 1 to almost 4 degrees; and in the Transvaal, where the deficits were mostly between 2 and 3½ degrees, they ranged from 0.1 degree at Komatipoort to 3.9 degrees at Louis Trichardt. In the Cape Province the days were warmer than usual, commonly by 2-3 degrees, over the more central and western parts, the north of the Transkei and of Bechuanaland; a similar excess occurred at stations in the south and east of the Free State, the east and extreme south-west of the Transvaal, also in Swaziland. In Zululand the days were normal. A deficiency in day temperatures was registered over the rest of the country, being greatest in the more northerly parts of the Union, particularly the north and south of Natal, the north and north-east of the Free State, and the central parts of the Transvaal. Night temperatures were also mostly lower than usual, except in the centre and west of the Cape Province, Zululand, and a few stations in the east and south of the Transvaal. The deficits in the majority of cases lay between a few tenths and 1 degree, but rose to 3 and 4 degrees in parts of the Transvaal, Free State, and Natal. The mean warmest station was Komatipoort (72.6 degrees), and the coolest Belfast (52.1 degrees), the difference amounting to 20.5 degrees. The highest mean maximum (88.4 degrees) was registered at Komatipoort, and the lowest mean minimum (35.1 degrees) at Belfast, showing a mean monthly range of 53.3 degrees over all stations. The fact of the occurrence of large and rapid fluctuations of temperature during the month is reflected by the highest maxima being recorded on fifteen days between the 6th and 30th, most widely on the 29th and 30th, whilst the lowest temperatures were noted on 13 days, viz., 1st, 3rd to 4th, 7th to 10th, 13th to 15th, 26th, and 27th, chiefly on 16th and 26th. The extremes for the month were 104.0 degrees at Komatipoort on the 26th, and 24.0 degrees at Belfast on the 13th, an extreme range of 80.0 degrees. Frosts were of wide occurrence, particularly after the snowstorm and on the 25th to 26th, when

considerable damage was caused to fruit and vegetables, etc., at Potchefstroom, Wakkerstroom, Lichtenburg, De Wittekranz, and Nantes (Ermelo), Rugby (Bethlehem), Verkykerakop (Harrismith), Ladysmith, Grootfontein (Middelburg, C.P.), Rietfontein (Aliwal North), Elma (Vryburg), etc.

Precipitation during the month was above the average over the south of the Transvaal (and Swaziland) by amounts varying from a few hundredths to over an inch; by similar quantities in the north-east and north-central parts of the Orange Free State; whilst over Natal, the surplus amounts were larger, ranging from slightly under an inch to about 3.0 inches. Along the south coastal area, eastwards from Capetown, the excess amounts were mostly about half an inch, but rising to 1.7 inch at Port St. Johns; small excesses were also met with in the more easterly portions of Kaffraria. Elsewhere the month's rainfall was short of the normal, usually by one-quarter to three-quarters of an inch. Showers occurred over the Cape Peninsula and the south-west, mainly during the first and third weeks; over the southern Karroo and parts of the west-central Karroo during the first week; and local light showers over the west and south coasts, the south-east, and Kaffraria, as well as parts of the east-central Karroo. Continuous drought was experienced over the northern Karroo, northern Border, Bechuanaland, and the greater part of the north-east and central Karroo. In Natal, rains occurred at intervals throughout the month. The most noteworthy feature, however, was a widespread snowstorm between the 7th and 9th, but reaching its greatest intensity on 8th and 9th. During this period snow fell over portions of a wide area extending roughly in a north-east direction from Capetown (Table Mountain) to the high veld of the Transvaal. The heaviest part of the storm would appear to have covered the middle and higher portions of Natal and the east of the Free State. The snow lay 8-10 inches thick over portions of the Free State, and in places drifted to several feet, causing heavy losses in stock in parts of the Transvaal, Free State, and Natal, considerable delays to trains, and interfering with road transport. In the Cape Province, snow fell on Table Mountain, at Robertson Plantation, Uniondale, the mountains in the neighbourhood of Prince Albert, parts of Graaff-Reinet, Middelburg, Fort Beaufort, Stockenstrom, Wodehouse, Albert. Xalanga, Mount Frere, and Mount Ayliff. In Natal, snow occurred in the divisions of Ladysmith (Klip River), Umvoti, Estcourt, Mooi River, Lion's River, Helpmakaar, and Nkandhla; in the Free State snow was heavy in the Districts of Bethlehem, Frankfort, Harrismith, Heilbron, and Vrede, and to a lighter extent in Ficksburg, Ladybrand, Lindley, and Senekal, with slight falls in parts of Thaba 'Nchu, Bloemfontein, Bethulie, Philippolis, Edenburg, Vredefort, and Rouxville. Over the Transvaal, general rains occurred on the 8th and 9th, precipitation assuming the form of snow in the Districts of Bethal, Carolina, Ermelo, Standerton, and to a less extent in those of Heidelberg, Potchefstroom, Piet Retief, Middelburg, Wakkerstroom, and Witwatersrand. Over portions of the area affected considerable losses in stock (large and small) occurred as a result of the accompanying and subsequent cold weather, although the cold was not so intense as after the snowstorm of June, 1902. In this connection, the following extract from a letter dated Harrismith, 8th October, 1853, given in an old Cape Year Book, will serve to show that wintry weather has occurred later than that of the 8th to 9th September of this year: "We have had awful weather here for South Africa. It snowed for three nights and two days, and blew a gale of wind for four whole days from S.E. The snowdrifts were nine or ten feet deep in many places. Although the snow began to fall on the 22nd September, it has not yet melted on the hills. The rivers are all overflowing. Thousands and thousands of game are lying dead, also hundreds of cattle. A poor young man, of the name of Hiscock, was drowned in the Wilge River on Monday morning last (3rd October)."

The snowstorm of this month was associated with a vigorous high-pressure area, apparently moving from south-west to north-east, following in the wake of a low, the rear isobars (29.90 inches) of which just skirted the south-east and east coasts on the 6th and 7th. Fortunately, the gradient had decreased considerably on the 9th, and still more on the 10th, so that the strong, bitterly cold southerly winds which frequently follow these storms were practically absent, although the low temperature on the 9th killed considerable quantities of fruit. The distribution of snow on the present occasion would appear to have been controlled mainly by the orographic features of the country, the greatest depths being reported in the neighbourhood and on the slopes of the Drakensbergen.

Scattered showers also occurred over the Orange Free State between the 21st and 23rd.

With the exception already noted, precipitation was below the average over the Cape, the west and south of the Free State, and the central and the northern portions of the Transvaal, as well as its extreme south-west. Hail was noted as occurring at several stations in the west and south-west of the Cape Province. The accumulated rainfall since the beginning of the year is above the normal, except over a belt extending from the eastern Transvaal through the east of the Orange Free State and west of Natal, and those portions of the Cape bordering the south and west of the Free State. In several instances the shortages are large, e.g. 7.03 inches at Barberton and 5.76 inches at Ermelo, decreasing southwards to 0.37 inch at Aliwal North, and increasing to 1-2 inches to the west of the Orange Free State. On the other hand, the accumulative precipitation since the 1st July is in excess over limited areas, extending from Calvinia south-east to Knysna and westwards to the coast, the greater portion of Natal and Zululand (the exceptional area here being the north-west), the north centre of the Free State, and a few stations in the Transvaal between Komatipoort and Potchefstroom, as well as the neighbourhood of Piet Retief. Except in the south-west of the Cape and a few favoured areas in Natal and the Transvaal, additional rain was anxiously looked for, the grass in the veld, although showing green, being very slow in growth, and pasturage consequently scanty. The frosts on the 9th, 25th to 26th caused considerable damage to fruit, in some cases destroying all hopes of peach crops.

OBSERVERS' NOTES FOR SEPTEMBER, 1921.

TRANSVAAL.

Barberton.—Violent windstorms and rapid alterations of temperature have occurred during the month. The country is now very dry, and rain is badly needed. Rainfall: 0.54 inch on two days.—Walter Grubb.

Ermelo.—Unusual and irregular temperatures; cattle still starving and wretchedly low in condition. Extreme temperatures during the month have been a prevailing feature. From below freezing point to height of temperatures reached in January only have caused much illness in this usually healthy part. The snow only aggravated a very unbearable meteorological condition. Rainfall: 0.77 inch on two days.—Mrs. S. M. Nicolson.

Middelburg.—Hot, sultry weather became more hot each day, culminated in a sudden change on the evening of the 7th and the following two days, fine rain falling at the same time. The cold was accentuated by the wet, and losses of stock, at the time in poor condition, have been considerable in the surrounding districts. Hot weather soon returned, and, as is usual, continued until the end of the month. Rainfall: 0.10 inch on two days.—Dr. H. A. Spencer.

Pietersburg.—Very dry; rain badly needed. Rainfall: Nil.—W. J. Frankleyne.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), SEPTEMBER, 1921.

PLACE.	Observer.	Month—Sept., 1921.		Normal Monthly Temperature.	Differ- ence from Normal.	Extremes.			
		Mean Max.	Mean Min.			Highest.	Date.	Lowest.	Date.
<i>Trompsburg—</i>									
Beitart.....	The Forester.....	69.1	35.1	55.7	— 3.0	84.0	29th.....	24.0	13th.
Barboston.....	W. Grubb.....	80.4	67.8	60.6	+ 1.2	96.0	24th.....	45.0	10th.
Bloemhof.....	A. Adamsen.....	79.2	61.4	61.8	— 0.4	94.0	30th.....	29.0	10th.
Brenth.....	Mrs. S. M. Nicolson.....	73.1	40.9	58.0	— 1.6	86.0	20th.....	20.0	13th.
Johannesburg (Observatory).....	The Staff.....	69.6	47.3	58.4	— 0.7	83.0	28th.....	31.8	10th.
Kiarkstad (Strathmore).....	Gus, Scott.....	76.5	43.1	63.3	— 3.5	90.0	28th & 30th.....	30.0	26th.
Komatipoort.....	H. J. Evans.....	88.1	58.2	72.7	— 0.1	104.0	24th.....	45.0	1st.
Louis Trichardt.....	L. J. de Bruin.....	75.8	48.1	60.0	— 3.9	93.0	26th.....	39.0	1st & 14th.
Middelburg.....	Dr. H. A. Spencer.....	75.0	41.6	60.2	— 1.9	87.0	29th.....	32.0	10th & 13th.
Nyctroom.....	G. Bakker.....	79.0	41.3	64.5	— 0.5	93.0	29th.....	45.0	13th & 15th.
Pilgrims Rest.....	E. M. Skea.....	75.0	44.4	60.5	— 2.0	90.0	23rd.....	30.0	1st.
Pietermaritzburg.....	W. J. Franklynne.....	75.4	46.2	62.8	— 0.0	88.0	28th.....	36.0	14th.
Potchefstroom (Exp. Farm).....	The Manager.....	77.8	42.8	61.1	— 0.8	91.0	28th.....	30.0	20th.
Pretoria (Meteorological Office).....	The Staff.....	75.0	47.2	63.4	— 2.3	86.8	29th.....	38.8	10th.
Pieter Retief.....	J. Werner.....	72.7	46.0	60.9	— 1.1	88.0	7th.....	36.0	36th & 10th.
Standerton.....	M. Ferguson.....	72.1	39.2	56.6	— 1.0	86.1	29th.....	23.2	10th.
Zeerust.....	H. Dietrich.....	78.4	44.5	63.4	— 2.0	91.0	29th.....	35.2	14th.
<i>Swaziland—</i>									
Mbabane.....	Swaziland Police.....	73.8	48.7	61.2	— 0.0	91.0	24th.....	37.0	13th.
<i>Orange Free State—</i>									
Bloemfontein.....	G. A. Schepers.....	72.6	43.3	59.1	— 1.1	89.2	29th.....	31.4	26th.
Bethulle.....	J. J. Wardhaugh.....	74.3	42.7	58.5	— 0.3	84.0	28th & 30th.....	32.0	26th.
Radnor.....	The Forester.....	65.4	46.9	54.6	— 1.4	78.0	28th & 29th.....	27.0	10th.
Lindley.....	J. Collister-Oates.....	72.7	40.0	59.0	— 2.0	83.8	29th.....	29.7	14th.
Ladybrand.....	The Forester.....	71.1	40.5	55.8	— 0.6	82.0	29th.....	30.0	20th.
<i>Natal—</i>									
Durban (Pointe).....	The Port Captain.....	72.0	53.4	67.6	— 1.9	79.8	7th.....	50.2	10th.
Dundee.....	West Thorrild.....	73.7	44.1	63.0	— 4.1	89.0	6th.....	25.0	10th.
Haynes.....	The Gaoler.....	77.0	57.4	66.7	— 1.0	92.0	6th.....	48.0	9th.
Maitzberg (Mental Hospital).....	The Staff.....	77.0	51.1	65.2	— 1.0	94.0	6th.....	38.0	10th.
<i>Cape—</i>									
Alwal North.....	A. Alcock.....	73.3	40.7	56.7	— 0.3	84.0	28th.....	29.0	26th.
Bedford.....	T. C. Hall.....	72.3	45.3	58.8	— 0.2	90.7	18th.....	32.0	26th.
Carnarvon.....	A. P. Malherbe.....	74.5	40.2	54.2	— 3.2	85.0	30th.....	30.0	10th.
Cape Town (Royal Observatory).....	The Staff.....	65.2	49.0	57.1	— 0.1	83.0	12th.....	39.0	3rd.
Claarwater.....	W. J. Downes.....	78.0	43.0	59.6	— 1.8	95.0	13th, 15th, & 18th.....	32.0	8th.
East London.....	The Port Captain.....	70.9	54.0	61.8	— 0.0	97.0	20th.....	46.0	8th, 9th, & 10th.
<i>Transvaal—</i>									
Graaff-Reinet.....	S. E. D. Treadwell.....	77.2	49.0	60.1	— 3.0	93.7	18th.....	33.4	9th.
Groot Drakenstein.....	Lionel Baker.....	68.8	46.3	58.3	— 0.7	86.2	12th.....	36.9	4th.
Kokstad.....	H. D. Coyle.....	70.7	42.0	56.8	— 0.4	85.0	19th.....	30.0	10th.
Kimberley.....	J. Acton.....	79.2	44.0	62.4	— 0.4	93.0	30th.....	33.0	23th.
Maifeking (Convent).....	The Mother Superior.....	80.4	45.0	63.2	— 0.5	91.8	29th.....	32.0	9th.
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	64.8	52.0	58.4	— 0.0	88.0	13th.....	42.0	7th & 8th.
Murraysburg.....	A. Cameron.....	72.5	37.3	53.6	— 1.3	85.0	30th.....	25.0	9th.
O'okiep.....	J. Burrows.....	73.3	48.8	63.8	— 2.2	87.2	18th.....	33.3	8th.
Port Elizabeth.....	The Lightkeeper.....	65.5	51.8	59.7	— 1.1	89.0	13th.....	43.0	8th.
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	70.4	57.7	64.0	— 0.0	94.0	17th.....	48.0	9th & 27th.
Queenstown.....	H. Holley.....	72.2	42.7	58.2	— 0.8	86.0	17th, 18th, & 19th.....	29.0	26th.
Vryburg.....	C. Butler.....	70.6	41.4	62.7	— 2.2	94.0	30th.....	29.0	26th.
Wynberg (Convent).....	The Mother Superior.....	67.2	47.4	58.2	— 0.0	83.0	13th.....	40.5	4th.

RAINFALL, SEPTEMBER, 1921.

PLACE.	OBSERVER.	Month.	Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.	
		Sept., 1921.									
<i>Transvaal—</i>											
Barberton.....	W. Grubb.....	Inches, 0.54	Inches, 0.90	- 0.36	Inches, 15.66	Inches, 22.60	- 7.03	Inches, 0.54	Inches, 1.75	- 1.21	
Belfast.....	The Forester.....	0.73	0.96	- 0.23	20.43	18.67	+ 1.76	0.73	1.52	- 0.79	
Bethal.....	H. F. Joubert.....	0.70	0.55	+ 0.15	21.51	16.08	- 5.43	0.70	1.21	- 0.51	
Bloemhof.....	A. Adamson.....	0.96	0.96	- 0.00	13.51	13.86	- 0.35	0.96	1.36	- 0.40	
Claremont.....	S. A. Poller.....	0.98	0.95	+ 0.03	13.76	11.87	+ 2.89	0.98	0.40	+ 1.58	
Ermelo.....	Mrs. S. M. Nicolson.....	0.77	0.74	+ 0.03	10.55	16.31	- 5.76	0.77	1.32	- 0.55	
Haerertsburg.....	S. A. Polire.....	0.59	0.97	- 0.38	30.89	28.64	+ 2.25	1.02	1.85	- 0.83	
Heidelberg.....	W. A. ter Horst.....	0.62	0.84	- 0.22	19.78	16.34	+ 3.44	0.62	1.52	- 0.90	
Johannesburg (Observatory).....	The Staff.....	1.67	0.80	+ 0.87	18.63	16.41	+ 2.22	1.67	1.41	+ 0.26	
Klerksdorp (Strathmore).....	C. Scott.....	0.83	0.49	+ 0.34	17.62	14.65	+ 2.97	0.83	0.88	- 0.05	
Komatipoort.....	H. J. Evans.....	1.03	0.46	+ 0.57	16.60	18.02	- 1.42	1.14	4.08	- 2.94	
Louis Trichardt.....	I. J. de Bruin.....	0.51	0.54	- 0.03	25.97	20.68	+ 5.29	1.30	1.38	- 0.08	
Middelburg.....	Dr. H. A. Spencer.....	0.16	0.32	- 0.16	16.02	16.00	+ 0.02	0.16	0.91	- 0.75	
Nylstroom.....	G. Bakker.....	0.00	0.57	- 0.57	23.05	14.09	+ 8.96	0.00	1.02	- 1.02	
Pieterburg.....	W. J. Frankleyne.....	0.00	0.30	- 0.30	14.12	12.91	+ 1.21	0.00	0.74	- 0.74	
Piet Retief.....	F. Werner.....	1.12	1.12	- 0.00	23.27	17.30	+ 5.97	2.33	1.89	+ 0.44	
Pilgrims Rest.....	E. M. Skoa.....	1.01	1.02	- 0.01	26.20	28.31	- 2.11	1.13	1.88	- 0.75	
Potchefstroom (Exp. Farm).....	The Manager.....	1.25	0.65	+ 0.60	26.17	14.03	+ 12.14	1.25	1.04	+ 0.21	
Pretoria (Meteorological Office).....	The Staff.....	0.90	0.38	+ 0.52	17.94	18.05	- 0.11	0.90	0.99	- 0.09	
Roosburg.....	N. H. Muaro.....	0.00	0.24	- 0.24	19.48	15.10	+ 4.38	0.00	1.16	- 1.16	
Rustenburg.....	S. A. Polire.....	1.22	0.36	+ 0.86	22.08	16.18	+ 5.90	1.22	1.27	- 0.05	
Standerton.....	M. Ferguson.....	0.73	0.73	- 0.00	16.48	16.98	- 0.50	0.80	1.55	- 0.75	
Wakkerstroom.....	L. de Bank.....	0.73	0.92	- 0.19	16.48	19.07	- 2.61	0.73	1.99	- 1.26	
Woodbush.....	The Forester.....	1.60	1.62	- 0.02	62.18	50.39	+ 11.79	2.30	3.40	- 1.10	
Zeerust.....	H. Dietrich.....	0.00	0.30	- 0.30	18.05	13.71	+ 4.34	0.00	0.74	- 0.74	
<i>Swaziland—</i>											
Mbabane.....	Swaziland Police.....	2.39	1.04	+ 1.35	37.83	31.75	+ 6.08	2.88	2.89	- 0.01	
<i>Orange Free State—</i>											
Bethlehem.....	J. J. Warthaugh.....	0.13	0.73	- 0.60	17.08	13.53	+ 3.55	0.23	1.57	- 1.34	
Buena Vista.....	G. A. Schepers.....	0.60	0.65	- 0.05	17.04	13.04	+ 4.00	0.60	1.45	- 0.85	
Harrismith.....	The Forester.....	1.11	0.83	+ 0.28	13.11	16.72	- 3.61	1.11	1.86	- 0.75	
Kroonstad.....	S. E. Northfield.....	0.77	0.88	- 0.11	13.91	12.93	+ 0.98	0.77	2.25	- 1.48	
Ladybrand.....	The Forester.....	0.81	1.64	- 0.83	17.52	17.85	- 0.33	0.81	2.40	- 1.59	
Lindley.....	J. Collister-Oates.....	1.92	0.89	+ 1.03	16.80	15.49	+ 1.31	1.92	1.03	+ 0.89	
<i>Natal—</i>											
Dundee.....	West Thorrild.....	2.70	1.21	+ 1.49	16.62	20.04	- 3.42	2.70	2.00	+ 0.70	
Durban (Point).....	The Port Captain.....	3.95	2.56	+ 1.39	31.01	26.82	+ 4.19	4.07	4.63	- 0.56	
Edburg.....	The Gaoler.....	3.20	2.42	+ 0.78	30.07	26.52	+ 3.55	3.96	4.13	- 0.17	
Howick.....	The Gaoler.....	3.20	1.74	+ 1.46	21.50	20.47	+ 1.03	3.06	2.74	+ 0.32	
Ladysmith.....	D. A. R. Leatham.....	3.14	0.81	+ 2.33	14.42	17.71	- 3.29	3.14	1.61	+ 1.53	
Pietermaritzburg (Mental Hospital).....	The Staff.....	3.90	1.80	+ 2.10	23.19	21.54	+ 1.65	4.53	2.93	+ 1.60	
Urbeld.....	The Gaoler.....	2.29	1.44	+ 0.85	18.65	22.36	- 3.71	2.29	2.46	- 0.17	
Wesden.....	The Gaoler.....	2.57	0.68	+ 1.89	19.10	16.38	+ 2.72	2.57	1.70	+ 0.87	

RAINFALL, SEPTEMBER, 1921 (continued).

STATION.	OBSERVER.	Month.		Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.	
		Inches.	Sept., 1921.									
<i>Cape—</i>												
Altwal North.....	A. Aleock.....	0.16	0.80	0.73	0.73	14.79	19.16	0.37	0.10	2.04	1.85	
Beaufort West.....	The Gaoler.....	0.26	0.71	0.45	0.45	14.60	7.20	1.73	0.34	1.27	0.93	
Bedford.....	T. C. Hall.....	0.58	1.05	1.37	1.37	69.94	79.57	1.07	1.47	2.84	2.37	
Britstown.....	The Gaoler.....	0.00	0.62	0.62	0.62	18.95	8.90	0.96	0.12	1.01	0.80	
Calvina.....	The Gaoler.....	0.35	0.62	0.27	0.27	13.86	6.60	0.75	2.79	2.31	0.45	
Capetown (Royal Observatory).....	The Staff.....	2.88	2.26	1.62	1.62	23.35	21.89	1.46	11.17	9.24	1.93	
Ceres.....	A. Heatlie.....	3.34	4.16	0.82	0.82	59.37	34.29	25.08	21.81	19.87	1.94	
Carnarvon.....	A. P. Matherbe.....	0.40	0.27	0.27	0.27	11.67	6.54	5.13	9.77	9.77	0.74	
Clanwilliam.....	Mrs. W. J. Downes.....	0.16	0.78	0.62	0.62	11.81	7.41	3.63	3.80	3.18	0.12	
East London.....	A. Downie.....	2.52	3.23	0.71	0.71	20.03	23.20	3.17	1.27	0.41	2.14	
Fraserburg.....	The Gaoler.....	0.00	0.33	0.33	0.33	72.15	5.50	6.65	0.26	0.92	0.66	
Garies.....	The Gaoler.....	0.36	0.38	0.12	0.12	7.40	4.52	2.87	1.70	2.08	0.20	
Graaf-Reinet.....	S. K. D. Treadwell.....	0.20	3.26	0.14	0.14	10.83	30.22	9.87	16.17	13.31	1.86	
Groot Drakenstein.....	Linnel Baker.....	0.13	0.37	0.24	0.24	40.00	10.20	1.69	0.13	0.86	0.73	
Gripatown.....	The Gaoler.....	0.00	0.62	0.62	0.62	9.39	10.40	1.01	0.04	0.04	1.28	
Harover.....	The Gaoler.....	0.00	0.44	0.44	0.44	10.66	9.78	0.88	0.00	0.93	0.63	
Hopetown.....	The Gaoler.....	0.00	0.20	0.20	0.20	4.26	4.78	0.67	0.00	0.46	0.46	
Kezhardt.....	The Gaoler.....	0.00	0.57	0.57	0.57	10.42	11.33	1.11	0.00	1.00	1.00	
Kimberley.....	J. Acton.....	0.60	2.08	0.53	0.53	24.80	21.17	3.69	8.08	7.87	0.21	
Kynsna.....	The Gaoler.....	1.40	1.36	0.04	0.04	17.59	17.58	0.01	1.72	2.20	0.48	
Kobstad.....	H. D. Coyte.....	0.00	0.50	0.50	0.50	11.61	12.30	0.69	0.00	0.98	0.98	
Kuruman (Abonia).....	A. T. Sitwell.....	0.00	0.50	0.50	0.50	20.53	14.21	6.32	0.62	1.02	1.00	
Mafeking (Convent).....	Mother Superior.....	1.01	1.71	0.70	0.70	13.53	13.18	0.35	3.20	4.43	1.23	
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	0.06	0.63	0.57	0.57	10.21	8.66	1.55	0.22	1.22	1.00	
Murraysburg.....	A. Cameron.....	0.25	0.61	0.36	0.36	10.07	6.26	3.81	2.01	2.19	0.18	
O'okiep.....	J. Burrows.....	0.00	0.65	0.65	0.65	8.07	10.40	2.33	0.02	1.16	1.14	
Phillipstown.....	The Gaoler.....	1.95	2.26	0.31	0.31	22.00	17.55	4.45	8.76	7.91	0.85	
Piquetberg.....	The Gaoler.....	2.87	2.82	0.05	0.05	18.87	16.22	2.65	6.16	6.36	0.20	
Port Elizabeth.....	J. H. Allen.....	3.53	4.26	0.73	0.73	20.54	31.50	1.06	0.54	7.10	6.56	
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	0.00	0.97	0.97	0.97	8.01	7.82	0.19	0.02	0.59	0.57	
Prieska.....	The Gaoler.....	0.42	0.72	0.30	0.30	15.65	14.91	0.74	0.35	2.11	1.76	
Queenstown.....	H. Holley.....	0.30	0.68	0.38	0.38	7.43	6.76	0.67	0.61	1.36	0.72	
Steytierville.....	The Gaoler.....	0.88	1.80	0.92	0.92	13.01	7.72	5.29	2.62	2.36	0.26	
Sutherland.....	The Gaoler.....	3.41	2.84	0.57	0.57	29.80	23.82	5.98	7.68	7.30	0.38	
Swellendam.....	The Gaoler.....	0.88	1.80	0.92	0.92	18.80	17.76	1.04	0.97	3.10	2.13	
Umtata.....	A. Dispeck.....	0.55	1.38	0.83	0.83	12.81	10.56	2.25	2.08	3.50	1.31	
Uniondale.....	The Gaoler.....	0.00	0.17	0.17	0.17	8.63	5.37	3.26	0.02	0.34	0.32	
Upington.....	The Gaoler.....	0.00	0.51	0.51	0.51	10.82	8.07	2.75	0.65	1.06	0.41	
Victoria West.....	The Gaoler.....	0.00	0.36	0.36	0.36	16.27	13.60	2.67	0.00	0.77	0.77	
Vryburg.....	C. Butler.....	0.36	1.31	0.95	0.95	13.12	10.55	2.57	4.53	4.65	0.12	
Worcester.....	The Gaoler.....	3.82	4.88	1.06	1.06	42.20	40.40	1.80	18.30	19.61	1.31	
Wynberg (Convent).....	The Mother Superior.....	0.00	0.01	0.01	0.01	16.95	23.13	6.18	0.00	0.07	0.07	
<i>South-West Africa—</i>												
Toumeh.....	Ing. Schettler.....	0.00	0.08	0.08	0.08	24.43	15.99	8.44	0.00	0.10	0.10	
Waterberg.....	D. Hahn.....	0.00	0.07	0.07	0.07	4.23	3.37	0.86	0.00	0.07	0.07	
Usakos.....	Missionary Biehl.....	0.00	0.06	0.06	0.06	12.37	11.05	1.32	0.00	0.01	0.01	
Windhoek.....	Observatory.....	0.00	0.00	0.00	0.00	4.45	4.63	0.18	0.00	0.01	0.01	
Mariental.....	Baron T. Esbeck.....	0.00	0.01	0.01	0.01	3.82	3.63	0.19	0.01	0.01	0.01	
Hehrachabis.....	Peter Prefect.....	0.00	0.01	0.01	0.01	3.82	3.63	0.19	0.01	0.01	0.01	

Potchefstroom (Exp. Farm).—Frost on night of 25th, doing considerable damage to vegetables, and particularly Keiffer and Magnate pears, apricots, and peaches; certain amount of damage done to vines and wheat crop. Rainfall: 1.25 inch on two days.—The Manager.

Jakhalsfontein (Pietersburg).—High winds with duststorms were a leading feature of the month. The latter part had many cloudy, overcast days, with high, cold winds, but no rain. Rainfall: Nil.—Rev. James C. Palmer.

Standerton.—The first seven days of the month were very hot and dry. This was followed by a sudden drop in the temperature, and snow fell on the night of the 8th and all day on the 9th. During the rest of the month the weather was very changeable, high winds with much dust being very frequent. The prospects of rain were many times promising, but always ended in disappointments. The snowfall near the beginning of the month was beneficial to the veld and agriculture generally, but good soaking rains are urgently needed. Rainfall: 0.80 inch on two days.—M. Ferguson.

Rustenburg.—Splendid steady rain fell on 9th, refreshing everything, but more is now required; the young grass that was started by the rain requires more or else will wither up. Crops looking splendid, and water plentiful in some places. Harvesting has commenced, and good results are expected. On a large number of farms the grass has been burnt off, and in some places there is consequently no grass for cattle. Rainfall: 1.22 inch on three days.—Sergt. H. J. Streatfield.

Wakkerstroom.—Grass coming on slowly; rain needed again. The snow (10 inches) on the 8th and 9th helped, though numbers of stock died. The heaviest individual loss, I heard, was thirty head of cattle on the town lands. The very severe frost after the snow killed the late peach blossoms. Cattle not in good condition, and one might expect to hear of "stick-in-the-mud" cases. No diseases. Rainfall: 0.73 inch on three days.—Louis le Roux.

Lichtenburg.—Veld drying up; rain needed; frost on 26th; slight damage to fruit and early vegetables. Rainfall: Nil.—J. T. Allman.

Mosdene (Naboomspruit).—One of the most favourable Septembers we have had, and live stock of all descriptions are keeping in good condition. Owing to good late summer rains, there is plenty of grass, and grazing continues good. The mean of the maximum and minimum temperatures was both 5 degrees cooler than last September. Rainfall: 0.06 inch on one day.—E. E. Galpin.

Krugersdorp.—The weather opened out fine with warm days, followed by overcast skies with rain during the early morning of the 7th. Soaking rains fell on the 8th and 9th, when temperatures dropped somewhat rapidly; very heavy frost on 10th; maximum temperature for the month, 82.9 on 29th; veld very dry; early crops promising. Rainfall: 1.15 inch on four days.—George S. Garnett.

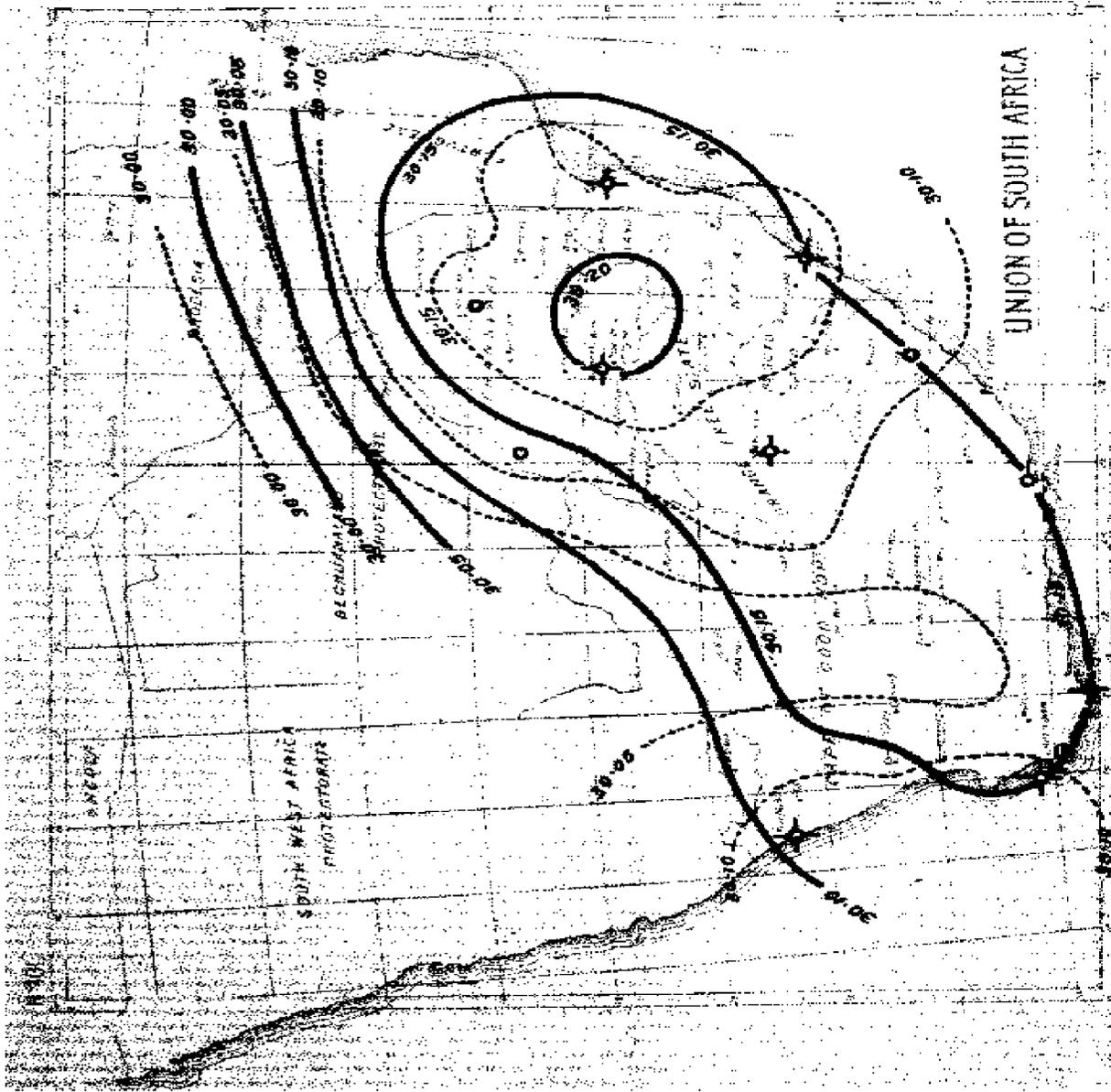
Waterval Boven.—Getting very dry. Rainfall: 1.0 inch on two days.—J. G. Berry.

Davel (Bethal).—Very dry; rain much needed. Rainfall: 1.02 inch on two days.—H. A. Wollenberg.

De Wittekranz (Ermelo).—All fruit early in bloom was damaged by frost after snowfall, 8th to 9th; no peaches this season. Rainfall: 1.06 inch on two days.—M. E. Jooste.

Nantes (Ermelo).—9th: From 2 a.m. to 6 p.m. snow with cold S.W. wind; average depth of snow in open veld, 8 inches; losses in large and small stock reported; very heavy frost after snow, 11th, 12th, 13th, and 14th, and cold winds doing considerable damage to fruit blossoms and new grass. Rainfall: 1.32 inch on two days.—F. W. Siemsen.

Rooskoppen (Standerton).—Snow 8th and 9th, lying about 4-5 inches deep; heavy frosts for several nights after snow; no losses among stock locally. Rainfall: 1.10 inch on two days.—J. Wilson.



September, 1921. Prevailing Winds and Mean Atmospheric Pressure at 8.50 a.m.
 The dashed lines indicate the normal distribution for September.

Klapplaatdrift (Standerton).—9th: Snow 9 a.m. to 4 p.m. Rain is badly needed for stock and crops. Rainfall: 0.75 inch on one day.—I. C. Swemmer.

Maquabie (Wakkerstroom).—Snow on 8th and 9th; no losses in stock. Rainfall: 0.88 inch on two days.—C. Taylor.

Keerom (Waterberg).—Rain badly wanted. Rainfall: 0.09 inch on one day.—D. A. de V. Wolhuter.

ORANGE FREE STATE.

Hoffontein (Kroonstad).—Slight frost on 14th, but not much damage; winds variable and strong. Rainfall: 0.93 inch on three days.—G. W. Muller.

Glen (School of Agriculture).—Heavy winds have been a common occurrence this month.—The Manager.

Kleinfontein (Bethlehem).—Considerable losses in large and small stock caused by cold wind and snow (8th, 9th). Rainfall: 2.65 inches on four days.—J. J. Viljoen.

Rugby (Bethlehem).—On 8th and 9th snow fell continuously for twenty-four hours, and lay for four days. Patches on the hillsides lay until the 24th, when the last snow disappeared. Average depth in the open, 8 inches. In places the snow drifted to five feet in depth, and caused heavy losses in stock all through the district. Losses in horned stock, as far as can be ascertained, totalled four thousand, and in sheep five thousand. There was bright sunshine from 4 p.m. to sunset on the 9th, which undoubtedly saved much stock. There was a sharp frost on night of 9th, which destroyed all fruit blossom. Rainfall: 0.75 inch on two days.—A. C. Glynn-Baker.

Bieskop (Frankfort).—Snow 8th and 9th; heavy losses of stock reported throughout the district. We had a fall of 7 inches for twenty-four hours. Rainfall: 1.43 inch on three days.—J. W. Jeffries.

Lincolnshire (Harrismith).—Heavy snowstorm 8th and 9th; fifty-six head of cattle died here; also forty sheep; neighbours also suffered losses. Rainfall: 1.75 inch on two days.—W. Bentum.

Rosedale (Harrismith).—8th and 9th: Snow; considerable losses in both large and small live stock. Rainfall: 0.97 inch on three days.—H. J. Immink.

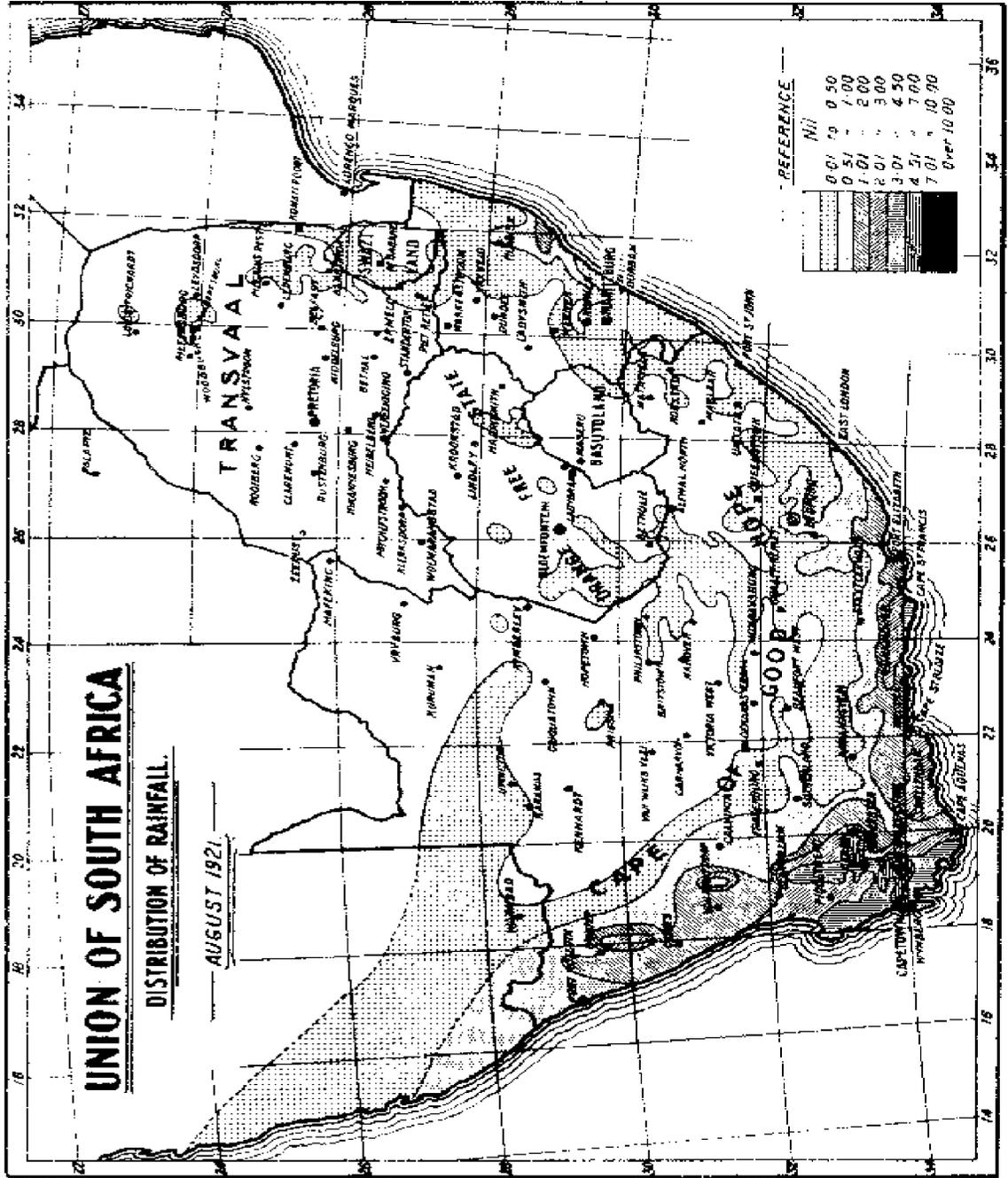
Verkekerskop (Harrismith).—Snow fell from 10 p.m. on 7th to 6 p.m. on 9th; strong winds and bitterly cold; heavy drifting of snow, and heavy death-rate amongst cattle; damage to fruit blossom, and trees badly broken by weight of snow. About 18 inches of snow fell, but not easily measured, owing to much drifting. Rainfall: 2.45 inches on three days.—M. Comrie.

Stanleydale (Harrismith).—8th and 9th: Snow an average depth of 8 inches on veld; very heavy losses of cattle and sheep through the snow and after-effects. Grass now growing fine, stock picking up, and ploughing in full swing. Rainfall: 1.27 inch on four days.—G. C. Atkins.

Heilbron.—8th-9th: Heaviest snowstorm in this district for eighteen years. Losses of cattle in district exceptionally heavy, owing mostly to lack of suitable shelter—no sheds nor windbreaks. On town lands sixteen head of cattle were lost for the same reason. Stock diseases for the month nil, and stock in fair condition, notwithstanding the very severe winter just passed through. Rainfall: 0.73 inch on three days.—P. A. du P. Naudé.

Deo Drop (Heilbron).—Heavy snowstorm on 8th-9th; it was bitterly cold, and hundreds of cattle succumbed to the cold. It is estimated that the District of Heilbron lost between three and four thousand head of cattle. Rainfall: 1.06 inch on three days.—W. M. Leonard.

Commando Drift.—A few lambs and poor cattle died through the extremes of the weather. Some days were very cold, and some very warm. Rain is badly needed. Rainfall: Nil.—P. Treiby.



Erfdeel (Senekal).—8th and 9th: Very cold rains with strong winds; in other districts, much snow and extreme cold, resulting in the death of considerable numbers of stock. The drought has not yet been broken in this district. The grass is green, but very short, and stock are very thin. Owing to the drought, the wheat crop is not promising. Rainfall: 1.32 inch on four days.—S. J. Smit.

Gordonia (Senekal).—8th: Fine snow during the night; cattle suffered heavily. Rainfall: 1.17 inch on two days.—G. G. Tricgaardt.

Prospect (Vrede).—The snow in this neighbourhood lay to a depth of 2 inches on the level—much deeper where drifted. Very few stock died from the result. It was most fortunate that the days following the snow were mild and warm. By the end of the month the veld had come on nicely, but rain would now do much good. Some farmers are ploughing; stock in good condition. Rainfall: 0.95 inch on four days.—T. Pitcairn.

Woudzicht (Vrede).—The month started with warm days, which altered suddenly on the night of the 6th. Rain fell during the night of the 7th, and was followed next day by a heavy snowstorm. The extreme cold caused many cattle and sheep to perish. Rainfall: 0.60 inch on three days.—J. N. Kohler.

Paardekraal (Winburg).—Rainfall: 0.97 inch on four days. Chilly weather on 8th and 9th; lambing good; sheep good, with promise of excellent strong clip; cattle all healthy, with good skins. Grass started growing at beginning of month, but was going off at end of month.—G. S. Lowe.

NATAL.

Point (Durban).—Fog on two days, 6th and 19th; very little thunder or lightning; hot wind on 23rd; generally windy; large amount of dew. Rainfall: 3.95 inches on twelve days.—The Port Captain.

Dundee.—The special feature of this month's report is, of course, the heavy snowstorm which commenced on the morning of the 8th, after a night's rain, continuing practically for thirty-six hours, the fall of snow exceeding that of the famous blizzard in 1905.* The damage to live stock in the district has been rather severe, and damage to many plantations still more severe. Rainfall: 2.70 inches on three days.—West Thorrold.

Hlabisa.—Nice rains have fallen during the month; weather very changeable, hot winds and cold snaps alternating, which have not been favourable to agriculturists. Rainfall: 5.35 inches on twelve days.—L. Double.

Newcastle (Convent).—The month was very windy, and the weather was alternately hot and cold.—The Mother Superior.

Ludysmith.—Since the snowstorm on the 8th and 9th, strong winds have been prevalent; heavy clouds have passed over on several occasions; rain is needed. Country is looking well, having been well watered by the snow. Early fruit crop ruined by cold. Rainfall: 3.14 inches on six days.—D. A. R. Leathern.

* "On the night of 31st May and early morning of 1st June, 1905, we had a severe snowstorm; at sunset the sky was clear, and it appeared to threaten a severe frost, but just after sunset clouds rapidly came up, and by 7 o'clock heavy rain commenced, and continued heavily until about 11 p.m., when it turned to snow, the ground rapidly becoming white; a heavy south-westerly gale was blowing at the time. In the morning, the country for miles wore a beautiful white aspect, and a terrific gale was still raging, with slight lull. Our trees and hedges were almost completely hidden with snow, most of our large trees were broken at the tops, and the side cypress hedge completely broken down. Rain-gauge was so heaped up (conical shape) with snow that it is difficult to say what the real fall was. The storm generally has been recorded as the most severe experienced in Natal. Much loss of stock from different parts, especially Greytown way."

Port Shepstone.—The weather conditions have been very changeable, most unsettled, and very windy. After the splendid rains during the month, the veld and hillsides are now looking nice and green. Rainfall: 4.82 inches on twelve days.—E. K. Andreassen.

Howick.—Fair amount of rain; weather very changeable during the month. Rainfall: 3.20 inches on nine days.—F. Nichols.

Vryheid.—Snow fell on the 9th and 10th, alternate weather since; strong north-westerly winds, which have dried up everything. Rainfall: 2.29 inches on five days.—C. A. Meyer.

Estcourt.—9th: Snow on hills to four miles south and east; no fall in town; heavy losses of stock during blizzard in district; rains on 9th and 10th beneficial to veld, and stock improving, but rain again required. Rainfall: 2.0 inches on three days.—A. A. McLean.

Edendale (Klip River).—At 6 a.m. on 8th snow commenced to fall heavily, and continued without a break until 4 p.m. on the 9th, when the ground was covered to a depth of about 2 feet 6 inches all over. The loss in cattle, big sheep, and lambs was very heavy in this area. Snow did not melt until the 13th, but the days following the snow were beautifully warm. Rainfall: 5.15 inches on three days.—T. N. Niland.

Mfongosi (Nkandhla).—On 8th and 9th, heavy snowfall on surrounding mountain. Much loss in cattle and small stock. Rainfall: 3.87 inches on five days.—W. E. Jones.

Sutherland (Helpmakoar).—Heavy snowstorm (7th to 9th), which caused great loss in stock. Rainfall: 3.56 inches on three days.—A. Muller.

CAPE.

Graaff-Reinet.—Snow on mountains on 8th; winds moderate; summer heat on the 18th, minimum temperature, 72.2 degrees. Rainfall: 0.44 inch on five days.—S. E. D. Treadwell.

Kokstad.—9th: A beautiful fall of snow and subsequent showers have brought the grass on well. No losses in stock worth recording in the district; Cattle and stock doing well. Rainfall: 1.40 inch on nine days.—H. D. Coyte.

Groot Drakenstein.—Temperature and rainfall about normal; favourable month all round. Rainfall: 3.14 inches on nine days.—Lionel Baker.

Mafeking (Convent).—Strong winds and much dust during the month.—The Mother Superior.

Murraysburg.—Cold, dry weather during month and also frost that did a lot of damage to fruit. Rainfall: 0.06 inch on one day.—A. Cameron.

O'okiep.—Very dry month; crops badly needing rain. Rainfall: 0.25 inch on one day.—J. Burrows.

Queenstown.—Dry month; rain wanted; strong winds and duststorms; hoar frost on three mornings. Rainfall: 0.22 inch on five days.—H. Molley.

Commando Kraal (Uitenhage).—Mostly cool at nights. Rainfall: 0.31 inch on six days.—Major J. Kreft.

Willowmore.—A windy and dusty month; rain is badly needed.—Mrs. B. M. Hemens.

Darling (Malmesbury).—Very reasonable month, and crops progressing well. Rainfall: 1.93 inch on ten days.—P. H. Drake.

Riversdale.—The Province never saw (since 1873) so much ground under cultivation, and the grain lands were seldom in better condition, so the prospects for a good harvest are good; only a good soaking rain more is needed. Rainfall: 1.50 inch on seven days.—Rev. Carl Prozesky.

Grootfontein (Middelburg).—The month was fairly warm on the whole, which accounts for fruit trees coming on well. Frost on the 26th (27.0 degrees) killed entire apricot crop, large part of peach crop, and likewise pears. Apples, quinces, and figs seem all right. Veld is beginning to grow again; rain very much needed. Weather, though variable in temperature, was more even than last month. Sickness in town and district seems to be less. Rainfall: Nil.—E. J. van Meerten.

Elsenburg (Stellenbosch).—The maximum temperature recorded during the month was 83.5 degrees on the 12th, and the minimum temperature 36.5 degrees on the 8th. Rainfall: 2.20 inches on seven days, the average being 2.68 inches. On the 7th, a heavy fall of hail was experienced, the surrounding mountains being thickly covered. Except for a few cold days, mild weather prevailed. There was an increase in the amount and velocity of the winds compared with previous month. Crops, though still in a backward condition, are beginning to show signs of a more vigorous and healthy growth.—D. Cuthbert.

Cape Town.—Month began dull; rain and north-westerly squalls with hail-showers on 6th and 7th; fresh snow on surrounding mountains. After some fine bright days, cold in the shade, a cold snap set in for a few days, followed by S.E. winds and warm weather.—A. Russell Fraser.

Rietfontein (Aliwal North).—Another dry month, with two cold snaps on 7th, 8th and 9th, and 25th and 26th; frost on 25th killed all apricots and plums; crops feeling want of rain. Rainfall: 0.05 inch on one day.—A. G. Smith.

Ceres.—Weather generally characteristic of the month. Lots of dew, and frost on eight mornings. Owing to abnormal rains, crops are poor, but indications of excellent fruit crop. Rainfall: 3.34 inches on six days.—A. Heatlie.

Cape Agulhas.—24th: Heavy hailstorm, with thunder and lightning, 5.30 p.m. to 6.10 p.m.; strong wind. Rainfall: 2.48 inches on ten days.—G. W. Ratcliffe.

Goede Hoop (Oradock).—A sharp frost on the 25th destroyed 90 per cent. of the fruit crop. Rainfall: 0.05 inch on one day.—J. L. Myburg.

Karee Grange (Hay).—Cattle looking well; Merino sheep not up to the mark. Rainfall: Nil.—R. Mann.

De Villiers (Albert).—A sharp frost on the 25th killed all fruit in the district. Rainfall: Nil.—F. E. Groch.

Elma (Vryburg).—Severe frosts on 25th and 26th; considerable damage done to fruit and vegetables.—Rainfall: Nil.—A. Geiling.

Tongkloof (Tarkastad).—No rain fell here this month; stock in general are beginning to feel the effects of this drought. A swarm of flying locusts is reported to be in our district.—W. J. van Heerden.

NOVEMBER WEATHER CHARACTERISTICS.

With the exception of the western and south-western coastal districts, where the rainfall is decreasing, there is a general increase in the amount of precipitation throughout the Union.

The heaviest rainfall should now be experienced in the eastern Transvaal and Swaziland, with normals of 5·0 inches. In Zululand, precipitation averages 4·5 inches; in Natal, 4·0 inches; in Kaffraria, 3·5 inches; in the south-east and Basutoland, 3·0 inches; in the western Transvaal and north-east of the Cape Province and along the south coast, 2·5 inches; in the Orange Free State, 2·0 inches; over the northern and east-central Karroo and the Cape Peninsula 1·5 inch, and slightly more than 1·0 inch in the remainder of the Province, excepting the western and south-western coastal districts, where the normal is less than 1·0 inch. Severe thunder and hailstorms may occur, more especially inland; in fact, the number of hail days is now at its maximum over the Transvaal, whilst the curve is still rising elsewhere.

The highest mean daily temperature is now experienced over the northern borders of the Cape Province, where the normal is 72 degrees. In Natal and the eastern Transvaal a mean temperature of 71 degrees may be anticipated, and on the west-central Karroo 69 degrees; on the southern Karroo 68 degrees; on the east-central Karroo and in the Orange Free State, 67 degrees; in the Peninsula 62 degrees, and over the remainder of the Union 65 degrees should be reached. Frosts are unlikely.

Wind shows a decrease in the mean velocity compared with October, except over the south-west, where there is a slight increase in force. The prevalent directions are north-north-west over the Transvaal, south-south-west over the northern border, north-east over the south-east of the Cape Province, and south over the Cape Peninsula. In comparison with the preceding month, there is a falling-off at Kimberley of all winds from east round by south to south-west, but an increase in those from all other directions, especially north-north-east. At Johannesburg there is an increase in frequency of winds between west-north-west, but a decrease in all others, more particularly northerly and south-south-westerly. At East London there is a greater frequency of winds from those points between north-east and south, as well as from north-north-east, but a diminution of those from all other directions. At Capetown the main increase is in those from points between south-south-east and south-south-west and from north-west, but a decrease of those from west and west-north-west.

Of the total possible number of hours of bright sunshine, about 84 per cent. should be enjoyed over the northern border, and about 50 per cent. over the south-east of the Cape Province; about 68 per cent. over the Peninsula, and 67 per cent. over the Transvaal.

C. STEWART,

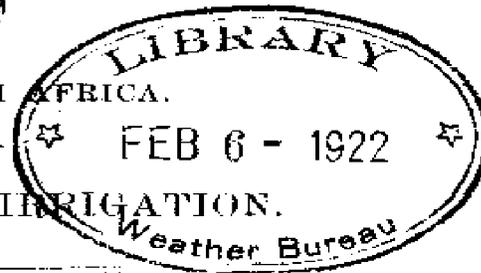
Chief Meteorologist.

Pretoria.



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.



MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

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MEAN pressure above the average in the south and centre, but practically normal elsewhere; temperature higher than usual in the Transvaal and Free State; normal in the Cape, and sub-normal in Natal; a marked absence of high temperatures; excess of precipitation over the greater portion of the Transvaal, parts of Natal, and the northern Karroo; sub-normal elsewhere; some destructive hailstorms, particularly about the middle of the month, less numerous than usual; and also several destructive local wind-squalls; and at least one sharp frost on the 14th, in the Free State:—such were the leading features of the weather of October, 1921.

Pressure.—The accompanying map shows that, whilst the mean pressure was practically normal over the west coast, Rhodesia, Transvaal, and Natal, it was about half a tenth in excess of the average along the south-west and over the centre of the Cape Province. The low-pressure over the interior is much less pronounced than usual, the equatorial low, although present on nine days, being on no occasion of any great intensity. High pressure areas were present throughout the month (except on three occasions), appearing in the south or south-west, and moving to the south-east and east. Low pressure areas were present six times: on 1st over the south, on 7th–8th over the south-west and south-east, on 10th in the east, surging down from the interior; on 13th, 16th, 21st, and 22nd over the south-east and east. The lowest pressure was 29.75 in. at Cape Agulhas on the 7th.

Temperature.—The mean temperature over the Union as a whole during October was 65.0 degrees, being 0.6 degree higher than the average. Both days and nights were somewhat warmer than usual, the former, with a mean of 77.7 degrees, being 0.4 degree, and the latter, with 52.3 degrees, being 0.8 degree above the corresponding normals. Taking the provinces separately, the temperature of the month over the Transvaal (67.5 degrees) was 1.4 degree in excess; over the Free State (63.0 degrees) it was 1.3 degree in excess; over the Cape (63.1 degrees) it was normal; whilst over Natal the mean for the

month (66.5 degrees) was sub-normal to the extent of 1.1 degree. In the Transvaal, the mean maximum (81.0 degrees) was 1.2 degree, and the mean minimum (54.1 degrees) was 1.7 degree above the corresponding averages; similarly in the Orange Free State the days, with a mean of 77.6 degrees, were 1.7 degree and the nights, with 48.3 degrees, were 0.9 degree higher than usual. In Natal the days (75.7 degrees) were sub-normal by 3.2 degrees, whilst the nights (57.4 degrees) were supra-normal by 1.0 degree. In the Cape Province, the mean maximum temperature (75.6 degrees) was only 0.2 degree above, and the mean minimum (50.7 degrees) only 0.1 degree below the corresponding averages. At the individual stations, the temperature of the month was below normal over the south-west and part of the Cape Peninsula, along the south coast, over the south-east and the northern Karroo; also in Natal, at Pietersburg in the northern Transvaal, Harrismith in the north-east of the Free State. The deficits were mostly less than a degree in the Cape Province, as also at Pietersburg, Harrismith, and the north-east of Natal, but increasing to 2-3 degrees in the south-east Cape, part of the Karroo, and the south of Natal. Elsewhere the monthly temperature was above the average, mostly by amounts less than a degree in the Cape Province, Swaziland, and Zululand; by 1-2½ degrees in the Free State; and 1-2 degrees in the Transvaal, but ranging from normal at Nylstroom to 4.9 degrees at Bloemhof. Both days and nights were cooler than usual over parts of the Cape Peninsula, the central portion of the south coastal area, the northern Karroo, and part of the south-east, by amounts ranging from a few tenths to 2-3 degrees in the south-east and the central Karroo. The day temperatures only were sub-normal over the central and western Transvaal, Zululand, Natal, the north-east of the Free State, the coastal area of Kaffraria, and the neighbourhood of Port Elizabeth. On the other hand, only the nights were cooler than the average over the west and south-west Cape and at East London and at Belfast (Transvaal). Elsewhere both day and night temperatures were in excess of the average, the areas including the greater part of the Transvaal, Free State, Swaziland, Namaqualand, the Transkei, the central Karroo, and the north-east of the Cape. The deficits in the day temperatures were greatest, about 5.0 degrees in the south of Natal, but were still high (2-3 degrees) in the south-east and south-west Cape and the northern Karroo. The shortages in the night temperatures varied from 0.2 degree at Bethulie (O.F.S.) to 3.0 degrees at Murraysburg, in the northern Karroo. The excesses in the mean maximum temperatures were large (2-4 degrees) in Namaqualand, the west coastal area, south of Bechuanaland, and the greater part of the Transvaal. The excesses in minimum temperatures were mostly about a degree, but rose to 2-3½ degrees in Namaqualand, northern Border, north of Bechuanaland, the south-east and south-central Transvaal, reaching 3.6 degrees at Bloemhof. The mean warmest station was Komatipoort, with a temperature of 76.4 degrees; the mean coolest Kokstad, in Kaffraria, with 58.6 degrees—a difference of 17.8 degrees. The highest mean maximum (89.5 degrees) occurred at Komatipoort, and the lowest (43.0 degrees) at Murraysburg, yielding a mean monthly range of 46.5 degrees over all stations. The warmest periods of the month were 1st to 2nd, 6th to 10th, 18th, 23rd to 27th, and on the 31st, the highest temperatures being recorded most widely on the 26th. The lowest temperatures were registered on twenty days of the month, mostly on 3rd, 12th, 16th, and 23rd. The extremes for the month were 106.0 degrees on the 10th and 27th at Komatipoort and 33.0 degrees at Murraysburg on the 23rd, yielding an extreme range of 73.0 degrees.

Precipitation was considerably less than usual over the greater portion of the Cape Province, practically the whole of the Free State, the central and

western parts of Natal, the east central and the west and south-west of the Transvaal. The shortages were commonly between a quarter and half an inch in the Cape Province, but ranged between 1 and 2 inches in the south-west, along the south coastal area to East London, as well as the east-central Karroo and the south-east; deficits rose to 2.76 inches at Port St. Johns. In the Free State, precipitation was lower than the normal by about a third of an inch at Bethulie, by quantities over an inch in the eastern and central portions, and by slightly more than $2\frac{1}{2}$ inches in the north-east. At Lindley, however, there was a small excess of less than a tenth. In Natal the deficits were small, less than a tenth, at Vryheid and Ladysmith, but increased to slightly over three-quarters of an inch at Dundee and one and three-quarter inches at Weenen. In the west and south-west of the Transvaal the rainfall was deficient by about an inch at Rustenburg and Bloembhof, but by quantities of half an inch or less elsewhere, being normal at Zeerust. Small shortages of less than half an inch were also met with on the eastern Transvaal between Belfast and Barberton, as also at Piet Retief in the south-east. An excess of rainfall was experienced over a comparatively narrow belt in the Cape Province, extending from Upington (with + 0.17 inch) south-eastwards to Queenstown (+ 0.02 inch). The greatest excess in this area was 1.60 inch at Prieska. In Natal, precipitation was approximately an inch in excess of normal south of Howick, as was also the case at Hlabisa, in Zululand. In the Transvaal, the excess was mostly between a quarter and three-quarters of an inch, but rising to almost 2 inches at Emelo, $2\frac{1}{2}$ inches at Pilgrims Rest, and 4-4 $\frac{1}{2}$ inches at Pietersburg and Woodbush, in the north. Swaziland was also benefited by an excess, the rainfall being + 3.07 inches at Mbabane. Although thunderstorms with occasional hailstorms occurred at times over the greater part of the summer rainfall area, precipitation during the month seems to have been of a more purely cyclonic than convectional type, the rains being mostly of a steady, penetrating character, well suited for agricultural purposes. Further evidence of a change of type is afforded by the unusual amount of cirrus cloud which almost invariably preceded the rains, together with a marked absence of any very high temperatures. Absolute drought prevailed during the month over the southern Karroo, part of the west central Karroo, the west of the northern Karroo, and Namaqualand. Occasional light showers were experienced throughout the month over the Cape Peninsula south-west, the south coast, and the more southerly portions of the west coastal area. Drizzling rains or local thunderstorms were met with from 1st to 3rd over parts of the central and northern Karroos and the northern Border and Bechuanaland; showers, associated in some cases with thunderstorms in the north-east of the Cape during the first week of the month, also at intervals throughout the month over the south-east and Kaffraria, being heaviest over the latter area. Rain was fairly general and fell at short intervals throughout the month in Natal, but much less frequent and more limited in distribution over the Free State, where some parts, particularly in the east, suffered from absolute or partial drought throughout the month; the rains over the latter area occurred mostly between the 2nd and 4th and 28th to 31st, with some local showers in the interval between these dates. Over the Transvaal, scattered showers occurred, mainly during the second half of the month; but more general rains, greater in quantity, on the 28th and 29th (one or two stations in the west, however, report nil for the month). Although hailstorms were reported as occurring on 3rd, 4th, 7th, 11th, 16th to 19th, 29th, and 30th, in various parts of the Free State, Natal and Transvaal, they were mostly light, and even when heavy but little damage was caused in many instances, owing to the absence of an accompanying strong wind. The most destructive of these storms were those on the 11th at Standerton, Pietersburg on the 17th and 19th, Middelburg on the 17th, Krugersdorp,

Kromdraai, and Mahalapye on the 19th, Paulpietersburg and Viljoensdrift, at Manitoba (District Bethlehem), Heilbron, and Potchefstroom on the 18th, when considerable damage was done to orchards, gardens, and crops, particularly at Standerton, Pietersburg, and Middelburg. (Note.—The hailstorm at Kromdraai on the 18th was noteworthy for the length of time during which hail fell, viz., 2 hours 5 minutes—*vide* Observers' Notes.) At the last two stations windows were also broken, whilst the loss in wheat on Haakdoorndraai and Blaauwbank farms is estimated at 400 bags. The accumulated rainfall since the beginning of the year is below the average by quantities varying between a few hundredths and one to two inches over a belt bordering the Free State stretching from Kuruman to Kokstad, as in part of the east central Karroo, the south-east and coastal area of the Transkei. A deficit is also met with in the north and east of the Free State, the north-east of Natal, and the east, south-east and south-west of the Transvaal. These deficits are large (3–9 inches) in Natal, and vary in the Orange Free State between 0.2 inch at Kroonstad and 6 inches at Harrismith; in the Transvaal they range from 0.4 inch at Komatipoort to 7.5 inches at Barberton. Elsewhere precipitation is in excess of the normal for the ten months of the year, in many cases by large amounts (6–16 inches), particularly in the northern Transvaal, parts of the northern Karroo, and the south-west of the Cape. On the other hand, the total rainfall since 1st July of the current year is mostly below the normal in the greater part of the Cape, the Free State, the central and northern parts of Natal, and the west, south, and east central parts of the Transvaal. The shortages for this period are greatest (2–4 inches) in the south and east of the Cape; exceed 2 inches in the greater part of the Free State; but are mostly under an inch in Natal and the Transvaal.

As a result of the conditions just noted, ploughing is being carried on in the more favoured areas of the Transvaal and Swaziland, in some cases at a much earlier date than usual, and cattle are stated to be in good condition. In other districts, particularly in the Free State and east of the Cape, ploughing operations have been delayed, whilst stock have not improved, owing to the failure of the grass to make any appreciable growth, as they ought to have done, or are even falling off in condition owing to the light rains being insufficient to cause any material growth of grass on the veld; in fact, from Kingwilliamstown comes an expression of fear that there may be a scarcity of pasturage. It is stated that no hopes are entertained of a fruit harvest in Standerton this summer. In the Groot Drakenstein district, the fruit crops are stated to be generally heavy, but that fungoid diseases are unusually prevalent, particularly "curl-leaf" in peaches and fusidadium in pears. At Grootfontein, Middelburg, "green fly" is very prevalent.

OBSERVERS' NOTES FOR OCTOBER, 1921.

TRANSVAAL.

Standerton.—Hot winds, heavy clouds, with distant thunder, prevailed during the first ten days of the month, when the drought was broken by a violent thunderstorm, unfortunately accompanied by heavy hail, which caused damage to gardens and stripped the blossoms and new-formed fruit from the trees. No hopes are now entertained of a fruit harvest in Standerton this coming summer. Thunderstorms again occurred on the 16th, 17th, and 18th, but the best rains fell towards the end of the month, when steady, soaking rains were experienced on the 28th and 29th. The veld is now a beautiful green, and stock have already shown a marked improvement. Ploughing is

RAINFALL, OCTOBER, 1921.

PLACE.	OBSERVER.	Month.		Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.	
		Inches.	Oct., 1921.									
<i>Trompsburg--</i>												
Barberton.....	W. Grubb.....	2.36	2.80	0.44	-	18.62	25.40	6.78	2.90	7.78	1.65	
Bethal.....	The Forester.....	3.95	3.20	-0.75	-	23.46	21.87	-1.59	3.78	4.72	0.94	
Bethal.....	H. F. Joubert.....	4.23	3.44	-0.79	-	25.74	19.32	-6.42	4.69	4.69	0.28	
Bloemhof.....	A. Adamson.....	0.23	1.44	1.21	+	13.74	15.00	1.26	0.23	2.50	2.27	
Claremont.....	S. A. Pollock.....	0.76	1.31	0.55	+	14.54	12.68	-1.86	0.78	1.71	0.93	
Ermelo.....	Mrs. S. M. Nicolson.....	3.07	4.63	1.56	+	16.52	20.34	3.82	6.74	5.35	0.38	
Haenertsburg.....	S. A. Pollock.....	3.62	3.07	-0.55	-	34.48	31.71	-2.77	4.64	5.02	0.35	
Heidelberg.....	W. A. ter Horst.....	2.92	2.57	-0.35	-	22.70	18.01	-4.69	3.54	4.09	0.55	
Johannesburg (Observatory).....	The Staff.....	2.88	2.74	-0.14	-	21.31	19.99	-1.32	4.55	4.09	0.44	
Klerksdorp (Strathmore).....	C. Scott.....	1.35	1.77	0.42	+	15.97	16.42	0.45	1.88	2.65	0.77	
Komatipoort.....	H. J. Evans.....	2.93	1.91	-1.02	-	19.33	19.93	0.60	4.07	2.24	-1.83	
Louis Trichard.....	L. J. de Bruin.....	2.92	2.94	0.02	+	28.89	23.32	-5.57	4.22	4.02	-0.20	
Middelburg.....	Dr. H. A. Spencer.....	3.43	2.79	-0.64	-	21.65	18.76	-2.89	3.53	3.07	-0.46	
Nylstroom.....	G. Bakker.....	3.58	2.14	-1.44	-	26.63	17.13	-9.50	3.58	3.16	-0.42	
Pretoriusburg.....	W. J. Frankleyne.....	3.94	1.94	-2.00	-	20.06	14.85	-5.21	3.91	2.68	-1.23	
Piet Retief.....	J. Werner.....	4.10	4.26	0.16	+	27.46	21.36	-6.10	3.90	3.26	-0.64	
Pharos Rest.....	E. M. Skea.....	4.63	2.20	-2.43	-	30.92	36.51	5.59	3.76	4.08	0.32	
Potchefstroom (Exp. Farm).....	The Manager.....	1.98	2.29	0.31	+	22.15	16.32	-5.83	3.23	3.33	0.10	
Pretoria (Meteorological Office).....	The Staff.....	2.95	2.77	-0.18	-	29.89	20.82	-9.07	3.85	3.70	-0.15	
Rooberg.....	N. R. Mann.....	2.61	1.65	-0.96	-	22.09	16.75	-5.34	2.61	2.81	0.20	
Rustenburg.....	S.A. Police.....	1.51	3.32	1.81	+	23.39	18.70	-4.69	2.73	3.70	0.97	
Standerton.....	M. Ferguson.....	4.00	3.53	-0.47	-	30.96	20.51	-10.45	4.80	5.08	0.28	
Wakkerstroom.....	L. le Roux.....	4.50	3.98	-0.52	-	30.96	23.05	-7.91	3.23	3.97	0.74	
Woodhush.....	The Forester.....	9.22	4.63	-4.59	-	71.40	35.02	-36.38	11.72	8.12	-3.60	
Zeerust.....	H. Dietrich.....	1.75	1.75	0.00	-	19.83	17.46	-2.37	1.75	2.40	0.74	
<i>Swaziland--</i>												
Mbabane.....	Swaziland Police.....	7.46	4.39	-3.07	-	45.39	36.14	-9.25	10.34	7.38	-2.96	
<i>Orange Free State--</i>												
Bethulle.....	J. J. Wardhaugh.....	0.94	1.24	0.30	+	18.02	14.77	-3.25	1.17	2.81	1.64	
Bloemfontein.....	G. A. Schiepers.....	0.49	1.70	1.21	+	17.32	14.74	-2.58	1.00	3.15	2.06	
Harrismith.....	The Forester.....	0.73	3.39	2.66	+	13.98	20.11	6.13	1.90	3.05	1.15	
Kroonstad.....	S. R. Northfield.....	1.13	2.20	1.07	+	15.01	13.22	-1.79	1.90	4.51	2.61	
Ladybrand.....	The Forester.....	1.55	2.38	0.83	+	19.07	20.42	1.35	2.36	2.67	0.31	
Lindley.....	J. Collister-Oates.....	2.33	2.27	-0.06	-	19.13	17.76	-1.37	4.25	3.90	-0.35	
<i>Natal--</i>												
Dundee.....	West Thorold.....	2.35	2.13	-0.22	-	13.97	23.17	9.20	3.05	3.92	0.87	
Durban (Point).....	The Port Captain.....	0.27	5.15	4.88	+	37.22	31.97	-5.25	10.88	9.68	-1.20	
Ellisras.....	The Gaoler.....	0.98	5.06	4.08	+	28.05	23.58	-4.47	12.54	9.19	-3.35	
Howick.....	The Gaoler.....	4.14	3.91	-0.23	-	25.73	23.51	-2.22	7.89	6.78	-1.11	
Ladysmith.....	D. A. R. Leathem.....	2.65	2.66	0.01	+	17.07	20.37	3.30	5.79	4.30	-1.49	
Pietermaritzburg (Mental Hospital).....	The Staff.....	3.94	3.11	-0.83	-	27.13	24.68	-2.45	8.53	6.02	-2.51	
Vryheid.....	The Gaoler.....	3.20	4.23	1.03	+	16.94	26.59	9.65	5.58	6.69	1.11	
Weener.....	The Gaoler.....	0.61	2.37	1.76	+	19.71	18.95	-0.76	3.18	4.16	0.98	

RAINFALL, OCTOBER, 1921 (continued).

PLACE.	OBSERVER.	Month.		Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.	
		Oct., 1921.	Inches.									
<i>Cape—</i>												
Alhwal North.....	A. Alcock.....	1.21	1.51	1.51	- 0.30	16.00	16.67	- 0.67	1.40	3.55	- 2.15	
Beaufort West.....	The Gaoler.....	0.08	0.64	0.64	- 0.56	14.67	7.84	+ 6.83	0.42	1.91	- 1.49	
Bedford.....	T. C. Hall.....	1.04	2.59	2.59	- 1.55	20.98	22.16	+ 1.18	2.51	6.48	- 3.92	
Bristown.....	The Gaoler.....	1.57	0.64	0.64	+ 0.93	20.52	9.62	+ 10.89	1.60	1.50	+ 0.10	
Calvinia.....	The Gaoler.....	0.14	0.52	0.52	- 0.38	13.49	7.12	+ 6.37	2.90	2.83	+ 0.07	
Capetown (Royal Observatory).....	The Staff.....	1.21	1.72	1.72	- 0.51	24.56	23.61	+ 0.95	12.38	10.96	+ 1.42	
Ceres.....	A. Heathie.....	1.71	3.73	3.73	- 2.02	61.08	38.02	+ 23.06	23.52	19.60	+ 3.92	
Carnarvon.....	A. F. Malherbe.....	0.00	0.48	0.48	- 0.48	11.67	7.02	+ 3.65	0.03	1.25	- 1.22	
Clanwilliam.....	Mrs. W. J. Downes.....	0.01	0.61	0.61	- 0.59	11.86	9.02	+ 2.84	3.52	3.19	- 0.47	
East London.....	A. Downie.....	2.16	3.73	3.73	- 1.57	22.19	23.03	- 0.84	6.43	10.14	- 3.71	
Fraserburg.....	The Gaoler.....	0.00	0.85	0.85	- 0.85	12.15	3.85	+ 8.30	0.26	1.27	- 1.01	
Garies.....	The Gaoler.....	0.07	0.92	0.92	- 0.85	7.47	4.85	+ 2.62	1.50	2.40	- 0.90	
Graaff-Reinet.....	S. E. D. Treadwell.....	0.14	1.16	1.16	- 1.02	10.97	11.33	- 0.36	0.68	8.29	- 2.61	
Groot Drakenstein.....	Lionel Baker.....	1.21	2.76	2.76	- 1.55	41.30	32.98	+ 8.32	17.38	16.07	+ 1.31	
Griquatown.....	The Gaoler.....	0.22	0.73	0.73	- 0.51	8.73	10.93	- 2.20	0.35	1.42	- 1.07	
Hopetown.....	The Gaoler.....	1.31	0.74	0.74	+ 0.57	10.70	11.14	- 0.44	1.35	2.06	- 0.71	
Kennard.....	The Gaoler.....	1.55	0.77	0.77	- 0.78	12.21	10.55	+ 1.66	1.55	1.70	- 0.15	
Kimberley.....	The Gaoler.....	0.19	0.88	0.88	- 0.69	6.15	4.97	+ 1.18	0.19	0.84	- 0.65	
Knyana.....	J. Acton.....	0.18	1.12	1.12	- 0.94	10.90	11.65	- 0.75	0.48	2.12	- 1.64	
Kokstad.....	The Gaoler.....	1.08	2.85	2.85	- 1.77	25.31	21.02	+ 4.29	0.14	10.72	- 1.58	
Kuruman (Abomas).....	H. D. Coyte.....	1.06	2.08	2.08	- 1.02	19.55	19.61	- 0.06	3.68	4.23	- 0.55	
Makling (Convent).....	A. T. Siltwell.....	1.20	0.45	0.45	+ 0.75	31.61	12.75	+ 18.86	0.00	1.43	- 1.43	
Mossel Bay (Cape St. Blaize).....	Mother Superior.....	1.20	1.54	1.54	- 0.34	21.61	15.75	+ 5.86	1.81	2.56	- 0.75	
Murrayburg.....	The Lightkeeper.....	0.39	1.67	1.67	- 1.28	15.14	14.85	+ 0.29	5.88	6.10	- 0.22	
O'okiep.....	A. Cameron.....	0.00	0.45	0.45	- 0.45	10.67	0.71	+ 9.96	2.01	2.94	- 0.93	
Phillipstown.....	J. Burrows.....	1.71	0.85	0.85	+ 0.86	9.78	11.73	- 1.95	1.47	2.04	- 0.57	
Piquetberg.....	The Gaoler.....	1.11	1.78	1.78	- 0.67	24.61	19.02	+ 5.59	4.98	9.87	- 4.89	
Port Elizabeth.....	J. P. Allen.....	0.29	2.20	2.20	- 1.91	10.16	19.88	- 9.72	0.65	8.62	- 7.97	
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	3.37	6.13	6.13	- 2.76	32.91	37.63	- 4.72	0.91	13.23	- 12.32	
Priseka.....	The Gaoler.....	2.08	0.48	0.48	+ 1.60	10.09	8.30	+ 1.79	2.10	1.07	+ 1.03	
Queenstown.....	H. Holley.....	1.63	1.61	1.61	- 0.02	17.25	18.32	- 1.07	3.95	3.72	+ 0.23	
Seydlerville.....	The Gaoler.....	0.04	0.80	0.80	- 0.76	7.97	7.36	+ 0.61	0.68	2.16	- 1.45	
Sutherland.....	The Gaoler.....	0.00	0.62	0.62	- 0.62	15.01	5.34	+ 9.67	2.62	2.98	- 0.36	
Swellendam.....	The Gaoler.....	0.93	3.18	3.18	- 2.25	30.73	27.00	+ 3.73	8.61	10.57	- 1.96	
Umtata.....	A. Dirpeck.....	1.63	2.47	2.47	- 0.84	20.23	20.23	- 0.00	2.00	5.37	- 3.37	
Umtata.....	The Gaoler.....	0.00	1.19	1.19	- 1.19	12.81	11.75	+ 1.06	2.08	4.78	- 2.70	
Uptington.....	The Gaoler.....	0.73	0.56	0.56	+ 0.17	9.36	5.93	+ 3.43	0.75	0.90	- 0.15	
Victoria West.....	The Gaoler.....	0.15	0.60	0.60	- 0.45	10.97	3.67	+ 7.30	0.20	1.66	- 1.46	
Vryburg.....	C. Butler.....	0.16	0.96	0.96	- 0.80	16.43	15.36	+ 1.07	0.16	1.73	- 1.57	
Worcester.....	The Gaoler.....	0.12	1.17	1.17	- 1.05	15.54	11.52	+ 4.02	3.82	5.82	- 2.00	
Wynberg (Convent).....	The Mother Superior.....	2.58	3.55	3.55	- 0.97	44.73	43.95	+ 0.78	20.88	23.19	- 2.31	
<i>South-West Africa—</i>												
Tsumeb.....	Ing. Schetter.....	0.37	0.80	0.80	- 0.43	17.32	24.25	- 6.93	0.37	0.87	- 0.50	
Waterberg.....	D. Hahn.....	0.50	0.23	0.23	+ 0.27	24.93	16.22	+ 8.71	0.50	0.33	- 0.17	
Usakos.....	Missionary Dieck.....	0.09	0.00	0.00	+ 0.09	5.97	4.23	+ 1.74	0.00	0.07	- 0.07	
Windhoek.....	Observatory.....	0.18	0.36	0.36	- 0.18	12.55	12.31	+ 0.24	0.18	0.56	- 0.38	
Mariental.....	Baron V. Eisebeck.....	0.07	0.65	0.65	- 0.58	4.52	4.74	- 0.22	0.07	0.06	+ 0.01	
Herzogenbusch.....	Pater Prefect.....	0.00	0.91	0.91	- 0.91	2.52	3.04	+ 0.52	0.04	0.10	- 0.06	

now progressing steadily for the mealie crop, but farmers seem rather disheartened with the poor price at present obtainable for this grain. Rainfall: 4.00 inches on nine days.—M. Ferguson.

Pretoria (West End).—No damage was done here by the hail on the evening of the 18th, but a little damage was done to fruit trees about three miles to west, the hail there being fairly large, and lasting about ten minutes. Rainfall: 3.11 inches on six days.—W. H. Foster.

Barberton.—High winds, preceded by high maximum temperatures, generally brought up cloudy days, but very little rain; a hot, dry month. Rainfall: 2.36 inches on seven days. Walter Grubb.

Krugersdorp.—Weather unsettled, with north-easterly winds and dust. Two light showers first half of month; good rains latter half; generally fine after sunset; slight mist early morning, 19th; heavy rain, accompanied by hail, doing a fair amount of damage to fruit and other crops on 19th, 31st; hail, size of peas, fell at 3 p.m. for short period. Crops and veld seem in fairly good condition. Rainfall: 2.85 inches on nine days.—George S. Garnett.

Kromdraai (Krugersdorp).—Hailstorm on 19th lasted two hours and five minutes; size of hail mostly about half an inch in diameter, but some over one inch in diameter; no damage to buildings except flooding; orchards ruined, and all crops in its wake destroyed; most damage done on this farm and next one; width of storm about three and a half miles, and distance travelled, about ten miles. Rainfall: 3.90 inches on six days.—W. Frost.

Jakhalsfontein (Pietersburg).—Very welcome rains during the middle and end of the month; previous to the rains, very much lightning and thunder; the rains were light; there was no hail in this part of the district. Rainfall: 2.60 inches on six days.—Rev. James C. Palmer.

Pietersburg.—Hot and dry early portion of month; rainfall of 7th (0.38 inch) soon evaporated. Terrific hailstorm afternoon of 17th; all orchards and gardens in town completely destroyed; crops on farms in vicinity wiped out; some small stock killed. Farmers who escaped storm of 17th had crops, etc., destroyed by hail of 19th. Rainfall: 5.94 inches on eight days.

“The hailstorm reported was the most severe ever experienced in this part. A dense dust storm commenced at 4.15 p.m. Monday, 17th, and the first hailstones fell at 4.30 p.m.; from that time until it ceased at 4.50 p.m. the hail fell thick and fast. I personally measured half a dozen of the largest that could be gathered without exposing myself to the fury of the storm, and none were under $1\frac{1}{2}$ by 1 inch; nearly all were fan-shaped, and driven by a fairly high wind; the damage caused has been great.

“All parts of the town have suffered from broken windows, one hotel losing thirty. The greatest damage, however, has been to orchards and gardens, the latter being completely obliterated, tiny stumps of vegetable plants only remaining. Fruit trees are bare stems only, hardly a leaf to be seen, and in the case of young trees the branches are split and broken.

“As far as I can gather, the hailstorm started ten miles south of Pietersburg, was roughly ten miles broad till reaching here, then narrowed to only some six miles, travelling north and north-north-east for another eighteen miles. This is the furthest point from which I have had any reports.

“Damage to stock and crops in the district will have been fairly extensive; several cases of small stock and donkeys and at least two cases of cattle being killed are known. All crops, wheat, etc., in the hail-swept area are utterly demolished, heavy loss falling on the Government Experimental Station, four miles south, which has lost practically everything.

“ The rainfall reported was for the period ending 8.30 a.m., 18th, and was made up as follows :—

Hailstorm and rain, 4.30–4.50 p.m., heavy	
rain continuing up to 5.50 p.m.....	1.36
Heavy rain midnight and after.....	1.21
Total.....	<u>2.57</u>

“ At midnight last night (Wednesday), a slight sprinkling of hail fell, but this morning the telephone agent, Rietkolk, twelve miles south, reports every window pane in his store broken; fowls killed. The storm travelled E.N.E. from him, and as this is through uninhabited or native country, no report of damage caused can be obtained except by going to a great deal of trouble.”
—W. J. Frankleyne.

Middelburg.—Sultry, damp weather, with occasional cold, damp evenings and occasional rains have obtained. Unfortunately, a severe hailstorm fell on the 17th, which did much damage to stock, crops, and fruit in the town and district. The maximum recorded was below the usual for the month; it has seldom happened in October that the temperature has not risen above 90 degrees; only last year it reached 96 degrees on one occasion. The mean temperatures are all above the average. Rainfall: 5.43 inches on thirteen days.—Dr. H. A. Spencer.

Lichtenburg.—Farmers complain not sufficient rain yet for breaking up virgin soil; veld in good condition. Rainfall: 2.24 inches on eight days.—J. T. Allman.

Mosdene (Naboomspruit).—Good rains have fallen a week earlier than usual, and the season for ploughing and planting summer crops has opened very favourably. There has been plenty of grass all through the dry season, and all classes of live stock are in good condition for this time of the year. On the 17th a severe hailstorm fell on a farm about ten miles south of this station. Rainfall: 4.27 inches on five days.—Ernest E. Galpin.

Wakkerstroom.—As a result of the snow in September and the nice rains this month, this place is a picture. Gardens are getting into shape, and every body from the farmer to the householder is kept busy outside. Rainfall: 4.50 inches on ten days.—Louis le Roux.

Bethal.—On the 28th and 29th we had 2.52 inches of rain, which was greatly welcomed, as the farmers were very anxious to start ploughing, and the veld was greatly in need of rain. Since this rain farmers are returning with their sheep and cattle from the bushveld. On the 15th or 16th, about eight miles from Bethal, on the north-eastern side, a hurricane passed, which caused much damage to buildings, trees, and cattle. Rainfall: 4.23 inches on seven days.—H. F. M. Joubert.

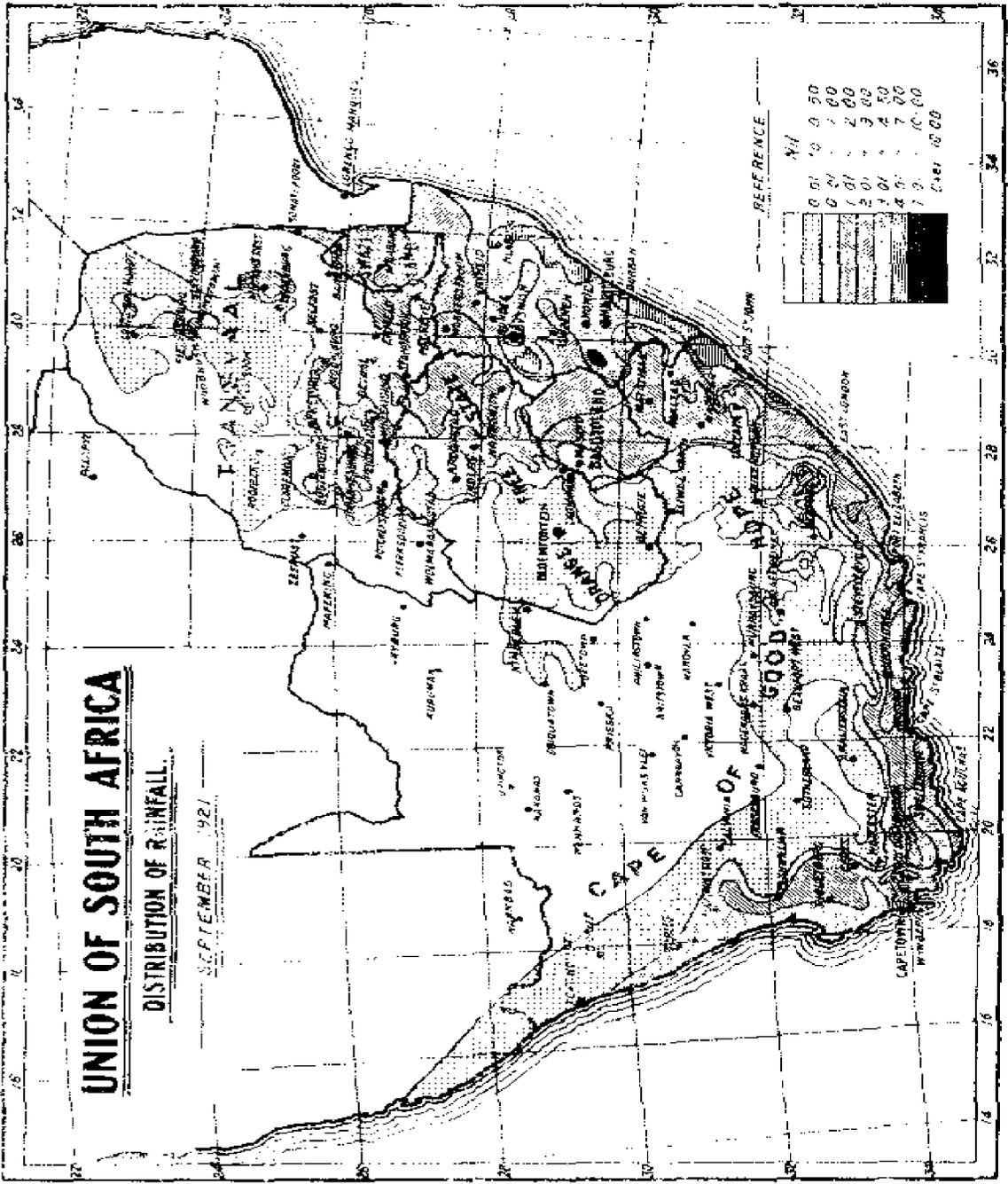
Rustenburg.—1.51 inches of rain, which fell on six days—all steady rains—greatly benefited the country. Things are looking green, and crops are splendid. Farmers are busy cutting wheat, oats, etc., and are also busy threshing: a record crop in this respect is expected. Cattle are in low condition, but with green grass should soon pick up. More rain is needed before ploughing and sowing can be done. No reports of locusts received during the month.—Sergt. H. J. Streatfield.

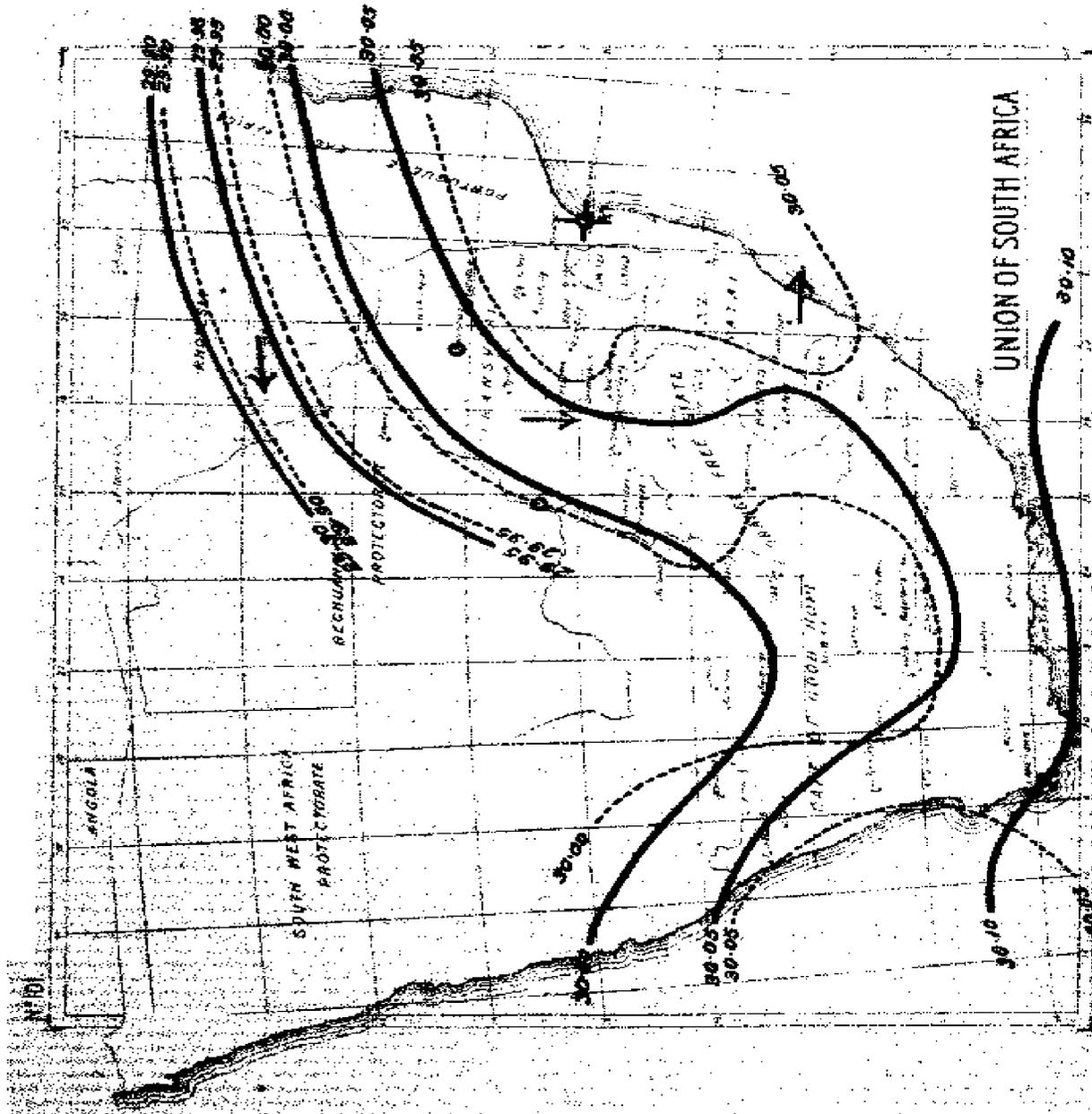
Messina.—Temperatures for the month of October, rather below the average. Welcome rains fell towards the end of month, but countryside still

UNION OF SOUTH AFRICA

DISTRIBUTION OF RAINFALL

SEPTEMBER 1921





October, 1921. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
 The dotted lines indicate the normal distribution for October.

very dry, and more rain badly needed. Rainfall: 1.08 inch on four days.—P. O. B. Frost.

Davel (Bethal).—Generally cold for time of year; frequent easterly winds after and during rains, keeping air cold. Rainfall: 4.57 inches on nine days.—H. A. Wollenberg.

Zandfontein (Rustenburg).—The general conditions during October were dry, and good rains are wanted. Rainfall: 1.25 inch on five days.—R. Boon.

Elandsfontein (Potchefstroom).—Rain was very welcome, but unfortunately it was not general. Cattle in good condition; also sheep farmers had a good lambing season. Crops fairly good, and maize has been started with. Rainfall: 2.21 inches on four days.—P. Davidtz.

Uluwarra (Waterberg).—Grass growing well; stock fat. Rainfall: 3.15 inches on four days.—J. A. Manson.

SWAZILAND.

Transvalia (Mbabane).—Crops backward through late rains. Rainfall: 3.73 inches on seven days.—M. Coates.

Mafuteni.—Welcome rains; several very strong winds; the squall on 21st was most furious, but apparently very local; 21st, 0.42 inch rain fell in less than five minutes during squall. Rainfall for month: 2.51 inches on eight days.—H. S. Parry.

Mbabane.—The country is looking splendid, and every body planting as fast as they can. Prospects of a very good season. Rainfall: 7.46 inches on nineteen days.—R. C. S. Markham.

ORANGE FREE STATE.

Stompkop (Bethlehem).—Drought very severe; crops and cattle suffering. Rainfall: 1.82 inch on seven days.—C. P. van der Merwe.

Rugby (Bethlehem).—A month of hot weather, with occasional showers of rain, which kept the grass fresh, but caused little growth. Cattle are consequently not in as good condition as they should be at this time of the year, though what little green grass there is has kept sheep in condition, and provided feed during the lambing season, which has been generally above the average as far as the number of lambs born is concerned, though there was a big percentage of weakly and deformed lambs amongst those first dropped after the snow. Ploughing for wheat, oats, and mealies has been possible all through the month, the land keeping moist and friable after the heavy fall of snow. Ploughing is far in advance of what is usual at this time of the year. There was a sharp hoar frost on night of 14th, after a day's violent south wind, which singed the leaves of the early mealies, and did a little damage to the fruit. Rainfall: 1.20 inch on six days.—A. C. Glynn Baker.

Belladale (Frankfort).—Very dry month; veld grass very short; result, large stock not in condition they should be; ploughing also hindered by ground being too dry.—D. McCalman.

Oldenburg (Harrismith).—The country is very dry. Rainfall: 1.18 inch on four days.—J. D. Ballot.

Motsuaking (Harrismith).—Crops only saved by mists; position becoming serious. Rainfall: 0.03 inch on one day.—G. Branch.

Stanleyvale (Harrismith).—Rather dry for crops; stock doing well; most mealies and oats up. Rainfall: 1.33 inches on eight days.—G. C. Atkins.

Dewdrop (Heilbron).—A good soaking rain will be welcome, as it is very dry, and stock—cattle especially—are beginning to suffer. A few destructive hailstorms passed over the district, and caused much damage to young fruit and crops. Rainfall: 1.53 inch on seven days.—W. M. Leonard.

Waterford (Lindley). The country is in a terrible condition: no ploughing has been done, and stock are falling off by the day on account of no veld. Rainfall: 0.36 inch on one day.—A. B. Oates.

Groothoek (Thaba Nchu).—Storms have occurred in district, but were not of much use: very little rain. Rainfall: Nil.—A. R. Smith.

Woudzicht (Vrede).—The rainfall was far below the average, causing delay in ploughing operations; only just sufficient grass to keep stock alive. Rainfall: 1.80 inch on six days. J. N. Kohler.

Mon Repos (Wepener).—Crops drying up; rain wanted badly. Rainfall: 0.78 inch on eight days.—Major E. M. Hardiman.

NATAL.

Edendale (Klip River).—Veld in very good order, and all stock fat; everything promising for a record season, and a tremendous amount of ploughing has been done. Rainfall: 1.33 inch on five days.—T. N. Niland.

Kloofend (Alexandra).—Rivers normal all the month; all rain soaked into ground. Rainfall: 5.58 inches on sixteen days.—J. D. Cruickshank.

Rongpoort (Weenen).—Remarkable for the number of days on which slight drizzle fell, and many dull days. Quite cold at night at times. Rainfall: 1.58 inch on eleven days.—J. H. Bartholomew.

Ladysmith.—Hot weather, with occasional light rains during early part of month. Very welcome and much needed rain fell on the 28th (1.41 inch), this being the first really good fall since the snowstorm in September. Rainfall: 2.65 inches on ten days.—D. A. R. Leathern.

Ismont (Mid-Illovo).—A very cold October. Rainfall: 4.59 inches on twenty-two days.—Lieut.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Cedara (School of Agriculture).—Heavy mists; fine rains, well distributed; hail on 30th; low averages of sunshine. Rainfall: 3.90 inches on twenty-one days.—The Principal.

Dundee.—We have had a few hot days during the month, but on the whole the weather has been cold for October; owing to this and the meagre rainfall grass has not grown as it should have done after the snowstorm; consequently live stock have not improved as they should. Rainfall: 2.35 inches on ten days.—West Thorrold.

Hlabisa.—Nice rains have fallen throughout the month, and the country is looking green and fresh. Rainfall: 5.97 inches on fourteen days.—L. Double.

Port Shepstone.—The weather this month has been most miserable, usually strong winds and rainy; very few sunny days. Rainfall: 5.43 inches on seventeen days.—E. K. Andreasen.

Paulpietersburg.—Hailstorm on 16th destroyed large quantities of fruit. Halo on 13th, exceptionally well defined. Several large and brilliant meteorites fell same evening.—A. A. Carter.

Hillcrest.—Good serviceable rains, with no waste. All rain of good value to farmers. Rainfall: 5.86 inches on twenty days.—A. J. Armfield.

Durban (Point).—Fairly windy during this month, averaging strong breezes, mostly from west to south-west, but nothing more than moderate gale on few days. Only two heavy thunderstorms; slight amount of thunder and lightning on only four other days. Cloudy on the whole, and generally hazy weather. No fog or mist; fair amount of dew. Rainfall: 6.21 inches on sixteen days.—A. G. Goulding.

Newcastle (Convent).—Windy days were of frequent occurrence; usually very hot at midday. Rainfall: 2.53 inches on nine days.—The Mother Superior.

CAPE PROVINCE.

Lovedale.—The month was cooler than usual by 1-2 degrees. Cool winds blowing from a cold sea and cloud, generally not very dense, brought little rain. The combined precipitation for September and October (1.29 inch) is unusually low. Only on two occasions has it been lower since 1880 (when our records begin), viz., 1896 and 1907. Rainfall: 0.85 inch on six days.—C. A. Filson.

Kokstad.—A cold October; fires in houses up to 30th, which is unusual; rain slightly below normal. Rainfall: 1.96 inch on thirteen days.—H. D. Coyte.

Mafeking (The Convent).—Two light hailstorms. Rainfall: 1.29 inch.—The Mother Superior.

Queenstown.—Dry month; rain wanted; veld drying up; cool south-east winds. Rainfall: 1.63 inch on four days.—H. Holley.

Ceres.—Weather generally changeable and cloudy; dews plentiful. Earthquake shock at 3.25 p.m. on 9th. Rainfall: 1.71 inch on seven days.—A. Heatlie.

Carnarvon.—Uneventful month, with many bright and calm days. Good harvesting prospects; crops would benefit if we could have some rain. Rainfall: Nil.—A. P. Malherbe.

Kingwilliamstown.—It is still very dry in the district. Just a little rain at intervals. In this district no ploughing has as yet been done, except in parts towards the mountains. Unless we get rains, things will be serious. There is no sickness amongst stock, but am afraid there will be a shortage of pasturage soon. Rainfall: 1.30 inch on seven days.—L. Clayton.

Graaff-Reinet.—Winds light and generally southerly. Fine, dry month; evenings cool; slight frost on the 23rd. Rainfall: 0.14 inch on one day.—S. E. D. Treadwell.

Groot Drakenstein.—A cool month, with less than half the average rainfall. Cold westerly winds were frequent in the p.m., with high thin cloud from west. Remarkable number of solar (four) and lunar (five) halos. Heavy fruit crops generally; fungoid unusually prevalent, especially "curl leaf" on peaches and fusicladium on pears. Rainfall: 1.21 inch on nine days.—Lionel Baker.

Commando Kraal (Uitenhage).—Wind and cold nights; latter most probably responsible for absence of rain that fell last October. Rainfall: 0.28 inch on four days.—Major J. Kreft.

Rietfontein (Alisal North).—Cool month, with variable weather; crops suffering at end of month from drought. Rainfall: 1.45 inch on seven days.—A. G. Smith.

Darling (Malmesbury).—Real Cape south-easter weather set in end of month, bringing summer after a very wet, cold winter and damp, cool spring. Rainfall: 1.20 inch on eleven days.—P. H. Drake.

O'okiep. Continuous drought from September 6th, adverse to crops; harvest prospects poor. Rainfall: Nil.—J. Barrows.

Riversdale.—A good soaking rain is now much more needed than at the end of last month. Rainfall: 0.78 inch on eight days.—Rev. Carl Prozesky.

Grootfontein (Middelburg).—On the whole the month has been cooler than usual. The frequency of the S.W. and S.E. winds is remarkable, as also the frequency of cirrus-stratus clouds. In spite of the rain on the 3rd (1.23 inch), the district is in great need of more rain. Farmers are all complaining of drought. Early oat crops beginning to mature, likewise lucerne. In the orchards "green fly" pest is very prevalent; no reports yet of "codlin moth." Early during the month a swarm of young locusts went over Grootfontein and Middelburg—came and went in one day; swarm was not large. Rainfall 1.33 inch on two days.—E. J. van Meerten.

Mahalapye (Bechuanaland).—The hailstorm of the 19th was the worst we have had here, but only went twelve miles west, not reaching Kalahari (twenty-one miles west) or Shoshong (twenty-eight miles south-west), but went twenty miles due east to Mokosheing and forty miles south-east towards Palla Camp, but stopped five miles before the Crocodile River. Rainfall: 2.03 inches on five days.—Miss M. Giles.

Draaifontein (Richmond).—Crops excellent, but fear some will be destroyed by locusts (voetgangers) which have appeared here in large swarms. Rainfall: 0.62 inch on one day.—J. Cilliers.

Deugas (Uniondale).—Late crops total failure; drought severe. Rainfall: 0.78 inch on three days.—M. Anthony.

BASUTOLAND.

Mafeteng.—Very dry month; veld dried up; gardening impossible. Cold nights; dust storms frequent. Stock in very poor condition; wheat crop almost a failure. Rainfall: 1.24 inch on eight days.—F. Hodgson.

DECEMBER WEATHER CHARACTERISTICS.

The south of the Cape Province now joins the western and south-western districts in a diminishing rainfall, but, with these exceptions, there is a tendency to an increase throughout the Union. Swaziland, with about 6.5 inches, is now the area of heaviest precipitation; then follows Zululand with 5.5 inches; the Transvaal, Basutoland, and Natal with 5.0 inches; Kaffraria with 4.5 inches; the south-east of the Cape with 3.5 inches; the Orange Free State and north-east of the Cape with 3.0 inches; the northern border of the Cape and the northern and east-central Karroo with 2.0 inches; the Peninsula with 1.0 inch; and the remainder of the Union with less than an inch. The period of minimum rainfall is now reached on the southern Karroo. Thunderstorms, accompanied by hail, are now of frequent occurrence, especially on the high veld, where they are responsible for most of the precipitation.

The highest mean daily temperature is still experienced over the northern borders of the Cape Province, where the normal now reaches 77 degrees. A mean temperature of 74 degrees may be anticipated in Natal; and in the Orange Free State, 71 degrees; over the eastern Transvaal, the east-central Karroo, and the south-east of the Cape, 70 degrees; over the Transvaal high veld, along the western and south-western coastal districts, and over the northern and central Karroo, 69 degrees; over the southern Karroo, and along the south coast, 67 degrees; and on the Peninsula, 66 degrees.

Over the Cape Peninsula the winds attain their maximum mean velocity during December, but elsewhere there is a continued decrease in force. Over the Transvaal, north-north-west continues to be the prevailing direction, notwithstanding a slightly diminished frequency of both north-north-westerly and northerly winds, as also of those from south and south-south-east. The breezes from the other points of the eastern half of the compass and of those from south-south-west and south-west show a slight increase in the frequency of their occurrence, whilst westerly winds are about the same as during November. At Kimberley, north-north-west winds are also numerous during this month, showing a large increase over those from the same direction during November. A similar although smaller increase is found in connection with the winds from the eastern half of the compass—an increase mainly at the expense of those from points between south and west-south-west. At East London, on the other hand, the prevalent direction is still north-east, although there is a falling-off in frequency (mostly slight) of all directions from east round by north to south-west. The only winds showing an increase in frequency are those from south-south-westerly and south-easterly directions.

In the Transvaal, the hours of bright sunshine should be about 60 per cent. of the total number possible, and in the Cape about 78 per cent. over the northern borders, 74 per cent. over the south-east, and 70 per cent. over the south-west.

C. STEWART,
Chief Meteorologist.

Pretoria



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

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MEAN pressure above the average along the south coast, almost normal elsewhere; mean temperature lower than usual but with considerable and sudden variations, ranging from the heat of midsummer during the early part of the month to cold of winter in the middle of the month; persistent northerly and north-easterly winds, with almost continuous overcast skies during the second half; unusually large number of rain days; excessive precipitation over greater part of the country causing heavy floods and damage to railways, fields, etc.; a number of destructive hailstorms; violent local winds causing damage to houses, etc.; some snow between 11th and 13th, with frosts during the same period; in fact, changeable, wet, boisterous weather characterized the month of November, 1921.

Pressure was practically the same as usual over the interior, east, and west, the main difference being the inclusion of an additional isobar (30.05 in.) along the south coast. The equatorial tongue was prominent during the greater part of the month, whilst high pressure areas were present on nineteen days. Coastal "lows" appeared on the 4th, 8th to 11th, 24th, 26th, and 28th. The advent of an intense high pressure area with cold southerly winds on the 12th caused a marked decrease in temperature amounting to 12-15 degrees over the greater part of the Union. [2]

Temperature.—The mean temperature during November (66.5 degrees) was 0.7 degree lower than usual, due to the days (77.6 degrees) being 1.9 degree cooler, whilst the nights (55.4 degrees) were 0.6 degree warmer than the corresponding averages. The deficiency in mean temperature was common to the Orange Free State, Natal, and the Transvaal, where it amounted to 2.3 degrees, 2.2 degrees, and 1.3 degree respectively. In the Cape Province, however, the mean maximum temperature (78.4 degrees) was 0.3 degree lower and the mean minimum temperature (55.9 degrees) was 1.5 degree higher than the normals, thus causing an excess of 0.6 degree more than usual. In Natal,

the days with a mean of 76.4 degrees were 4.8 degrees cooler and the nights with 59.4 were 0.4 degree warmer than the average. Similarly, the Transvaal mean maximum temperature (77.4 degrees) was less than usual by 2.7 degrees, whilst the mean minimum (55.2 degrees) was only 0.1 degree more than usual. On the other hand, in the Free State, both day and night temperatures (75.8 degrees and 50.7 degrees) were sub-normal, the former by 3.4 degrees and the latter by 1.2 degree. Considering the relation of the means for November, 1921, to the normals at the individual stations in the various provinces, it is found that there was an excess of temperature in the west, south-west of the Cape, along the south and south-east coast belt to Port St. Johns, over part of the south-east, east-central Karroo, and the south-east of the northern Karroo; also at a few stations in the north, and east, and south-west of the Transvaal; elsewhere, the mean temperature was lower than usual. The excess was greatest, 2-5 degrees, in the west and south-west, decreasing to a few tenths along the coast and in the northern Karroo, except at East London, where it rose to 2.6 degrees. Over the south-west and the east-central Karroo, the surplus was slightly more than $1\frac{1}{2}$ degree; at the Transvaal stations the excess was under 1 degree. The deficits were mostly about 2 degrees rising to 4 degrees or more in the west of Natal, the north-east of the Free State, and the northern border, but diminishing to one degree or less in the east of the Transvaal, the central portion of the northern Karroo, and the south of Bechuanaland. Both day and night temperatures were largely in excess of the average in the west, south-west, and on the south-east coast. In the west of the south coastal area, however, the days were only a tenth in excess, and the nights 1.6 degree, whilst at Port Elizabeth the days were 1.6 degree above but the nights 1 degree below normal. Over the northern and east-central Karroo, part of the south-east Cape, the south of Natal, in Zululand, and over the north and central Transvaal, and portion of the south-east and south-west only the minimum temperatures were higher than usual by a few tenths of a degree, the days being several degrees (2-6 degrees) lower than the average. In the eastern low veld and part of the high veld, the days were over half a degree warmer and the nights half a degree colder than usual. Elsewhere, the days were mostly about 2-3 degrees colder, but the deficit rose to 6-8 degrees in parts of Natal, the north-east of the Free State, the northern border of the Cape, and the central Transvaal. Over these remaining areas the night temperatures were usually only a degree or less short of the averages. The mean warmest station was Komatipoort with 76.2 degrees, and the mean coolest Harrismith in the Orange Free State, with 58.4, a difference of 17.8 degrees. The highest mean maximum was 88.3 degrees at Clanwilliam in the west of the Cape Province, and the lowest mean minimum 47.9 at Belfast on the Transvaal high veld. The warmest days of the month were 3rd, 7th to 11th, 18th, 23rd, 25th to 28th, and 30th, and the coldest spell was from the 11th to 16th, when the accompanying cold wind killed many newly-shorn sheep. The highest temperatures of the month were most numerous noted on the 7th, 10th, 11th, and 27th, and the lowest most widely on the 12th, 13th, and 14th. The extreme readings for the month were 103.0 degrees on the 25th, at Clanwilliam, and 32.0 degrees at Harrismith on the 14th, yielding an extreme range of 71 degrees for the month.

Precipitation was below the average in the west (excluding Namaqualand), south-east, and part of the south and south-east coastal areas of the Cape, the central parts of the Free State, parts of the high veld, south and centre of the Transvaal, and Bechuanaland. The deficits were mostly from a quarter to three-quarters of an inch, but exceeded an inch in a few cases, as at Swellendam and Ceres. Elsewhere, the rainfall was largely in excess mostly by

quantities of 1-3 inches, but rising to 4-6 inches in the northern and eastern Transvaal. Even these excessive quantities were surpassed at stations in the south-east Transvaal, Zululand, and Natal, where the surplus rose to 8-13 inches. The greatest excess was 13.24 inches at Dundee (Natal). The number of days on which rain fell was also unusually large, exceeding two-thirds of the month in some instances. Precipitation during this month established new records for November at a number of stations and in others approximated closely to previous maxima. Thus to take a station with a long-period record this month's total at Graaff-Reinet was exceeded only once since 1861, viz., in November, 1896, when 4.54 inches were registered and equalled by November, 1891. The totals for the month ranged from a few tenths, as at Garies (Namaqualand) (0.04 inch), to 16.73 inches at Dundee (Natal). Although thunderstorms were frequent, the rainfall was mostly of a steady, penetrating nature, well-adapted to benefit agriculture and at the same time reducing the intensity of the floods that followed in a number of cases owing to rivers overflowing their banks. Amongst notes on the rivers one may draw attention to the following:—The Assegai River at Piet Retief rose 15 feet above normal; the Olifants River at Middelburg, Transvaal, rose 18-20 feet, in parts overflowing its banks where these were low; at Newcastle (Natal), on the 28th, the river was in flood, the town being nearly flooded out; in Zululand, rivers overflowed their banks, the Umfolozi railway bridge being washed away; owing to heavy rains on 28th the Klip River at Ladysmith (Natal) overflowed its banks, flooding part of the town; the Vaal River at Standerton rose 28 feet as a result of eight days rain preceding the 28th, and owing to the bursting of dams fears were entertained of the river overflowing its banks as in 1911; from Theunissen in the Free State, it was reported that a large number of dams had burst, on the 28th the Vet River overflowed its banks miles of fencing carried away, and the Winburg branch railway line rendered impassable owing to washaways. To these may be added the newspaper report of a cloudburst on Saturday, 26th, in the vicinity of Post Retief, on a mountain side about thirty miles from Adelaide (Cape), when rivers came down in torrents, landslides occurred, and wheat lands ready for reaping were washed away. In consequence of the heavy rains, agricultural operations, ploughing, cleaning of lands, etc., were delayed, particularly on black lands, so that the quantity of maize, etc., sown would be considerably reduced; in some cases crops ready to be reaped were rotting in the ground, lands were washed away, and other damage caused; in other districts the rains enabled ploughing and planting to be carried out. In parts of the Free State, however, the rainfall was barely sufficient to enable ploughing to be carried on e.g. at Waterford (District Lindley) and Vaalbank (Bloemfontein District). Over the central and northern Karroo fairly continuous rains with heavy thunderstorms fell from 5th to 12th, and over the west and south-west light rains from 8th to 11th and on 26th. Only light showers fell along the south coast and southern Karroo, mostly during the second week, and over the northern border and Bechuanaland similar rains were distributed throughout the month. Over the more easterly portions of the Cape rain fell more or less continuously from about the 8th. Over Natal, the eastern Transvaal, and Free State rains were of frequent occurrence throughout the month, more particularly from the 17th to 30th, when almost continuous rains fell in many places. Quantities decreased in amount, and in frequency generally, from east to west over the Transvaal and Free State. Although thunderstorms were of frequent occurrence throughout the month these were mainly of a cyclonic type associated with decided barometric gradients as against the usual heat thunderstorms, whilst the colour and appearance of the lightning partook much less frequently of the violet, forked description, being more yellow to white and of a sheet-like description. An unusual feature of

this month's precipitation was the occurrence of snow on the 8th at Evelyn Valley and Pearston, and on various mountains in the Cape Province. Sleet fell at Krugersdorp (Transvaal) and snow on mountains round Kokstad on the 11th; snow at Rugby (Div. Bethlehem, O.F.S.), and on mountains round Queenstown, and sleet at Rietfontein (Aliwal North) on 12th; at Nottingham Road, but did not lie, on the 13th. The Drakensberg mountains were covered, and snow lay on Spionkop for a week. The wind accompanying this cold spell caused the death of many newly-shorn sheep. Hail was more frequent and of greater severity, on the whole, than during the preceding month. Amongst the most violent and destructive may be numbered those on the 1st at Ermelo; on the 11th at Middelburg, Bothsabelo (Div. Middelburg), and Malelane (Div. Barberton); on 17th at Rustenburg, Newlands, and Cranbourne (Div. Standerton), Belgravia, Roodepoort, and Maraisburg in the Witwatersrand; on 18th at Piet Retief; 19th at Pietersburg, Piet Retief (Transvaal Province); Wollenden, Wyford (Div. Klip River), Natal; on 20th at Bedford (Cape Province); on 21st at Breinersdorp (Swaziland), Meadows (Div. Bloemfontein), Middelplaats (Rouxville), Zandfontein (Div. Rustenburg); on 22nd at Carnarvon (Cape Province); on 23rd at Sydney-on-Vaal; on 25th at Malongeni (Natal); on 27th at Randfontein (Div. Kroonstad) and in the Malongeni District in Natal. Most of these storms were preceded or accompanied by very strong winds which uprooted trees, unroofed houses, verandas, lifted water-tanks, etc., whilst the hail caused great damage to fruit, growing crops, etc., and even perforated roofs. It would, therefore, appear that a series of linesqualls was the most prominent feature of this month's pressure distribution. The accumulated rainfall since the beginning of the year is mostly considerably above the average, except over a small area between Kuruman, Griquatown, and Kimberley, also at Port St. Johns, over the east of the Free State, at Vryheid in Natal, the neighbourhood of Pretoria, Ermelo, and Bloemhof, and Johannesburg in the Transvaal. The excesses are mostly over 4 inches, but exceeding 10 inches in parts of the Transvaal, Natal, and the south-west Cape. The surplus amounts are, however, under 3 inches over the greater part of the Free State, the south-east and north-west of the Cape. On the other hand, the cumulative amounts since 1st July are below normal over the west, portions of the south-west and southern Karroo, south-west and south-east, the north and south-east coastal areas, southern Karroo, Bechuanaland, and portions of the northern border, the greater portion of the Free State, the south-west and south-central areas of the Transvaal. Over these parts the deficits are mostly between half an inch and 2 inches, but exceed 3 inches in the south coast and southern Karroo. Elsewhere there is a surplus of precipitation amounting to 10-13 inches in parts of Natal and at Woodbush in the Transvaal. In the north-east and centre of the Free State, as well as a large portion of the Cape, the excess is under an inch, but mostly exceeds 2 inches in the Transvaal, rising to 7 and 8 inches in the north and south-east of this Province. Insect pests were unusually numerous in gardens, etc., during the month, whilst the plague of locusts is very wide-spread, particularly in the Cape Province.

OBSERVERS' NOTES FOR NOVEMBER, 1921.

TRANSVAAL.

Lichtenburg.—Best November rains since 1917. Veld is in good condition. Mealie planting done on extensive scale. Rainfall: 4.21 inches on thirteen days.—J. T. Allman.

Mosdene (Naboomspruit).—After a long dry spell of eighteen days, we had almost continuous rains from the 17th to the 29th, of an unusually soft and gentle character, there being no heavy storms at all, though on two

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), NOVEMBER, 1921.

Place.	Observer.	Month—Nov., 1921.		Normal Monthly Temperature.	Difference from Normal.	Highest.	Date.	Lowest.	Date.	
		Mean Max.	Mean Min.							
<i>France</i>										
Belfast.....	The Forester.....	72.5	47.9	60.2	+ 0.0	83.0	11th.	53.0	14th.	
Barbton.....	W. Grubb.....	74.5	60.1	69.8	+ 0.1	98.0	10th.	47.0	14th.	
Bloomhof.....	A. Adamson.....	84.7	55.4	70.4	- 0.8	95.0	8th.	40.0	14th.	
Ernebo.....	Mrs. S. M. Nicolson.....	72.8	49.7	61.2	- 1.0	82.0	11th.	35.8	18th.	
Johannesburg (Observatory).....	The Staff.....	70.8	51.9	63.0	- 1.6	82.0	10th.	42.0	13th.	
Klerksdorp (Stadumore).....	Chas. Scott.....	80.6	55.0	70.8	- 3.0	90.0	8th.	53.0	14th.	
Kranstropf.....	H. J. Evans and B. J. Kobbergill.....	87.2	65.1	76.9	- 0.7	101.0	9th.	49.0	14th.	
Louis Trichardt.....	I. J. de Bruin.....	79.8	50.9	69.0	+ 0.6	97.0	10th.	38.0	13th.	
Middelburg.....	Dr. H. A. Spencer.....	74.6	52.9	65.7	- 1.9	97.0	11th.	41.5	13th.	
Nylstroom.....	G. Bakker.....	79.0	58.8	69.0	- 2.0	91.0	10th & 11th.	40.0	14th.	
Pagrus Rest.....	E. M. Skea.....	74.9	53.7	64.3	- 1.6	93.0	8th.	47.0	14th.	
Pieteraburg.....	W. J. Frankloye.....	76.2	58.7	68.5	- 2.1	94.0	10th.	41.0	14th.	
Potchefstroom (Exp. Farm).....	The Manager.....	81.0	54.4	67.5	- 3.1	90.4	7th.	41.7	13th.	
Pretoria (Meteorological Office).....	The Staff.....	76.0	56.2	66.1	- 0.3	90.2	11th.	37.5	14th.	
Pret. Hotel.....	J. Werner.....	73.2	54.3	64.1	- 1.6	84.0	11th.	33.0	14th.	
Standerton.....	M. Ferguson.....	73.6	51.5	64.2	- 3.2	91.1	11th.	43.9	13th.	
Zeevat.....	H. Dietrich.....	80.4	57.1	72.0	- 0.6	90.0	10th & 11th.	40.0	14th.	
<i>Swaziland</i>										
Mbabane.....	Swaziland Police.....	79.5	54.6	64.0	- 1.1	88.6	18th.	38.6	13th.	
<i>Orange Free State</i>										
Bloemfontein.....	G. A. Schepers.....	79.5	53.0	67.7	- 2.3	89.4	27th.	22.0	14th.	
Bethulle.....	J. J. Wardhaugh.....	79.3	52.4	68.1	- 4.4	78.0	9th.	31.0	15th.	
Hartswijk.....	The Forester.....	68.7	48.1	62.8	- 2.3	85.0	7th.	35.0	13th.	
Lindley.....	J. Collister-Dates.....	76.3	50.9	65.9	- 1.9	83.0	7th & 18th.	53.8	14th.	
Ladybrand.....	The Forester.....	75.0	48.8	61.9	- 4.6	87.0	10th.	51.6	13th.	
<i>Natal</i>										
Durban (Point).....	The Port Captain.....	77.0	65.5	72.8	- 0.4	86.0	7th.	44.6	12th.	
Dundee.....	West Thorold.....	75.5	52.2	69.0	- 2.5	92.0	9th.	36.5	15th.	
Hiobles.....	The Gaoler.....	70.0	61.4	69.6	- 1.8	87.0	10th.	49.0	1st.	
Maitshburg (Mental Hospital).....	The Staff.....	75.8	57.4	69.1	- 0.9	90.0	3rd, 29th, & 30th.	38.0	14th.	
<i>Cape</i>										
Allwal North.....	A. Alcock.....	77.8	50.6	64.2	- 2.3	80.5	7th.	49.3	12th.	
Bedford.....	T. C. Hall.....	76.1	53.0	65.4	- 2.9	103.0	25th.	42.0	19th.	
Carnarvon.....	A. P. Rotherbe.....	80.0	53.4	67.6	- 2.0	82.0	29th.	35.0	11th & 13th.	
Capetown (Royal Observatory).....	The Staff.....	75.6	57.4	64.2	- 1.7	95.4	7th.	39.7	13th.	
Clanwilliam.....	Mrs. W. J. Downes.....	86.3	54.5	69.4	- 2.1	84.0	25th.	45.0	14th.	
East London.....	The Port Captain.....	74.3	62.5	65.8	- 4.0	92.0	16th & 27th.	38.0	12th.	
Grout-Belnet.....	S. E. D. Treadwell.....	81.4	56.1	67.1	- 2.1	89.0	27th.	44.0	13th.	
Groot-Brakpan.....	Lionel Baker.....	82.3	56.7	64.4	- 2.2	91.0	28th.	36.0	13th.	
Kolstad.....	H. D. Coyle.....	72.6	50.2	61.4	- 2.2	82.0	28th.	62.0	12th.	
Klimberley.....	J. Aeron.....	82.3	56.1	73.2	- 0.6	92.5	28th.	44.0	13th.	
Masking (Convent).....	The Mother Superior.....	84.5	57.2	72.6	- 0.6	77.0	28th.	36.0	13th.	
Mossel Bay (Cape St. Blasie).....	The Lightkeeper.....	71.3	59.9	64.8	- 0.4	90.0	7th, 27th, & 30th.	41.0	12th.	
Murrayaburg.....	Const. L. W. Nolle.....	78.8	52.2	65.1	- 0.3	95.0	23rd.	52.0	11th.	
O'okiep.....	J. Burrows.....	80.6	55.2	64.2	- 0.7	85.0	8th.	40.0	13th.	
Port Elizabeth.....	The Lightkeeper.....	72.7	58.1	65.1	- 0.7	82.0	10th & 27th.	41.0	12th.	
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	75.8	63.6	68.7	- 0.5	92.0	27th.	49.6	16th.	
Queenstown.....	H. Holley.....	77.1	52.4	66.8	- 0.5	95.0	28th.	40.0	13th.	
Vryburg.....	C. Butler.....	85.6	55.9	71.2	- 0.5	96.0	28th.	41.0	12th.	
Wynberg (Convent).....	The Mother Superior.....	74.6	56.8	62.2	- 0.5	87.2	26th.	49.6	16th.	

RAINFALL, NOVEMBER, 1921.

PLACÉ.	OBSERVER.	Month.		Normal.	Difference from Normal.	From 1st Jan., 1921.		Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.			Inches.	Inches.					
<i>Transvaal—</i>												
Barberton.....	W. Grubb.....	4.72	3.09	3.09	+ 1.63	24.74	20.18	20.18	+ 4.56	9.62	8.24	+ 1.38
Belfast.....	The Forester.....	6.67	4.19	4.19	+ 2.48	30.15	26.06	26.06	+ 4.09	10.45	8.91	+ 1.54
Bethal.....	H. F. Jonbert.....	4.96	5.35	5.35	- 0.39	30.76	24.87	24.87	+ 5.89	9.89	10.00	- 0.11
Bloemfontein.....	A. Adamson.....	1.99	1.78	1.78	+ 0.21	15.73	16.79	16.79	- 1.06	2.22	4.29	- 2.07
Claremont.....	S.A. Police.....	5.29	2.21	2.21	+ 3.08	19.83	14.89	14.89	+ 4.94	6.07	3.92	+ 2.15
Erinelo.....	Mrs. S. M. Nicolson.....	7.34	3.46	3.46	+ 3.88	23.86	25.62	25.62	- 1.76	14.08	10.63	+ 3.45
Kaenarburg.....	S.A. Police.....	7.98	3.46	3.46	+ 4.52	42.46	35.11	35.11	+ 7.35	12.62	8.42	+ 4.20
Heidelberg.....	W. A. ter Horst.....	2.86	4.68	4.68	- 1.82	20.98	23.59	23.59	- 0.83	6.42	8.77	- 2.35
Johannesburg (Observatory).....	The Staff.....	3.57	5.05	5.05	- 1.48	25.08	25.91	25.91	- 0.83	8.12	9.56	- 1.44
Klerksdorp (Strathmore).....	C. Scott.....	4.97	2.41	2.41	+ 2.56	23.94	18.83	18.83	+ 5.11	6.85	5.06	+ 1.79
Konakfontein.....	H. J. Evans and B. J. Fothergill.....	5.44	2.54	2.54	+ 2.90	24.07	22.47	22.47	+ 1.60	9.51	5.48	+ 4.03
Louis Trichardt.....	L. J. de Bruin.....	6.75	3.04	3.04	+ 3.71	35.94	26.36	26.36	+ 9.58	10.97	7.06	+ 3.91
Middelburg.....	Dr. H. A. Spencer.....	9.96	5.29	5.29	+ 4.67	30.31	24.05	24.05	+ 6.26	14.39	8.96	+ 5.43
Nystroum.....	G. Bakker.....	4.88	2.98	2.98	+ 1.90	31.51	20.71	20.71	+ 10.80	8.46	6.14	+ 2.32
Piet Retief.....	W. J. Frankleyne.....	7.50	2.59	2.59	+ 4.91	27.56	17.44	17.44	+ 10.12	18.44	5.27	+ 13.17
Pilgrims Rest.....	J. Werner.....	11.92	4.06	4.06	+ 7.86	39.08	25.62	25.62	+ 13.46	18.14	10.21	+ 7.93
Pretoria (Exp. Farm).....	E. M. Skea.....	10.10	4.11	4.11	+ 5.99	41.62	34.62	34.62	+ 7.00	15.86	8.19	+ 7.67
Pretoria (Meteorological Office).....	The Manager.....	3.70	3.11	3.11	+ 0.59	20.37	19.43	19.43	+ 0.94	7.45	0.41	+ 7.04
Rooiberg.....	The Staff.....	6.86	4.68	4.68	+ 2.18	24.88	25.50	25.50	- 0.62	7.64	8.44	- 0.80
Rustenburg.....	N. H. Muir.....	5.36	3.99	3.99	+ 1.37	28.95	20.74	20.74	+ 8.21	9.47	6.80	+ 2.67
Standerfontein.....	S.A. Police.....	6.81	5.12	5.12	+ 1.69	21.69	21.58	21.58	+ 0.11	8.09	6.67	+ 1.42
Wakkerstroom.....	M. Ferguson.....	11.30	4.38	4.38	+ 6.92	32.26	27.43	27.43	+ 4.83	16.53	10.35	+ 6.18
Woodsburg.....	L. le Roux.....	14.08	5.71	5.71	+ 8.37	35.08	20.73	20.73	+ 14.35	20.40	13.83	+ 6.57
Zeynsdorp.....	The Forester.....	3.49	3.35	3.35	+ 0.14	23.22	20.81	20.81	+ 2.41	5.24	6.84	- 1.60
<i>Swaziland—</i>												
Mbabane.....	Swaziland Police.....	8.47	6.53	6.53	+ 1.94	53.76	42.67	42.67	+ 11.09	18.81	13.91	+ 4.90
<i>Orange Free State—</i>												
Beaufort West.....	J. J. Wardhaugh.....	1.75	1.29	1.29	+ 0.46	19.77	16.06	16.06	+ 3.71	2.02	4.10	- 2.08
Bromfontein.....	G. A. Scheepers.....	1.80	1.75	1.75	+ 0.05	18.89	16.49	16.49	+ 2.40	2.45	4.90	- 2.45
Harrisburg.....	The Forester.....	7.55	3.86	3.86	+ 3.69	21.48	23.97	23.97	- 2.49	0.45	3.91	- 3.46
Kroonstad.....	S. B. Northfield.....	5.56	3.11	3.11	+ 2.45	20.90	19.38	19.38	+ 1.52	7.46	7.86	- 0.40
Ladybrand.....	The Forester.....	4.64	3.57	3.57	+ 1.07	23.71	24.00	24.00	- 0.29	7.60	8.64	- 1.04
Lindley.....	J. Collister-Oates.....	4.38	2.97	2.97	+ 1.41	23.51	20.73	20.73	+ 2.78	9.63	6.87	+ 2.76
<i>Natal—</i>												
Dundee.....	West Thorrild.....	16.73	3.49	3.49	+ 13.24	35.70	20.66	20.66	+ 15.04	21.73	8.71	+ 13.02
Durban (Point).....	The Port Captain.....	11.81	4.86	4.86	+ 6.95	49.08	36.83	36.83	+ 12.25	23.69	14.54	+ 9.15
St. Lucia.....	The Gaoler.....	5.48	5.48	5.48	0.00	48.93	37.06	37.06	+ 11.87	25.42	14.67	+ 10.75
St. Wick.....	The Gaoler.....	5.02	3.90	3.90	+ 1.12	30.76	27.41	27.41	+ 3.35	12.92	9.88	+ 3.04
St. Zulwen.....	B. G. Arnold.....	11.32	2.53	2.53	+ 8.79	28.89	22.60	22.60	+ 6.29	17.11	6.83	+ 10.28
Pietermaritzburg (Mental Hospital).....	The Staff.....	6.84	4.08	4.08	+ 2.76	39.47	28.76	28.76	+ 10.71	14.87	10.19	+ 4.68
Richards Bay.....	The Gaoler.....	9.00	4.25	4.25	+ 4.75	29.94	30.85	30.85	- 0.91	14.58	10.95	+ 3.63
Widdowson.....	The Gaoler.....	6.28	3.44	3.44	+ 2.84	26.99	22.39	22.39	+ 4.60	9.46	7.60	+ 1.86

RAINFALL, NOVEMBER, 1921 (continued).

PLACE.	OBSERVER.	Month.	Normal.	Difference from Normal.	From 1st Jan., 1921.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.								
Cape-										
Alfred North.....	A. Alcock.....	3.13	1.55	+ 1.28	19.13	18.42	+ 0.61	4.53	5.40	+ 0.87
Beaufort West.....	The Gaoler.....	2.45	0.74	+ 1.71	17.12	8.58	+ 8.54	8.87	3.65	+ 0.22
Bredford.....	T. C. Hall.....	0.86	2.89	- 3.45	27.38	26.05	+ 1.33	8.80	9.32	+ 0.46
Britford.....	The Gaoler.....	1.43	0.78	+ 0.65	19.09	10.41	+ 8.68	8.12	2.43	+ 0.69
Calvink.....	The Gaoler.....	0.88	0.40	+ 0.48	14.37	7.52	+ 6.85	3.78	3.23	+ 0.55
Cape town (Royal Observatory).....	The Staff.....	0.51	1.07	- 0.56	23.07	24.08	- 1.01	12.89	12.03	+ 0.86
Ceres.....	A. Heald.....	0.69	1.86	- 1.17	61.77	33.96	+ 27.81	24.21	21.46	+ 2.75
Cornarvon.....	A. P. Malherbe.....	2.74	0.32	+ 2.22	14.41	7.54	+ 6.87	2.77	1.77	+ 1.00
Clanwilliam.....	Mrs. W. J. Downes.....	0.10	0.39	- 0.29	11.46	8.41	+ 3.05	8.42	4.18	+ 0.70
East London.....	A. Downie.....	4.83	3.11	+ 1.72	27.02	30.04	- 3.02	9.64	13.25	- 3.71
Fraserburg.....	The Gaoler.....	1.79	0.42	+ 1.37	13.04	6.27	+ 6.77	2.65	1.69	+ 0.96
Garcia.....	The Gaoler.....	0.01	0.28	- 0.19	7.51	5.06	+ 2.45	1.99	2.63	- 0.73
Graaf-Reinet.....	S. E. D. Treadwell.....	4.50	1.24	+ 3.26	15.47	12.37	+ 3.10	5.18	4.53	+ 0.65
Groot Drakenstein.....	Lionel Baker.....	0.76	1.55	- 0.89	42.06	34.03	+ 8.03	18.14	17.78	+ 0.42
Griquatown.....	The Gaoler.....	2.28	0.81	+ 1.44	11.01	11.77	- 0.76	2.63	2.20	+ 0.44
Hanover.....	The Gaoler.....	2.16	1.15	+ 1.01	12.86	12.15	+ 0.71	3.31	3.07	+ 0.24
Hopetown.....	The Gaoler.....	1.45	1.11	+ 0.34	13.06	11.60	+ 1.46	1.19	1.10	+ 0.09
Kemharit.....	The Gaoler.....	1.00	0.29	+ 0.71	7.45	5.23	+ 2.22	2.31	1.34	+ 1.07
Kimberley.....	J. Acton.....	3.50	2.32	+ 1.18	12.73	14.18	- 1.45	2.31	3.65	- 0.46
Koedoe.....	H. P. Coyle.....	8.49	3.39	+ 5.10	28.04	23.00	+ 5.04	12.17	7.62	+ 4.55
Kuruman (Abroza).....	A. T. Stilwell.....	1.03	1.47	- 0.49	12.61	14.17	- 1.56	1.03	2.85	- 1.82
Matieling (Convent).....	Mother Superior.....	1.72	2.36	- 0.61	23.36	18.11	+ 5.25	3.03	4.92	- 1.89
Moss Bay (Cape St. Blaize).....	The Lightkeeper.....	1.04	1.14	- 0.10	16.22	15.99	+ 0.23	6.92	7.21	- 0.32
Murraysburg.....	Const. J. W. Nolt.....	4.42	0.80	+ 3.62	14.63	10.14	+ 4.50	4.04	2.79	+ 1.85
O'okiep.....	J. Burrows.....	0.29	0.23	+ 0.06	10.30	6.04	+ 4.26	2.30	3.17	- 0.87
Phillipstown.....	The Gaoler.....	3.02	1.17	+ 1.85	12.80	12.42	+ 0.38	4.75	3.18	+ 1.57
Phuaberg.....	The Gaoler.....	0.22	1.01	- 0.79	24.28	20.04	+ 4.24	10.00	10.70	- 0.70
Port Elizabeth.....	J. P. Allen.....	2.89	0.64	+ 2.25	31.99	20.55	+ 11.44	9.48	10.69	- 1.21
Prieska.....	The Gaoler.....	1.44	2.04	- 0.60	11.53	8.94	+ 2.59	3.54	1.71	+ 1.83
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	4.14	5.21	- 1.07	37.65	42.84	- 5.19	11.05	18.44	- 4.39
Queenstown.....	H. Holley.....	3.81	2.04	+ 1.77	21.09	18.56	+ 2.53	3.00	5.78	- 0.08
Sizyterville.....	The Gaoler.....	2.32	0.84	+ 1.48	10.29	8.42	+ 1.87	3.00	3.02	+ 0.02
Sutherland.....	The Gaoler.....	0.67	0.44	+ 0.23	15.67	8.80	+ 6.87	3.28	3.44	- 0.16
Swallendam.....	The Gaoler.....	1.65	2.36	- 0.71	31.78	29.59	+ 2.19	0.66	13.15	+ 3.49
Umtata.....	A. Dirpeck.....	0.68	2.53	- 1.85	31.78	22.76	+ 8.92	0.66	8.10	+ 1.18
Uniondale.....	The Gaoler.....	0.62	1.07	- 0.45	13.43	12.92	+ 0.51	2.70	5.95	- 3.25
Ungitson.....	The Gaoler.....	1.02	0.47	+ 0.55	10.08	6.40	+ 3.68	2.87	1.37	+ 1.50
Victoria West.....	The Gaoler.....	5.43	0.58	+ 4.85	16.40	9.25	+ 7.15	5.63	3.24	+ 2.39
Vryburg.....	C. Butler.....	0.71	1.44	- 0.73	17.09	17.09	+ 0.00	0.87	3.17	- 2.30
Worcester.....	The Gaoler.....	0.25	0.54	- 0.29	15.70	12.96	+ 2.74	4.90	6.36	- 1.46
Wynberg (Convent).....	The Mother Superior.....	0.80	1.77	- 0.91	15.94	15.72	+ 0.22	21.74	21.96	- 0.22
South-West Africa-										
Toumeh.....	Ing. Schetter.....	2.97	1.06	+ 1.91	20.29	25.20	- 4.91	3.34	1.83	+ 1.51
Uaraberg.....	D. Bahn.....	2.10	1.27	+ 0.83	27.03	17.49	+ 9.54	2.60	1.60	+ 1.00
Ukaros.....	Missionary Dienst.....	0.90	0.19	+ 0.71	5.97	4.42	+ 1.55	0.60	0.26	+ 0.34
Gobabis.....	Missionary Irle.....	2.72	1.11	+ 1.61	14.92	13.03	+ 1.89	3.05	1.69	+ 1.37
Windhoek.....	Observatory.....	0.94	0.81	+ 0.13	13.40	13.12	+ 0.28	1.12	1.37	- 0.25
Mariental.....	Baron V. Eschbeck.....	1.84	0.26	+ 1.58	6.46	5.00	+ 1.46	2.01	0.32	+ 1.69
Hahababis.....	Pater Prefect.....	0.40	0.23	+ 0.17	4.22	3.28	+ 0.94	0.44	0.34	+ 0.10

occasions there was much thunder and lightning. The season, so far, promises well, though the long wet spell will decrease the acreage that can be put under crops before the end of the year. It will take fully another week before the black turf lands dry sufficiently to plough or plant. As compared with November last year, the mean of the maxima temperatures is 79.6 as against 85.2 degrees, and the total sunshine 173.5 hours as against 284.5 hours. Rainfall: 7.65 inches on eleven days.—Ernest E. Galpin.

Sabie.—Rainfall for month (12.11 inches on twenty days) constitutes a record, the previous highest recorded being 11.59 inches in November, 1917.—W. Lea.

Jakhalsfontein (Pietersburg).—The latter part of month had steady rains. Heavy thunder and lightning at times; no damage to stock or buildings. Rainfall: 8.08 inches on fourteen days.—Rev. James C. Palmer.

Ventersdorp.—Sufficient rain has fallen for ploughing, but Ventersdorp has only caught the edges of the big storms which have fallen in the district. Rainfall: 2.25 inches on ten days.—W. M. Cheyne.

Piet Retief (Government Experimental Station).—This has been a very wet month, and the farmers have been delayed considerably in planting. The land has been washed out badly in places and hail storms in different sections have done considerable damage to tobacco, maize, and fruit. 18th, two light hailstorms; no damage; rainfall, 2.20 inches. 19th, severe hailstorm lasting an hour; considerable damage to crops, etc. The storm lasted about five hours; rainfall, 5.25 inches. Rainfall: 13.86 inches on twenty-one days.—Officer-in-Charge.

Messina.—Temperatures and rainfall normal. Plenty of water in the rivers, and country beautifully green. Rainfall: 3.66 inches on ten days.—P. O. B. Frost.

Wakkerstroom.—Crops have been hindered this month by excessive rain, cold, and hail. Cattle are in very good condition. Rainfall: 11.30 inches on twenty-two days.—Louis le Roux.

Pigeonhole (Zoutpansberg).—Fairly normal rains; did no harm. Rainfall: 12.26 inches on sixteen days.—Jno. McCallum.

Rustenburg.—Splendid rains have fallen during the month. Veld looking fine. Farmers are busy ploughing for summer crops. On the 17th a severe hailstorm passed over this town—hailstones as big as golf balls—doing a great deal of damage; practically all windows exposed to the north were broken; fruit trees damaged; several fowls killed. No locusts reported during this month. Rainfall: 5.36 inches on fourteen days.—Sergt. H. J. Streatfield.

Vereeniging.—Country in a splendid condition. Rainfall: 4.62 inches on sixteen days.—A. Webster.

Piet Retief.—Exceptionally rainy month, and very heavy hailstorms reported from all over the district. Heaviest rainfall for November ever experienced during my term as meteorological observer; it is also reported to be the heaviest rainfall for the past twenty years. All rivers are still in flood. The Assegai River rose to about fifteen feet above normal. Rains have caused severe damage to crops in the south-east part of this district. Rainfall: 11.62 inches on twenty-one days.—J. Werner.

Pietersburg.—Steady, soaking rains; terrific thunderstorm 19th, 2.38 inches fell in seventy minutes. Veld luxuriant. Rainfall: 7.50 inches on thirteen days.—W. Frankleyne.

Krugersdorp.—Unsettled weather with strong winds doing serious damage to orchard and other trees. Sleet fell on 11th. Cold snap on 13th, minimum, temperature dropped to 36·5 degrees. Farmers in district report that wild; wintry weather prevailed causing damage to standing crops and young stock; fruit orchards suffered extensively. Heavy thunderstorms during the month. Rainfall: 2·39 inches on eleven days, although beneficial, below normal.—G. S. Garnett.

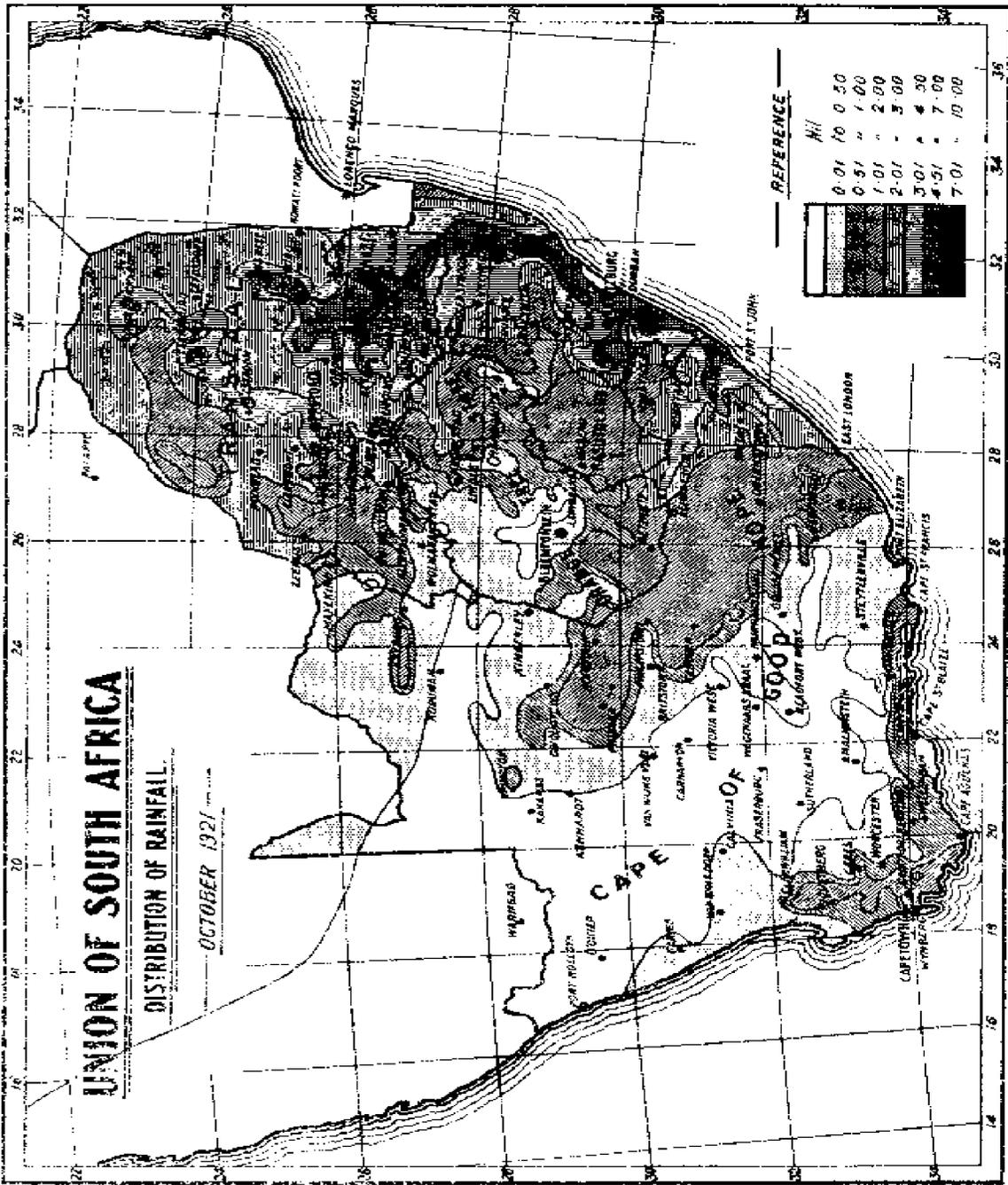
Middelburg.—The outstanding features of this month's extraordinary weather have been: Very hot, sultry weather up to 11th, when the glass suddenly dropped very low indeed; everybody was feeling this sudden depression, oppressed, sighing, and yawning, exhausted; early in the afternoon a black storm came up from N.W. driving clouds of dust before it, and within a few minutes of its striking the town, hail, driven by a regular hurricane, fell—stripping trees and shrubs of their foliage within a few minutes and leaving bare sticks standing in their place. The storm lasted perhaps twenty minutes, during which time the town and surrounding country was devastated as by a cloud of locusts—118 large trees were uprooted and blown down in this town and park; fields of wheat (to be cut that week) were reduced to chaff lying upon the ground; roofs of houses and verandahs were torn off and thrown, in the former case, over 100 yards away, and in the latter case, several hundred yards away; half a railway line upon one of these roofs was tossed thirty paces away from the shed; mosquito gauze on verandas was perforated in many places; the hood of a motor-car standing out in the storm was perforated and torn to pieces. The storm was just about a mile wide, perhaps less. On the 18th, rain came with a thunderstorm and followed by steady rain, heavy and light showers every day until the 29th—for eleven days—when the clouds broke and cool bright weather returned. During this eleven days 7·07 inches fell, the country was flooded and steadily running springs sprang up in gardens and in every direction; the Olifants River rose 18 to 20 feet, overflowing in many parts where banks are low. Total rainfall for month: 8·86 inches during half the days of the month—not a record for November; 1903 yielded 9·12 inches, and November, 1917, 8·89; but the average fall for this month during nineteen years being 5·64 inches, this month has yielded 3½ inches above the average.—Dr. H. A. Spencer.

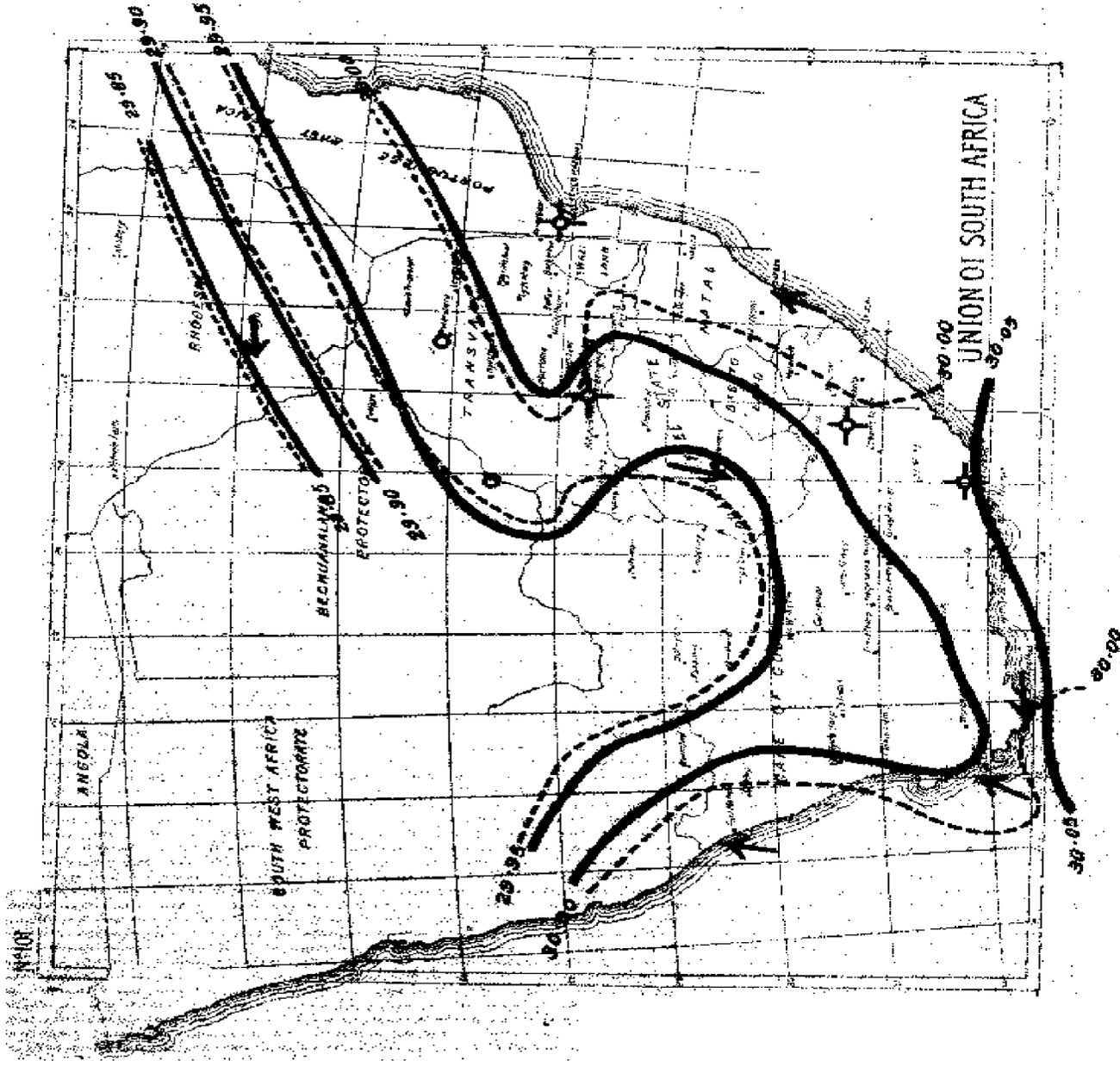
Barberton.—A fair quantity of rain fell during this month, but hardly sufficient to keep the springs running. Rainfall: 6·72 inches on twelve days.—Walter Grubb.

Standerton.—Steady, persistent rains were experienced throughout the month. Thunderstorms were neither frequent nor very violent, and there was an entire absence of hail. The most extraordinary feature was the sudden and unexpected drop in the temperature in the middle of the month. Ice was observed on top of the screen and other exposed woodwork on the mornings of the 14th, but inside the screen the thermometer registered above freezing point. Although no snow fell at this station, vegetation received a check, but the warm genial rains that fell during the latter half of the month soon made good ny damage. The veld is now in good condition and stock are rapidly putting on weight. Rainfall: 6·81 inches on twenty-one days.—M. Ferguson.

De Wittekrantz (Ermelo).—Crops, in places, washed away; large patches of maize damaged by continuous rains. Worms very active this month, whole lands being destroyed. Rainfall: 6·32 inches on twenty-one days.—M. E. Jooste.

Mimosa (Lichtenburg).—Veld is very good; ploughing in full swing. Rainfall: 1·37 inch on four days.—P. M. Prinsloo.





November, 1921. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
 The dotted lines indicate the normal distribution for November.

Zandfontein (Rustenburg).—The mealie season is extremely late owing to lateness of rains. Rainfall: 2.62 inches on ten days.—R. Boon.

Weltevreden (Standerton).—Too much continual rain prevented sowing of crops. Stock doing well. Rainfall: 7.58 inches on eighteen days.—D. Lane.

Ermelo.—Rain has fallen on twenty days, but very nice gentle rain. A hailstorm on 1st of month did much damage to fruit and gardens in the district; maize lands, in some places, were washed away. On the 14th frost almost fell here, but actually did fall on many low-lying parts. Rainfall: 7.34 inches on twenty days.—Mrs. S. M. Nicolson.

SWAZILAND.

Bremersdorp.—21st: Heavy hailstorm in afternoon—stones the size of hens' eggs. Rainfall: 7.18 inches on fourteen days.—J. H. Howe.

ORANGE FREE STATE.

Hoffontein (Kroonstad).—Rainfall: 3.58 inches on eleven days, of which 3.03 inches fell during the latter half of the month. Rains: mostly local showers. Heavier rains fell in neighbourhood, sometimes accompanied by hail. Very cold snap on 15th, with minimum temperature at 37 degrees.—G. W. Müller.

Rugby (Bethlehem).—A little snow fell on 12th, accompanied by a bitterly cold S.E. wind and followed on the two following nights by hoar-frost. The cold wind killed many shorn sheep, as many as 200 being lost in this way on one farm. The two frosts did some damage to mealies, fruit, pumpkins, and potatoes. Cattle and sheep, generally, are in excellent condition. Growing mealies and small grain crops promise well, but the incessant rains during the month have prevented any cleaning of lands. Rainfall: 9.33 inches on fourteen days.—A. C. Glynn Baker.

Vaalbank (Bloemfontein).—It is very dry, locally mainly owing to rain falling in light showers. Rainfall: 0.72 inch on seven days.—W. Callender-Easby.

Lokshock (Fauresmith).—We have been very unfortunate here as regards rain. During last three months we received less than one inch. Rainfall: 0.29 inch on two days.—Visser Bros.

Belladale (Frankfort).—On the whole a very favourable month as regards rain. It has hindered ploughing to some extent, but has brought on the veld; grass is now splendid and stock are taking on condition fast. Rainfall: 7.02 inches on twelve days.—D. McCalman.

Heilbron.—Stock are picking up wonderfully after the severe winter, and up to the present there is a remarkable absence of disease. Crops, owing to lateness of rains, are very young but promising. Grubs have done a certain amount of damage to young crops, but the recent rains almost entirely destroyed this pest, and farmers are very hopeful. Rainfall: 6.57 inches on fifteen days.—P. A. du P. Naudé.

Waterford (Lindley).—Although good rains have fallen in some parts of the district we have not had enough in this area to continue ploughing. Cattle are in a terrible condition, and prospects are certainly not looking at all bright. Rainfall: 2.81 inches on five days.—A. B. Oates.

Prospect (Vrede).—The weather this month has been favourable on the whole. Ploughing and planting have progressed well, but there has been little heat (frost on 14th), and crops made slow growth. The veld is magnificent and stock healthy and in good condition. Rainfall: 5.82 inches on sixteen days.—T. Pitcairn.

Paardekraal (Winburg).—All dams overflowing; agricultural work delayed by condition of soil; all stock good. Rainfall: 6.87 inches on seventeen days.—G. S. Lowe.

NATAL.

Ladysmith.—Rainfall for November—11.32 inches on sixteen days—exceptionally heavy, and is within .37 of the abnormal fall for February, 1918, when the town was flooded. Farmers in the district state that in some cases over 12 inches fell in the country.—R. G. Arnold.

Newcastle.—The rainfall for month: 15.06 inches on twenty days. Too wet to go on the lands. Crops such as potatoes are now rotting and cannot be taken up. 28th, rainfall 2.84 inches; 6.30 a.m., several storms passed travelling N.E. to S.W.; small hail, but no damage done. River in flood; town nearly flooded out; houses occupied chiefly by Indians in lower part of town under water. Fine weather during the last two days.—J. T. Falgate.

Ismont (Mid-Iloro).—Cold and wet. Rainfall: 8.53 inches on twenty-two days.—Lieut.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Paulpietersburg.—Rain excessive—12.26 inches on twenty-one days—a succession of exceptionally heavy thunder and lightning storms.—A. A. Carter.

Hillcrest.—A very wet month. Rain more than double the average for the last eleven years. Roads in bad condition. Rainfall: 11.94 inches on twenty-one days.—Arthur J. Armfield.

Nottingham Road.—Very wet and cold. Snow fell on the 13th through the night but did not lie. Drakensberg covered and it lay for a week on Spion Kop. Many newly-shorn sheep died. Vegetation very rank. Rainfall: 9.82 inches on twenty-five days.—Miss E. Smythe.

Ngomi.—11th, lightning very vivid; nine donkeys and two natives being killed on the Reserve. Rainfall: 12.46 inches on twenty days.—J. Tustin.

Hlabisa.—Heavy and continuous rains fell during the month; the rivers overflowing their banks. The Umfolozi Bridge (railway) was washed away, disorganizing transport for northern Zululand. Crops also suffered in some parts. The grass is in splendid condition for cattle. Rainfall: 12.88 inches on eighteen days.—L. A. Double.

Dundee.—During the whole period (eighteen years) I have been recording Dundee weather I have never known anything approaching the rainfall for this month. So abnormal a rainfall at this time of the year has very seriously hampered farming operations in these parts; lands have been so inundated with water that they are unapproachable from an agricultural standpoint. Very severe hailstorms have also occurred in some parts of the district, accompanied by violent cyclones. Rainfall: 16.73 inches on twenty-three days.—West Thorold.

Rongpoort (Klip River).—Record month for number of days on which rain fell. Ground sodden; work retarded. Rainfall: 9.81 inches on twenty days.—J. Bartholomew.

CAPE.

Bedford.—The rainfall has only twice been exceeded since 1884, viz., 1893 and 1896, with 6.74 inches and 6.52 inches respectively. The evening of the 20th brought terrific hailstorm preceded by hurricane wind, which fortunately dropped when hail was falling. Much damage was done to gardens and most of stone-fruit crop in town. The chief feature of month, apart from rain, was

the temperature ranging from midsummer heat to winter cold. There was snow in the district on the 11th. Rainfall: 6.35 inches on fourteen days.—Thos. C. Hall.

Somerset East.—Forebodings of drought dispelled by splendid rains during the second week, totalling 4.01 inches. Hatching of locusts reported throughout district subsequent to rains. A plague of garden pests in town, chiefly slugs, snails, cut-worms. Rainfall: 4.15 inches on ten days.—C. Harris.

Great Fish Point (Bathurst).—The country is nice and green, every prospect of a good season this year. Rainfall: 3.99 inches on eleven days.—H. W. Mantle.

Darling (Malmesbury).—More normal weather for the time of year than we have had for past couple of years. Rainfall: 0.30 inch on two days.—P. H. Drake.

Prieska.—Large swarms of locusts, "voetganger" were reported all over the district; also a few swarms on the commonage, which were destroyed as far as possible. Destruction means in full swing. Rainfall: 1.44 inch on seven days.—J. Fourie.

Ceres.—Weather generally unsettled, with dews diminishing. Rainfall 0.69 inch on three days.—A. Heatlie.

Grootfontein (Middelburg).—Weather has been fairly cool during the month with occasional hot days. The heavy rains from the 5th to the 11th rendered the air cooler than usual. The S.E. winds have been very prevalent, and it is noticeable that the S.E. and S.W. winds have been more prevalent than the usual N.W. wind. An extraordinary feature has been the S.E. wind springing up in the evening in spite of the wind being from another direction at time of observation. The S.E. winds are more common to the 2000–3000 feet plateau. There is a great scarcity of fruit. Codling-moth has appeared and destroyed greater portion of apple and pear crops. Farmers are harvesting oats, rye, and early wheat and potatoes. Mealies are being put in. Rainfall: 3.68 inches on nine days.—E. J. van Meerten.

Riversdale.—A good rain is much needed, water is getting scarce; but as the harvest is in full swing the farmers would like to wait a few weeks more. Rainfall: 0.42 inch on seven days.—Rev. Carl Prozesky.

Uitenhage.—Hot days, thunderstorms, and rain. Rainfall: 2.90 inches on eleven days.—Herbert Inggs.

Grassridge Irrigation Works (Cradock).—I have noticed that we have had less precipitation at observation post on every occasion it has rained than at the engineer's residence, which is three miles up stream in a north-westerly direction. Plague of "voetganger" locusts all the month; forty swarms destroyed. Veld and live stock in excellent condition. Farmers reaping wheat, lucerne, etc., and preparing for sowing maize. Rainfall: 4.67 inches on twelve days.—S. Whitwham.

Willowmore.—Rain was very welcome. Very dry winds during month. Rainfall: 1.69 inch on six days.—Mrs. B. M. Hemens.

Queenstown.—Rain fell on seventeen days when 3.81 inches was registered. The greatest fall was on 11th, when .61 inch was recorded. A month of heavy dews; mornings dull and overcast; thunderstorms and rain above the average. Veld looking splendid. Snow on surrounding mountains on the 12th.—H. Holley.

Mafeking (Convent).—For this time of the year the weather has been unusually cool. There was a sudden drop of 19 degrees in the maximum temperature on the 12th. The rainfall, 1.72 inch, though distributed over twelve days, was light. A severe hailstorm in the district did not visit the town.—The Mother Superior.

Graaff-Reinet.—This has been a very trying month, the temperature rising above 90 degrees on 6 days, the highest being 95.4 on the 6th; on the 11th the maximum dropped to 52.2 degrees, the minimum temperature, 39.7 degrees, on the 13th. The rains have been most welcome, and the total for the month is a record for the last thirty years—according to old inhabitants; 4.50 inches on nine days.—S. E. D. Treadwell.

O'okiep.—Rain badly needed. Country getting dry. Rainfall: 0.29 inch on three days.—J. Burrows.

Carnarvon.—Excellent rains for November. Thunderstorm with hail on 22nd worked havoc with wheat crop one part of district. Many swarms of locusts in district as result of rains. Rainfall: 2.74 inches on seven days.—A. P. Malherbe.

Groot Drakenstein.—A dry, hot month with a good deal of wind, but no destructive south-easters. Rainfall slightly less than half the average. There has been a deficiency of rainfall for last four months, amounting to 2½ inches. Rainfall: 0.76 inch on five days.—Lionel Baker.

Kokstad.—Unusual rainfall—the heaviest since November, 1906, which totalled 9.50 inches. Snow on mountains on 11th; snow in November hitherto unknown. Mean monthly temperature below normal. Rainfall: 8.49 inches on eighteen days.—H. D. Coyte.

Karreekloof (Hope Town).—Locusts in terrible swarms. Rainfall: 0.86 inch on two days.—Lilienfeld and Wright.

Cromdale (Aberdeen).—Locusts hatching out all over the district. Rainfall: 3.93 inches on seven days.—J. N. Cruickshank.

Sydney-on-Vaal (Barkly West).—Thunder, lightning, and heavy hailstorm during afternoon of the 23rd. Steady rain after sundown. The heaviest fell in the district three miles east of here; damage to fruit trees and roads.—F. G. Richards.

Mahalapye (Bechuanaland).—At Pella Road, twenty miles south, there has been a terrible storm with hail, some stones went through the roof. Rainfall: 5.47 inches on sixteen days.—M. Giles.

BASUTOLAND.

Mafeteng.—Very cold nights 12th to 16th. Splendid rains fell from 19th to 26th. Veld looking well; stock improving rapidly. Rainfall: 5.29 inches on sixteen days.—F. Hodgson.

JANUARY WEATHER CHARACTERISTICS.

Except along the west coast, where the minimum of 0.14 inch is reached, and in the south-western districts of the Cape, the rainfall is now increasing. Over the eastern half of the Union the precipitation is usually at its maximum during January. Swaziland and Basutoland, the latter with a normal of about 7.0 inches, are the districts where the heaviest rainfall may be expected. About 5.5 inches should fall in the Transvaal; 5.0 inches in Natal; 4.5 inches in Kaffraria and over the north-east of the Cape; 4.0 inches in the Orange Free State and over the south-east of the Cape; 2.5 inches over the Cape northern border; 2.0 inches over the northern and east-central Karroo and along the south coast; 1.5 inch over the west-central Karroo; and less than an inch over the remainder of the Union.

The highest mean daily temperature is still experienced over the northern borders of the Cape Province, where the normal remains at 77 degrees; and the eastern Transvaal follows with 75 degrees; the southern Karroo with 74 degrees; the east-central Karroo and the Orange Free State with 72 degrees; Natal, the south-east and the south-west of the Cape, and the northern Karroo with 71 degrees; Basutoland, the central Karroo, and the Cape western coast with 70 degrees; the south coast and the north-east of the Cape, and the Transvaal high veld with 69 degrees; and then Kaffraria and the Cape Peninsula with 68 degrees. On the high veld, generally, the temperature is now at its maximum.

Notwithstanding a considerable decrease in the frequency of north-north-westerly winds at Johannesburg, compared with those of the previous month, this continues to be the prevalent direction, although northerly winds are almost of equal frequency; a similar state of affairs occurs at Kimberley, where north-north-west is also the direction of most frequent occurrence; at East London north-easterly winds are most numerous, although those from the south-south-west, south-west, and west-south-west are collectively more numerous than those from the north-north-east, north-east, and east-north-easterly directions; whilst over the Cape Peninsula south continues to be the prevalent wind-direction. Compared with December, there is at Johannesburg a general increased frequency of winds from all easterly directions between north and south-south-east, particularly east and east-south-east, and a decrease of all others, especially north-west and north-north-west. At Kimberley there is a diminution in frequency of winds between north-north-west and south-west as well as of those from south-east, south-south-east, and north-north-east, more particularly of westerly breezes, and an increase in those from the remaining directions especially east-north-east and east-south-east. At East London there is an increase in north-east to north-north-west as well as south-west and west-south-westerly winds, but a decrease in all others. Over the Cape Peninsula there is a falling off in south-east and south-south-easterly winds, with a corresponding increase of north-westerly breezes. Kimberley is the only station at which there is an increased wind velocity, all the others showing diminished force.

In the Transvaal about 56 per cent., on the Peninsula about 76 per cent., over the Cape northern border about 74 per cent., and over the south-east of the Cape about 48 per cent. of the total possible hours of bright sunshine should be enjoyed.

C. STEWART,
Chief Meteorologist.

PRETORIA.



UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

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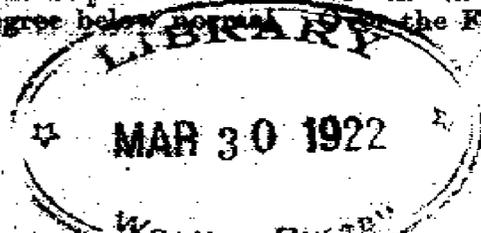
DECEMBER, 1921.

No. 12.

THE closing month of the year 1921 was marked by a practically normal mean pressure; exceptionally cloudy cool weather, with a large number of rainfall days; temperature two degrees lower than normal, with unusually cool days, particularly in the Orange Free State and Natal, an excess of rainfall over the greater part of the Cape, Orange Free State, and Natal, but limited to the south-west and south-east of the Transvaal; particularly stormy and wet during the last week, causing floods over the central and southern areas of the Cape Province; an unusual number of lightning fatalities to people and cattle; many destructive hailstorms; snow on the Drakensberg, and frost in the south-east of the Cape Province.

Pressure.—The mean isobars show but little deviation from normal, being, however, slightly lower than usual in the east, particularly over the Transvaal. The equatorial "low" was well-marked throughout the month, surging down to the coast. High pressure areas appeared on only five days: on 19th, 20th, and 22nd over the south, on 30th over the south-west, and on 31st over the south-east.

Temperature.—The mean temperature of the month was 68·8 degrees, or 1·1 degree lower than usual, the mean day temperature (79·7 degrees) being 2·1 degrees lower than the average, whilst the night temperatures were normal. Mean maximum temperatures were subnormal in all provinces, the greatest difference being 5·0 degrees over the Orange Free State, where the days had a mean of 77·8 degrees as against a normal of 82·8 degrees. In Natal the mean maximum was 79·6 degrees, or 3·3 degrees lower than usual; in the Transvaal 80·7 degrees, or 1·6 degree less than the average; whilst an almost equal deficit occurred over the Cape Province, where the mean day temperature was 79·6 degrees, or 1·5 degree below normal. In the Free State and Transvaal



the nights were cooler than usual, the mean minimum over the former being 53.8 degrees, or 1.8 degree lower than the average, and over the latter 57.5 degrees, or 0.7 degree below the normal. On the other hand, the nights were warmer than usual over Natal and the Cape Province, the mean minimum over the former being 64.4 degrees, or 1.8 degree below, and over the latter 58.5 degrees, or 0.6 degree lower than the corresponding averages. Considering the stations separately, the temperature of the month was above normal usually by amounts less than a degree along the south and south-east coasts, parts of the north-east of the Cape, and of Kaffraria; in Zululand, Swaziland, and the south-east of the Transvaal; it was normal in the south-west and part of the Transvaal high veld, but subnormal elsewhere. The deficits were mostly between 1 and 2 degrees, but increased to 4 and 5 degrees in the east of the Free State and portion of the south-west Transvaal. At a number of stations in the Transvaal and Cape the deficiencies amounted to only a few tenths of a degree. Both day and night temperatures were higher than usual in the Cape Peninsula, parts of the south and south-east coast, of the north-east, Kaffraria, and Swaziland. In Natal, Zululand, the neighbourhood of Port Elizabeth, the northern Border, the south-west and part of the south-east of the Cape, the south-east, part of the south-west, and of the north of the Transvaal, only night temperatures were in excess of normal, and over the middle-east and part of the Transvaal high veld only the days were warmer than usual. Elsewhere, both days and nights were cooler than usual, particularly in the Free State, the centre, west, and south-west of the Transvaal, and Namaqualand. The excess in the mean maximum temperature was mostly small, about half a degree or less, the greatest surplus being 1.8 degree at Wynberg, in the Cape Peninsula. The excesses in the minimum temperatures were somewhat greater, usually over 1 degree, rising to 2 degrees at several stations in each of the Provinces, reaching a maximum of 3.1 degrees at Kokstad, in Kaffraria. The deficits in the day temperatures were fairly large in the various provinces, 2-4 degrees being not unusual, but reaching 5.1 degrees at Klerksdorp, in the Transvaal, 7.6 degrees at Ladybrand, in the Orange Free State, 4.8 degrees at Maritzburg, Natal, and 6.8 degrees at Bedford, in the south-east of the Cape. The deficits in minimum temperatures were usually greater than the surplus amounts, being usually between 1 and 2 degrees, although falling to a few tenths at some stations, particularly in the Transvaal, but rising to 3 degrees in the Transvaal and to 4.1 degrees at O'okiep, in Namaqualand. The mean warmest station was Komatipoort (Transvaal), with a temperature of 79.4 degrees, and the mean coolest Belfast (Transvaal) and Harrismith (O.F.S.), with 61.2 degrees, a difference of 18.2 degrees. The highest mean day temperature was 91.0 degrees at Komatipoort, and the lowest night temperature 49.1 degrees at Belfast, both in the Transvaal. Highest temperatures for the month were registered on eighteen days, particularly the 17th and 18th, the longest periods during which no such extremes were recorded being from 10th to 15th and 27th to 30th inclusive. Lowest temperatures occurred on fifteen days, particularly on 20th over the Cape, the longest spell devoid of these extremes being from 4th to 11th and from 23rd to 27th inclusive. A temperature of 100 degrees was recorded at Clanwilliam on the 6th, while the lowest was 35.0 degrees on the 12th, at Murraysburg. There was thus an extreme range of 65.0 degrees throughout the month. On the 20th, frost was reported in the Bedford District.

Precipitation was of frequent occurrence at short intervals throughout the month in Natal, the east of the Cape, and Kaffraria, but a decided break in the rains over the greater part of the Transvaal and Free State between the 11th and 20th. Scattered thunderstorms occurred at intervals throughout the month

over the northern Border, Bechuanaland, and the Karroo, particularly at the end of the first, the beginning of the second, and during the last week of the month. In the west and south-west, the weather was generally fine and bright, with occasional light showers, especially between 9th and 16th and about the end of the month. Although generally associated with thunderstorms, the rainfall was mostly of a steady, soaking character. The exceptional period was from the 21st to 30th, when severe thunderstorms, accompanied by destructive hail or rainfall of great intensity, occurred over the greater part of the summer rainfall area. During this period considerable damage was done by hail and lightning, crops were practically drowned, and considerable damage caused to lands by erosion. Some rivers, e.g. the Vaal, were running high all through the month, and in consequence of heavy rains on the 28th and 29th, the Karroo Rivers, the Gamka, the Groot or Gamtoos, and Sundays Rivers, were in flood; washaways occurred on the Mossel Bay-Klipplaat line, especially in Toverwater's Poort, where two miles of the permanent way were reported to have been washed away; the bridge at Fullarton, twenty-four miles east of Willowmore, is stated to have collapsed, and eight farmhouses destroyed. Washaways on the main line north of Fraserburg Road, owing to the Gamka River being in flood, caused considerable delays to trains. The Gamka, according to a report from Calitzdorp, was 1,000 yards wide, and a bridge five miles from this town was destroyed. At Cleveland, on the Sundays River, the river changed its course in consequence of erosion, leaving a gap of approximately 40 feet between the right wing wall of the weir and the river bank; after the flood had subsided, it was found that the weir was on the left bank of the river, and no water could reach it. Several of the irrigation canals also collapsed. At Lake Mentz the water is reported to have reached a height of 38 feet, being higher than during the floods of May, 1916. Considerable damage was done to lands, fertile fields with their crops being washed away. The Blyde River Irrigation Works are also stated to have suffered in consequence of rains on the 24th, part of the dam wall being washed away. The Alexandria line was also under three feet of water, but no material damage was done. Precipitation during the month was subnormal over the Cape Peninsula, Gordonia, Bechuanaland, part of the northern Border, and Namaqualand, the south of the Free State, the central area of Natal, Swaziland, together with the north, north-east, middle, and south of the Transvaal. The deficits were mostly less than an inch, but exceeded 1.0 inch at Pretoria and Pilgrims Rest, and was between 2 and 3 inches at Ermelo and Louis Trichardt. Elsewhere the rainfall was above the average, usually by amounts under an inch in the west and south of the Cape Peninsula, but rising to 3-6 inches in parts of the central Karroo, the north-east of the Cape Province, and Kaffraria, the eastern half of the Free State, parts of the west and south-west Transvaal, the east and south of Natal. The accumulated rainfall since the beginning of the year was mostly in excess of the average over the Cape Province by amounts varying from a few tenths to almost 23 inches at Ceres in the south-west. The surplus amounts were commonly between 2 and 4 inches, but rose to 7-8 inches over parts of the northern Karroo, the south-west, and Kaffraria. In the Free State the excesses were usually between 3 and 5 inches, but decreased to little more than half an inch at Harrismith. Over the Transvaal the excess lay mostly between 4 and 8 inches, but increased to more than 10 inches at Nylstroom and Rustenburg, and to 14.81 inches at Piet Retief in the south-east. Large excesses were also registered in Natal, ranging from about 3 inches at Weenen to almost 17 inches at Durban. A deficiency in rainfall occurred along the east and south-east coast, at Wynberg in the Cape Peninsula, and in portions of Bechuanaland, the northern border, and the east of the northern Karroo. The shortages were usually between 1 and 2 inches, but increased to almost 4 inches at Phillipstown

and over 7 inches at Port St. Johns. Other areas of sub-normal precipitation were Bloemhof in the south-west, Pretoria in the south-centre, and Barberton in the east of the Transvaal, Vryheid in Natal. The aggregates since the 1st of July, 1921, were less than normal in the centre and south of the Transvaal, and Orange Free State, Bechuanaland, northern Border, the west coastal area, parts of the Cape Peninsula and south-west, also of the southern Karroo and of the north-east, together with the south-east littoral. The deficits were usually between $1\frac{1}{2}$ and 3 inches, but decreased to less than an inch over the west coast area. Elsewhere the six months' totals were in excess of normal commonly by 1-3 inches in the Cape, by over 3 inches in the Free State, by 2-6 inches in the Transvaal, and 4-10 inches in Natal. The surplus, however, rose to 10.58 inches at Kokstad (Cape Province) and 16.22 inches at Dundee in Natal, where other stations had more than 10 inches above the average. Hailstorms were unusually widespread and destructive during the month, particularly from 21st to 30th. The hail was large, and caused considerable damage to crops, fruit, and poultry, etc., on the 21st, over Boshof, Heilbron, Kroonstad, Phillipolis, Rouxville, and Vrede District. On this date snow was reported on the Drakensberg Mountains. Similar, and in some instances more severe, storms occurred over a much wider area between the 24th and 31st, more particularly on the 28th and 29th, small stock being killed, windows broken, and crops washed away; at Busby (Ermeelo) on the 26th, jagged hailstones not only destroyed crops, but cattle and sheep were bleeding from cuts from these stones. A number of sheep were reported to have been killed by hail during a storm on the last day of the year in the neighbourhood of Modder River. Apparently about ten natives were killed by lightning during storms on the 5th and 21st, in addition to sheep, horses, and cattle. Insect pests are proving unusually troublesome, the mealie-borer, fruit-fly, bagworm, etc., being prevalent in various areas, in addition to locusts so widespread over the Cape Province. The harvests in Namaqualand and at Darling (Malmesbury Division of the Cape) are stated to be very poor, whilst the prospects over parts of the Transvaal, Orange Free State, and Natal are by no means bright, owing to excessive rains and cool weather during this and the two previous months. In other parts, however, the rains have improved the condition of the veld and the mealie crops, in addition to providing water for storage, although many dams were washed away by the heavy rains.

OBSERVERS' NOTES FOR DECEMBER, 1921.

TRANSVAAL.

Middelburg.—This month, which is often very hot and humid, has this year been comparatively cool, with no maximum temperature of over 88 degrees, instead of one of 90 degrees to 95 degrees often recorded during December. The heat has been tempered by cool breezes, and most of the days clouded. The rainfall has been well up to the average, 4.43 inches on seventeen days having fallen, whilst an average for this month for the past nineteen years gives 4.60 inches. The year 1921 closes with a total rainfall of 35.09 inches, and as an average rainfall (annual) for the past eighteen years amounts to 30.46 inches, this year has had 4.63 inches above the average.—Dr. H. A. Spencer.

Pietersburg.—Rather dry early portion of month, soft rains latter end. No hail in town or immediate vicinity, but eastern and north-eastern portions of district suffered severely. Heavy hailstorm Haenertsburg area, 19th. Rainfall: 2.40 inches on eight days.—W. J. Frankleyne.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), DECEMBER, 1921.

PLACB.	OBSERVER.	Month—Dec., 1921.			Normal Monthly Temperature.	Difference from Normal.	Extremes.			
		Mean Max.	Mean Min.	Mean.			Highest.	Date.	Lowest.	Date.
<i>Tyrol—</i>										
Bellet.	The Forester.	73.4	40.1	61.2	61.2	-0.0	83.0	18th.	40.0	17th & 30th.
Barbaron.	W. Grubb.	81.2	62.4	71.8	72.1	-0.3	92.0	17th.	56.0	1st.
Bischof.	A. Adamson.	85.1	58.2	71.6	73.5	-1.9	94.0	17th & 26th.	39.0	29th.
Brisio.	Mrs. S. M. Nicolson.	78.6	51.2	64.9	66.4	-0.5	84.0	25th.	39.0	1st.
Johannesberg (Observatory).	The Staff.	75.0	53.9	64.4	64.8	-0.4	84.0	18th.	45.4	14th.
Kirchberg (Strathmore).	Chas. Scott.	81.5	57.1	69.3	73.4	-4.1	89.0	2nd, 17th, & 30th.	49.0	30th.
<i>Switzerland—</i>										
Konigsfurt.	B. J. Fothergill.	91.0	67.8	79.4	80.6	-1.2	99.0	18th.	61.0	1st.
Louis Truchardt.	L. J. de Bruin.	80.6	58.1	69.4	71.9	-2.5	98.0	18th.	52.0	17th.
Mildalburg.	Dr. H. A. Spencer.	79.5	53.5	66.5	67.4	-0.9	88.0	18th.	46.0	29th.
Nyström.	G. Bakker.	82.8	58.8	70.8	72.0	-1.2	92.0	18th.	51.0	15th.
Pigrins Rest.	E. M. Skea.	78.2	56.3	67.2	67.3	-0.1	86.5	16th & 17th.	48.0	15th.
Petersburg.	W. J. Franklyn.	79.9	59.3	69.6	70.2	-0.6	90.0	18th.	54.0	1st.
Potschtrömm (Exp. Farm).	The Manager.	83.3	56.6	70.0	70.1	-0.1	92.1	16th.	47.0	30th.
Präfura (Meteorological Office).	The Staff.	79.9	58.2	69.0	71.1	-2.1	90.2	18th.	43.9	15th.
Plat Relief.	J. Werner.	77.4	59.4	68.9	67.4	+0.6	86.9	18th.	45.0	9th.
Staudert.	M. Ferguson.	78.1	54.1	66.1	66.2	-0.1	91.8	19th.	49.9	14th.
Zerbst.	H. Dietrich.	83.0	58.4	71.0	74.7	-3.7	91.8	19th.	49.9	14th.
<i>Switzerland—</i>										
Melano.	Swissland Police.	76.6	57.2	66.9	66.4	+0.5	88.0	17th.	50.0	1st & 20th.
<i>Grande Frée State—</i>										
Biomonte.	G. A. Schepers.	80.3	56.5	68.4	71.9	-3.5	90.5	4th.	48.3	20th.
Bethulle.	J. J. Wardhaugh.	83.2	57.2	70.2	72.9	-2.7	94.6	4th.	45.0	20th.
Harismith.	The Forester.	71.8	50.7	61.2	65.4	-4.2	80.0	4th & 17th.	43.0	22nd.
Lindley.	J. Collister-Oates.	78.2	53.7	66.0	67.6	-1.6	88.0	3rd.	43.3	30th.
Ladybrand.	The Forester.	75.5	51.0	63.2	68.2	-5.0	83.0	16th.	44.0	14th, 20th, & 22nd.
<i>Natal—</i>										
Durban (Point).	The Port Captain.	79.6	67.9	73.8	74.8	-1.0	98.0	9th.	60.0	16th.
Dunoe.	West Thorold.	79.2	55.9	67.6	72.0	-4.4	91.0	17th.	46.0	30th.
Hiabac.	The Gaoler.	79.8	64.2	72.0	71.6	+0.4	87.0	17th & 18th.	59.0	14th, 15th, 19th & 20th.
<i>Maritzburg (Mental Hospital)—</i>										
<i>Cape—</i>										
Alwal North.	A. Alcock.	81.6	54.2	67.9	68.3	-0.4	92.0	4th.	40.5	20th.
Bedford.	T. C. Hall.	75.8	59.4	66.1	68.3	-2.2	90.0	23rd.	39.0	20th.
Carnarvon.	A. P. Malherbe.	86.9	54.6	69.2	73.5	-4.3	64.0	23rd.	43.0	31st.
Cape Town (Royal Observatory).	The Staff.	76.8	59.5	68.2	67.9	-0.9	87.5	25th.	54.6	12th.
Clarewilliam.	Mrs. W. J. Downes.	88.0	54.8	71.4	73.2	-1.8	100.0	6th.	45.0	20th.
East London.	The Port Captain.	74.6	64.5	69.6	68.5	-1.1	81.0	8th & 16th.	48.3	20th.
Great-Bednet.	S. E. D. Treadwell.	83.2	59.2	71.2	71.8	-0.6	96.8	23rd.	50.8	3rd.
Great Irankenstein.	Lionel Baker.	82.4	58.5	70.4	70.4	+0.0	96.4	6th & 25th.	50.8	3rd.
Kokstad.	H. D. Coyne.	76.1	53.6	64.8	63.2	-1.6	90.0	17th.	42.0	20th.
Kimberley.	J. Acton.	86.7	60.2	73.4	75.7	-2.3	96.0	14th.	49.0	29th.
Mackering (Convent).	The Mother Superior.	80.0	58.2	72.6	74.7	-2.1	85.3	17th.	50.0	13th & 30th.
Mossel Bay (Cape St. Blaize).	The Lightkeeper.	74.0	62.6	68.3	67.5	+0.8	81.0	7th.	56.0	29th.
Murraysburg.	Sergt. M. Whitaker.	82.2	53.6	67.9	69.4	-1.5	90.0	23rd.	35.0	12th.
O'okiep.	J. Burrows.	80.8	54.1	67.4	71.4	-4.0	83.3	7th & 31st.	42.0	12th.
Port Elizabeth.	The Lightkeeper.	72.7	64.0	68.4	67.7	+0.7	78.0	5th.	56.0	20th.
Port St. Johns (Cape Horns).	The Lightkeeper.	76.0	65.5	70.8	71.1	-0.8	81.0	1st.	59.0	20th.
Queenstown.	H. Holley.	82.0	57.2	69.6	68.4	-1.2	97.0	23rd.	42.0	31st.
Vryburg.	C. Buller.	86.8	59.2	73.0	73.3	-2.3	96.0	3rd.	47.0	29th.
Wyburg (Convent).	The Mother Superior.	77.3	59.3	68.3	66.3	+2.0	91.2	24th.	55.5	13th & 18th.

RAINFALL, DECEMBER, 1921.

PLACE.	OBSERVER.	Month. Dec., 1921.	Normal. Inches.	Difference from Normal.	From 1st Jan., 1921. Inches.	Normal. Inches.	Difference from Normal.	From 1st July, 1921. Inches.	Normal. Inches.	Difference from Normal.	
											Inches.
Transvaal—											
Barberton.....	W. Grubb.....	6.25	4.50	+ 1.75	31.0	33.74	- 2.74	16.88	12.80	+ 4.08	
Belfast.....	The Forester.....	6.88	5.94	+ 0.94	36.78	32.00	+ 4.78	17.08	14.85	+ 2.23	
Bethal.....	H. F. Joubert.....	3.40	3.52	- 0.12	34.10	30.39	+ 3.71	13.29	15.52	- 2.23	
Bloemhof.....	A. Adanson.....	2.34	2.03	+ 0.31	18.09	18.82	- 0.73	4.58	6.32	- 1.74	
Claremont.....	S.A. Police.....	3.82	3.24	+ 0.58	23.65	18.13	+ 5.52	9.89	7.16	+ 2.73	
Ermedo.....	Mrs. S. M. Nicolson.....	2.61	4.29	- 1.68	26.47	29.21	- 2.74	16.69	14.41	+ 2.28	
Heerdtburg.....	S.A. Police.....	4.83	5.25	- 0.42	46.99	40.36	+ 6.63	17.15	13.67	+ 3.48	
Heidelberg.....	W. A. ter Horst.....	6.07	4.14	+ 1.93	29.43	27.78	+ 1.65	10.27	12.91	- 2.64	
Johannesburg (Observatory).....	The Staff.....	6.78	3.06	+ 3.72	31.75	30.73	+ 1.02	14.79	14.38	+ 0.41	
Klerksdorp (Strathmore).....	C. Scott.....	6.30	3.80	+ 2.50	31.27	26.27	+ 5.00	13.63	8.12	+ 5.51	
Komatipoort.....	B. J. Potlervitch.....	3.11	6.00	- 2.89	38.75	32.36	+ 6.39	14.08	13.06	+ 1.02	
Lomb Trekarit.....	L. J. de Bruin.....	4.43	4.69	- 0.26	34.74	32.77	+ 1.97	18.82	13.65	+ 5.17	
Middelburg.....	Dr. H. A. Spencer.....	9.27	9.83	- 0.61	34.78	23.99	+ 10.79	11.73	10.02	+ 1.71	
Nyctroon.....	G. Bakker.....	2.40	4.25	- 1.85	20.98	21.69	- 0.71	15.84	9.52	+ 6.32	
Pietersburg.....	W. J. Frankleyne.....	6.36	5.00	+ 1.36	45.43	30.82	+ 14.61	24.49	15.21	+ 9.28	
Piet Retief.....	J. Werner.....	4.52	4.26	+ 0.26	45.94	40.48	+ 5.46	20.38	14.05	+ 6.33	
Pilgrims Rest.....	E. M. Skees.....	5.43	4.26	+ 1.17	31.80	23.69	+ 8.11	12.88	10.70	+ 2.18	
Polokwane (Exp. Farm).....	The Manager.....	3.14	3.18	- 0.04	27.82	29.68	- 1.86	10.78	12.62	- 1.84	
Preterita (Meteorological Office).....	The Staff.....	3.97	3.15	+ 0.82	32.92	23.89	+ 9.03	13.44	9.95	+ 3.49	
Roosburg.....	M. Baumann.....	6.46	4.63	+ 1.83	35.41	25.86	+ 9.55	14.55	10.95	+ 3.60	
Rosenburg.....	S.A. Police.....	4.23	4.63	- 0.40	35.41	30.25	+ 5.16	15.94	14.83	+ 1.11	
Standerton.....	M. Ferguson.....	5.96	4.70	+ 1.26	38.22	32.13	+ 6.09	22.49	15.05	+ 7.44	
Wakenvoort.....	L. de Roux.....	3.80	3.24	+ 0.56	27.18	24.05	+ 3.13	9.10	9.08	+ 0.02	
Woodbush.....	The Forester.....	7.01	7.51	- 0.50	60.77	50.18	+ 10.59	25.82	21.42	+ 4.40	
Zeerust.....	H. Distach.....	3.80	3.24	+ 0.56	27.18	24.05	+ 3.13	9.10	9.08	+ 0.02	
Swaziland—											
Mbabane.....	Swaziland Police.....	7.01	7.51	- 0.50	60.77	50.18	+ 10.59	25.82	21.42	+ 4.40	
Orange Free State—											
Bethells.....	J. J. Wardhaugh.....	2.13	2.40	- 0.27	21.90	18.46	+ 3.44	5.05	6.50	- 1.45	
Bloemfontein.....	G. A. Schepers.....	2.96	2.73	+ 0.23	21.85	19.22	+ 2.63	5.41	7.08	- 1.67	
Hartsmith.....	The Forester.....	7.30	4.22	+ 3.08	28.78	28.19	+ 0.59	16.75	19.13	- 2.38	
Kroonstad.....	S. B. Northfield.....	7.21	3.72	+ 3.49	27.81	22.05	+ 5.76	14.67	11.37	+ 3.30	
Ladybrand.....	The Forester.....	8.65	3.94	+ 4.71	32.90	27.34	+ 5.56	15.65	11.98	+ 3.67	
Emdley.....	J. Collister-Oates.....	5.81	3.61	+ 2.20	39.32	34.34	+ 4.98	14.44	10.48	+ 3.96	
Natal—											
Dundee.....	West Thoburn.....	7.76	4.61	+ 3.15	33.16	31.27	+ 1.89	29.54	13.32	+ 16.22	
Durban (Point).....	The Port Captain.....	9.70	4.93	+ 4.77	58.73	41.76	+ 16.97	32.39	19.47	+ 12.92	
Albosta.....	The Gaoler.....	6.24	6.17	+ 0.07	55.17	43.23	+ 11.94	31.66	20.84	+ 10.82	
Howick.....	The Gaoler.....	7.13	4.63	+ 2.50	37.83	32.04	+ 5.79	19.95	14.81	+ 5.14	
Ladysmith.....	B. G. Arnold.....	9.52	4.41	+ 5.11	37.91	27.31	+ 10.60	26.63	11.24	+ 15.39	
Pietermaritzburg (Mental Hospital).....	The Staff.....	9.05	5.04	+ 4.01	42.52	33.80	+ 8.72	23.92	15.14	+ 8.78	
Vryheid.....	The Gaoler.....	6.83	6.04	+ 0.79	32.77	30.85	+ 1.92	21.41	16.99	+ 4.42	
Worcester.....	The Gaoler.....	3.62	3.98	- 0.36	39.61	36.37	+ 3.24	13.08	11.58	+ 1.50	

RAINFALL, DECEMBER, 1921 (continued).

PLACE.	OBSERVER.	Month. (Dec., 1921.)	Normal. Inches.	Difference from Normal.	From 1st Jan., 1921.	Normal. Inches.	Difference from Normal.	From 1st July, 1921.	Normal. Inches.	Difference from Normal.
Cape—										
Abraal North.....	A. Alcock.....	2.85	2.62	+ 0.23	21.98	21.14	+ 0.84	7.88	8.02	- 0.14
Beaufort West.....	The Gaoler.....	3.18	0.88	+ 2.30	9.76	9.46	+ 0.30	0.05	3.53	- 3.48
Bedford.....	T. O. Hall.....	3.81	2.92	+ 0.89	31.14	27.97	+ 3.17	12.67	12.34	+ 0.33
Britstown.....	The Gaoler.....	0.26	0.94	- 0.68	19.85	11.35	+ 8.50	3.85	3.37	+ 0.48
Calvinia.....	The Gaoler.....	0.28	0.23	+ 0.05	14.65	7.74	+ 6.91	4.04	3.45	+ 0.59
Capetown (Royal Observatory).....	The Staff.....	0.76	0.86	- 0.10	25.83	25.54	+ 0.29	13.63	12.89	+ 0.74
Ceres.....	A. Heald.....	2.17	1.41	+ 0.76	63.94	41.29	+ 22.65	26.38	22.77	+ 3.61
Carnarvon.....	A. P. Malherbe.....	0.78	0.48	+ 0.30	15.19	8.02	+ 7.17	8.65	2.25	+ 1.30
Clanwilliam.....	A. P. Malherbe.....	0.90	0.18	+ 0.72	11.46	8.59	+ 2.87	3.42	4.36	- 0.94
East London.....	A. Downie.....	4.36	3.34	+ 1.02	31.40	33.38	- 1.98	13.92	16.69	- 2.77
Fraserburg.....	The Gaoler.....	2.27	0.37	+ 1.90	16.21	6.64	+ 9.57	4.82	2.06	+ 2.76
Garies.....	The Gaoler.....	0.21	0.12	+ 0.09	7.72	6.20	+ 1.52	2.11	2.75	- 0.64
Graaf-Reinet.....	S. E. D. Treadwell.....	4.48	1.35	+ 3.13	19.95	13.92	+ 6.03	9.66	6.88	+ 2.78
Groot Drakenstein.....	Lionel Baker.....	1.74	0.98	+ 0.76	43.80	35.61	+ 8.19	19.88	18.70	+ 1.18
Griquatown.....	The Gaoler.....	0.97	1.31	- 0.34	11.98	13.08	- 1.10	3.60	3.57	+ 0.03
Hanover.....	The Gaoler.....	1.18	1.07	+ 0.11	14.04	13.22	+ 0.82	4.69	4.14	+ 0.55
Hopetown.....	The Gaoler.....	2.81	1.12	+ 1.69	16.47	12.78	+ 3.69	5.81	3.98	+ 1.83
Kimberley.....	The Gaoler.....	0.10	0.41	- 0.31	7.55	5.61	+ 1.94	1.29	1.51	- 0.22
Kimberley.....	J. Acton.....	1.70	2.08	- 0.38	14.43	16.26	- 1.83	4.01	5.73	- 1.72
Koynsa.....	The Gaoler.....	3.38	2.30	+ 1.08	32.63	28.73	+ 3.90	13.92	15.43	- 1.51
Kobusdorp.....	H. D. Coyle.....	10.17	4.14	+ 6.03	34.21	27.14	+ 7.07	22.84	11.76	+ 10.58
Kuruman (Abonia).....	A. T. Sibwell.....	1.68	2.26	- 0.58	14.32	16.43	- 2.11	2.71	3.11	- 0.40
Maifaling (Convent).....	Mother Superior.....	2.61	3.40	- 0.79	25.97	21.51	+ 4.46	5.64	8.32	- 2.68
Mossel Bay (Cape St. Blaize).....	The Lightkeeper.....	2.65	1.34	+ 1.31	17.83	17.33	+ 0.50	0.57	8.58	+ 0.99
Murrayburg.....	Sergt. M. Whitaker.....	1.30	0.91	+ 0.39	11.71	11.04	+ 0.67	6.14	3.70	+ 2.44
O'okiep.....	J. Burrows.....	0.67	0.17	+ 0.50	10.14	7.11	+ 3.03	2.37	3.34	- 0.97
Phillipstown.....	The Gaoler.....	0.30	1.32	- 1.02	10.28	13.94	- 3.66	5.25	4.70	+ 0.55
Piquetberg.....	The Gaoler.....	1.43	0.70	+ 0.73	25.66	20.74	+ 4.92	11.53	11.40	+ 0.13
Port Elizabeth.....	J. E. Allen.....	6.30	1.08	+ 5.22	41.36	22.23	+ 19.13	15.78	12.87	+ 2.91
Port St. Johns (Cape Hermes).....	The Lightkeeper.....	8.45	5.85	+ 2.60	41.66	48.69	- 7.03	22.50	24.29	- 1.79
Freebake.....	The Gaoler.....	0.62	0.84	- 0.22	10.71	9.72	+ 0.99	4.16	2.49	+ 1.67
Queenstown.....	H. Hooley.....	3.85	2.85	+ 1.00	23.13	21.41	+ 1.72	11.64	8.61	+ 3.03
Steytlerville.....	The Gaoler.....	4.26	0.84	+ 3.42	19.23	9.22	+ 10.01	7.26	3.86	+ 3.40
Sutherland.....	The Gaoler.....	0.42	0.42	+ 0.00	10.51	9.22	+ 1.29	4.78	3.86	+ 0.92
Swellendam.....	A. Dixpeck.....	3.76	3.06	+ 0.70	34.49	32.64	+ 1.85	13.42	16.21	- 2.79
Uniondale.....	The Gaoler.....	6.73	2.88	+ 3.85	25.96	25.74	+ 0.22	16.01	11.08	+ 4.93
Umtata.....	The Gaoler.....	1.44	0.76	+ 0.68	14.25	13.58	+ 0.67	4.14	6.71	- 2.57
Ungaiton.....	The Gaoler.....	0.29	0.63	- 0.34	9.65	7.03	+ 2.62	2.66	2.00	+ 0.66
Victoria West.....	The Gaoler.....	2.86	0.80	+ 2.06	19.06	10.14	+ 8.92	8.20	3.13	+ 5.07
Vryburg.....	C. Butler.....	4.89	2.69	+ 2.20	22.03	19.09	+ 2.94	5.76	5.86	- 0.10
Worcester.....	The Gaoler.....	1.29	0.41	+ 0.88	16.83	12.67	+ 4.16	6.19	6.77	- 0.58
Wynberg (Convent).....	The Mother Superior.....	1.08	1.40	- 0.32	45.84	47.12	- 1.28	23.80	26.38	- 2.58
South-West Africa—										
Tauneh.....	Ing. Schetter.....	1.40	0.28	+ 1.12	21.69	31.57	- 9.88	4.74	8.21	- 3.47
Waterberg.....	D. Hahn.....	0.74	3.66	- 2.92	27.77	21.15	+ 6.62	3.34	5.26	- 1.92
Paalos.....	Missionary Diel.....	0.85	2.85	- 2.00	5.97	5.27	+ 0.70	0.00	1.11	- 1.11
Gobabis.....	Missionary Irl.....	0.91	1.28	- 0.37	15.83	16.21	- 0.38	3.37	3.97	- 0.60
Windhoek.....	Observatory.....	0.11	1.96	- 1.85	13.60	15.08	- 1.48	1.23	3.33	- 2.10
Mariental.....	Baron V. Eisebeck.....	0.17	0.94	- 0.77	6.63	5.95	+ 0.68	2.18	1.28	+ 0.92
Hetractahis.....	Pater Proefert.....	0.24	0.29	- 0.05	4.46	5.57	- 1.11	0.65	0.63	+ 0.02

Standerton.—With the exception of a dry period in the middle of the month, rains were fairly frequent and steady. Thunderstorms occurred on the 11th and 21st, on neither occasion very violent, and without hail. The winds were very light, and with a sky often overcast with heavy clouds, the heat at times was muggy and oppressive, which made the frequent showers doubly welcome. Complaints are coming in from the farmers regarding the damage done to their mealie crop by insects, the mealie-borer being particularly destructive this summer. Rainfall: 4.33 inches on thirteen days.—M. Ferguson.

Barberton.—Cool weather, with steady soaking rains, has prevailed throughout the month. Despite a considerable amount of thunder and lightning, sudden violent storms have been rare. Practically no hail has fallen in the town area, although a few heavy hailstorms have been reported in the outside districts. Rainfall: 6.26 inches on fifteen days.—Walter Grubb.

Mosdene (Naboomspruit).—As is not unusual in December, the greater portion of the month was dry. This has retarded germination, and in some places stopped ploughing and planting, but has not destroyed any of the young crops. Rainfall: 3.30 inches on eight days.—Ernest E. Galpin.

Krugersdorp.—Unsettled weather and usual summer storms. Thunder and lightning intense at times. Weather somewhat warm at times; maximum temperature reached 84.0 degrees on 18th. Nice rains fell towards end of month, badly needed for veld and crops, which were parched after warm spell. Heavy rains and squally winds damaged gardens and fruit orchards on 27th. Rainfall: 4.89 inches on thirteen days.—George S. Garnett.

Lichtenburg.—Destructive hailstorm reported passed about thirty-five miles south of station on 27th. Mealie crop doing well; veld good; cattle in sound condition. Rainfall: 3.04 inches on ten days.—J. T. Allman.

Ermelo.—December has been a most disappointing month. Little rain fell at this station, and vegetation did not make headway. In some parts the rains were abnormally heavy, and washed away whole fields of maize. Gall-sickness has broken out amongst cattle. Lightning storms have been terrible. Rainfall: 2.61 inches on twelve days.—Mrs. S. M. Nicolson.

Alkmaar (Barberton).—19th December: slight hail; crops on adjoining farms damaged. Rainfall: 9.49 inches on twelve days.—James E. Stevenson.

Vaalbank No. 66 (Bethal).—29th December: severe thunder and lightning killed two prime oxen close to one another. Rainfall: 4.88 inches on fifteen days.—Isaac Spitz.

Davel (Bethal).—Crops will be a complete failure on account of cold weather in October and November, excessive rains in November, and the prevalence of insect plagues. Rainfall: 3.62 inches on fourteen days.—H. A. Wollenburg.

Busby (Ermelo).—This, I think, has been the very worst season for hail known in these parts, and also in all parts of the Union. Farms near here have had six most terribly bad visitations, and on 26th December, Busby, which had escaped them, got clean wiped out of all crops by stones so jagged that on several farms cattle and sheep were bleeding from the cuts received from hail stones. Rainfall: 5.73 inches on eighteen days.—G. W. Lunt.

Modderfontein (Heidelberg).—Mealie-borer prevalent; crops fair. Rainfall: 3.19 inches on eight days.—S. Obree.

De Wagendrift (Pretoria).—Rain came too late ; crops very poor. Rainfall : 3.72 inches on eleven days.—Eric Chapman.

Weltevreden (Standerton).—Stock in good condition ; crops recovering from excessive rains of previous month. Rainfall : 4.10 inches on seven days.—D. Lane.

Altydmooi (Zoutpansberg).—Country looking lovely and green ; stock in the best of condition ; ploughing still going ahead. Rainfall : 3.14 inches on twelve days.—A. L. Gettliffe.

Mimosa (Lichtenburg).—On 27th a terrible hailstorm occurred, with small but destructive hailstones ; crops damaged and poultry killed. Rainfall : 4.32 inches on nine days.—P. M. Prinsloo.

SWAZILAND.

Transralia (Swaziland).—Crops are looking well at present. Rainfall : 7.84 inches on eleven days.—J. H. Coates.

ORANGE FREE STATE.

Rugby (Bethlehem).—Considerable damage to mealie crops is reported through cutworm and, in the early-planted mealies, through top-grub. Mealie crops are generally backward, owing to cold and wet weather experienced throughout the month, and, cultivation having been practically impossible, lands are overgrown with weeds. Oats and wheat crops, though not generally grown locally, have been put in this year, and are looking well. The veld is excellent, and stock are in good condition. Rainfall : 8.13 inches on nine days.—A. C. Glynn-Baker.

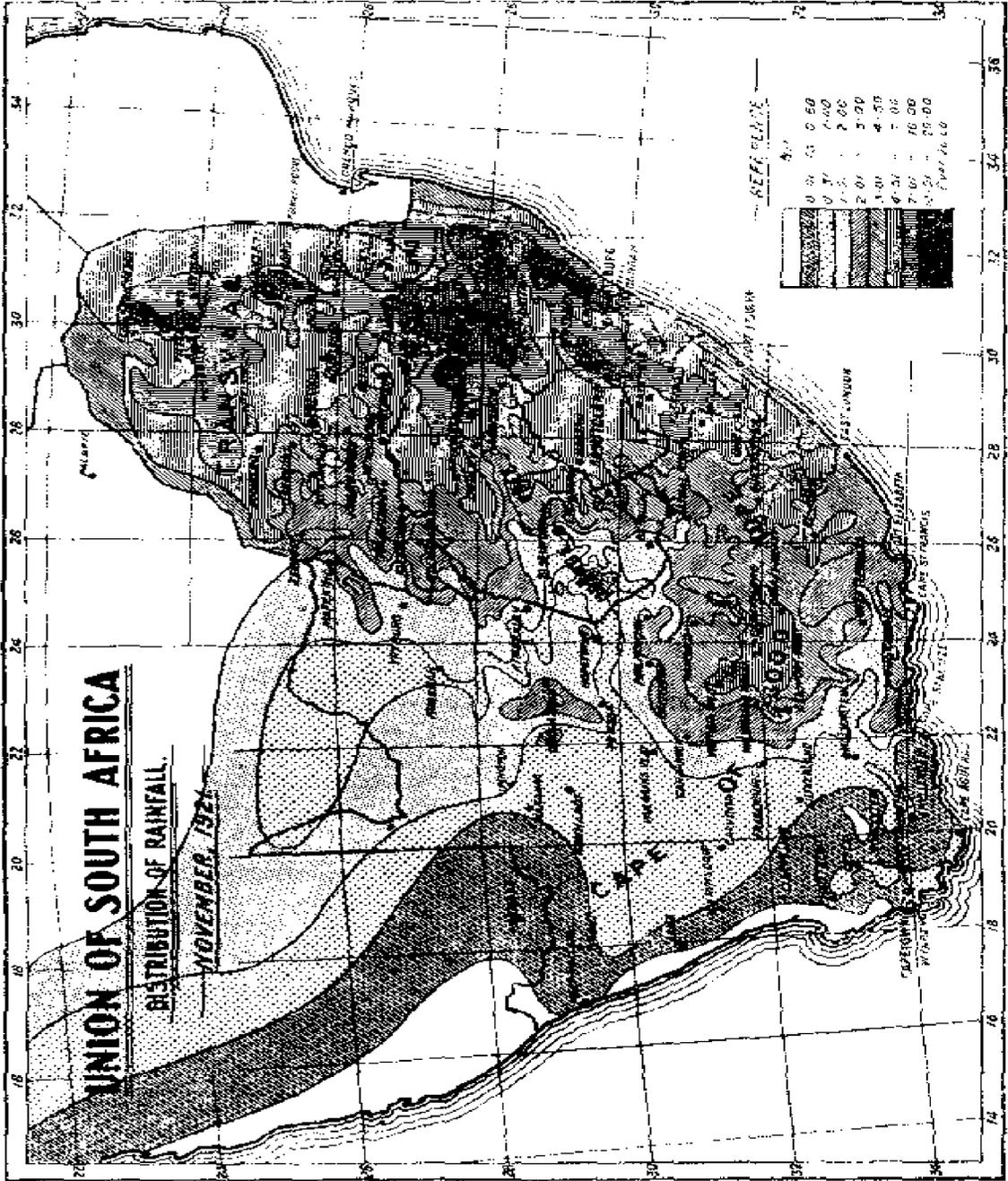
Heilbron.—Vegetation has suffered a severe set-back from the hailstorm of 21st December. Previously everything looked glorious, but crops and grazing have had a tremendous check, and with subsequent hot weather, grass has taken on a withered appearance. Stock have not suffered to any extent. Poultry also suffered considerably in town, hundreds being killed. Fruit and vegetable gardens in the course of the storm were completely wrecked or ruined. Rainfall : 4.19 inches on eleven days.—P. A. du P. Naude.

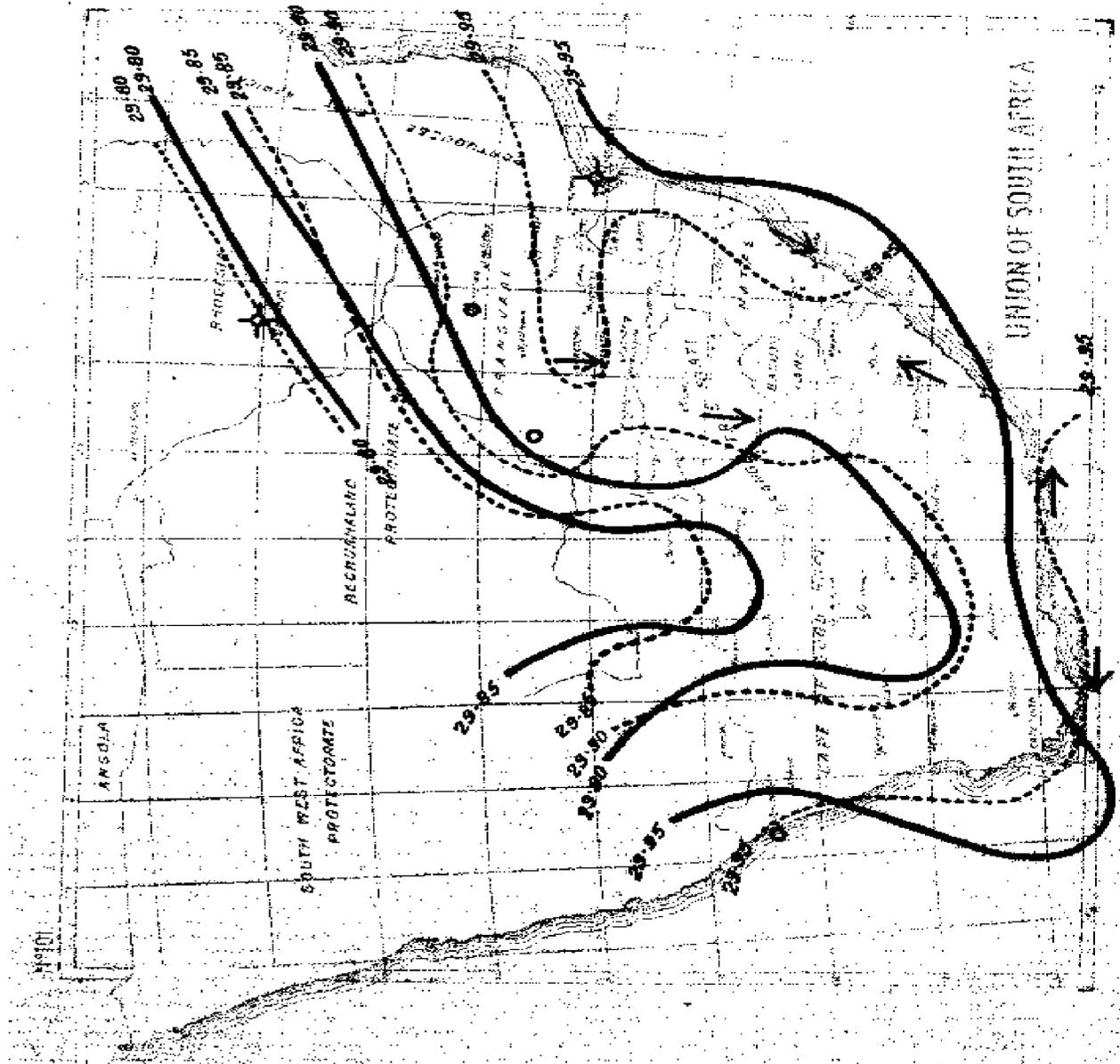
Waterford (Lindley).—The rainfall for this month is a record in these parts, and although a little damage has been done by washaways, the prospects for mealie crops have improved wonderfully. The veld has recovered in a wonderful way, and the grass is in seed everywhere. Stock have put on a lot of condition and are healthy. Rainfall : 9.04 inches on eight days.—A. B. Oates.

Prospect (Vrede).—Cutworms have done considerable damage in some mealie lands, but their time is past ; now stalk-borers are damaging mealies on some farms. On the whole, however, mealies, though small for the time of the year, do not look bad. Oats look well. Owing to abundant rains this season, veld is good, and cattle and horses are fat. The grass is too rank on many farms for sheep. Flies are numerous, and there is an unprecedented amount of trouble from maggots. Rainfall : 3.49 inches on ten days.—T. Pitcairn.

Woudzicht (Vrede).—The heavy rains and lack of warmth have had a bad effect on young mealies. Lands were waterlogged for days. Rainfall : 7.91 inches on ten days.—J. M. Kohler.

Paardekraal (Winburg).—Too much rain during month ; damage done to arable land ; blue grass has taken possession ; ground too wet to cultivate ; sheep and cattle beautiful. Rainfall : 7.08 inches on eleven days.—G. S. Lowe.





December, 1921. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
 The dotted lines indicate the normal distribution for December.

Holfontein (Kroonstad).—Rainfall: 8·07 inches on twelve days. Heavier fall was experienced in the immediate neighbourhood, it would appear; also a good amount of large-sized hail, of which this place only caught the fringe. Everything is looking fine.—G. W. Muller.

NATAL.

Nottingham Road.—Unseasonable weather; hailstorms, high winds, and a heavy fall of snow on the Drakensberg. Vegetable growth vigorous, and stock healthy. Rainfall: 10·11 inches on twenty-four days.—Miss E. Smythe.

Newcastle.—Heavy rains fell during the last week—3·02 inches; more rain on the outskirts of Newcastle. Rather a bad outlook for the mealie crops; farmers complain that their mealies are getting drowned through the water in the lands. Lucky no hailstorm, but surrounding districts have had hail. Rainfall: 5·87 inches on sixteen days.—The Gaoler.

Durban (Point).—Generally cloudy and overcast weather. Rainfall considerably above the average. Thunderstorms less frequent than usual at this time of year. Generally windy; moderate gales on seven days only, except on the 27th, when a tornado passed over, lasting about fifty minutes. Heavy thunder and lightning; no damage; force expended to seaward; very dark during the storm, and sky presenting a bright green appearance through the breaks in the cloud formation. Rainfall: 9·70 inches on sixteen days.—The Port Captain.

Hlabisa.—The weather has been seasonable; country looking fresh and green after heavy rains of last month. Rainfall: 6·24 inches on thirteen days.—L. Double.

Mid Illovo.—Heavy battering showers; erosive effects in cultivated lands exceptionally bad. Abnormal rainfall: 11·36 inches on twenty days.—Lieut.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Newcastle (Convent).—The month was unusually cool and very changeable; the sky was frequently overcast. It rained at intervals each day for seven consecutive days, beginning on the 24th. The 31st was a very fine day, and there is every sign that the weather is now settled again. Rainfall: 4·89 inches on fourteen days.—The Mother Superior.

Inguangwane.—The bagworm has made its appearance, but very few in numbers; the wattle beetle is bad—the insects in large numbers. The fruit beetle is also bad this year; the latter appears to be much more numerous this season than any former season. Rainfall: 10·07 inches on eighteen days.—F. H. Houshold.

Kloofend (Alexandria).—A heavy thunderstorm broke over the district about 2 p.m. on the 29th, accompanied by hail or jagged pieces of ice. One piece of hail measured 3 inches by 3 inches, and weighed over 4 oz. Great damage done to crops and window-panes. The rivers have been very full, and road transport has been stopped since the 10th inst. Rainfall: 10·62 inches on nineteen days.—H. Cruickshanks.

Rongpoort (Weenen).—Little better than last month, but lands too wet to work at times. Crops very late; no hot weather, but very cold at night occasionally. Rainfall: 7·54 inches on fourteen days.—J. H. Bartholomew.

CAPE.

Ceres.—Weather generally wetter and cooler than usual. Dews plentiful. Rainfall: 2.17 inches on seven days.—A. Heatlie.

Groot Drakenstein.—This month opened hot and dry. Light rains started falling on the 9th, after a clear month's drought, and continued till the 16th, which interrupted fruit-picking a good deal and damaged ripe fruit. The week preceding Christmas was again very hot, Christmas Day being the most trying we have had this summer. A thunderstorm on the 27th cooled it down somewhat. Rainfall: 1.74 inch on ten days.—Lionel Baker.

Darling (Malmesbury).—The harvest, generally speaking, has been bad—in many cases, very bad. The very heavy winter rains drowned a lot of the seed, which never germinated at all, and there was a shortage of later rains. An inch of rain at the end of October or early in November would have improved crops a lot. Rainfall: 1.11 inch on nine days.—P. H. Drake.

O'okiep.—Harvest month: results poor; many people barely recovered seed. Rainfall: 0.07 inch on three days.—J. Burrows.

Emerald Hill (The Priory, Port Elizabeth).—A violent thunderstorm broke out about midnight on Christmas Eve; heavy rain fell, 4.03 inches being recorded at 8.30 a.m. on the 25th; 3.71 inches recorded during following twenty-four hours; rainfall for twenty-four hours ending 8.30 a.m. on 28th, 4.39 inches. Part of our avenue badly damaged by the downpour on Christmas Eve. Rainfall: 13.30 inches on ten days.—The Mother Superior.

Jansenville.—The rainfall from the 24th to 29th December (inclusive), 6.76 inches, has been the heaviest known for a similar period since 1912. The Sundays River overflowed its banks in a few places. Rainfall: 7.98 inches on eight days.—E. H. Egan.

Grassridge (Cradock).—A few flying locusts have been observed here, but apparently have not swarmed yet. The river has been in spate only once, and that was caused by rain further up the river. The veld is in excellent condition; stock in first-class condition. Reaping lucerne and planting mealies have been chief farming operations. Rainfall: 2.50 inches on seven days.—S. Whitwham.

Sydney-on-Vaal (Barkly West).—Very temperate month, with low maximum temperatures compared with December records of other years; evenings cool and pleasant. Vaal River running high throughout the whole month. Rainfall: showery, and by no means general; some areas within near vicinity received a little or more. Rainfall: 2.71 inches on seven days.—J. G. Richards.

Bedford.—I do not remember a month when rain fell almost every day, with so low a total, nor a previous December when so much cloud was recorded. It is many years since frost was recorded in the district as late as 20th December, if ever before in December. During the greater part of the month, trees have been shedding their leaves, evidently the after-effects of the battering received from hailstorm last month. The humidity also seemed unprecedented. Rainfall: 3.81 inches on twenty days.—T. C. Hall.

Queenstown.—A month of showery weather. Veld looking fine. Terrific rainstorm afternoon of 24th—1.93 inch fell in one hour; hail damaged crops in town suburbs. Rainfall: 5.85 inches on sixteen days.—H. Holley.

Rietfontein (Alwal North).—Rainfall: 5.34 inches on eleven days, above average for month. Veld in very good condition; mealie crops looking well.—A. J. Smith.

Graaff-Reinet.—Wind light and variable. Rainfall: 4.48 inches on nine days; 2½ inches fell in about 30 minutes on the 25th, doing considerable damage to property.—S. E. D. Treadwell.

Bruinjtjes Hoogte (Pearston).—Blyde River Irrigation Scheme suffered by rain on 24th; part of dam-wall gone. Locusts are very prevalent; most swarms are turning to the flying stage; they are doing a fair amount of damage to mealie crops. Veld in splendid condition. Rainfall: 7.84 inches on ten days.—E. S. Miller.

Cromdale (Aberdeen).—All rivers in flood; dam broke. District still overrun with locusts, which are now beginning to fly. Rainfall: 5.83 inches on ten days.—J. N. Cruickshank.

Sledmere (Cathcart).—Hail on the 25th and 29th did damage to mealie and wheat crops. Rainfall: 4.93 inches on sixteen days.—J. C. Froneman.

Tover Klip (Uitenhage).—28th: Hail lasted ten minutes; a little damage was caused to buildings and live stock; all crops destroyed. Rainfall: 6.05 inches on nine days.—S. E. Marais.

Prince Albert.—Reports from district: heavy rains generally; much damage to crops, lands, property, and stock. Gamka River in flood. Rainfall: 2.06 inches on two days.—The Gaoler.

Ovendale (Willowmore).—We had a terrible hailstorm on Christmas afternoon; our farm is simply destroyed, and so is the railway line in the vicinity. On the 29th December, the Gamtoos Valley was, so to say, under water. The railway bridge at Fullarton, 35 feet high, was washed away. The damage done will surely run into many thousands of pounds. All locusts in these parts are in their flying stage at present. Rainfall: 8.15 inches on eleven days.—P. G. Kilian.

BASUTOLAND.

Mafeteng.—Beautiful rains throughout month; country looking splendid; stock fat; thunderstorms prevalent, with little hail, but no damage done. Nights generally very cool; hot days. Rainfall: 6.45 inches on sixteen days.—Fred. Hodgson.

FEBRUARY WEATHER CHARACTERISTICS.

Except along the west coast, where it is increasing, there is a marked decrease in the rainfall throughout the Union during the month of February. The eastern Transvaal, with a normal of about 5.5 inches, is now the area of heaviest precipitation, whilst the Transvaal high veld follows with slightly less than 5.0 inches. In Natal and Basutoland, 4.0 inches; in Kaffraria, 3.5 inches; over the Orange Free State and the north-east and south-east of the Cape Province, 3.0 inches; over the Cape northern borders, 2.0 inches; along the south coast and over the northern and east-central Karroo, 1.5 inch; and over the remainder of the Cape Province less than 1.0 inch, constitutes the normal.

The mean daily temperature is now decreasing inland, but over the coastal districts it is generally slightly higher than during the preceding month, and the yearly maximum is reached. The mean temperature usually experienced over the Cape northern border is about 77 degrees; over the southern Karroo, 75 degrees; over the Transvaal low veld, 74 degrees; over the east-central Karroo, 73 degrees; in the Orange Free State, Natal, over the northern Karroo, and the south-western and south-eastern districts of the Cape Province and along the west coast, 71 degrees; along the south coast and in Basutoland, 70 degrees; and in Kaffraria and over the Peninsula, 68 degrees.

The prevalent wind-directions during this month are south over the south-west of the Cape Province; north-east at East London, east-north-east at Kimberley, and north-north-west at Johannesburg. Compared with the previous month, there is a large increase of southerly winds over the Cape Peninsula, together with a slight increase of north-north-westerly winds, but a slight decrease of those from all other directions. At East London there is an increase of northerly and north-easterly winds, as also of westerly and west-north-westerly winds, but a diminution in the frequency of all other breezes, particularly of those from south-west; this is counterbalanced by an almost equal increase of those from north-east. Kimberley shows an increase in frequency of winds lying between north-east and south, also of those from west and west-north-west, more particularly of those from south-east, but a diminution in all others, especially those from south-south-west. At Johannesburg there is a considerable falling-off of all northerly winds (north-north-westerly and north-north-easterly), but a much smaller decrease of those from south-east, whilst all other directions, especially east-north-east and east, show enhanced values. Over the Cape Peninsula the winds attain their maximum force during February; at East London and Johannesburg the velocity remains the same as in the preceding month, whilst there is a slight decrease in velocity at Kimberley.

On the high veld, this is the cloudiest month of the year, the hours of bright sunshine in the Transvaal being now only 55 per cent. of the total number possible, whereas in the south-west of the Cape Province the percentage is now 87, and is the maximum of the year.

C. STEWART,

Chief Meteorologist.

Pretoria.