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MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. III. JANUARY, 1922. No. 1.

THE month of January, 1922, was characterized by unusually close, muggy, and oppressive weather; frequent thunderstorms, particularly during the last three weeks, with exceptionally vivid and almost continuous lightning; a serious deficiency of rainfall over the Transvaal, the Orange Free State, Natal, Kaffraria, the north and west and part of the south and south-east of the Cape; an excess over the south-west, the southern and central Karroos, and the south of the northern Karroo; some destructive hail and wind storms; a mean temperature in excess of normal during both days and nights, especially in the north-eastern half of the Union; and a normal mean pressure, with an excess of northerly to easterly winds.

Pressure.—The mean distribution of pressure during the month was practically normal, the isobars, as shown on the accompanying map, almost coinciding with their average position. The equatorial tongue was prominent throughout the month, the axis lying over the west of the Union during the first eight days of the month, and being more central during practically the remainder of the month. High pressure areas were present on six days, viz. 1st to 2nd, 6th to 10th, and 24th, from south to east, and on the west on the 30th. Low pressures appeared on the coast on ten days, viz. on south coast on 2nd, 14th, 16th, 17th, 23rd, and 25th; from south to east on 20th to 21st, 25th to 26th.

Temperature.—The mean temperature during the opening month of the year 1922 was 72·4 degrees, or 1·1 degree above normal, the difference being due to the day temperature (84·4 degrees) being 1·5 degree, and the night temperature (60·4 degrees) 0·7 degree, above the corresponding averages. Over the individual provinces, the monthly temperature was above the average, by 2·0 degrees in the Transvaal, 1·4 degree in the Free State, 0·8 degree in the Cape Province, but only by 0·3 degree in Natal. These excesses in the monthly

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temperatures of the Transvaal, Free State, and Cape Province were due principally to the days being considerably warmer than usual, whilst the nights were similarly affected, but to a much less extent. In Natal, however, the days (86·0 degrees) were 1·1 degree cooler, whilst the nights (64·3 degrees) were 1·7 degree warmer than usual. The largest excess (3·0 degrees) in the day temperature is found in the Transvaal, where the mean maximum was 84·6 degrees; in the Free State the mean maximum was 84·7 degrees, or 2·5 degrees, whilst in the Cape Province the mean maximum of 84·0 degrees was only 1·2 degree above the average. A similar order prevailed in the case of the mean minimum temperatures, the Transvaal with 60·5 degrees being 0·9 degree, whilst the Free State with 57·3 degrees and the Cape with 59·9 degrees were both above normal by the same amount of 0·4 degree. In Swaziland, as represented by Mbabane, the month's temperature (69·8 degrees) was in excess by 2·4 degrees, the mean maximum (80·2 degrees) being 3·9 degrees and the mean minimum (59·4 degrees) only 0·9 degree above the corresponding averages. At Mafeteng, in Basutoland, however, there was a deficiency in the monthly temperature of 1·1 degree, due to the mean day temperature (81·7 degrees) being 4·9 degrees short of the average, and the mean night temperature (56·3 degrees) only 2·7 in excess. At the individual stations supranormal temperatures were common to the Transvaal (including Swaziland), the Free State with the exception of the central portion of the eastern border, the south-western half of Natal, Zululand, Kaffraria, the north-east Cape and parts of the south-east and south central area, a portion of the Cape Peninsula, the south-west, Bechuanaland, the northern border, Gordonia, and Namaqualand. Over the remainder of the country, including the greater portion of the south coast, the Karroos, the greater portion of the south-east of the Cape, eastern border of the Free State, the western border of Basutoland, together with the north-eastern half of Natal, the monthly temperatures were usually less than a degree below normal. The largest deficits were found at Port Elizabeth, Mossel Bay, and Somerset East, where they varied from 1·4 degree at the first to 1·8 degree at the second of these places. The excesses over the Transvaal were mostly between 2·0 and 3·0 degrees, increasing to 4·8 degrees at Potchefstroom. Over the Free State they were usually slightly over 2·0 degrees, but diminished to a few tenths of a degree in Natal, except at Weenen, where the mean of 78·4 degrees was 1·4 degree above the average. In the Cape Province the monthly temperatures were mostly slightly over 2·0 degrees above normal in the northern half, increasing to 3·3 degrees at Aliwal North and 4·3 degrees at Kimberley; in the south-east and Kaffraria and the south-west the surplus amounts were generally between one and two degrees. The days were warmer than usual by 2–4 degrees in the Transvaal and Swaziland, but increasing to 5·5 degrees at Louis Trichardt in the north, and 6·0 degrees in the south-west; in the Free State by 3–4 degrees, except along the eastern border, where the excess dropped to less than a degree. In the Cape Province the excesses in the mean maximum were greatest over Gordonia, Bechuanaland, the northern Border, and the north-east, where they ranged from 3–5 degrees, but amounting to 6·2 degrees at Aliwal North; in the south-east and south-west the surplus amounts were generally between two and three degrees, but decreased to a few tenths of a degree in portions of the Karroo, the south-east, and south-west. Along the south coast, in parts of the south-east and the central Karroo deficits occurred of 1½–3 degrees, whilst in Natal the days were cooler than usual by 1–2 degrees, except at Weenen, where they were 2·9 degrees hotter than usual. Generally speaking, the nights were warmer than the average by several tenths of a degree, increasing to over a degree in the south and west, and reaching a plus amount of 3·7 at Potchefstroom. In the Free State the excess in the southern portion amounted

to half a degree or less, decreasing to a deficit of 1·4 degree at Ladybrand on the eastern Border; in the northern portions the excess was over a degree. In Natal the nights were warmer by 1½ to 3 degrees, except at Dundee and Weenen, where they were practically normal. Excesses of mean minimum temperatures also occurred over the northern portion of the Cape, commonly of slightly over a degree, but rising to 3·8 degrees at Kimberley. Excesses of a few tenths of a degree occurred in the Transkei, north-east, and portions of the south-east and south-west of the Cape Province, but in the extreme easterly parts of the south coast and of the central Karroo they rose to between 1½ and 2 degrees. *Deficits of a few tenths occurred in parts of the south-east, rising to 1·0 degree* or slightly more along the south and south-west coast, and amounting to 2·0 degrees at Carnarvon, in the northern Karroo. Thus, generally both days and nights were warmer over the Transvaal, Free State, and the north-east of the Cape; and they were cooler than usual along the south coast and portions of the central Karroo and south-east; whilst the day temperatures were below and the night temperatures above normal in Natal. The highest monthly temperature was 82·7 degrees at Komatipoort and the lowest 63·8 degrees at Belfast, a difference of 16·7 degrees. During the month there was no outstanding warm period, maxima being recorded on nineteen days, most numerously on 2nd, 20th, 21st, and 29th. The longest period of successive days on which no extreme temperature was recorded was from 8th to 14th inclusive. On the other hand, although minima were registered on fifteen days, they were most common during the first three days and the last day of the month, no *period of more than four days being without one of these extremes being* registered. Temperatures of 100·0 degrees and over were registered mostly at stations just inside the coastal belt, also at places in the interior, the northern Border, Bechuanaland, Gordonia, northern Karroo, and the north-east of the Cape, at Stanger and Weenen in Natal, also at Bloemhof and Komatipoort in the Transvaal. Temperatures of 42 degrees or lower were confined to Carnarvon in the northern Karroo and Belfast on the Transvaal high veld. The extremes for the month were 107·0 degrees on the 2nd at Kenhardt and 41·0 degrees on the 3rd at Belfast, showing an extreme range of 66·0 degrees during the month.

Precipitation, although fairly well distributed with regards to time, was greatly lacking in amount over the greater part of the summer-rainfall area, particularly the Transvaal, where the deficits were commonly between 2 and 5 inches, but increasing in the east and north to 9·64 inches at Haenertsburg *and over 15 inches at Woodbush. Being almost entirely associated with* thunderstorms, the quantities varied considerably in amount. In the north they were exceptionally small, amounting to considerably less than an inch in a number of cases, and actually falling to "nil" at Louis Trichardt. At Mbabane, in Swaziland, there was a shortage of over 4 inches, whilst in Natal the deficits were generally between 2 and 3 inches, but increasing to almost 6 inches at Hlabisa, in Zululand. The actual quantities registered in Natal were mostly between 1½ and 3½ inches. In the Free State, where the normals are mostly between 2½ to 4½ inches, the deficits ranged from 0·6 inch to 1·75 inch, being greater along the eastern and southern borders and in the west. Even in these three Provinces certain limited areas enjoyed an excess, e.g. in the Transvaal, Belfast on the high veld had a total of 7·09 inches, or 0·68 inch *above normal, whilst Potchefstroom in the south-west, with 5·14 inches, was* 1·07 inch in excess of the average. Conditions were also good in parts of the Rustenburg District. In Natal, Ladysmith showed a surplus of 0·69 inch. Perhaps the most satisfactory reports come from the north of the Free State, where Lindley shows an excess of an inch, and conditions were favourable to crops in the Vrede and Frankfort Districts; the rainfall in fact was rather

more than was desirable for the reaping of the oat-hay crop, which is stated to be rather plentiful this season, and sufficient to carry over any drought which may occur. In the Cape Province the month's precipitation was subnormal, usually by amounts of less than an inch over Bechuanaland, the northern Border, the greater part of the northern Karroo, Namaqualand, part of the north and east, the Transkei, and along the south-east and south coasts as far west as Knysna. The deficit was greatest (3·1 inches) at Kuruman, although absolute drought prevailed in parts of the northern Border and Namaqualand. Elsewhere there was a surplus mostly of one-third to three-quarters of an inch, but exceeding 1·0 inch in the south-west, the south-west of the northern Karroo, and the neighbourhood of Somerset East. The rainfall over the south-west was prejudicial to soft fruits, and hindered picking operations, whilst a south-easterly gale on the 9th caused serious damage to fruit crops. Although mainly associated with thunderstorms, the rainfall as a whole was light, scanty in amount, patchy in distribution, and generally unfavourable to agriculture and storage. These storms travelled mostly from some north-east or easterly and occasionally even a south-easterly direction, instead of from south-west, as they generally do. Lightning was unusually vivid and continuous, exhibiting a variety of colours: white, yellow, red, blue, and violet. Flashes darted in all directions, so that when viewed from a distance, an isolated thundercloud resembled a conflagration obscured by smoke. Some curious effects were occasionally produced: thus, on the afternoon of the 4th, about 4.33, during rain, a discharge took place between the edge of the iron roof of the veranda of this office and the ground; the appearance was that of a bluish waterfall, accompanied by a sizzling sound, and lasted apparently about two seconds. The same discharge caused electric light globes to burst with a loud crack; in the street it resembled a broad band of fire moving broadside on along the footpath. A number of people reported having thought their houses were struck at this particular time; one house was actually burned in Muckleneuk, and another was stated to have been partly burned in Arcadia. On the 19th, at The Brook No. 201 (District Ermelo), the lightning broke fence wires, split a 14-ft. iron standard from top to bottom, and another standard about six inches from the top. Shocks from fencing wires were also reported, and several fatalities occurred during the month. Some destructive hailstorms, e.g. on the 4th, at Middelburg, which played havoc with orchards, crops, and even stock; on the 5th, at Zandriverpoort (Waterberg); on the 8th, at Abrahamskraal (Thaba 'Nchu District, O.F.S.); on the 16th, at Oranjeville (Heilbron District); on the 20th, at Knapbrooke (Waterberg District); on the 21st, at Tafelberg (District Piet Retief); on the 30th, to the west of Olifants River, in the neighbourhood of De Wittekranz (Ermelo); oats and corn were totally destroyed, while doubts were entertained as to the recovery of the maize crop. In the neighbourhood of Kokstad much damage was done to farm crops by hail. In Natal and other parts of the Free State, hailstorms were reported as occurring, but were apparently light, as no damage was specified. Locusts have appeared and wrought considerable damage in the neighbourhood of Klerksdorp and Lichtenburg (Transvaal). The cutworm is reported to have caused a lot of damage to earlier mealies in the neighbourhood of Rexham (Zoutpansberg), and the mealie-borer is stated to be very bad at Belladale (District Frankfort, O.F.S.). Stock generally are reported as looking well, but wireworm is reported amongst sheep in the Frankfort District (O.F.S.).

The accumulated rainfall since the 1st July, 1921, is above normal in Natal, part of the north and east, south-east and south-west of the Transvaal, the north and east of the Orange Free State, the greater portion of the Karroos, the south-west, parts of the south coast, the south-east and north-east Cape, and the interior of Kaffraria, as well as at Port Nolloth, in Namaqualand.

The excess in the Transvaal varied between 0·16 inch at Rustenburg and 7·0 inches at Piet Retief; in the Free State between 2 and 5 inches; in Natal the surplus lay mostly between 3 and 5 inches, but rising to 10½ inches at Durban and 16 inches at Ladysmith; in the Cape Province the excess lay mostly between 2 and 4 inches, but rising to 6½ inches at Stutterheim and almost 10 inches at Kokstad. Elsewhere there was a deficiency as compared with the normal. Thus, in the Transvaal the seven months' rainfall is below the average by 2·5 to 4·5 inches over the central and southern portions, as also in the neighbourhood of Barberton, but is only about half an inch less than usual in the west, increasing to 5–6 inches in the north and north-east. In Swaziland the rainfall is almost normal. In the south-western half of the Free State the deficiency is in the neighbourhood of 3 inches. Over the west coast, the northern border of the Cape, Bechuanaland, and Namaqualand, the deficit varies from less than half an inch at Clanwilliam to 5½ inches at Kuruman, but is mostly between 2 and 3½ inches in the more northern parts. Over portions of the south-east, north-east, and south-east littoral of the Cape and the eastern portion of the southern Karroo the deficiency is mainly between 2 and 3 inches; in the neighbourhood of Uitenhage there is a deficiency of only about a third of an inch. In the Cape Peninsula, the Royal Observatory shows a surplus of 1·74 inch, whilst at Wynberg, farther south, there is a deficiency of over 3 inches. At Sydney-on-Vaal, the river was in flood practically throughout the month. On the 10th, the Gamka was again in flood, although to a much less extent than that of the 28th December last, when the water rose to the level of the platform of the river gauge. On the 23rd, a heavy rain in the Umvubagazi valley, three miles from Umzimkulu, caused the Umvubagazi River to rise higher than it has ever done before, with the result that a house and all its occupants were washed away. Three Kaffir women and three children were drowned. On the 14th, at 6 p.m., a heavy windstorm started about fifteen miles from Umzimkulu and passed in a general north-easterly direction, passing the neighbourhood of Nels Rust, Mid-Illovo, to Umlaas Road, Cato Ridge, and Camperdown, unroofing houses, uprooting trees, and breaking down telegraph poles and wires. The area of destruction seems to have been fairly wide, extending through Mid-Illovo to Winkle Spruit. The outer edge of this storm seems to have been felt at Port Shepstone, whilst the barograph tracings at Hillary, Durban, and Stanger all show the characteristics of a line squall between 8 and 9 p.m., although no reports of damage were received from these stations.

OBSERVERS' NOTES FOR JANUARY, 1922.

TRANSVAAL.

Klerksdorp.—More rain wanted towards end of month for maize crop, which, however, still looks well. Locusts in district have done considerable damage. Rainfall: 4·79 inches on fifteen days.—Chas. Scott.

Witbank.—Very hot month, with bad thunder and lightning storms; severe hailstorms, which did damage to gardens, fruit, etc. Rainfall: 6·47 inches on fifteen days.—A. Barlow.

Pietersburg.—Extremely hot and dry; crops and veld drying off. Up to 30th, when 0·61 inch rainfall was recorded, this was the driest January on record, only a quarter of an inch having fallen. Bitterly in need of rain. Rainfall: 0·86 inch on four days.—W. J. Frankleyne.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), JANUARY, 1922.

Place.	Observer.	Month—Jan., 1922. Mean Max.	Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Date.	Lowest.	Date.
		° F.	° F.	° F.	° F.	° F.	° F.		° F.	
Transvaal—										
Barberton	Walter Grubb	84·9	63·6	74·2	73·2	+ 1·0	95·5	21st	55·0	3rd.
Belfast	The Forester	76·7	51·0	63·8	63·0	— 0·8	85·0	18th	41·0	3rd.
Bloemhof	A. Adamson	91·8	62·1	77·0	74·5	+ 2·5	100·0	4th & 20th	56·0	31st.
Ermelo	Mrs. S. M. Nicolson	81·8	56·7	69·2	66·2	+ 3·0	88·0	5th	46·0	24th.
Johannesburg (Observatory)	The Staff	79·7	57·4	68·6	65·4	+ 3·2	81·9	18th	49·1	1st.
Kierksdorp (Strathmore)	Chas. Scott	87·9	60·7	74·3	73·9	+ 0·4	94·0	20th & 22nd	53·0	31st.
Komatipoort	B. J. Fothergill	95·1	70·0	82·7	80·5	+ 2·2	104·0	17th, 21st, & 26th	60·0	3rd.
Louis Trichardt	I. J. de Bruin	85·0	62·8	73·9	70·6	+ 3·3	96·0	18th	52·0	3rd & 8th.
Middelburg	Dr. H. A. Spencer	84·7	56·6	70·6	68·2	+ 2·4	90·0	18th	49·0	2nd.
Nylstroom	G. Bekker	86·5	60·7	73·6	72·3	+ 1·3	95·0	18th	52·0	1st.
Pietersburg	W. J. Frankleyne	84·8	60·3	72·6	70·7	+ 1·9	93·0	18th	50·0	1st.
Piet Retief	J. Wetner	80·0	60·3	70·2	66·9	+ 3·3	91·0	21st	51·5	2nd.
Pigeonhole (New Agatha)	J. McCallum	—	60·5				—		52·0	3rd.
Pilgrims Rest	E. M. Skea	81·6	58·0	69·8	68·0	+ 1·8	93·0	21st	45·5	3rd.
Potchefstroom (Exp. Farm)	The Manager	89·0	60·5	75·0	70·2	+ 4·8	98·0	15th	54·8	1st.
Pretoria (Meteorological Office)	The Staff	84·5	60·9	72·7	71·8	+ 0·9	90·4	19th	53·7	1st.
Standerton				—	67·8	—	—		—	
Zeerust	H. Dietrich	88·6	63·1	75·8	74·4	+ 1·4	94·5	24th	55·0	3rd.
Swaziland—										
Mbabane	Swaziland Police	80·2	59·4	69·8	67·4	+ 2·4	88·0	21st	51·0	23rd.
Orange Free State—										
Bethulie	J. J. Wardhaugh	91·3	59·6	75·4	73·3	+ 2·1	98·0	3rd	49·0	22nd & 31st.
Bloemfontein	G. A. Schepers	88·6	60·8	74·7	72·5	+ 2·2	95·2	20th	52·9	31st.
Harrismith	The Forester	77·1	54·2	65·6	64·8	+ 0·8	84·0	19th & 20th	48·0	1st. & 7th.
Ladybrand	The Forester	82·1	54·9	68·5	68·8	— 0·3	89·0	29th	50·0	10th.
Lindley	J. Collister-Oates	84·4	57·2	70·8	68·5	+ 2·3	90·2	20th	53·3	1st.
Natal—										
Dundee	West Thorrold	83·2	60·0	71·6	72·2	— 0·6	93·0	21st	50·0	2nd.
Durban (Point)	The Port Captain	83·4	70·2	76·8	76·6	+ 0·2	89·2	28th & 29th	64·4	22nd.
Estcourt	A. A. McLean	83·1	61·2	72·2	71·7	+ 0·5	92·0	21st & 29th	52·0	1st.
Hlabisa	The Gaoler	83·0	66·4	75·0	74·4	+ 0·6	91·0	17th & 29th	60·0	1st & 2nd.
Ladysmith	R. G. Arnold	91·4	63·0	77·2	77·0	+ 0·2	99·0	29th	55·0	1st.
Maritzburg (Mental Hospital)	The Staff	83·1	64·0	73·6	73·3	+ 0·3	97·2	28th	56·0	2nd.
Stanger	C. C. Fess	85·1	67·9	76·5	76·6	— 0·1	103·0	17th	58·0	2nd.
Weenen	The Gaoler	95·2	61·7	78·4	77·0	+ 1·4	105·0	21st	52·0	1st & 2nd.

AIR TEMPERATURES, JANUARY, 1922—*continued.*

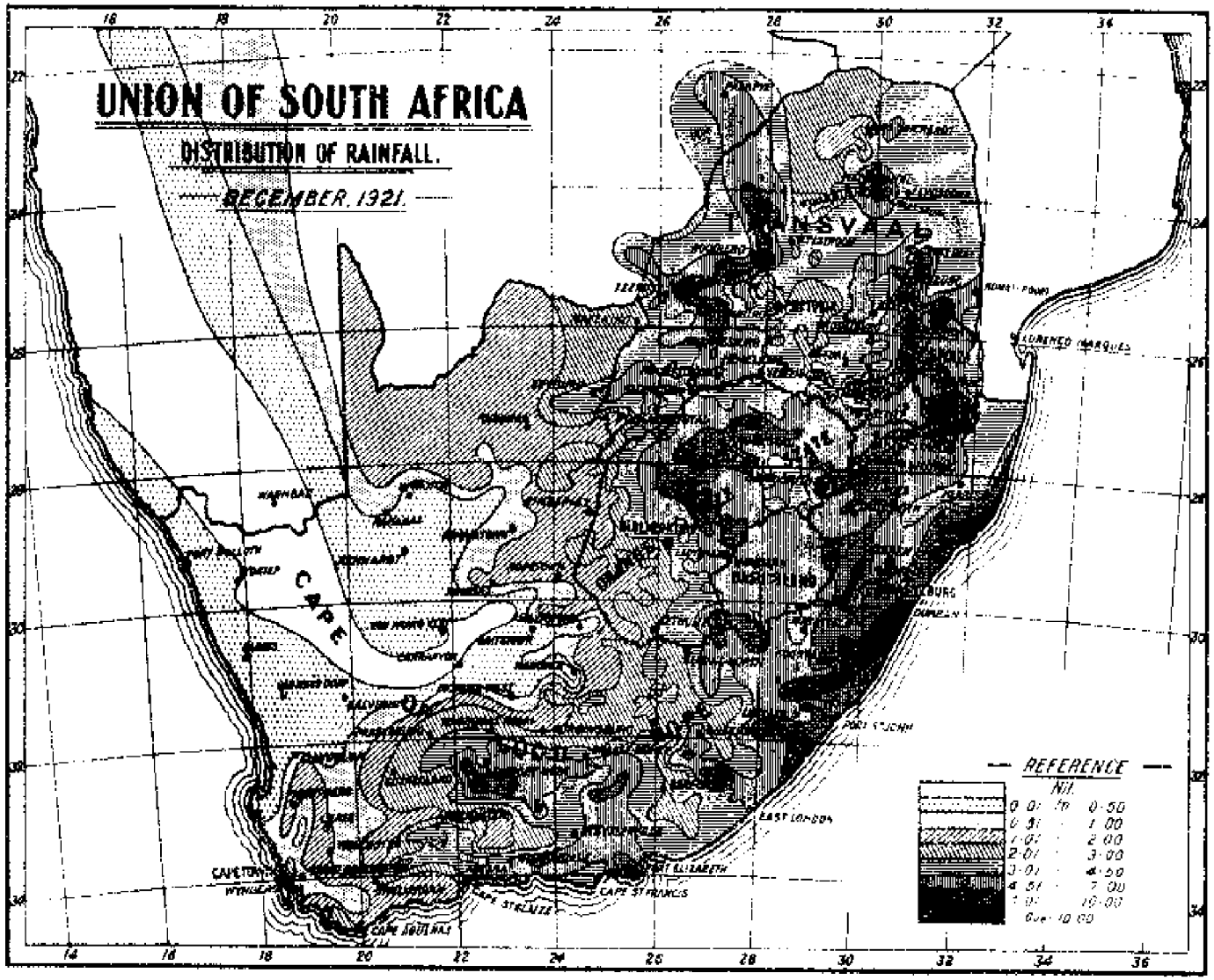
Place.	Observer.	Month—Jan., 1922. Mean Max.	Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Date.	Lowest.	Date.
		° F.	° F.	° F.	° F.	° F.	° F.		° F.	
Cape Province—										
Aliwal North	Alex. Alcock	88·7	57·1	72·9	69·6	+ 3·3	95·5	20th	49·5	31st.
Bedford	T. C. Hall	81·7	56·7	69·2	69·6	− 0·4	100·0	2nd	43·0	31st.
Capetown (Royal Observatory)	The Staff	78·0	58·3	68·6	69·3	− 0·7	91·9	4th	48·5	17th.
Carnarvon	A. P. Malherbe	90·3	55·4	72·8	73·5	− 0·7	100·0	7th	42·0	3rd.
East London	The Port Captain	76·4	63·9	70·2	70·0	+ 0·2	86·0	17th	56·0	22nd.
Graaff-Reinet	S. E. D. Treadwell	86·4	60·2	73·3	73·5	− 0·2	99·0	2nd	50·8	31st.
Grahamstown	The Vet. Research Offr.	80·3	56·6	68·4	68·5	− 0·1	103·0	2nd	45·0	1st & 31st.
Groot Drakenstein	Lionel Baker	83·3	59·1	71·2	70·2	+ 1·0	100·0	4th	47·6	18th.
Kenhardt	R. Seydell	97·1	64·2	80·6	78·4	+ 2·2	107·0	4th & 6th	55·0	12th.
Kimberley	Jno. Acton	95·4	64·8	80·1	75·8	+ 4·3	105·0	4th	59·0	27th.
Kingwilliamstown	L. Clayton	83·3	61·2	72·2	72·4	− 0·2	102·5	25th	49·0	22nd.
Kokstad	H. B. Coyte	80·5	56·1	68·3	66·4	+ 1·9	92·0	29th	48·0	1st.
Mafeking (Convent)	The Mother Superior.	92·1	63·5	77·8	75·6	+ 2·2	98·8	15th	57·2	2nd.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	72·7	63·4	68·0	69·8	− 1·8	78·0	3rd	57·0	31st.
Murraysburg	—	—	—	—	71·5	—	—	—	—	—
O'okiep	J. Burrows	85·4	57·5	71·4	70·2	+ 1·2	100·5	4th	49·0	29th.
Port Elizabeth	The Lightkeeper	73·8	63·2	68·5	69·9	− 1·4	82·0	17th	55·0	31st.
Port Nolloth	The Lightkeeper	69·8	53·8	61·6	59·9	+ 1·7	75·0	18th & 29th	45·0	22nd.
Port St. Johns (Cape Hermes)	The Lightkeeper	77·0	67·1	72·0	71·2	+ 0·8	84·0	3rd	62·0	1st.
Queenstown	H. Holley	86·2	57·7	72·0	69·4	+ 2·6	100·0	28th	47·0	31st.
Somerset East	C. Harris	81·1	57·5	69·3	70·9	− 1·6	98·9	2nd	44·5	31st.
Stutterheim	F. C. Bousfield	81·1	58·2	69·6	67·7	+ 1·9	98·5	2nd	46·6	22nd & 31st.
Sydney's Hope	Rev. S. Rippon	78·5	58·6	68·6	67·6	+ 1·0	99·0	2nd	48·0	31st.
Uitenhage	H. Inggs	82·2	61·6	71·9	72·0	− 0·1	103·6	25th	50·3	23rd.
Umtata	Miss N. Dix Peek	81·6	60·4	71·0	69·9	+ 1·1	100·0	28th	49·5	2nd.
Vryburg	Chas. Butler	93·9	63·7	78·8	76·1	+ 2·7	102·0	22nd	58·0	2nd, 15th, & 31st.
Wynberg (Convent)	The Mother Superior.	78·7	58·7	68·7	67·2	+ 1·5	91·5	2nd	50·5	18th.
Basutoland—										
Mafeteng	F. Hodgson	81·7	56·3	69·0	70·1	− 1·1	88·0	20th & 23rd	47·0	31st.

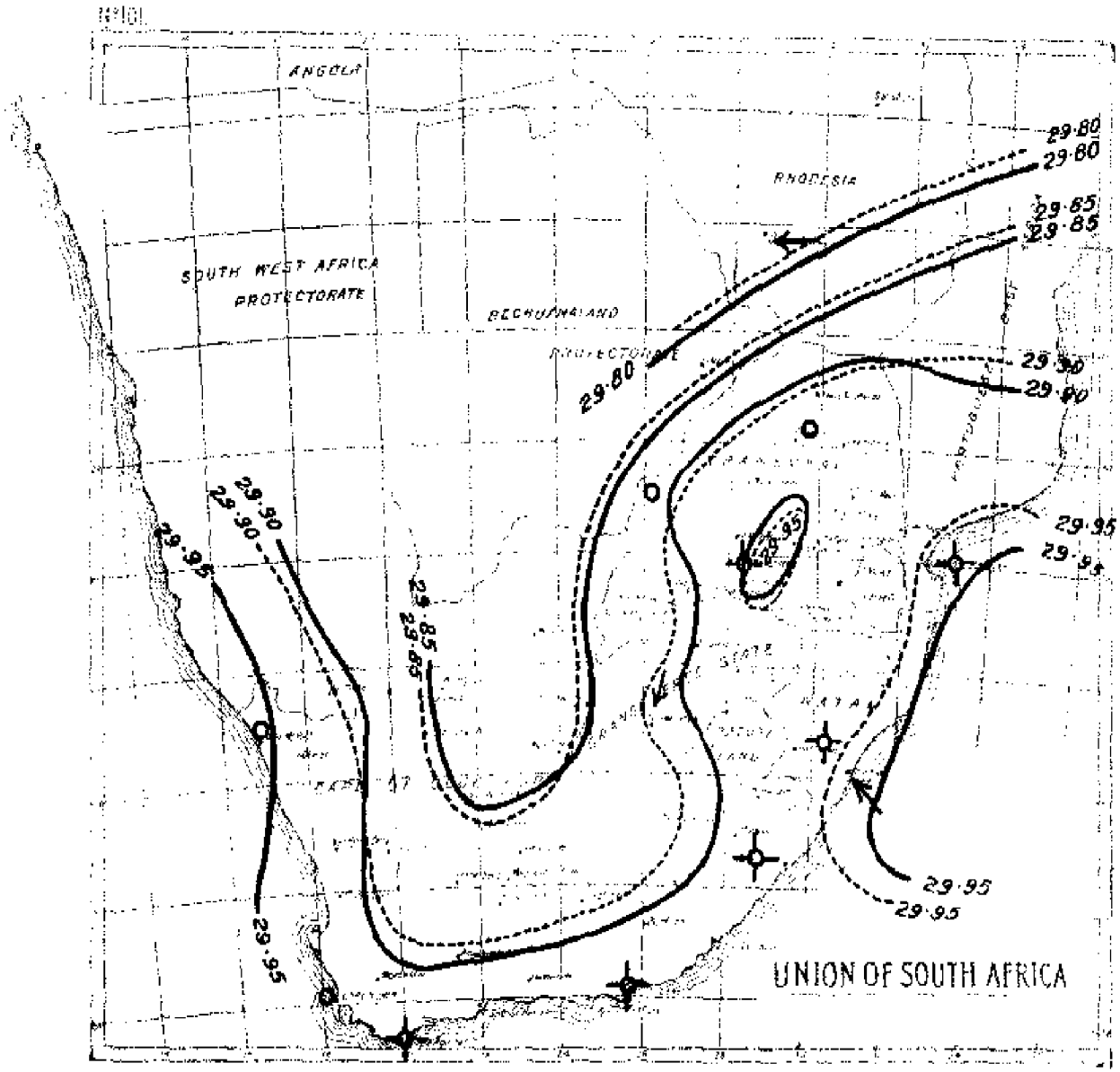
RAINFALL, JANUARY, 1922.

Place.	Observer.	Month. Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
Transvaal—		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Barberton	W. Grubb	3·52	9·12	− 5·60	19·40	21·92	− 2·52
Bethal	H. Joubert	4·44	5·55	− 1·11	17·73	21·07	− 3·34
Belfast	The Forester	7·09	6·41	+ 0·68	24·17	21·26	+ 2·91
Bloemhof	A. Adamson	3·24	3·30	− 0·06	7·82	19·62	−11·80
Claremont	S. A. Police	0·73	3·86	− 3·13	10·62	11·02	− 0·40
Ermelo	Mrs. S. M. Nicolson	4·39	5·16	− 0·77	21·08	19·57	+ 1·51
Haenertsburg	S. A. Police	1·85	11·49	− 9·64	19·00	25·16	− 6·16
Heidelberg	W. ter Horst	2·91	4·73	− 1·82	13·18	17·64	− 4·46
Johannesburg (Observatory)	The Staff	2·58	5·57	− 2·99	17·37	19·95	− 2·58
Klerksdorp (Strathmore)	C. Scott	4·79	4·40	+ 0·39	18·42	12·52	+ 5·90
Komatipoort	B. J. Fothergill	1·70	5·00	− 3·30	17·51	14·28	+ 3·23
Louis Trichardt	J. de Bruin	0·00	6·40	− 6·40	14·08	19·46	− 5·38
Middelburg	Dr. H. A. Spencer	5·13	5·31	− 0·18	23·95	18·96	+ 4·99
Nylstroom	G. Bekker	2·49	4·96	− 2·47	14·22	14·98	− 0·76
Pietersburg	W. J. Frankleyne	0·86	4·46	− 3·60	16·70	13·98	+ 2·72
Piet Retief	J. Werner	3·70	5·98	− 2·28	28·19	21·19	+ 7·00
Pilgrims Rest	E. M. Skea	3·30	8·56	− 5·26	23·68	22·61	+ 1·07
Pigeonhole (New Agatha)	J. McCallum	1·24	5·64	− 4·40	—	—	—
Potchefstroom	The Manager	5·14	4·07	+ 1·07	18·02	14·77	+ 3·25
Pretoria (Meteorological Office)	The Staff	3·45	6·33	− 2·88	14·23	18·95	− 4·72
Roodberg	M. Baumann	2·45	6·47	− 4·02	15·89	16·42	− 0·53
Rustenburg	S.A. Police	2·01	5·45	− 3·44	16·56	16·40	+ 0·16
Standerton	—	—	4·27	—	—	19·10	—
Wakkerstroom	L. le Roux	3·81	6·00	− 2·19	26·30	21·05	+ 5·25
Woodbush No. 1	The Forester	3·06	18·38	− 15·32	—	43·47	—
Zeerust	H. Dietrich	2·38	4·83	− 2·45	11·48	13·91	− 2·43
Swaziland—							
Mbabane	Swaziland Police	5·56	10·00	− 4·44	31·38	31·42	− 0·04
Orange Free State—							
Bethulie	J. J. Wardhaugh	1·01	2·76	− 1·75	6·06	9·26	− 3·20
Bloemfontein	G. A. Schepers	1·85	2·48	− 0·63	7·26	10·11	− 2·85
Harrismith	The Forester	3·17	4·82	− 1·65	19·92	17·95	+ 1·97
Kroonstad	S. B. Northfield	3·31	3·90	− 0·59	17·98	15·27	+ 2·71
Ladybrand	The Forester	3·44	4·61	− 1·17	19·09	16·59	+ 2·50
Lindley	J. Collister-Oates	5·11	4·11	+ 1·00	19·55	14·59	+ 4·96
Boshof	A. J. Nicholas	2·03	3·05	− 1·02	6·93	10·41	− 3·48
Natal—							
Dundee	W. Thorrold	4·04	6·19	− 2·15	33·58	19·51	−14·07
Durban (Point)	The Port Captain	1·68	4·11	− 2·43	34·07	23·58	+10·49
Estcourt	A. A. McLean	3·57	5·44	− 1·87	21·77	17·24	+ 4·53
Hlabisa	The Gaoler	1·66	7·46	− 5·80	33·32	28·30	+ 5·02
Howick	The Gaoler	2·39	5·11	− 2·72	22·34	19·42	+ 2·92
Ladysmith	R. G. Arnold	5·36	4·67	+ 0·69	31·99	15·91	+16·08
Pietermaritzburg (Mental Hospital)	The Staff	2·41	5·21	− 2·80	26·33	20·35	+ 5·98
Stanger	C. C. Voss	1·38	5·14	− 3·76	—	27·35	—
Vryheid	The Gaoler	5·73	8·03	− 2·30	27·14	25·02	+ 2·12
Weenen	The Gaoler	3·89	5·24	− 1·35	16·97	16·82	+ 0·15
Cape Province—							
Aliwal North	A. Alcock	1·90	2·99	− 1·09	9·28	11·01	− 1·73
Beaufort West	The Gaoler	1·33	1·14	+ 0·19	7·38	4·67	+ 2·71
Bedford	T. C. Hall	4·20	3·32	+ 0·88	16·67	15·56	+ 1·11
Britstown	The Gaoler	1·21	1·08	+ 0·13	4·50	4·45	+ 0·14
Calvinia	The Gaoler	0·21	0·14	+ 0·07	4·27	3·59	+ 0·68
Capetown (Royal Observatory)	The Staff	1·66	0·68	+ 0·98	15·31	13·57	+ 1·74
Ceres	A. Heatlie	2·80	1·02	+ 1·78	29·18	24·62	+ 4·56
Carnarvon	A. P. Malherbe	0·20	1·08	− 0·08	3·75	3·33	+ 0·42
Clanwilliam	Mrs. Downes	0·85	0·19	+ 0·66	4·17	4·55	− 0·38
East London	A. Downie	3·32	3·12	+ 0·20	17·24	19·71	− 2·47
Fraserburg	The Gaoler	2·01	0·74	+ 1·27	6·33	2·80	+ 3·53
Garies	The Gaoler	0·00	0·11	− 0·11	2·11	2·86	− 0·75
Graaff-Reinet	S. E. D. Treadwell	1·73	1·42	+ 0·31	11·38	7·30	+ 4·08

RAINFALL, JANUARY, 1922—*continued.*

Place.	Observer.	Month, Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal
Cape Province—con.		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Groot Drakenstein...	L. Baker.....	3·04	1·15	+ 1·89	22·92	18·70	+ 4·22
Griquatown.....	The Gaoler.....	0·00	1·82	— 1·82	3·60	5·39	— 1·79
Grahamstown.....	Vety. Research Offic	2·14	2·60	— 0·46	13·73	16·72	— 2·99
Hanover.....	The Gaoler.....	1·43	1·65	— 0·22	6·12	5·79	+ 0·33
Hopetown.....	*The Gaoler*.....	—	*1·95*	—	—	*5·88*	—
Kenhardt.....	R. Seydell.....	0·37	0·58	— 0·21	1·66	2·09	— 0·43
Kimberley.....	J. Acton.....	1·54	2·43	— 0·89	5·55	8·16	— 2·61
Knysna.....	The Gaoler.....	1·57	1·96	— 0·39	17·49	17·45	+ 0·04
Kokstad.....	H. D. Coyte.....	3·88	4·51	— 0·63	26·22	16·27	+ 9·95
Kingwilliamstown....	*L. Clayton*.....	*1·97*	*2·54*	— *0·57*	*14·53*	*14·29*	+ *0·24*
Kuruman (Abtonia)..	A. T. Sitwell.....	0·58	3·69	— 3·11	3·29	8·80	— 5·51
Mafeking (Convent)..	The Mother Superior	3·11	3·98	— 0·87	8·75	12·30	— 3·55
Mosse) Bay (Cape St. Blaize).....	The Lightkeeper....	1·21	1·09	+ 0·12	10·78	9·67	+ 1·11
Murraysburg.....	—	*1·81*	*1·18*	+ *0·63*	*7·95*	*4·88*	+ *3·07*
O'okiep.....	J. Burrows.....	0·00	0·21	— 0·21	2·37	3·55	— 1·18
Philipstown.....	The Gaoler.....	2·07	1·77	+ 0·30	7·32	6·47	+ 0·85
Piquetberg.....	The Gaoler.....	1·22	0·54	+ 0·68	12·75	11·94	+ 0·81
Port Elizabeth.....	J. E. Allen.....	0·52	1·12	— 0·60	16·30	13·49	— 2·81
Port St. Johns.....	The Lightkeeper....	4·57	4·85	— 0·28	27·07	29·14	— 2·07
Port Nolloth.....	The Lightkeeper....	0·07	0·08	— 0·01	1·30	1·19	+ 0·11
Prieska.....	The Gaoler.....	0·37	1·31	— 0·94	4·53	3·80	+ 0·73
Queenstown.....	H. Holley.....	3·44	3·33	+ 0·11	15·08	11·94	— 3·14
Steytlerville.....	The Gaoler.....	1·33	0·90	+ 0·43	8·59	4·76	— 3·83
Sutherland.....	The Gaoler.....	1·43	0·48	+ 0·95	6·21	4·34	+ 1·87
Swellendam.....	The Gaoler.....	4·12	2·57	+ 1·55	17·54	18·78	— 1·24
Sydney's Hope.....	The Rev. S. Rippon.	1·68	2·08	— 0·40	13·14	13·14	± 0·00
Somerset East.....	C. Harris.....	4·56	2·78	+ 1·78	16·20	13·61	+ 2·59
Stutterheim.....	F. C. Beustield.....	5·43	3·87	+ 1·56	23·62	17·05	+ 6·57
Uitenhage.....	H. Inggs.....	0·65	1·01	— 0·36	12·03	10·06	+ 1·97
Umtata.....	Miss N. Dix Peek..	3·29	3·48	— 0·19	19·30	14·56	+ 4·74
Uniondale.....	The Gaoler.....	1·60	0·73	+ 0·87	5·74	7·44	— 1·70
Upington.....	The Gaoler.....	0·00	0·86	— 0·86	2·66	2·86	— 0·20
Victoria West.....	The Gaoler.....	2·33	0·97	+ 1·36	10·62	4·10	+ 6·52
Vryburg.....	C. Butler.....	2·60	4·30	— 1·70	8·36	10·16	— 1·80
Worcester.....	The Gaoler.....	1·57	0·27	+ 1·30	7·75	7·04	+ 0·72
Wynberg (Convent)..	The Mother Superior	1·71	1·51	+ 0·20	24·51	27·87	— 3·36
Basutoland—							
Mafeteng.....	F. Hodgson.....	3·82	5·48	— 1·66	17·18	17·81	— 0·63
South-West Africa—							
Tsumeb.....	Ing. Schetter.....	1·57	8·40	— 6·83	6·31	16·61	—10·30
Waterberg.....	D. Hahn.....	3·72	5·58	— 1·86	7·06	10·84	— 3·78
Usakos.....	Missionary Diehl...	0·24	1·46	— 1·22	0·24	2·57	— 2·33
Gobabis.....	Missionary Irle.....	2·23	4·41	— 2·18	6·20	8·38	— 2·18
Windhoek.....	Observatory.....	2·45	3·75	— 1·30	3·68	7·08	— 3·40
Mariental.....	*Baron V. Esebeck* ..	*0·26*	*1·14*	— *0·88*	*2·44*	*2·40*	+ *0·04*
Heirachabis.....	Pater Prefect.....	2·91	0·38	+ 2·53	3·59	1·01	+ 2·58


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
DECEMBER, 1921.
CAPE
REFERENCE
Nil.
0·01 to 0·50
0·51 1·00
1·01 2·00
2·01 3·00
3·01 4·50
4·51 7·00
7·01 10·00
Over 10·00
CAPE TOWN
CAPE AGULHAS
CAPE ST FRANCIS
EAST LONDON
PORT ST JOHN
LORENZO MARQUES



January, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for January.

Barberton.—After a dry spell at the beginning of the month, the weather broke, and regular showers have occurred, generally accompanied by electrical disturbances. Probably owing to the unusual moist atmosphere, the weather has been rather trying, although by no means exceptionally hot. Rainfall: 3·50 inches on thirteen days.—Walter Grubb.

Pigeonhole (New Agatha).—Very dry; crops in many cases wilted for want of rain, and certain to be a short crop. Rainfall: 1·24 inch on ten days.—Jno. McCallum.

Mosdene (Nabcomspruit).—A very hot and dry month, and crops have suffered severely. The average January rainfall for the last five years is 5·47 inches, whilst the mean of the daily maximum temperature is 5 degrees higher than last year. The germination of seeds planted during the month has been very bad, whilst earlier planted mealies are tasselling prematurely. The rainfall at the end of the month only just came in time to prevent total loss of many crops in the neighbourhood. Rainfall: 3·0 inches on eight days.—Ernest E. Galpin.

Middelburg.—This month has been very close and muggy, though the maximum temperature only once rose to 90 degrees (and 94 degrees, 92 degrees, and 91 degrees have often been recorded during this month), and the mean temperature has been usually high. The rainfall has been well distributed during the month, and slightly above the average for the past nineteen years: the interval of drought, which so often occurs during this month, and upon which the success or failure of the country's crop so largely depends, has not this year been in evidence. Another disastrous hailstorm, with a wind-squall, unfortunately occurred during the afternoon of the 4th, which played havoc with orchards, crops, and even stock; many hundreds of pounds, representing months of hard work, were thus lost to many of the farmers of the district in the course of half an hour. Luckily, the hailstorm was very local, following a wavy course across the country of no great width, and leaving many farms in the enjoyment of the fruits of their labour. Rainfall: 5·15 inches on fifteen days.—Dr. H. A. Spencer.

Wakkerstroom.—Crops suffered considerably from drought in some parts of the district; cattle are in good condition. Rainfall: 3·81 inches on fourteen days.—Theodore le Roux.

Lichtenburg.—Crops, cattle, and veld in good condition; but, unfortunately, swarms of locusts, doing considerable damage to crops, passed over district. Rainfall: 3·51 inches on fourteen days.—J. T. Allman.

Gemboksfontein (Middelburg).—Rains fell locally during the month on the 22nd, when 2·66 inches fell at this station; some of the farms in the near vicinity had no rain. Rainfall: 6·32 inches on fourteen days.—G. J. Imrie.

Elim (Zoutpansberg).—By far the driest month on record since observations commenced (1905). All crops a complete failure; too late to plant and expect a yield. Rainfall: 0·65 inches on three days.—Mrs. H. R. Mingard.

De Wittekrans (Ermelo).—Crops very good in places, while again whole patches poor. 30th: severe hailstorm west of Olifants River; oats and corn totally destroyed; it is doubtful if the maize will recover. Rainfall: 4·11 inches on ten days.—M. E. Jooste.

Tafelberg (Piet Retief).—21st: Hailstorm did a great deal of damage; stones half an inch in size. Rainfall: 3·44 inches on seven days.—A. B. Engelbrecht.

Elandsfontein (*Potchefstroom*).—In spite of the rainfall for the month, the sun is so hot that the ground remains dry and the plants scorched. Farmers hope that February will bring more rain. No locusts here yet, and the mealie crop promises to be fairly good. Rainfall: 2·20 inches on nine days.—P. Davidtz.

Hartebeesthoek (*Pretoria*).—Maize crop spoiled by drought. Rainfall: 4·76 inches on sixteen days.—A. Kenhart.

Modderfontein (*Pretoria*).—Crops fair. Rainfall: 3·89 inches on ten days.—S. Obree.

Bronkhorstspruit (*Pretoria*).—Farmers are complaining about drought. Rainfall: 3·30 inches on ten days.—R. Evers.

Zandfontein (*Rustenburg*).—The weather conditions during January were good for all crops. Mealies are looking splendid, and there is every promise of a good crop. Tobacco is reported as not up to standard. Rainfall: 4·49 inches on eight days.—R. Boon.

Ricketsvragte (*Waterberg*).—Mealies suffering for want of rain. Rainfall: 3·64 inches on five days.—A. Anderson.

Illawarra (*Waterberg*).—Hottest period I have ever experienced here; crops suffering and grass brown. Rainfall: 2·91 inches on five days.—J. A. Manson.

Woburn (*Waterberg*).—The last half of January was very hot; scorching winds. Mealies are needing rain badly. Rainfall: 2·91 inches on five days.—D. S. Malan.

Goodhope (*Waterberg*).—Has been a very trying month for the crops. 20th: very bad hailstorm at Knapbrooke. Rainfall: 2·90 inches on nine days.—J. L. Harries.

Zandriverpoort (*Waterberg*).—5th January: Heaviest hailstorm for ten years; stones as big as marbles. Rainfall: 4·42 inches on nine days.—J. Viljoen.

Doornkloof (*Zoutpansberg*).—This has been a very trying month for crops. Rainfall has been exceptionally patchy, and our lower farms (i.e. farther south of the mountain) have had little or no rain. Rainfall: 1·92 inch on seven days.—S. M. Ralston.

Onverwacht (*Zoutpansberg*).—This little rain is much to the disadvantage of the country. Mealies, etc., are dry, and the future for this part of the country looks gloomy. It will be necessary to plough again if we are fortunate enough to get more rain. No frost here. Rainfall: 0·49 inch on two days.—B. Wessmann.

Kleinbegin (*Zoutpansberg*).—Crops in a doubtful condition. Rainfall: 1·18 inch on four days.—A. Bicheno.

Rexham (*Zoutpansberg*).—A very dry month here. The rainfall of the 31st just saved the mealie crop from being a total failure. The cutworm caused a lot of damage to the earlier mealies, turning many fields quite white. Crops on the whole are not too good. Rainfall: 0·98 inch on one day.—A. S. McComb.

Arwenhurst (*Zoutpansberg*).—Heat during month intense; crops mostly past recovery in some cases, in others only a light crop expected. Rainfall: 1·52 inch on six days.—Eric von Arwen.

Deercroft (*Waterberg*).—Crops needing rain badly. Rainfall: 3·20 inches on eight days.—G. R. Mitchell.

Kromdraai (*Witwatersrand*).—Rains too light; crops require steady, soaking rain. Rainfall: 3·03 inches on sixteen days.—*W. Frost.*

ORANGE FREE STATE.

Holfontein (*Kroonstad*).—Winds north and north-east predominant and fairly strong; crops promising. Rainfall: 4·03 inches on twelve days.—G. W. Müller.

Belladale (*Frankfort*).—A very favourable month as far as rain is concerned; rather more than many farmers wished for, as oat-hay, which is rather plentiful this season, is being cut. Cattle are looking well, but the wet is a bit too much for the sheep, which are much troubled with wireworms. Mealie-borer is very bad; the outlook for a good mealie crop is far from good. Rainfall: 6·57 inches on ten days.—D. McCalman.

Oranjeville (*Heilbron*).—16th: Fearful hailstorm; great damage done to crops. Rainfall: 2·84 inches on ten days.—*W. J. van Heerden.*

Waterford (*Lindley*).—We have been having excellent rains for the growing crop. The mealies have recovered wonderfully from the heavy rains of the previous month, and everything now points to a record crop in these parts. Farmers are busy reaping fodder, of which there are large quantities of all kinds, and, unless they sell, should have enough to see them through any drought we may have. Stock of all descriptions are looking well. Rainfall: 3·87 inches on ten days.—A. B. Oates.

Woudzicht (*Vrede*).—The month was very favourable for crops, the mealies having much improved through the warm weather and light rains. Rainfall: 6·51 inches on fourteen days.—J. N. Köhler.

Springbokvlakte, Vredefort.—Crops suffering from drought. Rainfall: 2·83 inches on seven days.—M. E. Brindley.

NATAL.

Dundee.—A very dry month generally. Rainfall: 4·04 inches on ten days.—West Thorrold.

Hlabisa.—Rainfall: 1·66 inch on eight days: much below average for January. Crops need heavy rains to save them in this part of the country.—L. Double.

Ladysmith.—Weather was very trying during January; farmers complaining of want of rain to freshen crops. Rainfall: 5·36 inches on eight days.—R. G. Arnold.

Newcastle (*Convent*).—Sufficient rain to keep the ground moist. Some very hot days experienced; severe lightning occasionally. Rainfall: 4·34 inches on thirteen days.—The Mother Superior.

Mid-Illovo.—Insufficient rains for crops; usual night mists; veld good. Rainfall: 2·37 inches on eighteen days.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Cape St. Lucia.—A hot month; conditions unfavourable for crops; rain badly wanted. Rainfall: 1·75 inch on eleven days.—*J. Murphy.*

Nkwalenì (*Emtonjaneni*).—There have been many very hot, dry days, and crops and veld have been seriously affected. Rainfall: 1·57 inch on three days.—K. N. Young.

Mposa (Lower Umfolozi).—The country is exceptionally dry; weather has been very warm; crops are feeling drought considerably. Rainfall: 1·03 inch on five days.—W. Springorum.

Rongpoort (Weenen).—Rainfall for month: 5·27 inches on nine days, and no day out of nine with a fall less than a quarter of an inch. Top-grub very bad in mealies.—J. H. Bartholomew.

CAPE PROVINCE.

Bedford.—The chief feature of the month was the great variability of the temperature. On the afternoon of the 11th, a very heavy rain yielded 1·04 inch in thirty-five minutes. Rainfall: 4·20 inches on seventeen days.—T. C. Hall.

Mafeking (Convent).—Weather very warm during the month; almost three-quarters of an inch fell in thirty minutes during the afternoon of the 30th. Rainfall: 3·11 inches on thirteen days.—The Mother Superior.

Kokstad.—Much damage to farm crops by hail. Rainfall: 3·88 inches on twelve days.—H. D. Coyte.

Queenstown.—Rain fell on ten days, when 3·44 inches were recorded. The greatest fall was on the 11th, when 2·21 inches were registered; 1·05 inch of this amount fell in 25 minutes. Dry, hot month; rain wanted badly.—H. Holley.

Aliwal North.—High temperatures; strong northerly winds. Rainfall: 1·90 inch on nine days.—Alex. Alcock.

Lovedale.—The first week was hot and dry, and the excellent growth of December began to wither. There was a downpour of 2·64 inches on the 11th, but this, apart from useful showers on the 8th (0·60 inch) and 25th (0·39 inch), formed practically all the rain that fell, and the month ended dry. Rainfall: 3·83 inches on eight days.—C. A. Pilson.

Ceres.—Weather generally cooler than usual, with heavy dews and frequent westerly winds. Rainfall: 2·80 inches on seven days.—A. Heatlie.

Darling.—Nothing particular to remark. The nice rains (quite exceptional for January) have been very good for gardens and vineyards, and the veld has benefited. Rainfall: 1·77 inch on seven days.—P. H. Drake.

Rietfontein (Aliwal North).—Rather dry month, with hot spells. Rainfall: 1·86 inch on eight days.—A. G. Smith.

Riversdale.—The rain has done a great deal of good, and the practical farmer has prepared the ground for mealies and beans; a good soaking rain is needed for a promising late harvest. Rainfall: 2·86 inches on eight days.—Rev. Carl Prozesky.

Sydney-on-Vaal (Barkly West).—Preponderance of high maximum temperatures; very light showers only, although heavier rainfall experienced in near vicinity; river in flood practically throughout the whole month. Rainfall: 0·64 inch on six days.—J. G. Richards.

Groot Drakenstein.—This month opened hot, but cooled down and remained cool with excessive rainfall from the 8th. The south-easterly gale on the 9th was about the worst ever experienced at this time of year, and enormous damage was done to fruit crop. One company owning seven farms in the valley estimated their loss in one variety of pear alone at 100 tons. The rain also damaged soft fruit, and delayed picking operations. Rainfall: 3·04 inches on eight days.—Lionel Baker.

Umzimkulu (East Griqualand).—14th, 6 p.m.: about fifteen miles from Umzimkulu a cyclone carried away a trading store almost bodily, leaving other buildings 30 feet from the store untouched. On the 23rd a terrific rain (probably a cloudburst) in the Umvubagazi Valley three miles away caused the Umvubagazi River to rise higher than has ever been known, with the result that a house with all its occupants were washed away. Three Kaffir women and three children were drowned. Rainfall: 3·03 inches on eleven days.—D. MacIntyre.

Bechuanaland.

Serowe.—Lowest rainfall on record; crops practically ruined; heat also a record. Rainfall: January, 1915, 14·19 inches; January, 1916, 2·22 inches; January, 1917, 2·59 inches; January, 1918, 8·84 inches; January, 1919, 10·58 inches; January, 1920, 6·25 inches; January, 1921, 6·14 inches: January, 1922, 1·02 inch.—G. M. Petrie.

Basutoland.

Mafeteng.—Very hot spell from the 12th to 31st. Good rains fell on 8th (0·93 inch), 9th (1·42 inch), and 25th (0·69 inch). Thunderstorms prevalent, but no hail. Very strong northerly winds on 16th. Rainfall: 3·82 inches on nine days.—F. Hodgson.

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 north-north-east to south-south-east 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 north-north-west, 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 north, north-north-west and south-south-west, with, on the other hand, a marked increase of winds from north-east. Over the Cape Peninsula there is, coincident with a considerable decrease of southerly winds, an increase of winds from south-east and south-south-east, 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.

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MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

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MEAN pressure higher than usual in the south; temperature slightly above the mean in the Transvaal, but lower than the normal elsewhere; days warmer than usual in the Transvaal, Swaziland, and Free State, normal in the Cape and sub-normal elsewhere; nights generally cooler than usual with some slight frosts; precipitation considerably below the average in the Transvaal, Orange Free State, Natal, and parts of the Cape Province; absolute drought over the west coast, central Karroo, and parts of the northern Karroo; an excess of rainfall over the south-west Cape and part of the south coast; a deficiency of southerly winds over the Cape Peninsula; frequent thunderstorms, particularly during the early part of the month, and a few destructive hailstorms: such were the leading features of the weather of February, 1922.

Pressure.—The pressure map for this month shows that the position of the isobars lay slightly further inland all over the Union, whilst the 29·95-inch isobar along the south coast was replaced by one of 30·00 inches. The prevailing winds were easterly to north-easterly over the eastern half of the country and southerly along the west, the latter, however, being less frequent and lighter in force than usual, except on the last three days of the month, over the south-west and the Cape Peninsula. The equatorial low pressure was strongly in evidence during the greater part of the month, whilst low pressure areas appeared on the coast on twelve days; from west to south-east on 2nd, 3rd, and 5th to 9th, from south to south-east on 15th to 18th, on south-east on 21st; high pressure areas occurred on seven days from west to south-east on 10th and 11th; on south on 13th and 23rd; and from south to south-east on 19th, 20th, and 28th.

Temperature.—The mean temperature over the Union (70·7 degrees) was half a degree lower than usual, the nights with a mean of 59·0 degrees being 1 degree colder than the average and the days with 82·5 degrees, only a tenth

higher than the normal. If the Provinces be considered separately, it is found (that the Transvaal alone showed an excess (plus 0·4 degree) over the norma 70·0 degrees) for the month. In the other Provinces and adjoining territoriesl there was a deficiency in mean temperature ranging from 0·8 degree in the Cape to 1·8 degree in Natal, whilst single stations in Swaziland and Basutoland showed shortages of 0·5 degree and 4·4 degrees respectively. In all sections of the country the mean minima fell short of the normal, but in the Transvaal this was more than compensated by an excess of 1·7 degree in the mean maximum for the month (82·4 degrees); the mean minimum temperature there (58·5 degrees) was only 0·8 degree below the average. In Natal and Basutoland both days and nights were colder than usual; the mean maximum in Natal (83·2 degrees) being 3·4 degrees, and in Basutoland (80·1 degrees) being 3·8 degrees below the average; in the former Province the nights, with a temperature of 62·0 degrees, were only 0·3 degree, whilst at Mafeteng, in Basutoland, with a mean of 52·7 degrees, the nights were 4·9 degrees below the average. In the Free State the mean maximum temperature (80·7 degrees) was 1·3 degree above, and the mean minimum (53·9 degrees) was 2·8 degrees below the corresponding averages. In Swaziland the deficit in the mean night temperature (56·0 degrees) was practically double the excess in the day temperature (76·6 degrees). Over the Cape as a whole, the days, with a mean of 82·6 degrees, were normal, but the nights (59·1 degrees) sub-normal to the extent of 1·1 degree.

On examining the variations from the normal in greater detail it is found there was an excess of temperature over the Cape Peninsula and south-west, Namaqualand, the northern Karroo, northern border, Bechuanaland, the north east, parts of the south-east of the Cape, the central portion of the Free State, the west, south-west, east and north-centre and south-centre of the Transvaal. These departures from the average were mostly less than one degree, except in the northern Karroo and Bechuanaland, the extreme south-west of the Transvaal, the Witwatersrand and other points of the high veld, the eastern middle, and the low veld, also at Bloemfontein in the Free State, where they varied between 1 and 2 degrees, attaining the maximum of plus 2·4 degrees at Bloemhof. Elsewhere, temperature was sub-normal, mostly by less than a degree over the Transvaal, north of the Free State, Swaziland, parts of Natal and Zululand; along the eastern border of the Free State, the deficits increased to almost 2 degrees and still further to between 2 and 3 degrees over the greater portion of Natal and the Cape Province. The largest deficits recorded were 4·4 degrees at Mafeteng (Basutoland) and 4·5 degrees at Grahamstown in the south-east of the Cape. Along the south and south-east coasts the mean monthly temperature was about a degree lower than usual. The day temperatures, as shown by the mean maxima, were higher than usual over the greater part of the Transvaal, Swaziland, Free State, the Cape north of 32° S. Lat., as well as the Cape Peninsula, and parts of the south-east. Generally speaking, the excess in day temperature increased towards the interior. Over the Transvaal, however, the day temperature seems to have varied from a deficit of 1·0 degree at Pretoria to a surplus in all directions, becoming negative again, however, in the extreme south-east at Piet Retief and in the north at Louis Trichardt, a distribution very like what obtained in the case of the mean monthly temperature. In the Free State the excess in maximum temperature varied from 1·4 degree at Ladybrand to 3·6 degrees at Bloemfontein, and in the Cape Province from 0·6 at the Royal Observatory in the Cape Peninsula to 6·4 degrees at Carnarvon in the northern Karroo. Over Natal the days were much cooler by 3–5 degrees than the average; in the north-east of the Free State by a little less than 2 degrees, but in the Cape generally by 2–3 degrees. In the last Province, however, the deficit reached as much as 3·9

degrees at Grahamstown, but in Kaffraria it dropped to between 1 and 2 degrees. The mean minima were lower than usual at most stations, commonly by a few tenths, but exceeding 2 degrees at a few places in the Transvaal; by 1½–3 degrees in the Free State, and by 0·5–1·5 degree generally over the Cape. In a few instances the night temperatures departed most widely from the normal at Ladybrand in the Orange Free State, where the deficit was 4·7 degrees, at Mafeteng in Basutoland, where the shortage amounted to 4·9 degrees, and at Grahamstown, in the Cape, where it exceeded 5 degrees. At a few stations in each Province, but principally in Natal, there were small excesses in the minima usually of less than one degree. The mean warmest station was Komatipoort, with a mean temperature for the month of 81·2 degrees, and the mean coolest station Belfast, on the Transvaal high veld, with 61·2 degrees, a difference of 20 degrees. The highest mean maximum was 94·7 degrees at Kenhardt, and the lowest mean minimum 49·3 degrees at Belfast. The highest temperatures during the month were recorded from 2nd to 9th, 12th to 18th, 23rd, 24th, 27th, and 28th, but most widely on the 17th, when the greater part of the Transvaal, Free State, and parts of the Cape and Natal were affected. The lowest temperatures were registered on 1st, 3rd, 6th, 9th, 11th, on 13th, 16th, 19th to 23rd, 25th, 26th, and 28th, but most widely between the 19th and 22nd, when the major portion of the summer rainfall area experienced this extreme for the month. Temperatures exceeding 100 degrees were registered at a number of stations in the east, south, and west of the Cape, at Weenen in Natal, and at Komatipoort in the eastern Transvaal; the highest being 105·4 degrees at Clanwilliam on the 28th. The lowest temperatures were recorded on sixteen days, chiefly between 19th and 22nd, practically over the whole Union, but also widely over the Cape on the 11th. The lowest shade temperature registered was 40·0 degrees at Belfast on the 22nd, giving an extreme monthly range of 65·4 degrees over all stations. Frost was observed on two days at Overdene, in the Ficksburg District of the Free State.

Precipitation.—The only areas showing an excess of rainfall during the month were portions of the south-west of the Cape Province, including the Cape Peninsula, and the western part of the south coastal area as far east as Knysna; the neighbourhood of Belfast and Wakkerstroom in the Transvaal, and of Vryheid and Ladysmith in Natal. These excesses were mostly small, generally under half an inch, but varying from 0·03 inch at Mossel Bay to 1·24 inch at Ladysmith in Natal. Elsewhere, there was a deficiency in rainfall mostly between 2 and 4 inches in the Transvaal, but exceeding 5 inches at Pilgrims Rest in the east, and rising to 7·51 inches at Woodbush in the north; in the Free State the deficits were mostly about 2·25 inches, but decreased to under half an inch in the north-eastern border at Harrismith; in Natal the deficits ranged from 0·03 inch at Weenen to 2·5 inches at Howick, being mostly over 2 inches in the southern parts of the Province, decreasing to a few tenths in the centre and north; in the Cape Province the deficiencies were greatest in Bechuanaland, the northern border, north-eastern portions of the northern Karroo, portions of the north-east and south-east, where they also exceeded two inches, decreasing in a general way southwards and westwards. Absolute drought was experienced throughout the month in parts of the Free State, particularly portions of the Fauresmith, Boshof, Bloemfontein, and Winburg districts, also over the west coast, the west-central Karroo, parts of the east-central Karroo, and northern Karroo, and northern border of the Cape. The rains during the month were almost entirely of the thunderstorm type and extremely local, more particularly after the 11th. These storms, during the first third of the month, partook of the same character as those in January, but appeared to be more purely due to heat convection from the 18th to the

end of the month. Occasionally showers of considerable intensity occurred over limited areas, whilst adjoining areas received little or nothing. In consequence of the local nature of the precipitation, a few areas received fairly good rains on seven or eight days well distributed throughout the month, whilst others, e.g. in the Bloemhof District, had rainfall on only one day or even none at all. In many places the month's rainfall was the lowest recorded during the last ten years or more, and following on the low unsatisfactory precipitation of the previous month has adversely affected the mealie and other crops to such an extent that in some places there seems little hope of reaping any harvest this season. The veld was becoming parched in many places and the grass turning yellow. Conditions seem to have been most favourable to agriculture in the Krugersdorp and Piet Retief Districts of the Transvaal, the Klip River and the Weenen Districts of Natal, in the Vrede and Bethlehem Districts of the Free State, and parts of the south of the Cape Province. Insect pests have been troublesome, and locusts are numerous in the south-west of the Transvaal and the southerly portions of the Free State. At Rugby (District Bethlehem, Orange Free State), the top grub is stated to have suddenly deserted its host with a consequent marked improvement in the growth of the maize crop; wheat and oats there, however, have been attacked by rust. From Hamelfontein (District Edenburg, Orange Free State) comes a report that owing to the drought and the dams drying up, farmers were trekking with large stock, although small stock were still in good condition. Crops, generally, are reported as likely to be poor in consequence of the drought, but fodder is plentiful at Heilbron. Stock are mostly in good condition; although some cases of horse-sickness are reported from Mid-Illovo, Klip River, and Nottingham Road in Natal, and blue-tongue in sheep in Klip River (Natal) and Harrismith (Orange Free State), whilst a moderate amount of disease and deaths amongst cattle occurred in the District of Grahamstown (Cape Province). A few destructive hailstorms occurred during the month in the Piet Retief District, and the neighbourhood of Doornkloof (Zoutpansberg Division, Transvaal) and Woodford (District Bethlehem, Orange Free State), the damage being apparently confined to crops; otherwise these storms were mostly light. Lightning was particularly brilliant and severe during the early part of the month; on the 9th it struck three houses in Mbabane and thrice in the vicinity of the police camp. The accumulated rainfall since the beginning of the year is generally above the average in the south and south-west, over the central Karroo, and the south-west of the northern Karroo, also in the neighbourhood of Belfast on the Transvaal high veld, and at Ladysmith in Natal, where the greatest excess (1·93 inch) is found. Elsewhere, there is a considerable deficit, ranging in the Transvaal from 1·4 inch to 22·8 inches, but mostly between 3 and 8 inches; in the Free State between 2 and 4 inches; in Natal mostly about 4 inches, but rising to 6·8 inches at Hlabisa in Zululand. In the Cape Province the shortages are mostly under an inch in the coastal areas of the west and south-east and south of the Karroo, but increasing to 2–3½ inches in the northern parts of the northern Karroo, northern border, the north-east, inland portions of the south-east, and Kaffraria. The total precipitations since the beginning of July of last year is mostly considerably above the normal in the south-west of the Cape, portions of the south coastal area, the central Karroo, and the south of the northern Karroo, also in part of the north-east, in Kaffraria, Natal, the north, east, south-east, and south-west of the Transvaal, and the eastern half of the Free State. The surplus amounts are mostly between 1 and 8 inches in the Cape Province, but rising to 8 inches at Kokstad; much more variable in Natal, where they range from 0·42 inch at Howick to 17·32 inches at Ladysmith; in the Free State they are smaller, varying between 0·16 inch at Ladybrand and 3·18 inches at Lindley; whilst in the Transvaal the excess is mostly over

3 inches, but ranging from 0·29 inch at Potchefstroom to 6·06 inches at Wakkerstroom. Elsewhere, the cumulative amounts of precipitation are sub-normal; being commonly less than an inch in the coastal areas and greater part of the northern Karroo, but increasing to 2–6 inches in the south-east, northern border, Bechuanaland, and Basutoland; in the Free State the shortage is between 5 and 6 inches, but extremely variable in the Transvaal, where it varies from less than a tenth of an inch at Rustenburg to 13·7 inches at Woodbush, being mostly, however, between 4 and 8 inches.

OBSERVERS' NOTES FOR FEBRUARY, 1922.

TRANSVAAL.

Pigeonhole (*New Agatha*).—Crops, owing to drought, practically a failure; in many cases half a crop is only expected, but in the majority of cases there will be none. Rainfall: 4·13 inches on thirteen days.—J. McCallum.

Pilgrims Rest.—The rainfall for February—2·63 inches on thirteen days—is the lowest on record for this centre.—E. M. Skea.

Barberton.—Rainfall very deficient this month. Mealie crops are suffering severely, and the cotton crop is beginning to show the effects of the drought. Rainfall: 0·91 inch on eight days.—Walter Grubb.

Pietersburg.—Drought early portions of month, slightly relieved by soft rains. More rain badly needed. Rainfall: 2·22 inches on five days.—W. Frankleyne.

Middelburg.—Hot days with the nights becoming cooler have characterized the weather this month; the temperature by day, however, has not been excessive, though a shade temperature of 90·0 degrees was recorded. The rainfall, at least in the town, has been slightly below the average but well distributed throughout the month, so that crops are looking exceptionally fine throughout the district. The rains were, however, very local and seldom general, so that on one occasion, though none fell in town, nearly three inches fell almost in sight of town in the course of a little over an hour. Some very heavy falls were recorded on several occasions in the district. Rainfall: 3·14 inches on fifteen days.—Dr. H. A. Spencer.

Klerksdorp.—Exceptionally hot and dry month. Crops suffering very much. Rainfall: 0·93 inch on nine days.—C. Scott.

Mosdene (*Naboomspruit*).—An extraordinary dry month for February, which, following a low rainfall for January, has checked growth and stunted crops so that they will be considerably below normal. Unless good rains iall during March, many of the late sown crops will not reach maturity. The pasturage has also been adversely affected and is getting very dry. Clouds gather and the weather makes up for rain nearly every day, only to end in disappointment. What showers do fall are very local. Rainfall: 0·71 inch on five days.—Ernest E. Galpin.

Wakkerstroom.—The nights are becoming rather chilly. The grass is dying off. Good rains this month: 5·54 inches on twelve days.—Louis le Roux.

Krugersdorp.—The month opened with heavy rains and remained cloudy and unsettled, with nice showers at intervals. Days being somewhat cooler. Veld and crops looking well. Insect pests very troublesome. Rainfall: 4·36 inches on fourteen days.—George S. Garnett.

AIR TEMPERATURES, FEBRUARY, 1922—(*continued*).

Place.	Observer.	Month—Feb., 1922. Mean Max.	Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Date.	Lowest.	Date.
Cape—										
Alfred North	Alex. Alcock	85·3	53·9	69·6	69·2	+ 0·4	93·0	6th	40·5	21st.
Bedford	T. C. Hall	80·6	55·2	67·9	70·7	− 2·8	102·0	6th	45·0	1st & 11th.
Capetown (Royal Observatory)	The Staff	79·8	60·9	70·4	69·7	+ 0·7	96·7	5th	55·8	9th.
Carnarvon	A. P. Malherbe	88·1	56·3	72·2	69·4	+ 2·8	94·0	2nd	42·0	19th.
Clanwilliam	P. E. Scholtz	89·8	56·4	73·1	75·8	− 2·7	105·4	28th	46·1	19th.
East London	The Port Captain	76·3	63·6	70·0	69·5	+ 0·5	82·0	8th	58·0	22nd & 23rd.
Graaff-Reinet	S. E. D. Treadwell	86·8	58·7	72·8	74·0	− 1·2	98·7	17th	46·6	20th.
Grahamstown	The Vet. Res. Officer	78·2	54·4	66·3	70·8	− 4·5	99·0	6th	43·0	11th.
Groot Drakenstein	Lionel Baker	85·3	60·9	73·1	72·6	+ 0·5	102·3	5th	46·9	11th.
Kenhardt	E. Seydell	94·7	63·1	78·9	78·6	+ 0·3	102·0	5th, 24th, & 28th	51·0	21st.
Kimberley		—	—	—	—	—	—	—	—	—
Kingwilliamstown	L. Clayton	82·3	59·6	71·0	73·0	− 2·0	100·0	2nd	50·5	21st.
Kokstad	H. D. Coyte	76·9	53·6	65·2	66·4	− 1·2	90·0	15th	44·3	21st.
Mafeking (Convent)	The Mother Superior	89·1	61·0	75·0	72·9	+ 2·1	95·0	17th	56·0	18th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	73·5	63·6	68·6	69·6	− 1·0	79·0	27th	56·0	9th & 10th.
Murraysburg		—	—	—	69·3	—	—	—	—	—
O'okiep	J. Burrows	86·6	58·5	72·6	72·2	+ 0·4	98·0	28th	47·5	22nd.
Port Elizabeth	The Lightkeeper	74·5	63·3	68·9	69·8	− 0·9	80·0	6th	51·0	10th.
Port Nolloth	The Lightkeeper	65·9	52·5	59·2	60·1	− 0·9	72·0	18th	42·0	23rd.
Port St. Johns (Cape Hermes)	The Lightkeeper	77·9	67·1	72·5	72·4	+ 0·1	84·0	17th & 18th.	60·0	11th & 20th.
Queenstown	H. Holley	84·8	56·9	70·8	69·9	+ 0·9	101·0	6th	46·0	19th & 20th.
Somerset East	C. Harris	81·3	55·6	68·4	71·4	− 3·0	97·0	6th	45·5	11th.
Stutterheim	F. C. Bousfield	79·8	56·8	68·3	68·0	+ 0·3	97·8	15th	47·3	19th.
Sydney Hope	Rev. S. Rippon	79·2	57·4	68·3	70·2	− 1·9	101·0	6th	48·0	19th.
Uitenhage	H. Inggs	82·5	60·2	71·4	73·4	− 2·0	102·8	2nd	45·6	11th.
Umtata	Miss N. Dix Peek	80·4	59·5	69·7	70·6	− 0·9	93·0	6th & 17th	50·0	20th.
Vryburg	Chas. Butler	91·5	61·5	76·5	75·2	+ 1·3	97·0	13th, 16th, 17th, & 24th	52·0	13th.
Wynberg (Convent)	The Mother Superior	78·6	59·2	68·9	68·8	+ 0·1	94·5	5th	53·2	11th.
Basutoland—										
Maseteng	F. Hodgson	80·1	52·7	66·4	70·8	− 4·4	86·0	7th	41·0	20th.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), FEBRUARY, 1922.

Place.	Observer.	Month—Feb., 1922. Mean Max.	Month—Feb., 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
		° F.	° F.	° F.	° F.	° F.	° F.		° F.	
Transvaal—										
Barberton	Walter Grubb	85·0	61·7	73·4	72·4	+ 1·0	95·0	17th	57·0	20th.
Belfast	The Forester	73·0	49·3	61·2	62·4	− 1·2	82·0	17th	40·0	22nd.
Bloemhof	A. Adamson	90·8	57·9	74·4	72·0	+ 2·4	98·0	13th & 16th.	50·0	20th.
Ermelo	Mrs. S. M. Nicolson	78·7	53·3	66·0	65·3	+ 0·7	88·0	17th	48·0	20th.
Johannesburg (Observatory)	The Staff	76·0	55·4	65·7	64·4	+ 1·3	83·3	17th & 23rd.	49·2	28th.
Klerksdorp (Strathmore)	Chas. Scott	80·8	58·2	72·5	72·7	− 0·2	93·0	17th & 23rd.	51·0	28th.
Komatipoort	B. J. Fothergill	94·2	68·2	81·2	79·4	+ 1·8	103·5	18th	62·0	22nd.
Louis Trichardt	I. J. de Bruin	77·6	60·8	69·2	69·9	− 0·7	92·0	9th	51·0	20th.
Middelburg	Dr. H. A. Spencer	81·9	55·4	68·6	68·1	+ 0·5	90·0	17th	50·0	22nd.
Nylstroom	G. Bakker	83·9	59·5	71·7	71·3	+ 0·4	92·9	18th	55·9	6th, 16th, & 22nd.
Pietersburg	W. J. Frankleyne	81·8	58·9	70·4	69·6	+ 0·8	90·0	17th	54·0	3rd.
Piet Retief	J. Werner	76·2	57·5	66·8	67·1	− 0·3	89·0	17th	52·0	20th.
Pigeonhole (New Agatha)	Jno. McCallum	—	—	—	—	—	—	—	—	—
Pilgrims Rest	E. M. Skea	79·3	55·5	67·4	67·0	+ 0·4	90·0	9th	49·0	23rd.
Potchefstroom (Exp. Farm)	The Manager	87·4	58·3	72·8	69·8	+ 3·0	92·6	7th	51·2	28th.
Pretoria (Meteorological Office)	The Staff	81·2	58·8	70·0	70·8	− 0·8	88·0	17th	53·0	22nd.
Standerton	.....	—	—	—	—	—	—	—	—	—
Zeerust	H. Dietrich	86·3	61·4	73·8	72·9	+ 0·9	94·9	4th	56·0	28th.
Swaziland—										
Mbabane	Swaziland Police	76·6	56·0	66·3	66·8	− 0·5	87·0	9th	51·0	11th & 25th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	88·4	57·3	72·8	71·9	+ 0·9	93·9	14th	42·0	20th.
Bloemfontein	G. A. Schepers	86·5	57·9	72·2	71·2	+ 1·0	91·4	14th	42·9	20th.
Harrismith	The Forester	74·0	51·5	62·8	64·6	− 1·8	82·0	17th	43·0	20th.
Ladybrand	The Forester	80·5	52·1	66·3	68·0	− 1·7	86·0	7th & 17th.	43·0	20th.
Lindley	J. Collister-Oates	81·8	54·0	67·9	68·4	− 0·5	87·5	17th	46·0	22nd & 28th.
Natal—										
Dundee	West Thorrold	79·7	57·1	68·4	71·2	− 2·8	91·0	15th	48·0	28th.
Durban (Point)	The Port Captain	82·1	69·0	75·6	76·6	− 1·0	88·8	8th	61·2	20th.
Estcourt	A. A. McLean	80·0	58·2	69·1	71·0	− 1·9	90·0	15th & 16th.	51·0	21st.
Hlabisa	The Gaoler	81·6	64·6	73·1	73·4	− 0·3	87·0	3rd, 7th, 12th, 17th, & 18th	58·0	21st.
Ladysmith	R. G. Arnold	87·6	60·0	73·8	76·3	− 2·5	97·0	3rd, 15th, and 17th	54·0	25th & 28th.
Maritzburg (Mental Hospital)	The Superintendent	80·3	62·0	71·2	73·4	− 2·2	91·0	16th & 18th.	54·5	21st.
Stanger	C. C. Foss	82·4	66·6	74·5	77·2	− 2·7	96·7	18th	60·0	11th.
Weenen	The Gaoler	91·5	58·7	75·1	76·0	− 0·9	102·0	10th	52·0	20th, 21st, & 26th.

RAINFALL, FEBRUARY, 1922.

Place.	Observer.	Month. Feb., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	0·91	4·69	− 3·78	4·43	13·81	− 9·38	20·31	26·61	− 6·30
Bethal	H. Joubert	4·17	4·46	− 0·29	8·61	10·01	− 1·40	21·90	25·53	− 3·63
Belfast	The Forester	4·30	3·80	+ 0·50	11·39	10·21	+ 1·18	28·47	25·06	+ 3·41
Bloemhof	A. Adamson	0·80	4·09	− 3·29	4·04	7·39	− 3·35	8·62	13·71	− 5·09
Claremont	S.A. Police	1·80	2·09	− 0·29	2·53	5·95	− 3·42	12·42	13·11	− 0·69
Ermelo	Mrs. S. M. Nicolson	2·41	3·98	− 1·57	6·80	9·14	− 2·34	23·59	23·55	+ 0·04
Heidelberg	W. ter Horst	3·22	5·05	− 1·83	6·13	9·78	− 3·65	16·40	22·69	− 6·29
Johannesburg (Observatory)	The Staff	3·00	4·97	− 1·91	5·64	10·54	− 4·90	20·43	24·92	− 4·49
Klerksdorp (Strathmore)	Chas. Scott	0·93	3·65	− 2·72	5·72	8·05	− 2·33	19·35	16·17	+ 3·18
Komatipoort	B. J. Fothergill	0·75	5·14	− 4·39	2·45	10·14	− 7·69	18·26	19·42	− 1·16
Louis Trichardt	J. de Bruin	4·30	6·42	− 2·12	4·30	12·82	− 8·52	18·38	25·88	− 7·50
Middelburg	Dr. H. A. Spencer	3·14	4·36	− 1·22	8·27	9·67	− 1·40	27·09	23·32	+ 3·77
Nylstroom	G. Bakker	3·27	4·25	− 0·98	5·76	9·21	− 3·45	17·49	19·23	− 1·74
Pietersburg	W. J. Frankleyne	2·22	4·03	− 1·81	3·08	8·49	− 5·41	18·92	18·01	+ 0·91
Piet Retief	J. Werner	2·47	4·32	− 1·85	6·17	10·30	− 4·13	30·66	25·51	+ 5·15
Pilgrims Rest	E. M. Skea	2·63	7·78	− 5·15	5·93	16·34	−10·41	26·31	30·39	− 4·08
Pigeonhole (New Agatha)	J. McCallum	4·13	6·44	− 2·31	5·37	12·08	− 6·71	34·18	27·09	+ 7·09
Potchefstroom	The Manager	0·87	3·83	− 2·96	6·01	7·90	− 1·89	18·89	18·60	+ 0·29
Pretoria (Meteorological Office)	The Staff	1·24	5·01	− 3·77	4·69	11·34	− 6·65	15·47	23·96	− 8·49
Roodberg	M. Baumann	3·33	3·38	− 0·15	5·68	9·85	− 4·17	19·12	19·80	− 0·68
Rustenburg	S.A. Police	4·08	4·31	− 0·23	6·09	9·76	− 3·67	20·64	20·71	− 0·07
Wakkerstroom	L. le Roux	5·54	4·73	+ 0·81	9·35	10·73	− 1·38	31·84	25·78	+ 6·06
Woodbush	The Forester	4·89	12·40	− 7·51	7·95	30·78	− 2·28	42·15	55·87	−13·72
Zeerust	H. Dietrich	2·52	4·36	− 1·84	4·90	9·19	− 4·29	14·00	18·27	− 4·27
Swaziland—										
Mbabane	Swazi Police	4·63	7·83	− 3·20	10·19	17·83	− 7·64	36·01	39·25	− 3·24
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·99	3·36	− 2·37	2·00	6·12	− 4·12	7·05	12·62	− 5·57
Bloemfontein	G. A. Schepers	1·09	3·30	− 2·21	2·94	5·78	− 2·84	8·35	13·41	− 5·06
Boshof	A. J. Nicholas	0·44	2·77	− 2·33	2·47	5·82	− 3·35	7·37	13·18	− 5·81
Harrismith	The Forester	3·66	4·09	− 0·43	6·83	8·91	− 2·08	23·58	22·04	+ 1·54
Kroonstad	S. R. Northfield	1·04	2·80	− 1·76	4·35	6·70	− 2·35	19·02	18·07	+ 0·95
Ladybrand	The Forester	1·66	4·00	− 2·34	5·10	8·61	− 3·51	20·75	20·59	+ 0·16
Lindley	J. Collister-Oates	1·81	3·59	− 1·78	6·92	7·70	− 0·78	21·36	18·18	+ 3·18

RAINFALL, FEBRUARY, 1922—(*continued*).

Place.	Observer.	Month. Feb., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Natal—										
Dundee	West Thorrold	4·52	4·70	− 0·18	8·56	10·89	− 2·33	38·10	24·21	+13·89
Durban (Point)	The Port Captain	2·77	4·91	− 2·14	4·45	9·02	− 4·57	36·84	28·49	+ 8·35
Estcourt	A. A. McLean	2·82	4·76	− 1·94	6·39	10·20	− 3·81	24·59	22·00	+ 2·59
Hlabisa	The Gaoler	4·10	5·12	− 1·02	5·76	12·58	− 6·82	37·42	33·42	+ 4·00
Howick	The Gaoler	2·55	5·05	− 2·50	4·94	10·16	− 5·22	24·89	24·47	+ 0·42
Ladysmith	R. G. Arnold	5·92	4·68	+ 1·24	11·28	9·35	+ 1·93	37·91	20·59	+17·32
Pietermaritzburg (Mental Hospt.)	The Staff	2·33	5·06	− 2·73	4·74	10·27	− 5·53	28·66	25·41	+ 3·25
Stanger	C. C. Voss	3·91	4·22	− 0·31	5·29	9·36	− 4·07	—	31·57	—
Vryheid	The Gaoler	5·21	4·36	+ 0·85	10·94	12·39	− 1·45	32·35	29·38	+ 2·97
Weenen	The Gaoler	3·91	3·94	− 0·03	7·80	9·18	− 1·38	20·88	20·76	+ 0·12
Cape—										
Aliwal North	A. Alcock	0·84	3·43	− 2·59	2·74	6·42	− 3·68	10·12	14·44	− 2·32
Beaufort West	The Gaoler	0·46	1·26	− 0·80	1·79	2·40	− 0·61	7·84	5·93	+ 1·91
Bedford	T. C. Hall	2·47	3·63	− 1·16	6·67	6·95	− 0·28	19·14	19·19	− 0·05
Britstown	The Gaoler	0·09	1·90	− 1·81	1·30	2·98	− 1·68	4·68	6·35	− 1·67
Calvinia	The Gaoler	0·09	0·43	− 0·34	0·30	0·57	− 0·27	4·36	6·02	− 1·66
Capetown (Royal Observatory)	The Staff	0·87	0·59	+ 0·28	2·53	1·27	+ 1·26	16·18	14·16	+ 2·02
Ceres	A. Heatlie	0·26	0·60	− 0·34	3·06	1·62	+ 1·44	29·44	25·22	+ 4·22
Carnarvon	A. P. Malherbe	0·05	1·21	− 1·16	0·25	2·29	− 2·04	3·80	4·54	− 0·74
Clanwilliam	P. E. Scholtz	0·22	0·29	− 0·07	1·07	0·48	+ 0·59	4·39	4·84	− 0·45
East London	A. Downie	3·31	3·40	− 0·09	6·63	6·52	+ 0·11	20·55	23·11	− 2·56
Fraserburg	The Gaoler	0·00	0·89	− 0·89	2·01	1·63	+ 0·38	6·33	3·69	+ 2·64
Garies	The Gaoler	0·00	0·13	− 0·13	0·00	0·24	− 0·24	2·11	2·90	− 0·88
Graaff-Reinet	S. E. D. Treadwell	0·32	1·74	− 1·42	2·05	3·16	− 1·11	11·70	9·04	+ 2·66
Groot Drakenstein	Lionel Baker	0·71	0·64	+ 0·07	3·75	1·79	+ 1·96	23·63	20·49	+ 3·14
Griquatown	The Gaoler	0·47	2·28	− 1·81	0·47	4·10	− 3·63	4·07	7·67	− 3·60
Grahamstown	Vet. Research Officer	1·42	2·89	− 1·47	3·56	5·49	− 1·93	15·15	19·61	− 4·46
Hanover	The Gaoler	0·44	2·08	− 1·64	1·87	3·73	− 1·86	6·56	7·87	− 1·31
Hopetown	The Gaoler	0·63	1·81	− 1·18	1·12	3·76	− 2·64	6·93	7·69	− 0·76
Kenhardt	R. Seydell	0·33	1·16	− 0·83	0·70	1·74	− 1·04	1·99	3·25	− 1·26
Kimberley	R. J. Leisk	0·20	2·66	− 2·46	1·74	5·09	− 3·35	5·75	10·82	− 5·07
Knysna	The Gaoler	3·27	2·21	+ 1·06	4·84	4·17	+ 0·67	20·76	19·66	+ 1·10
Kokstad	H. D. Coyte	2·39	4·19	− 1·80	6·27	8·70	− 2·43	28·61	20·46	+ 8·15
Kingwilliamstown	L. Clayton	1·32	3·32	− 2·00	3·29	5·86	− 2·57	15·85	17·61	− 1·76
Kuruman (Abtonia)	A. T. Sitwell	1·43	2·71	− 1·28	2·01	6·40	− 4·39	4·72	11·51	− 6·79
Maleking (Convent)	The Mother Superior	0·82	3·55	− 2·73	3·03	7·53	− 3·60	9·57	15·85	− 6·28
Mossel Bay (Cape St. Blaize)	The Lightkeeper	1·59	1·56	+ 0·03	2·80	2·65	+ 0·15	12·87	11·23	+ 1·14
Murraysburg	The Gaoler	0·10	1·59	− 1·49	1·91	2·77	− 0·86	8·05	6·47	+ 1·58
O'okiep	J. Burrows	0·00	0·36	− 0·36	0·00	0·57	− 0·57	2·37	3·91	− 1·54

RAINFALL, FEBRUARY, 1922—(*continued*).

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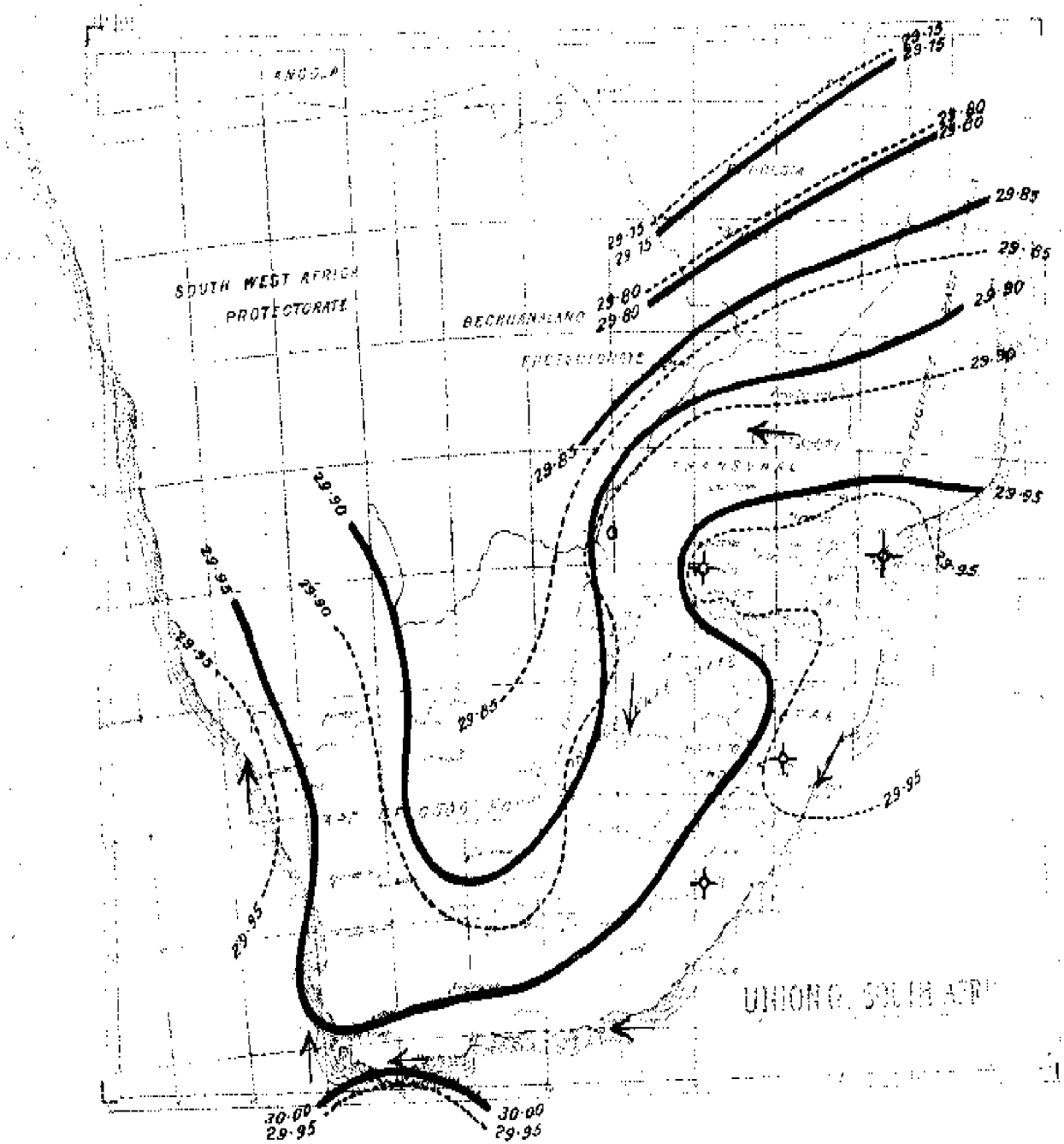
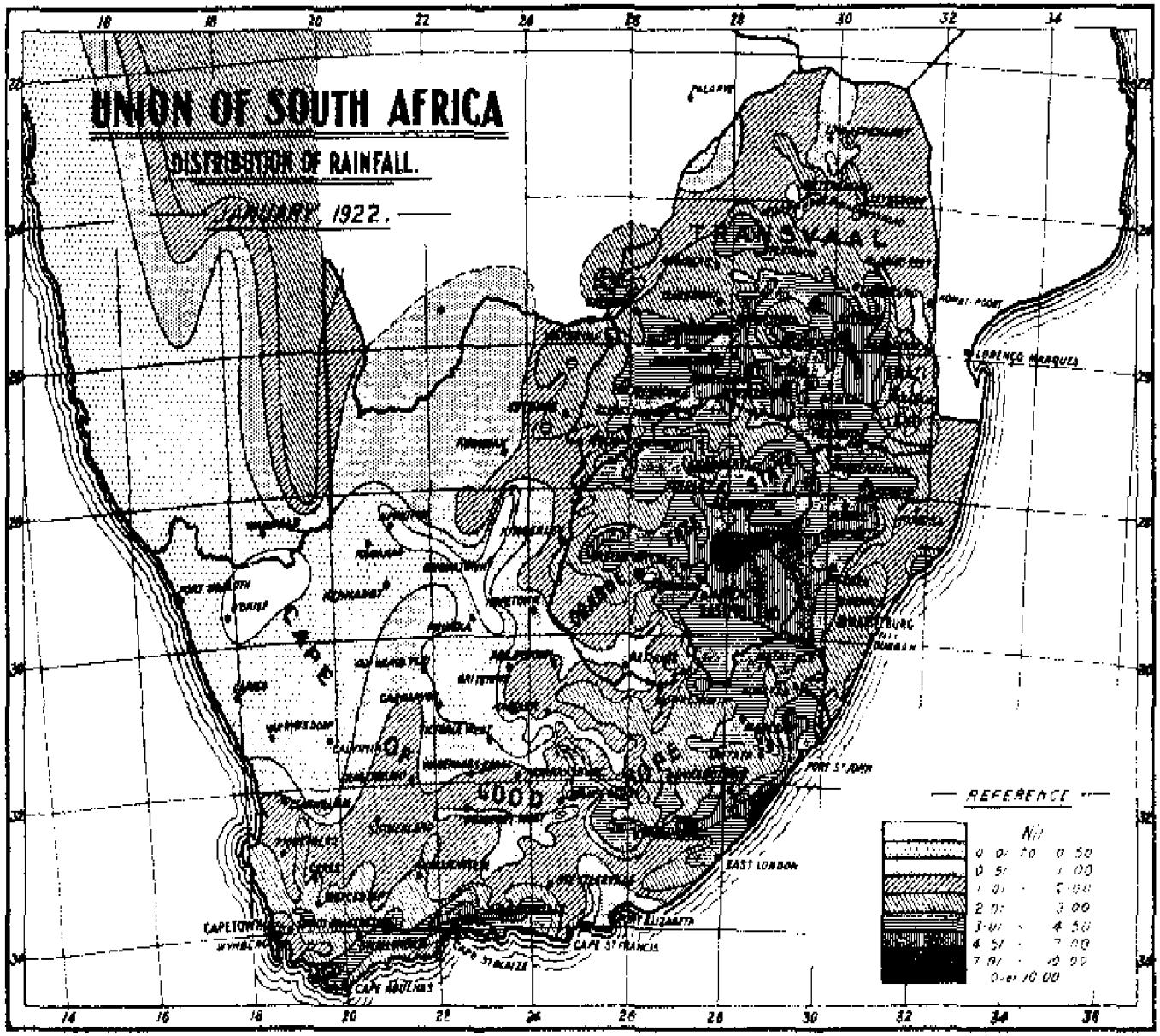
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches	Inches.
Cape—continued—										
Philipstown	The Gaoler	0·10	2·17	− 2·07	2·17	3·94	− 1·77	7·42	8·64	− 1·22
Piquetberg	The Gaoler	0·62	0·51	+ 0·11	1·84	1·05	+ 0·79	13·37	12·45	+ 0·92
Port Elizabeth	The Lightkeeper	0·90	1·20	− 0·30	1·42	2·32	− 0·90	17·20	14·69	+ 2·51
Port St. Johns (Cape Hermes)	The Lightkeeper	2·87	5·74	− 2·87	7·44	10·59	− 3·15	29·94	34·88	− 4·94
Port Nolloth	The Lightkeeper	0·12	0·02	+ 0·10	0·19	0·10	+ 0·09	1·42	1·21	+ 0·21
Prieska	The Gaoler	0·11	1·50	− 1·39	0·48	2·81	− 2·33	4·64	5·30	− 0·66
Queenstown	H. Holley	1·48	3·72	− 2·24	4·92	7·05	− 2·13	16·56	15·66	+ 0·90
Steytlerville	The Gaoler	0·20	1·25	− 1·05	1·53	2·15	− 0·62	8·79	6·01	+ 2·78
Sutherland	The Gaoler	0·09	0·68	− 0·59	1·52	1·16	+ 0·36	6·30	5·02	+ 1·28
Swellendam	The Gaoler	3·17	2·79	+ 0·38	7·29	5·36	+ 1·93	20·71	21·57	− 0·86
Sydneys Hope	Rev. S. Rippon	1·35	2·10	− 0·75	3·03	4·18	− 1·15	14·49	15·24	− 0·75
Somerset East	C. Harris	1·59	3·11	− 1·52	6·15	5·89	+ 0·26	17·79	16·72	+ 1·07
Stutterheim	F. C. Bousfield	1·78	4·25	− 2·47	7·21	8·12	− 0·91	25·40	21·30	+ 4·10
Uitenhage	H. Inggs	1·10	1·67	− 0·57	1·75	2·68	− 0·93	13·13	11·73	+ 1·40
Umtata	Miss N. Dix Peck	1·73	3·65	− 1·92	5·02	7·13	− 2·11	21·03	18·21	+ 2·82
Uniondale	The Gaoler	0·51	1·01	− 0·50	2·11	1·74	+ 0·37	6·25	8·45	− 2·20
Uitenhage	The Gaoler	0·37	1·05	− 0·68	0·37	1·91	− 1·54	3·03	3·91	− 0·88
Victoria West	The Gaoler	0·29	1·81	− 1·52	2·62	2·78	− 0·16	10·91	5·91	+ 5·00
Vryburg	C. Butler	0·69	3·68	− 2·99	3·29	7·98	− 4·69	9·05	13·84	− 4·79
Worcester	The Gaoler	0·29	0·37	− 0·08	1·86	0·64	+ 1·22	8·05	7·41	+ 0·64
Wynberg (Convent)	The Mother Superior	0·63	0·54	+ 0·09	2·74	2·05	+ 0·69	25·14	28·41	− 3·27
Basutoland—										
Maseru	F. Hodgson	1·56	4·61	− 3·05	5·38	10·09	− 4·71	18·74	22·42	− 3·68
South-West Africa—										
Okanjati	Ing. Schetter	2·42	8·64	− 6·22	3·99	17·07	−14·08	8·73	25·25	−16·52
Waterberg	D. Hahn	3·37	4·57	− 2·20	6·09	10·15	− 4·06	9·43	15·41	− 5·98
Usakos	Missionary Diehl	0·04	1·00	− 0·96	0·28	2·46	− 2·18	0·28	3·57	− 3·29
Gobabis	Missionary Irle	0·30	3·56	− 3·26	2·53	7·97	− 5·44	6·50	11·94	− 5·44
Windhoek	Observatory	1·86	3·00	− 1·14	4·31	6·75	− 2·44	5·54	10·08	− 4·54
Mariental	Baron V. Esebeck	1·08	1·83	− 0·75	1·34	2·97	− 1·63	3·52	4·23	− 0·71
Hatrachabis	Peter Prefect	0·31	1·20	− 0·89	3·22	1·58	+ 1·64	3·90	2·21	+ 1·69



February, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for February.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
JANUARY, 1922.
TRANSVAAL
CAPE OF GOOD HOPE
LORENÇO MARQUES
PORT ST JOHN
EAST LONDON
CAPE ST FRANCIS
CAPE ABULHAS
CAPETOWN
REFERENCE
Nil
Over 10 00

Piet Retief.—This month has been very favourable for crops; nearly all crops have made good growth, especially mealies and grass. The rainfall has been sufficient over a considerable part of the district. Two destructive hail-storms have been reported, one in the eastern and the other in the western part of the district. Rainfall: 3·97 inches on eleven days.—Government Experimental Station.

Christiana.—Generally, a very dry month, and rain is very much needed. On the 2nd, the day was clear and bright, and at 2.30 p.m. rain-clouds were observed, and at 3 p.m. rain commenced and fell at intervals for two hours, registering 0·64 inch. A little hail accompanied the rain, but no damage was done. From reports I hear this rain was confined to Christiana. On the 18th, 0·12 inch was registered. The latter part of the month showed indications of rain, but has kept away so far. Rainfall: 0·76 inch on two days.—John J. Cooke.

Gemboksfontein (Middelburg).—The rains fell very locally during the month. Rainfall: 5·54 inches on thirteen days.—Geo. J. Imrie.

Lichtenburg.—Grass plentiful, but wilted due to scanty rain. Full seventy farms infested with voetgangers. Rainfall: 1·66 inch on ten days.—J. T. Allman.

Paardefontein (Standerton).—Very dry; grass and crops needing rain. Rainfall: 2·03 inches on seven days.—W. Garnett.

Waaikraal (Rustenburg).—The small downpours during this month were of little avail, as the moisture was quickly absorbed again by the abnormally hot sun. Rainfall: 3·14 inches on ten days.—W. Behrens.

Honingnestkranz (Pretoria).—Crops are suffering considerably from drought. Mealies are dying off. Rainfall: 1·60 inch on eight days.—H. Ellis.

Reston (Middelburg).—Crops fair. Stock in good condition. Rainfall: 3·49 inches on nine days.—A. G. Purves.

Zandfontein (Bloemhof).—Crops and grass all burned up. These drought conditions are terrible, and we fear for the winter. Rainfall: 1·05 inch on nine days.—T. McLetchie.

Highlands (Barberton).—Native mealies have dried up, and they will have a poor crop of kaffir corn. Rainfall: 1·10 inch on three days.—M. Smith.

Doornkloof (Zoutpansberg).—Rains of 10th (1·91 inch) have revived most crops, but lower farm had crops damaged by hail on above date. Rainfall: 4·09 inches on three days.—S. M. Ralston.

Kromdraai (Witwatersrand).—Mostly storms with heavy run-off. Country needs steady soaking rains to do any good. Dry-land crops suffering considerably from drought. Rainfall: 4·31 inches on eleven days.—W. Frost.

Mallow (Waterberg).—Crops in this area not as good as last year. All rains this month extremely local, and many farms are showing signs of drought. Dews fairly heavy all the month. Rainfall: 3·52 inches on thirteen days.—E. Biccard.

Keerom (Waterberg).—Unless it rains within a day or two there will be no crops. Rainfall: 0·55 inch on two days.—D. A. Wolhuter.

Deercroft (Waterberg).—Crops requiring rain very badly—some are beyond recovery. Rainfall: 1·15 inch on nine days.—(Mrs.) G. R. Mitchell.

SWAZILAND.

Mbabane.—Terrific thunderstorm commenced at 7 p.m. on 9th, and lasted for an hour, during which period 1·77 inch fell. This is the most severe thunderstorm known by the observer since he entered Swaziland in 1903; lightning struck three times within the vicinity of the police camp; three houses were struck in Mbabane township, but without loss of life. Rainfall: 4·63 inches on sixteen days.—R. C. S. Markham.

Mafuteni.—A dangerous month for crops. A serious shortage all through middle and east Swaziland. Rainfall: 2·44 inches on six days.—H. S. Parry.

Transvalia.—Condition of crops far below normal. Rainfall: 3·60 inches on nine days.—J. H. Coates.

NATAL.

Durban (Point).—Weather generally normal for time of year, only one heavy gale on the 19th, several moderate gales; cloudy as a rule; small quantity of dew. Heavy thunderstorm on 18th, but little rain—otherwise no lightning for month. Rainfall: 2·77 inches on twelve days.—A. G. Goulding.

Ladysmith.—Country was in need of rain. The welcome two inches at the end of the month has greatly improved matters. Rainfall: 5·92 inches on eleven days.—R. G. Arnold.

Maritzburg (Mental Hospital).—The month has been very dry, with only 2·33 inches on nine days. There have been no violent thunderstorms.—The Superintendent.

Dundee.—A very pleasant month for February. Growth good. Rainfall: 4·52 inches on thirteen days.—West Thornold.

Hlabisa.—Weather has been seasonable, but previous dry weather has been the cause of crops coming to maturity too early. Hence mealies have contracted grub badly, and crops in the district will be below the average. Rainfall: 4·10 inches on eleven days.—L. Double.

Hillary.—Following on the driest January recorded by me (since 1907), February's rainfall is also the least recorded during those fifteen years. Total for two months: 4·41 inches as against an average of 9·91 inches. The minimum readings of thermometers in the screen (59·9 degrees) and on the grass (56·7 degrees) on the 21st are the lowest I have registered for February. Rainfall: 1·82 inch on fourteen days.—H. A. Thorpe.

Cape St. Lucia.—Light winds during greater part of month. Veld looking parched, but stock in fairly good condition. Rainfall: 1·56 inch on seven days.—J. Murphy.

Mid-Illovo.—Rainfall 3·23 inches on thirteen days, much below average; crops have suffered for want of good rains. Stock in fair condition; grazing good. A few cases of horse-sickness reported.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Nottingham Road.—Storms very local. Some very cold nights for February. Horse-sickness on three or four farms. Crops forward. Rainfall: 4·18 inches on twenty-one days.—Miss E. Smythe.

Edendale (Klip River).—All crops splendid; at least 25 per cent. better than last year. Cattle in excellent condition, but blue-tongue and horse-sickness bad. Rainfall: 5·20 inches on nine days.—T. N. Niland.

Rongpoort (*Weenen*).—Pleasant month; slightly dry at times. Rain every week-end during the month. Very hot at times. Rainfall: 3·11 inches on ten days.—J. H. Bartholomew.

Nkwaleni (*Entonjaneni*).—Very hot and dry; maize crop seriously affected. Rainfall: 1·76 inch on eight days.—K. N. Young.

Virginia (*Lower Umfolozi*).—Very windy (N. E. prevalent) and hot month. Crops and stock falling off. Rainfall: 2·11 inches on twelve days.—W. F. E. Leathern.

Orange Free State.

Rugby (*Bethlehem*).—There has been an extraordinary improvement in the growing maize crop during the month, the top grub having completely and almost suddenly deserted their hosts, and there was a consequent marked improvement in the growth. The late mealies were not attacked by the grub and are looking excellent, though somewhat behindhand. Wheat crops have been completely destroyed by rust, and the oat crop has also been much affected thereby, though the grain has not suffered to the same extent as the wheat has. Rainfall: 3·31 inches on seven days.—A. C. Glynn-Baker.

Doornplaat (*Bloemfontein*).—Overrun with locusts for last six weeks; veld eaten away. The driest February for ten years. Rainfall: 0·15 inch on two days.—C. G. Oertel.

Katdoornput (*Bloemfontein*).—Very dry, and tons of locusts. Rainfall: 0·00.—C. Mulke.

Hamelfontein (*Edenburg*).—Drought getting serious; dams dry. Farmers all round trekking with big stock; small stock still in good condition. Rainfall: 0·46 inch on four days.—Morison & Birrell.

Overdene (*Ficksburg*).—A very trying month. Rainfall far below average. Alternate heat and cold; frost observed on two mornings in low-lying vleis. No harm to crops. Mealies wilting for want of moisture. Rainfall: 2·05 inches on eight days.—H. Thorrold.

Jansdeel (*Harrismith*).—Stock in general look well, with exception of spring lambs, which are in bad condition. Sheep affected with blue-tongue. Rainfall: 3·90 inches on five days.—J. J. Uijs.

Waterford (*Lindley*).—Up to the 15th, the mealie crop in these parts was looking grand, and promised to give a record yield; on account of the drought and hot weather, the crop has gone back at least 25 per cent., and unless we have good rains within the next ten days I do not think we shall get 50 per cent. of wheat expected. Rainfall: 2·15 inches on five days.—A. B. Oates.

Highbury (*Philippolis*).—Driest February for the last eleven years. Rainfall: 0·35 inch on two days.—H. P. v. d. Merwe.

Heilbron (*Heilbron*).—There has been a remarkable absence of thunder during the month. What there was was very mild. There were no stock diseases during the month, and no outbreaks or deaths have been reported. Reports of crops suffering have been made, but it is hoped the rains towards the end of the month were more general, and that these saved the main crop of maize. Fodder crops are more abundant than last season, and a good deal has been gathered in already; good supplies are on offer almost daily and prices low. Live stock is in good condition. Rainfall: 1·41 inch on eight days. —P. A. du P. Naudé.

Woudzicht (Vrede).—Good rains and warm weather improved the mealie crop to a large extent. Also fair weather for reaping oats, etc. Rainfall: 5·22 inches on nine days.—J. N. Köhler.

CAPE.

Graaff-Reinet.—This has been quite a pleasant month for February, with few really hot days. Country getting dry. Rainfall: 0·32 inch on three days.—S. E. D. Treadwell.

Aliwal North.—Unusually hot and dry for February. Rain badly wanted. Rainfall: 0·84 inch on six days.—A. Alcock.

Maclear.—Month of very small rainfall in comparison with average amount for this month.—Dr. W. Mackenzie.

Ceres.—Weather generally cooler than usual, with heavy dews. Rainfall: 0·26 inch on three days.—A. Heatlie.

Elsenburg.—Until the last week the month was generally rather cool; a strong wind from the south-east on the 28th did a considerable amount of damage in the orchard. The rainfall this month—0·90 inch on five days—was about the same as for the corresponding month of last year, 0·86 inch. The average for the month being 0·49 inch.—*D. C. Crawford.*

Riversdale.—The outlook for the late harvest is very good, but the rain has done some harm to the ripening grapes. Rainfall: 1·97 inch on ten days.—Rev. Carl Prozesky.

Carnarvon.—Hot, dry, windy month. Rain badly needed. Rainfall: 0·05 inch on one day.—A. P. Malherbe.

Grootfontein (Middelburg).—Temperature generally low during the month, with a few exceedingly oppressive hot days. Heavy accumulation of Cumulus clouds sometimes in afternoons, but no rains. South-east winds fairly prevalent. Farmers are harvesting such fruit as they have. Drought being very much felt. The little rain that did fall did no appreciable good. Rainfall: 0·60 inch on three days.—E. J. van Meerten.

O'okiep.—Country suffering from continued drought. Rainfall: Nil.—J. Burrows.

Kingwilliamstown.—The country is getting very dry. We can do with about four inches of rain to save the grain and prepare us for winter. Dust from south-east almost every afternoon. Rainfall: 1·32 inch on eight days.—L. Clayton.

Grahamstown.—Rain badly needed in district; crops and veld wilting. Fair amount of disease and deaths among cattle. Hailstorm on 15th did good deal of damage in patches. Rainfall: 1·42 inch on six days.—Edward J. George.

Mafeking (Convent).—Exceptionally dry. Rainfall only 0·82 inch on four days as compared with 6·43 inches in February last year.—The Mother Superior.

Queenstown.—A dry month, veld dry; mealie crops in district, unless irrigated, a failure. Only twice during the last fifty years has less rain been recorded for February, viz., 1883 with 1·25, and 1916 with 1·19. Rainfall: 1·48 inch on nine days.—H. Holley.

Groot Drakenstein.—On the whole, a cool month for February. Persistent south-east winds during the last week with warm nights. Rainfall: 0·71 inch on five days.—Lionel Baker.

Clanwilliam.—Exceptionally cool. Rainfall: 0·25 inch on two days.—P. E. Scholtz.

Logaging (Mafeking).—Veld dried up. No crops. Abundance of locusts; a bad outlook for coming year. Rainfall: 0·29 inch on three days.—V. Daly.

Elma (Vryburg).—This month has been very hot and dry; crops in poor condition. Rainfall: 1·13 inch on two days.—A. Geiling.

BECHUANALAND.

Serowe.—Welcome rain—1·15 inch—fell on the 26th, but not nearly enough. Veld very dry; crops practically ruined for want of rain. Rainfall: 1·60 inch on five days.—G. M. Petrie.

BASUTOLAND.

Mafeteng.—Very dry month. Hot days, cool nights. Veld falling off rapidly. Rainfall: 1·56 inch on nine days.—F. Hodgson.

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-western 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 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 winds from south-east round by east to north-north-west, with an increase in frequency of stronger winds from the other points of the compass; over the Cape Peninsula, southerly winds still prevail, but with diminished force.

C. STEWART,
Chief Meteorologist.

Pretoria.

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MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. III. **MARCH, 1922.** **No. 3.**

PRACTICALLY normal mean barometric pressure; a mean monthly temperature higher than usual with warm days and cool nights in the Transvaal, Orange Free State, and Cape Provinces, but lower than the average in Natal during both day and night; an excess of rainfall over the south-eastern half and portions of the west of the Transvaal, the north of the Free State, along the south coast, and over part of the south-west of the Cape: large and serious deficiency elsewhere of precipitation amounting to partial or even absolute drought in many places; a number of destructive hailstorms mainly in the east of the Transvaal, but extending to the north of the Free State and into Natal; one or two frosts towards the end of the month in Basutoland and the Orange Free State; a prevalence of easterly winds over the interior and west to south-west along the south and east coasts; such were the outstanding features of the weather of March, 1922.

Pressure.—The mean pressure, as may be seen from the accompanying map was practically normal for the month, the only material differences being the position occupied by the 30-inch isobar on the east which lies slightly further south and more inland whilst that on the west lies nearer the coast than usual. The accompanying weather was generally fine over the western half of the Union with a few dull and cloudy days over the south-west and south Cape and some showers and mist along the coast. Over the eastern portion it was generally cloudy and unsettled with scattered thunderstorms; these storms and rain were seldom general, being mostly confined to the Transvaal and Natal, occasionally extending to the Free State and south-east of the Cape.

The equatorial low pressure was present throughout the greater part of the month. Low pressure areas passed along the coast, on 1st and 2nd from west to south, from south to south-east and east on 21st and 22nd and on 30th and 31st, being particularly low on the 21st when strong winds prevailed over the south-east. High pressure areas were present over the east on 1st, 2nd, 11th, and 25th; over the south on the 15th; over west, south, south-east, and east on 6th to 9th, on 18th to 20th, and 22nd to 23rd. The prevailing winds were northerly to easterly over the eastern half of the country, southerly in the west, and westerly along the south and south-east coasts.

Temperature.—Taken as a whole the month was 0·8 degree warmer than usual, having a mean temperature of 69·2 degrees as against an average of 68·4 degrees. The difference was due to the days with a mean temperature of 81·4 degrees, being 1·7 degree above normal, although the nights with a mean of 56·9 degrees were 0·3 degree cooler than usual. Over the Transvaal as a whole both day and night temperatures were higher than the average, the former (with 81·3 degrees) by 2·7 degrees and the latter (with 56·2 degrees) by 0·5 degree, thus raising the monthly mean by 1·6 degree above the normal. In marked contrast were the conditions prevailing in Natal, where a decrease in mean temperature of 1·0 degree was brought about by the mean maximum temperature being 1·3 degree and the mean minimum temperature 0·7 degree below the corresponding averages of 83·3 degrees and 60·5 degrees. Over both the Free State and the Cape Provinces, the day temperatures were in excess and the night temperatures in defect of the averages. In the Free State the mean maximum (80·7 degrees) was higher than the normal by 4·1 degrees, whilst the mean minimum (51·5 degrees) was 1·2 degree lower, thus increasing the mean monthly temperature by 1·4 degree above the usual values. In the Cape, the mean maximum of 81·6 degrees was 1·5 degree higher, whilst the mean minimum of 57·4 degrees was 0·6 degree lower than the normal values, causing a mean excess of 0·5 degree in the temperature for March last for that Province. Considering the stations separately, temperature was above normal over the whole of the Transvaal, the Free State (except in the north-east), and the Cape Province, with the exception of parts of the west coast, of the east-central Karroo, of the south-east, and Transkei. The excesses over the Transvaal, Free State, and Zululand were mostly between 1 and 2 degrees, rising to over 3 degrees at one or two places; but in the Cape Province the mean monthly temperature was generally between a few tenths and 1½ degrees higher, but exceeded 2 degrees at some stations in the northern border, Bechuanaland, and the south-east of the Cape. In Natal, the north-east of the Free State, and portions of the east and west of the Cape Province, the month was cooler than usual by amounts ranging from a few tenths in the Transkei, Basutoland, and at Port Nolloth, through 1·2 degrees in Natal to 3·9 degrees at Grahamstown. Day temperatures were mostly higher than usual and, generally speaking, increased inland to the Free State and the south-west Transvaal. Over the Transvaal, the excess in temperature ranged from 0·3 degree at Middelburg to 7·3 degrees at Bloemhof: in the Free State it varied between 3·7 degrees at Lindley and 6·5 degrees at Bloemfontein; in the Cape Province these maximum temperatures were higher than usual by amounts varying from 0·7 degree at the Royal Observatory, Capetown, to 4·9 degrees at Mafeking, but rising to 6·3 degrees at Stutterheim: in Natal and Zululand the excess in day temperature was comparatively small, about 1 degree, varying from 0·3 degree at Ladysmith to 1·4 degree at Hlabisa (Zululand). On the other hand, most stations in Natal had mean maxima below normal by 2·3 degrees: in the south-east of the Cape, at Port St. Johns in Kaffraria, at Mossel Bay on the south coast, as well as along the west coast, the days were also cooler than usual by 1·2 degrees, whilst small deficits of less than 1 degree were also met with at Harrismith in the north-east of the Free State and at Pretoria in the Transvaal. The nights were warmer than usual over the greater part of the Transvaal by amounts varying from a few tenths of a degree to 2·3 degrees at Piet Retief; at Hlabisa in Zululand by 4·9 degrees and Stanger by 0·9 degree. In the Cape excessive night temperatures were confined to Bechuanaland and to the coastal stations in the south-east, south-west, and Cape Peninsula and Namaqualand: but extending inland in the eastern portion as far as Graaff-Reinet; the surplus amounts were mostly small, from a few tenths of a degree to 1 degree, but exceeding 2 degrees at

Wynberg in the Cape Peninsula and O'okiep in Namaqualand. The mean minima, however, were lower than usual in the south-west of the Transvaal, in the Free State, and the greater portions of Natal and the Cape Province. These deficits were mostly between 0·5 and 1·5 degree, but exceeded 2 degrees in Natal and the east of the Cape, being 2·9 degrees at Aliwal North, 3·6 degrees at Queenstown, and 5·5 degrees at Grahamstown. The highest temperatures of the month were recorded on twenty different days, most widely on the 2nd and 31st. Temperatures exceeding 100 degrees were confined to the more southerly and westerly parts of the Cape Province, the maximum of 104·2 degrees occurring at Clanwilliam on the 8th, although 103·0 degrees was registered on the 11th at Kenhardt. The lowest temperatures were recorded on thirteen days, viz., 1st, 2nd, 12th, 17th, 20th to 24th, and 28th to 31st, but most generally on the 23rd. The minimum for the month was 36·0 at Aliwal North on the 23rd. There was therefore an extreme monthly range of 68·2 degrees over these stations. The mean warmest station was Komatipoort, with a temperature of 78·6 degrees, and the coolest, Port Nolloth, with 59·2, a difference of 19·4 degrees. The highest mean maximum of 93·3 belongs to Kenhardt on the northern border of the Cape and the lowest mean minimum (48·0 degrees) to Belfast on the Transvaal high veld. The weather of the month was remarkable for the unusual absence of ground frosts although a killing frost occurred on the night of the 22nd at Vaalbank (division of Bloemfontein), destroying mealies, vegetables, and vines; a little frost was also experienced at Quilimane (division of Wepener), and at Mafeteng (Basutoland), on the 23rd and 24th.

Precipitation.—Although the month of March is usually to be depended on for a considerable contribution to the annual total over the summer rainfall area, there has been a serious shortage during the past month over Swaziland, Natal, Basutoland, and the major portions of the Free State and Cape Provinces, as well as portions of the west and north of the Transvaal. Over a considerable portion of the west coastal area, the northern Karroo, the northern border and Bechuanaland, parts of the south-west Transvaal, and of the south and south-east of the Free State absolute drought prevailed during the month, whilst at many other stations in the same areas the quantities registered were so small as to be of but little use even for agricultural purposes. Moreover, as this is the last month in which rain in any quantity may be reasonably looked for over the greater part of the Union the outlook for the coming winter as regards pasturage and water for cattle, etc., is far from encouraging. Many pans and dams are already dry and the veld in many places devoid of grass. Taking the season as a whole, the thunderstorms have not been productive of many showers of sufficient intensity to produce the necessary run off for storage purposes, or cause floods in rivers. Over the central and northern portions of the Cape Province, the greater part of Natal and the Free State, as well as in Swaziland, the deficits were mostly between 2 and 2½ inches, but increasing to 3·4 inches at Port St. Johns, Durban (Natal), Mafeteng in Basutoland, and at Louis Trichardt in the northern Transvaal, whilst the usually well-watered Woodbush fell short of the normal by 4·49 inches. In parts of Natal, the north-east of the Free State, the inland portions of Kaffraria, and the west and south-west of the Transvaal, and the south-west Cape, however, the shortages were smaller, usually less than an inch. A better state of affairs prevailed in the east and south of the Transvaal, the north of the Free State, and parts of Natal, along the south coast and over the southern Karroo, as well as at some stations in the south-west of the Cape, where the rainfall was in excess of the usual amounts. A small excess also occurred at Port Nolloth, Namaqualand. The surplus amounts varied in the Transvaal from 0·01 inch at Belfast to 2·62 inches at Rethal. In Natal and the Cape the excesses were generally under an inch,

but the largest surplus of 3·71 inches was recorded at Swellendam in the south coastal area of the Cape. South-West Africa was affected similarly to the north of the Cape, all stations reporting being considerably below normal. The deficits there varied in amount from 46 per cent. at Tsumeb to 78 per cent. at Usakos, with absolute drought at Mariental and Heirachabis.

The number of rain-days varied considerably over the various divisions of the Transvaal, being most numerous in the east, where rain fell on eighteen days in the Lydenburg division; their frequency decreased northwards to 8 in the Zoutpansberg, 6 at Standerton, 9 at Piet Retief, and was least (5) in the district of Bloemhof. In the north and east of the Free State light showers fell fairly frequently with a few fairly large amounts. In the centre, south, and west the falls were mostly light and local or entirely wanting. Over Natal rain was frequent, varying from very light to fairly heavy. In the Cape light local showers affected the greater part of the country, especially during the third and last weeks of the month. A number of destructive hailstorms occurred in the Transvaal—on the 2nd at Verkeerdepan (District Carolina); on the 3rd at Waterpan (District Middelburg); on the 11th at Reston in the same division, and at Good Hope (Waterberg); on the 12th and 19th at Kingsdown (Bethal District); on the 4th and 19th at Busby (Ermelo District)—all causing some damage to crops; on the 17th two hailstorms, lasting about ten minutes each, caused considerable damage to tobacco at Piet Retief; on the 19th all standing crops on a farm adjoining Pisanghoek (Zoutpansberg) were destroyed. A few hailstorms were also reported from the Free State, being noted as heavy on the 15th at Holfontein (Kroonstad District), and at Stanleyvale (Harrismith) on the 2nd, 10th, 12th, and 13th, causing damage to the mealie crops. Frequent hailstorms were reported as occurring in Natal, but evidently little damage occurred although the hail was reported as "bad" on the 19th at Merrievale (Lions River Division), and the size of pigeons' eggs on the 18th at Virginia in the Lower Umfolosi Division.

The accumulated rainfall since 1st July, 1921, shows an excess over the south-west, the south-east, the central Karroo, the south-west of the northern Karroo, at Port Nolloth, and the inland portions of Kaffraria; in Natal, the north and north-east of the Free State, and parts of the north-east, south-east, west, and south-west Transvaal. The surplus in the Cape varied from 0·36 inch at Port Nolloth to 7·64 inches at Kokstad in the Transkei; in the Free State it was generally over an inch; in Natal it ranged from 0·25 inch at Weenen to 14·76 inches at Ladysmith; and in the Transvaal from 0·84 inch at Rooiberg in the west to 8·64 inches at Pigeonhole in the north-east. Over the rest of the country the total from the middle of last year is below normal, being mostly between 1 and 2 inches in the west and south-east of the Cape, but increasing inland and northward through 2–4 inches on the northern Karroo to 6–8 inches over the northern border and in Bechuanaland: Grahamstown in the south-east also showed a deficiency of over 6 inches. In the Free State the deficiency was greatest in the centre and west, but decreased to about 4 inches in the south and 2 inches in the east. Over the Transvaal the shortage varied considerably, being less than an inch in the west and south-west and at Komatipoort, but increasing towards the centre where Pretoria is about 8½ inches below normal, and increasing still further to the north-east, where there is a shortfall of 10·64 inches at Louis Trichardt and 18·21 inches at Woodbush. Swaziland and Barberton are also short of the normal amounts by 5–6 inches. A similar survey of the total amounts since the beginning of the present year shows a much more limited area of excess rainfall, such amounts being limited to the south coast, south-west, and part of the west coast as far north as Clanwilliam, as also at Port Nolloth, also at a few stations in the Transvaal high veld. The excess varies from 0·14 inch at Port Nolloth to 5·64 inches at Swellendam.

Elsewhere a serious deficiency exists, increasing, generally speaking, from 2–4 inches in the east and more southerly interior parts to 5–7 inches in the north, i.e. the northern border and Bechuanaland. A deficit of 4–9 inches also prevails over the south-east coastal belts. In the Free State the shortage is generally between 2 and 3 inches in the north-eastern half and 5–6 inches in the south-western half. In the Transvaal the shortages are smallest in the south-east, south, and south-west (1–3 inches), but increase to 6½ inches at Pretoria, 7–9 inches in the east and Swaziland, to almost 12 inches at Louis Trichardt, and culminating at Woodbush, where the deficit exceeds 27 inches. Taken as a whole, precipitation has been very unfavourable for agriculture and water storage, a condition of affairs emphasized by most observers in their notes. For example, from Makouwskop (83), in the Bloemhof District, it is stated that not a drop of rain fell on some farms in the neighbourhood during this month, so that nearly all dams and pans are dry. At Blaauwwildebeestput, in the Lichtenburg Division, the rain on the 25th was the first for seven weeks, so that crops there had depreciated 50 per cent.; the mealies average 8–10 feet high, but have no cobs, the worst season in ten years. Generally, the crops and pasture are stated to be very poor, more particularly in the western halves of the various Provinces, whilst cattle are falling off in condition in some areas. Even in the more favoured Ermelo District the hail and rain on the 19th, although lasting only half an hour (1·92 inches), caused considerable damage to crops and in washaways. The hail lay in the shade for five days. At Rugby, in the Bethlehem District of the Free State, the oat crops are stated to have turned out considerably below expectation owing to rust, and the mealie crop poor owing to damage by the top-grub. The absence of rain is also making itself felt by preventing ploughing and the sowing of winter crops. Similar conditions prevailed over the greater part of the Cape. A killing frost on the night of the 22nd caused damage to mealies, potatoes, vegetables, and vines in parts of the district of Bloemfontein, Thaba 'Nchu, and Wepener; slight frost also occurred at Vryburg on the 23rd, and at Mafeking on the 23rd and 24th.

A more cheerful note is struck in reports from the eastern Transvaal and parts of Natal and the north-east of the Free State and the south of the Cape, where the rains during the month have helped to improve the veld and crops and make up for damage caused by hail earlier in the season.

OBSERVERS' NOTES FOR MARCH, 1922.

Transvaal.

Lichtenburg.—Small rainfall for March—1·47 inch on ten days. Cattle losing condition.—J. T. Allman.

Gemboksfontein (Middelburg).—Hailstorms fell in the vicinity of this station, according to the reports from farmers—damage done not severe. Rainfall 4·76 inches on fourteen days.—Geo. J. Imrie.

Wakkerstroom.—Winter is fast approaching on the high veld. Grass is dying off and frost may be expected at an early date. Rainfall: 2·38 inches on nine days.—Louis le Roux.

Jakhalsfontein (Pietersburg).—Although a fair amount of rain crops likely to be poor in immediate vicinity. Rainfall: 3·22 inches on nine days.—Rev. James C. Palmer.

Middelburg.—Cooler weather has obtained during the month; though the days are still hot the nights are rapidly becoming cooler. Very good rains fell without too long rainless intervals, so that there is good promise of a good harvest, the prolonged good rains making up for much of the damage done by

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), MARCH, 1922.

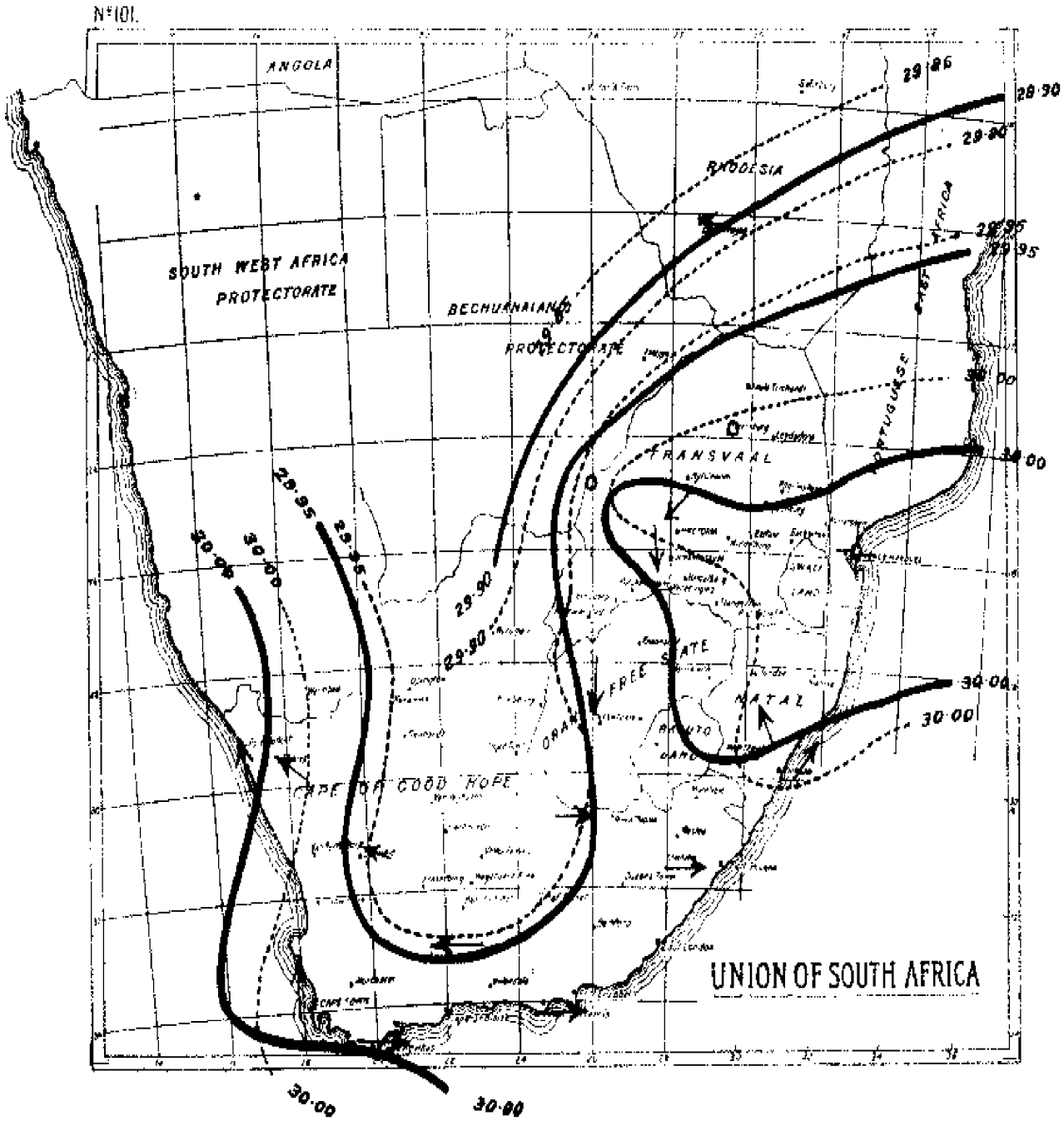
Place.	Observer.	Month—March, 1922. Mean Max.	Month—March, 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
		° F.	° F.	° F.	° F.	° F.	° F.		° F.	
Transvaal—										
Barberton	W. Grubb	82·6	61·4	72·0	70·6	− 1·4	88·0	5th, 22nd, and 30th	55·0	24th.
Belfast	The Forester	72·1	48·0	60·0	59·8	+ 0·2	77·0	24th	39·0	29th.
Bloemhof	A. Adamson	80·0	54·6	72·2	68·8	+ 3·4	98·0	12th and 13th	41·0	23rd.
Ermelo	Mrs. S. M. Nicolson	77·2	50·6	63·9	62·2	+ 1·7	86·0	13th	46·0	29th.
Johannesburg (Observatory)	The Staff	74·5	54·2	64·4	62·3	+ 2·1	82·0	11th	49·0	1st
Klerksdorp (Strathmore)	Chas. Scott	80·4	55·1	70·8	69·5	+ 1·3	94·5	5th	42·0	23rd.
Komatipoort	B. J. Fothergill	90·8	66·5	78·6	77·0	+ 1·6	99·5	22nd	61·0	2nd.
Louis Trichardt	L. J. de Bruin	81·4	59·8	70·6	68·8	+ 1·8	91·0	5th and 22nd	55·0	2nd.
Middelburg	Dr. H. A. Spencer	79·1	53·2	66·2	65·6	+ 0·6	85·0	10th	47·0	12th.
Nylstroom	G. Bakker	83·5	56·7	70·1	68·4	+ 1·7	88·5	5th, 6th, and 13th	50·0	31st.
Pietersburg	G. Roos	79·5	57·4	68·4	67·0	+ 1·4	88·0	18th	53·0	21st.
Piet Retief	J. Werner	76·8	56·1	66·4	65·2	+ 1·2	87·5	16th	50·5	23rd.
Pigeonhole (New Agatha)	Jno. McCallum	72·8	57·9	65·4	—	—	84·0	5th	54·0	2nd, 23rd, and 24th.
Pilgrims Rest	E. M. Skea	76·4	55·3	65·8	65·3	+ 0·5	85·0	16th and 31st.	48·0	29th.
Potchefstroom (Exp. Farm)	The Manager	85·2	54·9	70·0	66·8	+ 3·2	94·0	13th	46·0	23rd.
Pretoria (Meteorological Office)	The Staff	79·2	56·9	68·0	67·8	+ 0·2	85·1	5th	51·4	30th.
Standerton		—	—	—	63·0	—	—		—	
Zeerust	H. Dietrich	86·6	58·8	72·7	69·4	+ 3·3	92·4	6th	47·5	23rd.
Swaziland—										
Mbabane	Swaziland Police	75·7	56·4	66·0	64·6	+ 1·4	85·0	31st	50·0	23rd and 24th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	85·0	53·4	69·2	66·8	+ 2·4	95·0	2nd	36·6	23rd.
Bloemfontein	G. A. Schepers	84·8	55·1	70·0	66·7	+ 3·3	92·6	2nd	40·1	23rd.
Harrismith	The Forester	71·9	48·3	60·1	61·0	− 0·9	78·0	10th	42·0	20th.
Ladybrand	The Forester	80·9	49·9	65·4	63·6	+ 1·8	89·0	11th	38·0	24th.
Lindley	J. Collister-Oates	81·0	51·0	66·0	65·3	+ 0·7	85·8	13th	40·0	24th.
Natal—										
Dundee	West Thornold	78·5	54·1	66·3	68·7	− 2·4	86·0	31st	50·0	20th and 23rd.
Durban (Point)	The Port Captain	81·2	67·5	74·4	76·0	− 1·6	85·8	10th	63·2	20th and 23rd.
Estcourt	A. A. McLean	79·0	55·6	67·0	69·4	− 2·4	90·0	31st	50·0	17th, 23rd, 24th & 28th.
Hlabisa	The Gaoler	81·5	64·7	73·1	70·0	+ 3·1	89·0	30th	59·0	23rd.
Ladysmith	R. G. Arnold	85·0	57·1	71·0	71·6	− 0·6	93·0	30th	51·0	20th and 24th.
Maritzburg (Mental Hospital)	The Superintendent	79·6	59·4	69·5	71·4	− 1·9	93·2	31st	52·5	23rd.
Stanger	C. C. Foss	82·2	65·6	73·9	74·4	− 0·5	97·8	31st	60·5	23rd.
Weenen	The Gaoler	88·7	55·4	72·0	73·2	− 1·2	95·0	10th, 14th, & 31st	50·0	23rd.

AIR TEMPERATURES, MARCH, 1922—(*continued*).

Place.	Observer.	Month—March, 1922. Mean Max.	Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Date.	Lowest.	Date.
		° F	° F	° F	° F	° F	° F		° F	
Cape—										
Alfred North	Alex. Alcock	83·5	50·2	66·8	66·1	+ 0·7	93·5	2nd	36·0	23rd.
Bedford	T. C. Hall	80·6	54·1	67·4	66·8	+ 0·6	101·0	2nd	39·0	23rd.
Capetown (Royal Observatory)	The Staff	78·1	59·4	68·8	68·0	+ 0·8	100·2	11th	48·0	22nd.
Carnarvon	A. P. Malherbe	86·3	55·4	70·8	68·9	+ 1·9	97·0	9th	40·0	23rd.
Clanwilliam	P. E. Scholtz	88·4	56·2	72·3	73·8	− 1·5	104·2	8th	44·6	23rd.
East London	The Port Captain	77·6	62·4	70·0	68·7	+ 1·3	86·0	29th and 30th	53·0	24th.
Graaff-Reinet	S. E. D. Treadwell	85·5	58·1	71·8	69·8	+ 2·0	100·7	2nd	44·0	23rd.
Grahamstown	The Vet. Res. Officer	79·0	52·8	65·9	69·8	− 3·9	97·0	2nd	38·0	23rd and 24th.
Groot Drakenstein	Lionel Baker	82·9	59·5	71·2	69·4	+ 1·8	101·5	11th	48·6	23rd.
Keurboom	R. Seydell	93·3	60·3	76·8	74·8	+ 2·0	103·0	11th	41·0	23rd.
Kimberley	J. H. Greeff	88·7	58·1	73·4	72·0	+ 1·4	98·0	11th	38·0	23rd.
Klugwilliamstown	L. Clayton	83·5	57·3	70·4	72·0	− 1·6	100·5	2nd	43·0	23rd.
Kolstad	H. D. Coyte	77·0	50·5	63·8	63·6	+ 0·2	87·0	21st and 31st.	42·9	23rd.
Mafeking (Convent)	The Mother Superior	89·0	58·5	73·8	70·9	+ 2·9	95·8	12th	46·0	23rd.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	73·1	61·9	67·5	68·6	− 1·1	83·0	31st	52·2	22nd.
Murraysburg	.....	—	—	—	66·4		—	—	—	—
O'okiep	J. Burrows	85·0	58·3	71·6	70·0	+ 1·6	98·2	1st	42·5	22nd.
Port Elizabeth	The Lightkeeper	75·5	63·2	69·4	69·0	+ 0·4	83·0	31st	53·0	23rd.
Port Nolloth	The Lightkeeper	65·5	52·9	59·2	59·4	− 0·2	72·0	3rd	40·0	23rd.
Port St. Johns (Cape Hermes)	The Lightkeeper	77·2	65·5	71·4	71·6	− 0·2	81·0	29th and 30th	59·0	23rd.
Queenstown	H. Holley	83·4	53·0	68·2	68·1	+ 0·1	99·0	2nd	38·0	23rd.
Somerset East	C. Harris	81·3	55·1	68·2	69·5	− 1·3	98·6	9th	40·0	23rd.
Stutterheim	F. C. Bousfield	83·7	54·9	69·3	67·0	+ 2·3	98·4	2nd	40·0	23rd.
Sydney's Hope	Rev. S. Rippon	70·4	58·2	68·8	68·2	+ 0·6	99·8	2nd	44·5	23rd.
Ulterhage	H. Inggs	83·2	58·4	70·8	70·0	0·8	100·7	9th	44·6	23rd.
Umtata	Miss N. Dix Peck	81·6	57·0	69·3	69·6	− 0·3	97·5	2nd	41·5	23rd.
Vryburg	H. W. Collen	85·3	58·8	72·0	70·8	+ 1·2	95·0	13th	47·0	20th.
Wynberg (Convent)	The Mother Superior	76·9	59·6	68·2	67·2	+ 1·0	91·8	8th	48·5	22nd.
Basutoland—										
Mafeteng	F. Hodgson	79·7	50·5	65·1	65·7	− 0·6	86·0	2nd	38·0	23rd.

RAINFALL, MARCH, 1922.

Place.	Observer.	Month. Mar., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	4·46	3·73	+ 0·73	18·89	17·54	+ 8·65	24·77	30·34	− 5·57
Bethal	H. F. Joubert	5·52	2·90	+ 2·62	14·13	12·91	+ 1·22	27·42	28·43	− 1·01
Belfast	The Forester	4·46	4·45	+ 0·01	15·85	14·66	+ 1·19	32·93	29·51	+ 3·42
Bloemhof	A. Adamson	0·81	2·99	− 2·18	4·85	10·38	− 5·53	9·43	16·70	− 7·27
Claremont	S. A. Police	2·43	2·66	− 0·23	4·96	8·61	− 3·65	14·85	15·77	− 0·92
Ermelo	Mrs. S. M. Nicolson	4·24	3·41	+ 0·83	11·04	12·55	− 1·51	27·83	26·96	+ 0·87
Heidelberg	W. ter Horst	4·23	3·13	+ 1·10	10·36	12·91	− 2·55	20·63	25·82	− 5·19
Johannesburg (Observatory)	The Staff	4·96	3·76	+ 1·20	10·60	14·30	− 3·70	25·39	28·68	− 3·29
Klerksdorp (Strathmore)	C. Scott	1·70	3·05	− 1·35	7·42	11·10	− 3·68	21·05	19·22	+ 1·83
Komatipoort	B. J. Fothergill	1·62	1·08	+ 0·54	7·07	14·22	− 7·15	22·88	23·50	− 0·62
Louis Trichardt	I. J. de Bruin	0·19	3·33	− 3·14	4·49	16·15	−11·66	18·57	29·21	−10·64
Middelburg	Dr. H. A. Spencer	4·59	3·38	+ 1·21	12·86	13·05	− 0·19	31·68	26·70	+ 4·98
Nylstroom	G. Bakker	1·62	3·02	− 1·40	7·38	12·23	− 4·85	19·11	22·25	− 3·11
Pietersburg	G. Roos	2·83	2·18	+ 0·65	5·91	10·67	− 4·76	21·75	20·19	+ 1·56
Piet Retief	J. Werner	3·33	2·76	+ 0·57	9·50	13·06	− 3·56	33·99	28·27	+ 5·72
Pilgrims Rest	E. M. Skea	8·85	6·24	+ 2·61	14·78	22·58	− 7·80	35·16	36·63	− 1·47
Pigeonhole	J. McCallum	5·42	3·87	+ 1·55	10·79	15·95	− 5·16	39·60	30·96	+ 8·64
Potchefstroom	The Manager	2·29	2·51	− 0·22	8·30	10·41	− 2·11	21·18	21·11	+ 0·07
Pretoria (Meteorological Office)	The Staff	3·74	3·63	+ 0·11	8·43	14·97	− 6·54	19·21	27·59	− 8·38
Roodberg	M. Baumann	3·86	2·54	+ 1·32	9·54	12·39	− 2·85	22·98	22·34	+ 0·64
Rustenburg	S.A. Police	2·82	3·63	− 0·81	8·93	13·39	− 4·48	23·46	24·34	− 0·88
Wakkerstroom	L. le Roux	2·38	3·64	− 1·26	11·73	14·37	− 2·64	34·22	29·42	+ 4·80
Woodbush (1)	The Forester	6·19	10·68	− 4·49	14·14	41·46	−27·32	48·34	66·55	−18·21
Zeerust	H. Dietrich	1·68	3·33	− 1·65	6·58	12·52	− 5·94	15·68	21·60	− 5·92
Swaziland—										
Mbabane	Swaziland Police	4·25	6·40	− 2·15	14·44	24·23	− 9·79	10·26	15·65	− 5·39
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·73	2·92	− 2·19	2·73	9·04	− 6·31	7·78	15·54	− 7·76
Bloemfontein	G. A. Schepers	0·11	2·74	− 2·63	3·05	8·52	− 5·47	8·46	16·15	− 7·69
Boshof	A. J. Nicolas	1·77	3·83	− 2·06	4·24	9·65	− 5·41	9·14	17·01	− 7·87
Harrismith	The Forester	2·85	3·26	− 0·41	9·68	12·17	− 2·49	26·43	25·30	+ 1·13
Kroonstad	S. R. Northfield	2·13	2·05	+ 0·08	6·48	8·75	− 2·27	21·15	20·12	+ 1·03
Ladybrand	The Forester	0·80	3·00	− 2·20	5·96	11·67	− 5·71	21·61	23·65	− 2·04
Lindley	J. Collister-Oates	1·17	2·96	− 1·79	8·09	10·66	− 2·57	22·53	21·14	+ 1·39



March, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.

The dotted lines indicate the normal distribution for March.

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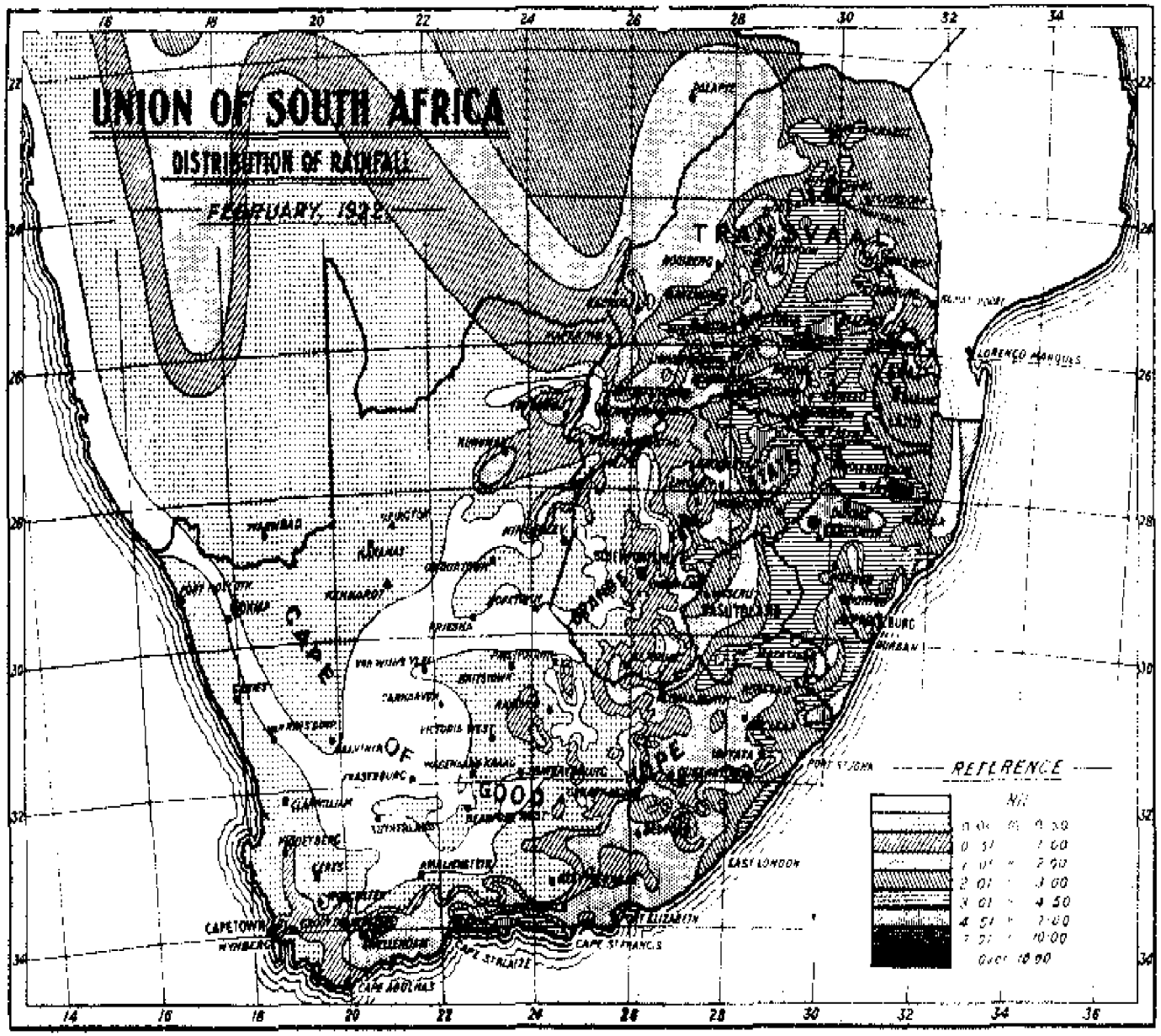
RAINFALL, MARCH, 1922—(*continued*).

Place.	Observer.	Month. Mar., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Natal—										
Dundee	W. Thorneld	3·64	3·69	− 0·05	12·20	14·58	− 2·38	41·74	27·90	+ 13·84
Durban (Point)	The Port Captain	1·73	5·85	− 4·12	6·18	14·87	− 8·69	38·57	34·34	+ 4·23
Estcourt	A. A. McLean	2·01	3·66	− 1·65	8·40	13·86	− 5·46	26·66	25·66	+ 0·94
Flabina	The Gaoler	2·40	4·33	− 1·93	8·16	16·91	− 8·75	39·82	37·75	+ 2·07
Howick	The Gaoler	5·11	4·19	+ 0·92	10·05	14·35	− 4·30	30·00	28·66	+ 1·34
Ladysmith	R. G. Arnold	1·54	4·10	− 2·56	12·82	13·45	− 0·63	39·45	24·69	+ 14·76
Pietermaritzburg (Mental Hospital)	The Staff	2·92	4·81	− 1·89	7·66	15·08	− 7·42	31·58	30·22	+ 1·36
Stanger	C. C. Voss	3·30	5·03	− 1·73	8·59	14·39	− 5·80	—	36·60	—
Vryheid	The Gaoler	2·75	3·69	− 0·94	13·09	10·68	+ 2·39	35·10	33·07	+ 2·03
Weenen	The Gaoler	2·99	2·86	+ 0·13	10·79	12·04	− 1·25	23·87	23·62	+ 0·25
Cape—										
Alfred North	A. Alcock	0·47	3·22	− 2·75	3·21	9·64	− 6·43	10·49	17·66	− 7·17
Beaufort West	The Gaoler	1·56	1·58	− 0·02	8·35	3·98	+ 0·63	9·40	7·51	+ 1·89
Bedford	T. C. Hall	2·50	3·84	− 1·34	9·17	10·79	− 1·62	21·64	23·03	− 1·39
Britstown	The Gaoler	0·00	2·05	− 2·05	1·30	5·03	− 3·73	4·68	8·40	− 3·72
Calvinia	The Gaoler	0·04	0·66	− 0·62	0·34	1·23	− 0·89	4·40	4·68	− 0·28
Capetown (Royal Observatory)	The Staff	0·57	0·95	− 0·38	3·10	2·22	+ 0·88	16·75	15·11	+ 1·64
Ceres	A. Heatlie	1·54	1·06	+ 0·48	4·60	2·68	+ 1·92	30·98	25·45	+ 5·53
Carnarvon	A. P. Malherbe	0·00	1·52	− 1·52	0·25	3·81	− 3·56	3·80	6·06	− 2·26
Clanwilliam	P. E. Scholtz	0·00	0·27	− 0·27	1·07	0·75	+ 0·32	4·39	5·11	− 0·72
East London	A. Downie	1·88	3·46	− 1·58	8·51	9·98	− 1·47	22·43	26·57	− 4·14
Fraserburg	The Gaoler	0·00	1·05	− 1·05	2·01	2·68	− 0·67	6·33	4·74	+ 1·59
Garies	The Gaoler	0·00	0·13	− 0·13	0·00	0·37	− 0·37	2·11	3·12	− 1·01
Graaff-Reinet	S. E. D. Treadwell	0·51	2·13	− 1·62	2·58	5·29	− 2·73	12·21	11·17	+ 1·04
Groot Drakenstein	Lionel Baker	1·13	1·30	− 0·17	4·88	3·09	+ 1·79	24·76	21·79	+ 2·97
Griquatown	The Gaoler	0·11	2·43	− 2·32	0·58	6·53	− 5·59	4·18	10·10	− 5·92
Grahamstown	Vet. Research Officer	1·35	3·22	− 1·87	4·91	8·71	− 3·80	16·50	22·83	− 6·33
Hanover	The Gaoler	0·11	2·32	− 2·21	1·98	6·05	− 4·07	6·67	10·19	− 3·52
Hopetown	The Gaoler	0·23	2·64	− 2·41	1·35	6·40	− 5·05	7·16	10·33	− 3·17
Kenhardt	R. Seydell	0·00	1·08	− 1·08	0·70	2·82	− 2·12	1·99	4·33	− 2·34
Kimberley	R. J. Lelsk	0·96	2·83	− 1·87	2·70	7·92	− 5·22	6·71	13·65	− 6·94
Knysna	The Gaoler	2·69	2·49	+ 0·20	7·53	6·66	+ 0·87	23·45	22·15	+ 1·30
Kokstad	H. D. Coyte	2·94	3·45	− 0·51	9·21	12·15	− 2·94	31·55	23·91	+ 7·64
Kingwilliamstown	L. Clayton	1·08	2·99	− 1·91	4·37	8·85	− 4·48	16·93	20·60	− 3·67
Kuruman (Abtonia)	A. T. Sitwell	0·64	2·69	− 2·05	2·65	9·09	− 6·44	5·36	14·20	− 8·84
Maleking (Convent)	Mother Superior	1·06	3·23	− 2·18	4·99	10·76	− 5·78	10·62	19·08	− 8·46
Mossel Bay (Cape St. Blaize)	The Lightkeeper	2·09	1·43	+ 0·66	4·89	4·08	+ 0·81	14·46	12·66	+ 1·80
Murraysburg	The Gaoler	0·15	2·03	− 1·88	2·06	4·80	− 2·74	8·20	8·50	− 0·30
O'okiep	J. Burrows	0·06	0·43	− 0·37	0·06	1·00	− 0·94	2·43	4·34	− 1·91

RAINFALL. MARCH. 1922—(*continued*).

Place.	Observer.	Month. Mar., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches	Inches.
Cape—continued—										
Philipstown	The Gaoler	0·00	2·47	− 2·47	2·17	6·41	− 4·24	7·42	11·11	− 3·69
Piquetberg	The Gaoler	0·38	0·55	− 0·17	2·22	1·60	+ 0·62	13·75	13·00	+ 0·75
Port Elizabeth	The Lightkeeper	1·15	1·67	− 0·52	2·57	3·99	− 1·42	18·35	16·36	+ 1·99
Port St. Johns	The Lightkeeper	1·50	5·16	− 3·57	9·08	15·75	− 6·72	31·53	40·04	− 8·51
Port Nolloth	The Lightkeeper	0·17	0·02	+ 0·15	0·36	0·12	+ 0·24	1·59	1·23	+ 0·36
Prieska	The Gaoler	0·10	2·06	− 1·96	0·58	4·87	4·29	4·74	7·36	− 2·62
Queenstown	H. Holley	1·37	2·78	− 1·41	6·29	9·83	− 3·54	17·93	18·44	− 0·51
Steytlerville	The Gaoler	2·82	1·56	+ 1·26	4·85	3·71	+ 0·64	11·61	7·57	+ 4·04
Sutherland	The Gaoler	0·09	0·91	− 0·91	1·52	2·07	− 0·55	6·30	5·93	+ 0·37
Swellendam	The Gaoler	6·04	2·93	+ 3·71	13·93	8·29	5·64	27·35	24·50	+ 2·85
Sydneys Hope	Rev. S. Rippon	2·31	2·15	+ 0·16	5·34	6·33	− 0·99	16·80	17·39	− 0·59
Somerset East	C. Harris	1·90	3·11	− 1·21	8·05	9·00	− 0·95	19·69	19·83	− 0·14
Stutterheim	F. C. Bousfield	1·45	4·00	− 2·55	8·66	12·12	3·46	26·85	25·30	+ 1·55
Ultenhage	H. Inggs	1·89	1·84	+ 0·05	3·64	4·52	0·88	15·02	13·57	+ 1·45
Umtata	Miss N. Dix Peck	2·45	3·25	0·80	7·47	10·38	− 2·91	23·48	21·46	+ 2·02
Uniondale	The Gaoler	1·87	1·39	+ 0·48	3·98	3·13	0·85	8·12	9·84	− 1·72
Upington	The Gaoler	0·01	1·63	1·62	0·38	3·54	− 3·16	3·04	5·54	− 2·50
Victoria West	The Gaoler	0·00	1·84	− 1·84	2·62	4·62	− 2·00	10·91	7·75	+ 3·16
Vryburg	C. Butler	1·14	3·41	− 2·27	4·43	11·39	6·96	10·19	17·25	− 7·06
Worcester	The Gaoler	1·00	0·51	+ 0·49	2·86	1·15	+ 1·71	9·05	7·92	+ 1·13
Wynberg (Convent)	The Mother Superior	0·13	1·50	− 1·37	2·87	3·55	0·68	25·27	29·91	− 4·64
Basutoland—										
Maketang	F. Hodgson	0·44	4·26	− 3·82	5·82	14·25	− 8·43	19·18	26·68	− 7·50
South-West Africa—										
Tsumeb	Ing. Schetter	1·96	3·65	− 1·69	5·05	20·60	− 14·74	10·69	28·90	− 18·21
Waterberg	D. Hahn	1·15	3·46	− 2·31	7·24	13·61	− 6·37	10·58	18·87	− 8·29
Usakos	Missionary Diehl	0·20	0·91	− 0·71	0·48	3·37	− 2·89	0·48	4·48	− 4·00
Gobabis	Missionary Irle	1·42	2·74	− 1·32	3·95	10·71	− 6·76	7·92	14·68	− 6·76
Windhoek	Observatory	1·09	3·13	− 2·04	5·40	9·88	− 4·48	6·63	13·21	− 7·58
Mariental	Baron V. Eschwege	0·00	1·00	− 1·00	1·31	4·08	− 2·69	3·52	5·29	− 1·77
Heirachabis	Pater Prefect	0·00	0·57	− 0·57	3·22	2·15	− 1·07	3·90	2·78	− 1·10


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL
FEBRUARY, 1922
TRANSVAAL
CAPE OF GOOD HOPE
LORENÇO MARQUES
PORT ST JOHN
EAST LONDON
CAPE ST FRANCIS
CAPE AGULHAS
CAPETOWN
WYNBERG
VICTORIA WEST
PRIESKA
BRITSTOWN
CARNARVON
KENHARDT
WARMBAD
PORT NOLLOTH
CLANWILLIAM
MIDDELBERG
CERES
AMALIENSTEIN
CAPE STRAITZE
PORT ELIZABETH
BURBAN
REFERENCE
Nil
0 51 1 00
1 01 2 00
2 01 3 00
3 01 4 50
4 51 7 00
7 01 10 00
Over 10 00

the hail early in the season. During the latter part of the month the weather has quite taken on the characteristics of winter weather, brilliant days without cloud. Rainfall: 4·59 inches on sixteen days.—Dr. H. A. Spencer.

Piet Retief.—During the early part of the month very severe thunderstorms were experienced with exceptionally vivid lightning. Rainfall: 3·33 inches on ten days.—J. Werner.

Barberton.—The weather continued very dry until towards the end of the month, although heavy showers are reported as having fallen in other parts of the district, and the rivers have been very full at times. The season has not been favourable for the cotton crops, and the mealies have suffered severely from drought. *Rainfall: 4·46 inches on eleven days.—Walter Grubb.*

Strathmore (Klerksdorp).—Again hot and dry month. Crops have suffered severely. Rainfall: 1·70 inch on six days.—Chas. Scott.

Christiana.—Nothing unusual to report during the month. A severe and scarce winter is predicted for animals owing to the scarcity of forage. Rainfall: 1·06 inch on three days.—J. J. Cooke.

Piet Retief (Exp. Station).—On the 17th two hailstorms lasting about ten minutes each; considerable damage to tobacco on station and in Piet Retief. Rainfall: 2·97 inches on eleven days.—Officer in charge.

Kingsdown (Bethal).—Hailstorms on 12th and 19th; crops damaged. Rainfall: 4·99 inches on eleven days.—I. Spitz.

Makouwskop No. 83 (Bloemhof).—Not a drop of rain on some farms in the neighbourhood during this month; nearly all dams and pans dry. Rainfall: 1·48 inch on five days.—W. Hellatt.

Verkeerdepan (Carolina).—Some damage done by hail and heavy rains on 2nd (1·21 inch), 4th (0·80 inch), 5th (0·75 inch), and 14th (1·04 inch). Rainfall: 5·30 inches on twelve days.—F. King.

Silverkop (Carolina).—Crops very good. Rainfall: 5·52 inches on thirteen days.—J. Archibald.

Busby (Ermelo).—On the 4th bad hail and 3·09 inches of rain, and on the 19th at 4 p.m. after cool day most disastrous rains and hail. Rain (1·92 inch) lasted half an hour and did no end of damage in washaways and to crops. Hail lying in shade for five days. Rainfall: 7·19 inches on fourteen days.—G. Lunt.

Blaauwwildebeestput (Lichtenburg).—25th, first rain on lands for seven weeks. All maize has seeded, but no cobs. Crop depreciated over 50 per cent. Kaffir corn good. Worst seeding season in ten years. Mealies average 8–10 feet high, but have no cobs. Rainfall: 1·13 on nine days.—C. Hull.

Reston (Middelburg).—Severe hail with damage to crops on the 11th. Crops fair, though late. Stock medium. Rainfall: 4·55 inches on thirteen days.—A. G. Purves.

Waterpan Middelburg).—Some damage done by hail on the 3rd. Rainfall: 4·37 inches on nine days.—M. C. Dougall.

Modderfontein Settlement (Pretoria).—Maize backward. Teff and potato crops good. Rainfall: 5·90 inches on twelve days.—S. C. Obree.

Grootboom No. 444 (Rustenburg).—Crops suffered very much from drought during the first part of March. Crops do not look so very bad on the black soil, but those upon the red have suffered more severely. Cattle in excellent condition; veld looking well, though ripe.—Rainfall: 2·76 inches on ten days.—I. Nouhuys.

Good Hope No. 2024 (*Waterberg*).—Very bad hailstorm did a lot of damage to mealie crops on 11th. Rainfall: 3·36 inches on ten days.—I. Harris.

Pisanghoek (*Zoutpansberg*).—On one of the adjoining farms all standing crops were destroyed by hail on 19th. Rainfall: 1·85 inch on six days.—H. de Guss.

Groot Geluk (*Zoutpansberg*).—Crops and grazing very poor. Rainfall: 0·42 inch on five days.—T. H. Morgan.

SWAZILAND.

Transvalia.—Rains this month have slightly relieved the situation. Crops, however, only about half normal. Rainfall: 2·14 inches on nine days.—H. Coates.

ORANGE FREE STATE.

Rugby (*Bethlehem*).—Mealie crops are very poor, the second hatching of the top-grub having done a tremendous lot of damage. Oat crops have threshed out nearly 40 per cent. below expectations, owing to the rust having destroyed the grain. Veld grass is scarce and grazing parched and poor. Rainfall: 1·28 inch on eight days.—A. C. Glynn Baker.

Vaalbank (*Bloemfontein*).—A killing frost fell night of 22nd; all vegetables and vines badly burnt. Rainfall: 0·76 inch on four days.—W. Callendar-Easby.

Hamelfontein (*Edenburg*).—Drought still on; veld in bad condition; small stock still in good condition. Rainfall: 0·40 inch on three days.—Morison & Birrell.

Stanleyvale (*Harrismith*).—A very nice month with, however, a good bit of hail about. Fair amount of stiff-sickness among cattle, otherwise fair. Hail did a good bit of damage to mealies. Rainfall: 4·35 inches on thirteen days.—G. C. Atkins.

Alma (*Ladybrand*).—In 1915 I had 0·50 inch only in March; this is the only month the rainfall has been anything approaching that minimum for thirty years, the time I have kept a record. Very dry. Rainfall: 0·55 inch on three days. On night of 22nd slight frost did great harm to mealies, which for the most part are late.—H. W. Stockdale.

Ben Nevis (*Thaba 'Nchu*).—Very gloomy outlook for winter. Crops parched: no green feed. Ground too hard and dry to plough and, to cap all, millions of locusts are destroying the veld. Rainfall: 0·20 inch on three days.—A. K. Worringham.

Linana (*Thaba 'Nchu*).—Heavy fall of frost, killing all late mealies and potatoes. Rainfall: 0·15 inch on one day.—H. A. V. Harley.

Quilimane (*Wepener*).—During March we have experienced unusually dry and hot weather during the day, and remarkably cool nights with a little frost. Things are beginning to look very serious and unless it rains early in April, the prospects are very bad for winter. Rainfall: nil.—J. H. v. Rensburg.

Paardekraal (*Winburg*).—The most ghastly March on record here. Maize crop gone in and quite withered up. Milk supply greatly fallen off in quality and quantity. Young cattle not good, owing to wireworm. No winter crops sown yet. Locusts in neighbourhood in small swarms. Rainfall: 0·44 inch on five days.—G. S. Lowe.

Holfontein (*Kroonstad*).—Rain on the 25th, 0·88 inch—just saved greater part of the crops. General condition very dry. Winds easterly and fairly strong throughout. Heavy hail with large stones on the 15th. Rainfall: 2·04 inches on seven days.—G. W. Müller.

NATAL.

Cape St. Lucia.—Veld improving after fine rains. Stock are healthy. Native crops poor. Rainfall: 3·66 inches on fourteen days.—J. Murphy.

Mid-Illovo.—Pleasant weather, though insufficient rain for crops and veld. Top-grub bad in maize crop. Horse-sickness exceptionally bad. Rainfall, 1·71 inch on twelve days—much below average. Lt.-Col. J. W. V. Montgomery: C.M.G., D.S.O.

Nottingham Road.—Very cool nights: frequent hailstorms, very local. Three-day sickness prevalent amongst cattle, and a little horse-sickness. Rainfall: 3·20 inches on nineteen days. Miss E. Smythe.

Dundee.—A good month to help forward the mealie crop. The latter end of February had all the feelings of an early autumn, much more so than the end of this month. Rainfall: 3·64 inches on twelve days. West Thorrold.

Hlabisa.—The rainfall 2·40 inches on nine days—below the average, and heavy rains are needed before winter sets in to ensure winter grazing.—L. Double.

Edendale (Klip River).—All crops excellent, but good rain needed for winter crops and late mealies. All stock in splendid condition and very little horse-sickness or blue-tongue during month. Rainfall: 3·85 inches on ten days.—T. W. Niland.

Kloofend (Alexandria).—This is the lowest record for March since I began to keep a record in 1904. Rainfall: 0·88 inch on ten days.—J. C. Cruickshank.

Rongpoort (Weenen).—Exceptionally dry month. Crops very late and can't get along for want of rain. Hoping for late frosts. Rainfall: 1·14 inch on six days.—J. H. Bartholmew.

Summerford (Izopo).—Country very dry. Rainfall: 3·37 inches on ten days.—D. Campbell.

CAPE.

Darling (Malmesbury).—Normal conditions for the time of the year—a sharp falling-off in temperature in the last half of month, and autumn set in. Rainfall: 0·64 inch on six days. P. H. Drake.

Abtonia (Kuruman).—Very dry, but stock in excellent condition. Rainfall: 0·64 inch on nine days.—A. T. Sitwell.

Great Fish Point (Bathurst).—Surrounding country getting very dry for want of a good soaking rain. Rainfall: 1·47 inch on seven days. H. W. Mantle.

Riversdale.—The country looks lovely. The farmer begins to prepare the land for the early harvest, sowing the oats and barley. Rainfall: 3·06 inches on nine days.—Rev. Carl Prozesky.

Lovedale.—Days warmer and nights cooler than usual, leaving mean temperature about the average. Rainfall: 1·81 inch on seven days—meagre, thus, in spite of January being above normal, we are now 1·71 short for the quarter.—Charles A. Pilson.

Elsenburg (Stellenbosch).—The month was dry; a rainfall of 0·68 inch on four days against an average of 1·12 inch. This was very opportune for the farmers who were busy drying grapes. D. C. Crawford.

Rietfontein (Aliwal North).—A very dry month with cold snaps. Mealies drying up. No ploughing being done. Driest month since 1903. Rainfall: 0·59 inch on six days.—A. G. Smith.

Sydney-on-Vaal (*Barkly West*).—Continued dry weather up to middle of month. Heavy showers on evening of 15th—1·48 inch—brought a welcome decrease in temperature, but were too heavy to make much permanent improvement in the veld. Live stock are in excellent condition, but prospects for them through the winter are not bright. Rainfall: 2·10 inches on four days. J. G. Richards.

Maclear.—Said to be an unusually dry month for this district. Rainfall: 2·34 inches on nine days. D. W. Mackenzie.

Kingwilliamstown.—We are in for a very bad winter, nothing for the stock to eat. The crops are all burnt up. If we do get any rain it may help the late planting. The mealie borer is playing havoc with the early crops. Rainfall: 1·08 inch on seven days.—L. Clayton.

Alicad North.—The weather continues hot and dry. Rainfall: 0·47 inch on seven days. Alex. Alcock.

Keshavit.—The month passes without any rain, and it is considered the last and best month for rain. The position of the farmers is critical and will get worse, as the next regular rainfall can only be expected now with next summer season. Winter rains, if ever they occur, are not of much benefit as the flora is not adapted to them.—R. Seydell.

Vryburg.—Drought prevalent. Wind variable. Rainfall: 1·11 inch on five days. H. W. Collen.

Queenstown.—A dry month: veld very dry. Slight hoar frost on the 23rd. Heavy hailstorm on 16th, damaging crops. Rainfall: 1·37 inch on seven days.—H. Holley.

Kokstad.—Hot, dry winds at end of month. Rain much needed. Smart earthquake shock at 12.27 a.m. on 21st, lasting 6 seconds. Rainfall: 2·94 inches on seven days.—H. D. Coyte.

Somerset East.—Cool nights with gentle south-easterly winds. Generally heavy morning mists on Boschberg mountains. Rainfall: 1·90 inch on six days.—C. Harris.

Graaff-Reinet.—Winds moderate and variable. Fair amount of deposit from dew. Rainfall: 0·51 inch on five days.—S. E. D. Treadwell.

Carnarvon.—No sign of rain. Country suffering from drought. Rainfall: nil.—A. P. Malherbe.

Mafeking (*Convent*).—The drought of February has continued during March. Veld as bare as in midwinter. Rainfall: 1·05 inch on eleven days as against 11·02 inches during March, 1921.—The Mother Superior.

Clanwilliam.—The weather kept particularly cool during the month. Rainfall: nil.—P. E. Scholtz.

Vruchtbaar (*Wellington*).—The heavy rain during this month caused considerable damage to fruit-drying farmers; hundreds of tons were spoiled on drying trays and grounds. Rainfall: 1·96 inch on three days. P. J. Cillie.

Toughloof (*Tarkastad*).—Heavy thunderstorm accompanied by hail; this fell on a narrow strip of country, breaking a dam on this farm. Rainfall: 2·80 inches on three days.—J. J. van Heerden.

Tsomo.—Mealie crops a failure. Rainfall: 1·28 inch on five days.—Gaoler.

BASUTOLAND.

Mafeteng.—Very hot and dry month. Cold nights with slight frosts on 23rd and 24th. Rainfall: 0·44 inch on six days.—F. Hodgson.

MAY WEATHER CHARACTERISTICS.

Over the Cape Peninsula precipitation is now increasing rapidly, the average over this area being about 5 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-westerly winds, but an increase of northerly and all winds having westerly components, particularly of those from north-west, although those from west-south-west have a slight excess over the other directions.

Over the Cape Peninsula north-westerly and southerly winds are about equally frequent, while over the northern border there is a marked increase of winds from south and east-north-east together with a decrease of all winds from north round by west to west-south-west, as well as of south-east winds. The winds from south are slightly in excess of those from east-north-east; 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 north and west-north-west and from south, all others showing a diminution in frequency; north-north-west is the prevalent direction.

C. STEWART,
Chief Meteorologist.

Pretoria.

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MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. III. **APRIL, 1922.** **No. 4.**

MEAN barometric pressure higher than usual; monthly temperature about 2 degrees more than the average, both days and nights being warmer than usual; an absence of the usual severe frosts; absolute drought over the western Transvaal, the greater portion of the Free State and northern Karroo, the northern border, and Bechuanaland; a serious deficiency of precipitation elsewhere amounting to partial drought, except in the south and part of the south-west of the Cape Province, where there was an excess of rainfall; one or two destructive hailstorms; some unusually high temperatures constituting a record for the season; mists over the south-west and the Cape Peninsula: that is, almost typical anti-cyclonic conditions prevailed throughout the month of April, 1922.

Pressure.—Mean pressure during April was generally several hundredths of an inch above normal, except in the east, where it was about normal. Anti-cyclonic conditions with accompanying fine, bright weather prevailed throughout the greater part of the month, the equatorial low pressure being practically absent except on the last few days. A few cloudy days with showers occurred in the south of the Cape, Natal, and the Transvaal, and heavy mists occurred from time to time over the south-west coast and the Cape Peninsula. High-pressure areas lay over the south to south-east and east on 2nd to 6th and 7th to 8th; over the west to south, south-east, and east on 9th to 11th and 12th to 25th. Low-pressure areas passed along the coast, in the east on the 1st, in the west on 4th, south-west to south-east on 8th to 9th, over south to east on 12th to 13th, over south on 25th. The readings of the barometer were very low (29·55–29·60 inches), with strong northerly winds on the 12th.

Temperature.—The mean temperature over the Union during April was 65·4 degrees, being 1·7 degree higher than normal. An excess was common to both day and night temperatures, the mean maximum (78·8 degrees) being 2·7 degrees and the mean minimum (52·0 degrees) being 0·7 degree higher than usual. The mean monthly temperature was in excess over the Provinces, with the exception of Natal, where it was normal. In the Free State the mean day temperature (78·4 degrees) was 6·7 degrees and the mean night temperature (48·5 degrees) was 2·6 degrees higher than usual, causing an excess of 4·7 degrees

above the average in the mean temperature of April. Over the Transvaal the excess of 1·9 degree was due to the mean maximum (79·2 degrees) being 3·3 degrees and the mean minimum (49·4 degrees) only 0·4 degree above the corresponding averages. In the Cape Province the mean day temperature (78·1 degrees) was 2·4 degrees and the mean night temperature (52·8 degrees) was 0·8 degree higher than usual, causing an excess of 1·6 degree in the mean monthly temperature. Considering the stations separately, it is seen that, with few exceptions, the mean temperature for the month was considerably above normal by mostly between 3 and 4 degrees in the central portions of the Union, but rising to 5·9 degrees at Bloemfontein, 6·2 degrees at Bloemhof, and 7·0 degrees at Bethulie. The excess decreased outwards towards the coast, being generally under 1 degree in Natal and along the south coast. In the area between Port Elizabeth, Uitenhage, and Grahamstown, however, there were deficits of about 1 degree, also at Port Nolloth and Clanwilliam in the west, and at Durban, Weenen, Dundee, in Natal; whilst the mean temperature of the month was lower than normal by less than a degree at Belfast, Pilgrims Rest, and Nylstroom in the Transvaal. The day temperatures were considerably higher than usual over almost the whole country, generally by 2–4 degrees, but increasing to 8 degrees and even 9 degrees in the south-west of the Transvaal and centre and south of the Free State. In the Transvaal the excesses were greatest to the south and south-west, the departures varying between minus 1·1 degree at Pietersburg and 8·8 degrees at Potchefstroom. In the Free State the mean maxima were uniformly high, being least in the north-east, where the mean day temperatures were only 2·2 degrees in excess of the normal, as against 9·2 degrees at Bethulie in the south. In Natal and Zululand the departures were more variable, ranging from minus 3·7 degrees at Durban (Point) to plus 3·4 degrees at Ladysmith; Hlabisa in Zululand also shows a deficit of 1·5 degree. In the Cape Province the mean day temperatures were mostly 5–7 degrees higher in the northern and central portions, decreasing towards the coasts, where the departures were either small positive or negative quantities. The largest excess was 7·3 degrees at Kimberley and the greatest deficit 3·2 degrees at Uitenhage. Deficits were most common between Uitenhage and Port St. Johns, also at Port Nolloth in Namaqualand. In the case of the mean night temperatures, surplus amounts were usually smaller in amount than in the case of the day temperatures, whilst deficits were more frequently met with. In the Transvaal the departures of the minimum temperatures from the mean varied from minus 4·1 degrees at Nylstroom to plus 4·0 degrees at Piet Retief. In the Free State the departures ranged from plus 4·7 degrees at Bethulie to minus 0·5 degree at Lindley; in Natal and Zululand they varied from minus 3·7 degrees at Dundee to plus 3·0 degrees at Hlabisa. In the Cape Province stations in the north and central portions had mean minima 2–3 degrees in excess of the average, whilst stations on or near the coast were mostly colder than usual by about 1–2 degrees. The extreme variations ranged from an excess of 4·4 degrees at Port St. Johns to a deficit of 1·9 degree at Clanwilliam. The mean warmest station was Komatipoort, with a temperature of 74·3 degrees for the month, and the mean coolest Belfast, with 55·2 degrees, a difference of 19·1 degrees. The highest mean maximum was 88·2 degrees at Komatipoort, and the lowest mean minimum 39·3 degrees at Belfast. The month of April was remarkable for the unusually high temperatures recorded over practically the whole Union, extreme readings of over 100 degrees being recorded at Komatipoort (Transvaal), Capetown, Clanwilliam, Groot Drakenstein, Kingwilliamstown, Port Elizabeth, Stutterheim, and Uitenhage. With the exception of Komatipoort, where the month's extreme of 102 degrees was registered on the 13th, these maxima were recorded on the 4th and 5th during a prevalence of northerly winds, evidently of the

Föhn type. There was also a marked absence of shade temperatures below freezing, the lowest reading being 28·0 degrees on the 25th and 26th at Belfast. The highest reading was 106·5 degrees at Clanwilliam on the 4th, yielding an extreme range of 78·5 degrees over these stations during April. The highest readings were recorded on twenty-one days, most widely on the 1st, 5th and 12th, whilst the lowest readings were registered on twenty days of the month, principally the 14th and 25th.

Precipitation.—In the south coastal area between Knysna and Port Elizabeth and inland as far as Steytlerville, also at Piquetberg in the south-west, at Durban (Natal) and Komatipoort, precipitation was above the average. The excess in the south varied from 2·75 inches at Knysna to 0·15 inch at Steytlerville. At Piquetberg the rainfall was 1·34 inch, whilst at Durban and Komatipoort it was about 2½ inches in excess of the normal. Elsewhere the rainfall was in defect by amounts that are large for the season, that is to say, generally by ¾–1½ inch, but rising at a few stations to 2 inches, the maximum deficit being 2·68 inches at Vryheid in the north of Natal. Absolute drought prevailed over the south-west of the Transvaal, Bechuanaland, the northern border, the greater part of the northern Karroo and of the Free State. No rainfall was also reported from a large number of stations in most of the other divisions of the Transvaal and parts of the north-east Cape and of the west-central Karroo. Light local showers, totalling less than ½ inch, also fell over a much larger area. The maximum total registered was 6·39 inches at Durban, whilst the amount of 5·44 inches fell at Port Shepstone. Light rain fell over different localities in the Union between 1st and 4th, 7th and 10th, on the 14th, 17th to 19th, and 27th to 30th, whilst isolated heavy thunderstorms occurred in Natal. *Hailstorms* occurred on the 10th at Wakkerstroom (Transvaal), Nottingham Road (Natal), and Galaxy (Vrede District, Orange Free State), causing considerable damage at the first-mentioned place; on the 28th at White River, where considerable damage was caused by the accompanying heavy wind to trees and thatched buildings; on the 30th at Mbabane (Swaziland), Maboko (Lydenburg District, Transvaal) and neighbourhood, Hilltop and White River (Barberton), Dundee and Nottingham Road in Natal. At Hilltop the stones weighed 2½ oz., and at Dundee were stated to be of the size of pigeons' eggs, whilst destructive effects similar to those produced by the earlier storm were caused at White River.

The accumulated rainfall since 1st July, 1921, is above the normal in the south-west, along the south coast, portion of the central Karroo and southern part of the northern Karroo; excess precipitation is also found in the interior of the Transkei, Zululand, the upper portion of Natal, at Durban, at Wakkerstroom, portions of the high veld, low veld, and the Zoutpansberg in the Transvaal. In the Cape Province the excess ranges from 0·03 inch at Port Nolloth (Namaqualand) to 6·42 inches at Kokstad in the Transkei; in Natal it varies from 13·31 inches at Ladysmith to 0·16 inch at Estcourt; and in the Transvaal from 0·31 inch at Pietersburg to 7·89 inches at Pigeonhole (Zoutpansberg Division). Over the remainder of the country there was a large deficiency in precipitation, ranging in the Transvaal from 0·17 inch at Rooiberg in the western Transvaal to 19·78 inches at Woodbush; in the Free State it varied between 0·11 inch at Kroonstad and 9·75 inches at Bloemfontein; in the Cape Province from 0·20 inch at Sutherland in the northern Karroo to 10·71 inches at Port St. Johns, whilst in Natal the deficits were small (under ¾ inch). On the other hand, a consideration of the total rainfall of the first four months of the current year shows that an excess of rainfall is confined to a limited area in the south-west of the Cape Province, lying to the south of a line extending from Clanwilliam to Uniondale. The surplus amounts in

this area varied between 5·12 inches at Swellendam and 0·01 inch at the Royal Observatory (Capetown). A deficit, however, even affected part of the Cape Peninsula, Wynberg showing a shortfall of 2·13 inches for this short period as against a minus quantity of 6·19 inches for the ten months since 1st July, 1921. The failure of the rains since the beginning of the year has caused a most serious condition of affairs over the greater portion of the country. Owing to the lack of pasture in the western Transvaal, farmers are already trekking with their stock, both sheep and cattle, to the low veld, whilst most of the rivers are unusually low, dams and springs failing, whilst in Bechuanaland the lack of sufficient wind has prevented the working of windmills and air-motors; in addition, most crops are either a total failure or considerably below normal.

OBSERVERS' NOTES FOR APRIL, 1922.

TRANSVAAL.

Bloemhof.—Drought very severe; grazing very scarce, stock owners already shifting their cattle to other districts. Rainfall: Nil.—A. Adamson.

Ermelo.—A very dry month, but fortunately no frost fell in this part, and the maize has ripened well. This is fortunate, as the crop is not a good one. Cattle will find little or no grazing left when sheep have trekked through to the low veld. Rainfall: 0·43 inch on five days.—Mrs. S. M. Nicolson.

Strathmore (Klerksdorp).—Exceptionally dry. Rainfall: Nil.—Chas. Scott.

Barberton.—A dry month with occasional high maximum temperatures. Rainfall: 1·73 inch on eight days.—Walter Grubb.

Middelburg.—The weather has been unusually genial and mild for the month, a usual thing after a summer of good rainfall. Fresh winds have been experienced from east during a good part of the month, and threatening rain, which failed to materialize, on a good many occasions. Rainfall: 0·13 inch on six days.—Dr. H. A. Spencer.

Mosdene (Naboomspruit).—The month has been practically rainless, and the previous three months having been unusually dry, crops will be 40 per cent. to 50 per cent. under normal, whilst grazing prospects for next spring are bad. Rainfall: 0·02 inch on one day.—Ernest E. Galpin.

Wakkerstroom.—On the 10th a very heavy hailstorm passed on the west side of the town, doing much damage. The next morning a hill, visible from the town, was still covered with hail and looked like snow. Rainfall: 0·24 inch on two days.—Louis le Roux.

Maboki (Lydenburg).—With the storm on the 30th there was slight hail. Towards the berg, west and north-west, I understand hail did considerable damage. All crops less than 40 per cent. Rainfall: 1·55 inch on ten days. —P. C. Jensen.

White River.—The weather has been very hot during the month. Indications of rain at times, but nothing much resulted in way of rainfall. On the 28th, at 5 p.m., a violent gale rose suddenly, with heavy driving rain and also some hail, several trees blown over and branches broken, thatched buildings also damaged. On the 30th, at about 9.30 a.m., another heavy windstorm, accompanied by driving rain and hail, with further damage to trees and crops. Rainfall: 2·36 inches on six days.—H. P. Pooley.

Jakhalsfontein (Pietersburg).—The latter part of the month changed suddenly to dry, high winds, with cold and overcast skies. The veld is dry, and prospects for the winter are not very bright. Rainfall: 0·03 inch on one day.—Rev. James C. Palmer.

TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), APRIL, 1922

Place.	Observer.	Month—April, 1922. Mean Max.	Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Date.	Lowest.	Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Transvaal—										
Barberton	W. Grubb	80·5	56·4	68·4	67·0	+ 1·4	93·0	13th	51·0	25th.
Belfast	The Forester	71·2	39·3	55·2	55·9	− 0·7	78·0	1st	28·0	25th and 26th.
Bloemhof	A. Adamson	86·3	50·1	68·2	62·0	+ 6·2	90·0	2nd, 3rd, 12th, 17th, 21st, 22nd, 23rd, and 24th	41·0	30th.
Ermelo	Mrs. S. M. Nicolson	76·9	45·1	61·0	57·3	+ 3·7	82·0	22nd	36·0	25th.
Johannesburg (Observatory)	The Staff	73·4	52·4	62·9	58·8	+ 4·1	80·0	22nd	46·2	19th.
Klerksdorp (Strathmore)	Chas. Scott	82·8	48·1	65·4	63·1	+ 2·3	88·0	2nd	40·0	28th.
Komatipoort	Fothergill and Evans	88·2	60·4	74·3	73·0	+ 1·3	102·0	13th	53·0	26th.
Louis Trichardt	I. J. de Bruin	80·2	54·9	67·6	64·2	+ 3·4	92·0	1st	48·0	26th.
Middelburg	Dr. H. A. Spencer	78·9	44·4	61·6	60·2	+ 1·4	85·0	13th and 21st	34·0	25th.
Nylstroom	G. Bakker	80·9	46·8	63·8	64·5	− 0·7	89·0	1st	39·0	26th
Pietersburg	W. Dempster	76·1	50·8	63·3	63·3	± 0·0	85·0	1st	42·0	25th.
Piet Retief	J. Werner	76·2	51·9	64·0	60·7	+ 3·3	86·0	1st	45·3	25th.
Pigeonhole (New Agatha)	Jno. McCallum	69·4	55·5	62·4	—	. .	83·0	1st	51·0	3rd, 5th, 20th, and 24th.
Pilgrims Rest	E. M. Skea	75·9	47·0	61·4	61·6	− 0·2	87·0	1st	37·0	26th.
Potchefstroom (Exp. Farm)	The Manager	85·0	47·8	66·4	60·5	+ 5·9	90·5	2nd	42·0	15th, 26th, and 28th.
Pretoria (Meteorological Office)	The Staff	78·8	50·2	64·5	62·9	+ 1·6	84·3	1st	43·8	26th.
Standerton	.....	—	—	—	58·0	—	—	—	—	
Zeerust	H. Dietrich	83·3	48·7	66·0	63·7	+ 2·3	91·3	1st	39·1	28th.
Swaziland—										
Mbabane	Swaziland Police	74·2	52·1	63·2	62·5	+ 0·7	89·0	1st	45·0	24th and 25th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	82·9	51·1	67·0	60·0	7·0	—	—	—	—
Bloemfontein	G. A. Schepers	80·8	50·7	65·8	59·9	5·9	85·4	12th	43·9	14th.
Harrismith	The Forester	71·4	45·2	58·3	56·0	+ 2·3	76·0	1st, 6th, 7th, 9th, 10th, 12th, 13th, 17th, 22nd, 23rd & 24th	40·0	19th and 29th
Ladybrand	The Forester	78·7	47·0	62·8	59·2	+ 3·6	84·0	6th and 7th	41·0	16th.
Lindley	J. Collister-Oates	78·9	44·3	61·6	58·8	+ 2·8	84·5	7th	37·0	26th and 29th.
Natal—										
Dundee	West Thorrold	78·4	48·1	63·2	64·6	− 1·4	87·0	1st	41·0	26th.
Durban (Point)	The Port Captain	77·8	65·3	71·6	72·4	− 0·8	85·4	11th	59·4	2nd.
Estcourt	A. A. McLean	79·2	49·8	64·5	64·2	+ 0·3	89·0	6th	42·0	29th.
Hlabisa	The Gaoler	78·7	61·9	70·3	69·6	+ 0·7	88·0	12th	58·0	2nd, 3rd, 17th, and 19th.
Ladysmith	R. G. Arnold	84·1	52·3	68·2	67·4	+ 0·8	94·0	6th	46·0	20th.
Maritsburg (Mental Hospital)	The Staff	79·1	57·0	68·0	67·8	+ 0·2	92·4	6th	51·0	30th.
Stanger	C. C. Foss	82·0	62·0	72·0	71·5	+ 0·5	99·0	8th	57·7	20th.
Weenen	The Gaoler	84·8	50·0	67·4	67·6	− 0·2	97·0	6th	42·0	10th, 20th, 21st & 25th.

AIR TEMPERATURES, APRIL, 1922—(*continued*).

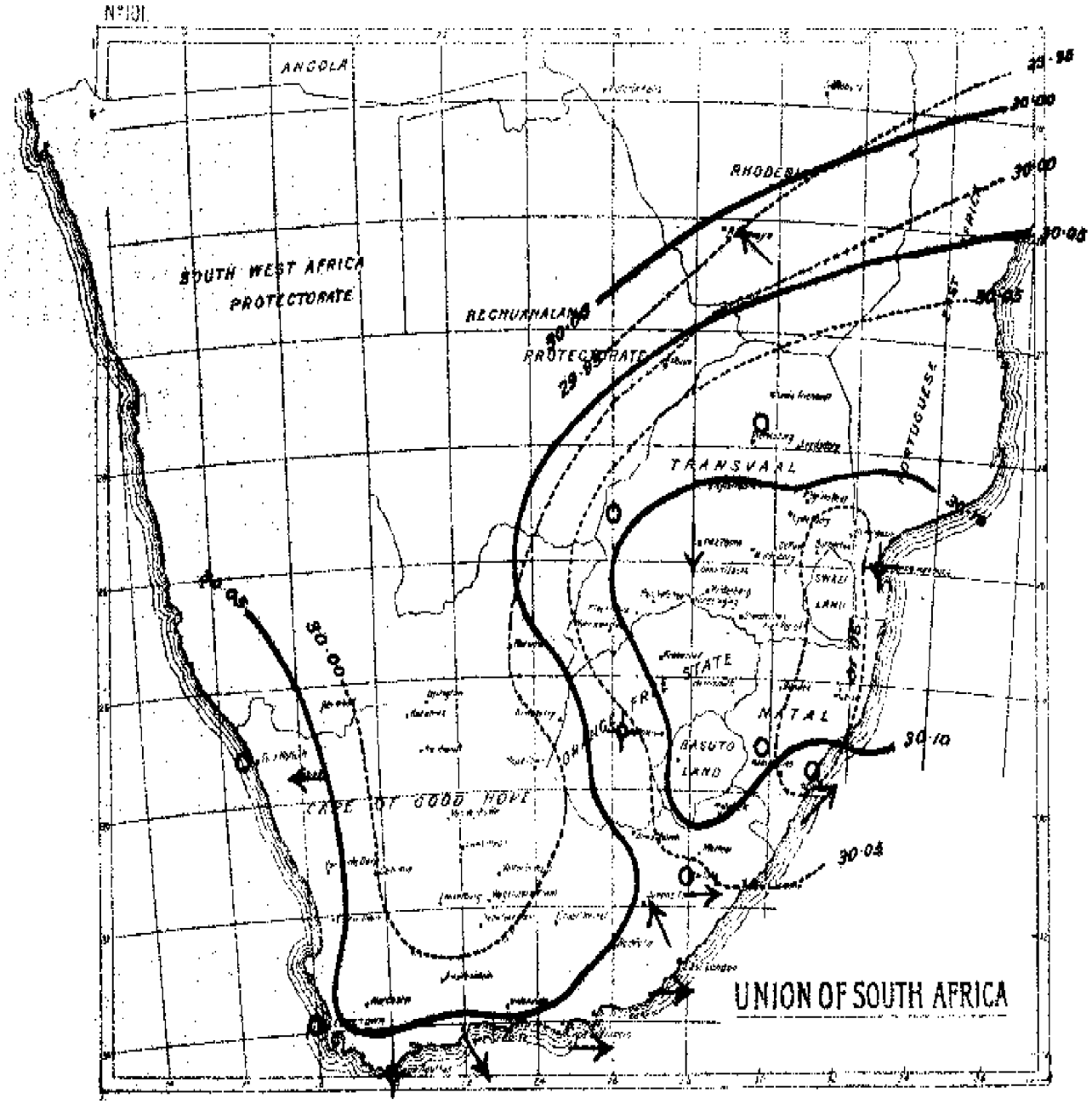
Place.	Observer.	Month—April, 1922. Mean Max.	Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Date.	Lowest.	Date.
		° F	° F	° F	° F	° F	° F		° F	
Cape—										
Aliwal North	Alex. Alcock	80·0	45·7	62·8	59·0	− 3·8	85·0	*5th and 6th.*	34·5	15th.
Bedford	T. C. Hall	77·1	50·3	63·7	63·2	+ 0·5	98·0	5th	37·0	14th.
Capetown (Royal Observatory)	The Staff	73·9	54·4	64·2	63·1	+ 1·1	101·8	4th	46·6	12th.
Carnarvon	A. P. Malherbe	80·7	47·5	64·1	60·2	+ 3·9	89·0	4th and 18th.	32·0	14th.
Clanwilliam	P. E. Scholtz	83·5	49·2	66·4	67·2	− 0·8	106·5	4th	41·0	14th.
East London	The Port Captain	74·8	59·7	67·2	66·2	+ 1·0	99·0	12th	52·0	14th.
Graaff-Reinet	S. E. D. Treadwell	81·7	53·6	67·6	64·1	+ 3·5	99·2	4th and 5th	45·0	3rd.
Grahamstown	The Vet. Res. Officer.	75·5	50·9	63·2	63·9	− 0·7	98·5	5th	36·0	14th.
Groot Drakenstein	Lionel Baker	77·6	51·5	64·6	64·0	+ 0·6	104·6	4th	43·9	11th.
Kenhardt	R. Seydell	86·0	52·8	69·7	66·2	+ 3·5	96·0	4th and 19th.	38·0	14th.
Kimberley	Jno. Acton	83·5	53·5	68·5	63·6	+ 4·9	91·0	16th and 22nd	43·0	30th.
Kingwilliamstown	L. Clayton	79·3	55·3	67·3	66·4	+ 0·9	104·0	5th	43·5	14th.
Kokstad	H. D. Coyte	76·1	46·4	61·2	59·4	+ 1·8	87·0	5th and 12th.	39·9	20th.
Maleking (Convent)	The Mother Superior	84·4	51·5	68·0	63·5	+ 4·5	91·0	1st and 2nd	35·0	30th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	71·8	58·0	64·9	64·4	+ 0·5	94·0	4th	50·0	13th.
Murraysburg	.....	—	—	—	60·2	—	—	—	—	—
O'okiep	J. Burrows	81·2	57·9	69·6	65·8	+ 3·8	98·0	4th	39·8	29th.
Port Elizabeth	The Lightkeeper	72·7	58·2	65·4	65·5	− 0·1	102·0	5th	51·0	14th.
Port Nolloth	The Lightkeeper	66·2	48·6	57·4	58·8	− 1·4	99·0	23rd	39·0	14th.
Port St. Johns (Cape Hermes)	The Lightkeeper	75·7	63·7	69·7	68·4	+ 1·3	89·0	12th	60·0	2nd, 3rd, 20th, and 21st.
Queenstown	*H. Holley*	*79·0*	*48·8*	*63·9*	*61·9*	+ 2·0	*92·0*	*5th*	*34·0*	*14th.*
Somerset East	C. Harris	78·2	50·7	64·4	63·6	+ 0·8	98·0	5th	30·0	14th.
Stutterheim	F. C. Bousfield	80·2	53·1	66·6	62·4	+ 4·2	100·6	5th	42·1	3rd.
Sydney's Hope	Rev. S. Rippon	73·0	54·5	64·2	65·2	− 1·0	98·5	5th	46·8	2nd.
Uitenhage	H. Inggs	78·2	53·9	66·0	67·2	− 1·2	104·0	5th	41·3	14th.
Uitlate	Miss N. Dix Peek	80·9	51·6	66·2	64·5	+ 1·7	97·5	5th	41·9	30th.
Vryburg	H. W. Collen	83·9	49·7	66·8	63·1	+ 3·7	91·0	1st	40·0	30th.
Wynberg (Convent)	The Mother Superior	72·7	54·4	63·6	62·8	+ 0·8	85·5	7th	49·8	9th.
Basutoland—										
Maseteng	F. Hodgson	75·9	47·9	61·9	59·6	+ 2·3	*81·0*	*6th and 12th.*	*40·0*	*2nd.*

RAINFALL, APRIL, 1922.

Place.	Observer.	Month. April, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	1·73	2·24	− 0·51	10·62	19·78	− 9·16	26·50	32·58	− 6·08
Bethal	H. F. Joubert	0·12	1·23	− 1·11	14·25	14·14	+ 0·11	27·54	29·66	− 2·12
Belfast	The Forester	0·33	1·84	− 1·51	16·18	16·50	− 0·32	33·26	31·35	+ 1·91
Bloemhof	A. Adamson	0·00	1·27	− 1·27	4·85	11·65	− 6·80	9·43	17·97	− 8·54
Claremont	S. A. Police	0·00	1·80	− 1·80	4·96	10·41	− 5·45	14·85	17·57	− 2·72
Ermelo	Mrs. S. M. Nicolson	0·43	1·55	− 1·12	11·47	14·10	− 2·63	28·26	28·51	− 0·25
Haenertsburg	S.A. Police	0·00	1·48	− 1·48	12·25	24·25	− 1·20	29·39	37·92	− 8·53
Heidelberg	W. ter Horst	0·39	1·32	− 0·93	10·75	14·23	− 3·48	21·02	27·14	− 6·12
Johannesburg (Observatory)	The Staff	0·59	1·27	− 0·68	11·19	15·57	− 4·38	25·98	29·95	− 3·97
Klerksdorp (Strathmore)	C. Scott	0·00	1·87	− 1·87	7·42	12·97	− 5·55	21·05	21·09	− 0·04
Komatipoort	Messrs. Fothergill and Evans	4·39	1·73	+ 2·66	11·46	15·95	− 4·49	27·28	25·23	+ 2·05
Louis Trichardt	L. J. de Bruin	0·37	1·83	− 1·46	4·86	17·98	− 13·12	18·94	31·04	− 12·10
Middelburg	Dr. H. A. Spencer	0·13	1·46	− 1·33	12·99	14·51	− 1·52	31·81	28·16	+ 3·65
Nylstroom	G. Bakker	0·00	1·32	− 1·32	7·38	13·55	− 6·17	19·11	23·57	− 4·46
Pietersburg	W. Dempster	0·02	1·27	− 1·25	5·93	11·94	− 6·01	21·77	21·46	+ 0·31
Piet Retief	J. Werner	0·82	1·67	− 0·85	10·32	14·73	− 4·41	34·81	29·94	− 4·87
Pilgrims Rest	E. M. Skea	0·75	2·37	− 1·62	15·53	24·95	− 9·42	35·91	39·00	− 3·09
Pigeonhole (New Agatha)	J. McCallum	1·45	2·20	− 0·75	12·24	18·15	− 5·91	41·05	33·16	+ 7·89
Potchefstroom	The Manager	0·00	1·79	− 1·79	8·30	12·20	− 3·90	21·18	22·90	− 1·72
Pretoria (Meteorological Office)	The Staff	0·16	1·52	− 1·36	8·59	16·49	− 7·90	19·37	29·11	− 9·74
Rooiberg	M. Botumann	0·04	0·85	− 0·81	9·58	13·24	− 3·66	23·02	23·19	− 0·17
Rustenburg	S.A. Police	0·00	0·91	− 0·91	8·91	14·30	− 5·39	23·46	25·25	− 1·79
Wakkerstroom	L. le Roux	0·24	1·76	− 1·52	11·97	16·13	− 4·16	34·46	31·18	+ 3·28
Woodbush	The Forester	1·74	3·31	− 1·57	15·88	44·77	− 28·89	50·08	69·86	− 19·78
Zeerust	H. Dietrich	0·54	1·38	− 0·84	7·12	13·90	− 6·78	16·22	22·98	− 6·76
Swaziland—										
Mbabane	Swaziland Police	1·40	2·84	− 1·44	15·84	27·07	− 11·23	41·66	48·49	− 6·83
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·09	1·45	− 1·36	2·82	10·49	− 7·67	7·87	16·99	− 9·12
Bloemfontein	G. A. Schepers	0·00	2·06	− 2·06	3·05	10·58	− 7·53	8·46	18·21	− 9·75
Boshof	P. H. van Rooyen	0·00	1·47	− 1·47	4·24	11·12	− 6·88	9·14	18·48	− 9·34
Harrismith	The Forester	0·39	1·76	− 1·37	10·07	13·93	− 3·86	26·82	27·06	− 0·24
Kroonstad	S. R. Northfield	0·00	1·14	− 1·14	6·48	9·89	− 3·41	21·15	21·26	− 0·11
Ladybrand	The Forester	0·00	2·18	− 2·18	5·96	13·85	− 7·89	21·61	25·83	− 4·22
Lindley	J. Collister-Oates	0·00	1·91	− 1·91	8·09	12·57	− 4·48	22·53	23·05	− 0·52

RAINFALL, APRIL, 1922—(*continued*).

Place.	Observer.	Month. April, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Natal—										
Dundee	W. Thorrold	0·87	2·33	− 1·46	13·07	16·91	− 3·84	42·61	30·23	+12·38
Durban (Point)	The Port Captain	6·39	3·90	+ 2·49	12·57	18·77	− 6·20	44·96	38·24	+ 6·72
Estcourt	A. A. McLean	0·83	1·61	− 0·78	9·23	15·47	− 6·24	27·43	27·27	+ 0·16
Hlabisa	The Gaoler	1·25	3·09	− 1·84	9·41	20·06	−10·59	41·07	40·84	+ 0·23
Howick	The Gaoler	0·51	2·08	− 1·57	10·56	16·43	− 5·87	30·51	30·74	− 0·23
Ladysmith	R. G. Arnold	0·18	1·63	− 1·45	13·00	15·08	− 2·08	39·63	26·32	+13·31
Pietermaritzburg (Mental Hospt.)	The Staff	0·49	2·07	− 1·58	8·15	17·15	− 9·00	32·07	32·29	− 0·22
Stanger	C. C. Voss	2·04	2·75	− 0·71	10·63	17·14	− 6·51	—	59·35	—
Vryheid	The Gaoler	0·13	2·81	− 2·68	13·82	18·89	− 5·07	35·23	35·38	− 0·65
Weenen	The Gaoler	1·04	1·86	− 0·82	11·83	13·90	− 2·07	24·91	25·48	− 0·57
Cape—										
Aliwal North	A. Alcock	0·08	1·77	− 1·69	3·29	11·41	− 8·12	10·57	19·43	− 8·86
Beaufort West	The Gaoler	0·38	0·84	− 0·46	3·73	4·82	− 1·09	9·78	8·35	+ 1·43
Bedford	T. C. Hall	1·85	2·41	− 0·56	11·02	13·20	− 2·18	23·49	25·44	− 1·95
Britstown	The Gaoler	0·00	1·71	− 1·71	1·30	6·74	− 5·44	4·68	10·11	− 5·43
Calvinia	The Gaoler	0·55	0·98	− 0·43	0·89	2·21	− 1·32	4·95	5·66	− 0·71
Capetown (Royal Observatory)	The Staff	1·12	1·99	− 0·87	4·22	4·21	+ 0·01	17·87	17·10	+ 0·77
Ceres	A. Heatlie	2·44	3·13	− 0·69	7·04	5·81	+ 1·23	33·42	28·58	+ 4·84
Carnarvon	A. P. Malherbe	0·03	0·92	− 0·89	0·28	4·73	− 4·45	3·83	6·98	− 3·15
Clanwilliam	P. E. Scholtz	0·62	0·72	− 0·10	1·69	1·47	+ 0·22	5·01	5·83	− 0·82
East London	A. Downie	2·43	2·85	− 0·42	10·94	12·83	− 1·89	24·86	29·42	− 4·56
Fraserburg	The Gaoler	0·00	0·86	− 0·86	2·01	3·54	− 1·53	6·33	5·60	+ 0·73
Garies	The Gaoler	—	0·52	...	—	0·89	—	—	3·64	—
Graaff-Reinet	S. E. D. Treadwell	0·32	1·08	− 0·76	2·88	6·37	− 3·49	12·53	12·25	+ 0·28
Groot Drakenstein	Lionel Baker	1·59	2·98	− 1·39	6·47	6·07	+ 0·40	26·35	24·77	+ 1·58
Heilgetown	The Gaoler	0·00	1·69	− 1·69	0·58	8·22	− 7·64	4·18	11·79	− 7·61
Grahamstown	Vet. Research Officer	1·91	2·42	− 0·51	6·82	11·13	− 4·31	18·41	25·25	− 6·84
Hanover	The Gaoler	0·08	1·50	− 1·42	2·06	7·55	− 5·49	6·75	11·69	− 4·94
Hopetown	The Gaoler	0·00	1·14	− 1·14	1·35	7·54	− 6·19	7·16	11·47	− 4·31
Keurhardt	R. Seydell	0·00	0·64	− 0·64	0·70	3·46	− 2·76	1·99	4·97	− 2·98
Kimberley	J. Acton	0·00	1·56	− 1·56	2·70	9·48	− 6·78	6·71	15·21	− 8·50
Knysna	The Gaoler	4·94	2·19	+ 2·75	12·47	8·85	+ 3·62	28·39	24·34	+ 4·05
Kokstad	D. D. Coyte	0·36	1·58	− 1·22	9·57	13·73	− 4·16	31·91	25·49	+ 6·42
Kingwilliamstown	L. Clayton	1·51	2·29	− 0·78	5·88	11·14	− 5·26	18·44	22·89	− 4·45
Kuruman (Abbiala)	A. T. Sitwell	0·00	1·25	− 1·25	2·65	10·34	− 7·69	5·36	15·45	−10·09
Mafeking (Convent)	Mother Superior	0·00	1·92	− 1·92	4·98	12·68	− 7·70	10·62	21·00	−10·38
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·51	1·74	− 1·23	5·40	5·82	− 0·42	14·97	14·40	+ 0·57
Murraysburg	The Gaoler	0·30	1·06	− 0·76	2·36	5·86	− 3·50	8·50	9·56	− 1·06
Ookiep	J. Burrows	0·11	0·67	− 0·56	0·17	1·67	− 1·50	2·54	5·01	− 2·47



April, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for April.

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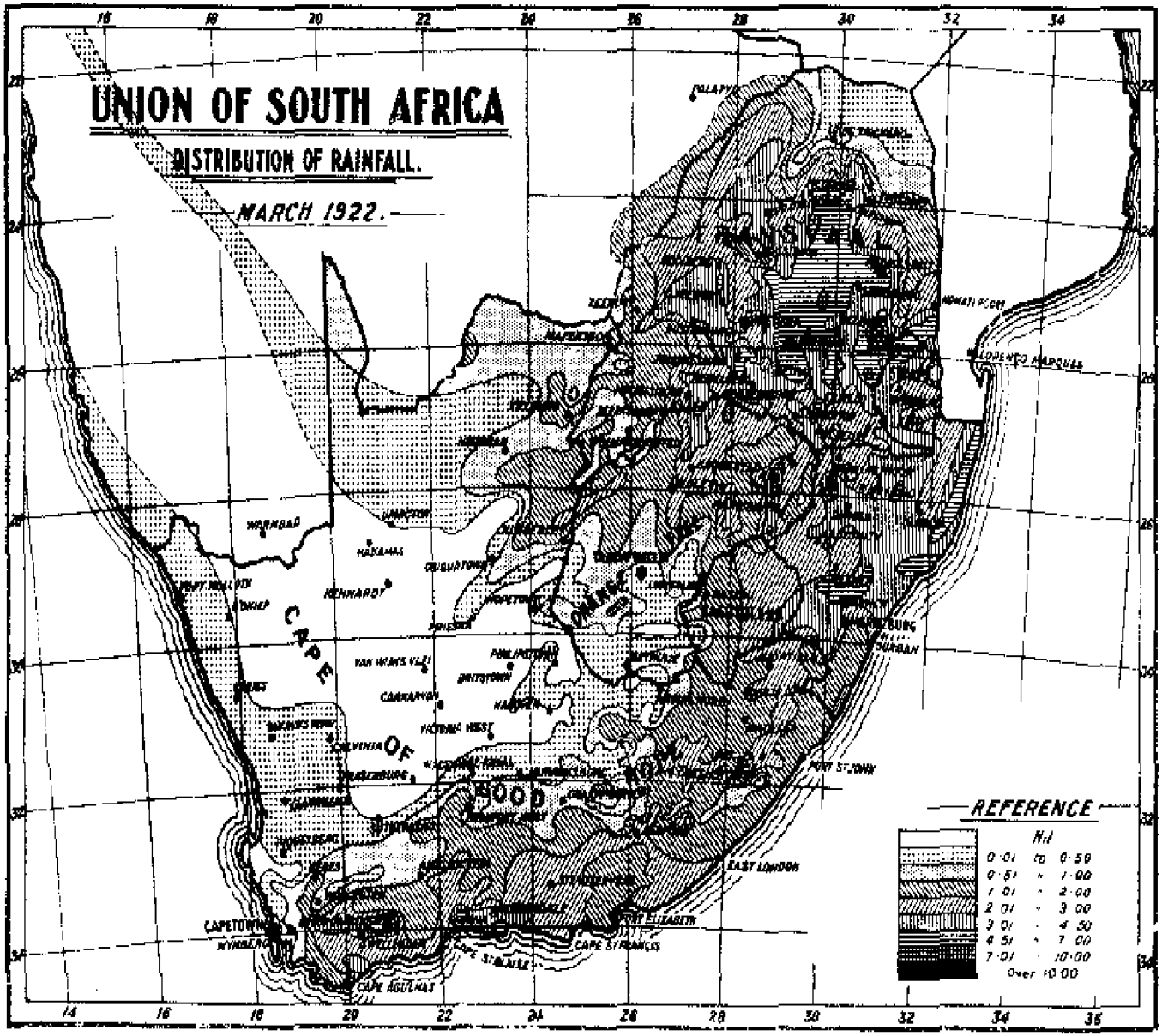
RAINFALL, APRIL, 1922.—(*continued*).

Place.	Observer.	Month. April, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches	Inches.
Cape—continued—										
Philipstown	The Gaoler	0·00	1·30	− 1·30	2·17	7·71	− 5·54	7·42	12·41	− 4·99
Piquetberg	The Gaoler	3·06	1·72	+ 1·34	5·28	3·32	+ 1·96	16·81	14·72	+ 2·09
Port Elizabeth	The Lightkeeper	2·98	1·95	+ 1·03	5·53	5·94	+ 0·39	21·33	18·31	+ 3·02
Port St. Johns (Cape Hermes)	The Lightkeeper	1·69	3·89	− 2·20	10·72	19·64	− 8·92	33·22	43·93	−10·71
Port Nolloth	The Lightkeeper	0·06	0·39	− 0·33	0·42	0·51	− 0·09	1·65	1·62	+ 0·03
Prieska	The Gaoler	0·08	1·42	− 1·36	0·64	6·29	− 5·65	4·80	8·78	− 3·98
Queenstown	H. Holley	0·68	1·60	− 0·92	6·97	11·43	− 4·46	18·61	20·04	− 1·43
Steytlerville	The Gaoler	0·95	0·80	+ 0·15	5·30	4·51	+ 0·79	12·56	8·37	+ 4·19
Sutherland	The Gaoler	0·45	1·02	− 0·57	1·97	3·09	− 1·12	6·75	6·95	− 0·20
Swellendam	The Gaoler	2·27	2·79	− 0·52	16·20	11·08	+ 5·12	29·02	27·29	+ 2·33
Sydneys Hope	Rev. E. Rippon	1·63	2·30	− 0·67	7·92	8·63	− 0·71	18·43	19·69	− 1·26
Somerset East	C. Harris	1·15	1·92	− 0·77	9·20	10·92	− 1·72	20·84	21·75	− 0·91
Stutterheim	F. C. Bousfield	2·84	2·38	+ 0·46	11·50	14·50	− 3·00	29·69	27·68	+ 2·01
Ultenhage	H. Inggs	2·99	1·72	+ 1·27	6·63	6·24	+ 0·39	18·01	15·29	+ 2·72
Umtata	Miss N. Dix Peek	0·08	1·93	− 1·85	7·65	12·31	− 4·76	23·56	23·39	+ 0·17
Uniondale	The Gaoler	1·67	1·23	+ 0·44	5·65	4·36	+ 1·29	9·79	11·07	− 1·28
Upington	The Gaoler	0·00	0·84	− 0·84	0·38	4·38	− 4·00	3·04	6·38	− 3·34
Victoria West	The Gaoler	0·00	1·03	− 1·03	2·62	5·65	− 3·03	10·91	8·78	+ 2·13
Vryburg	H. W. Colten	0·00	1·51	1·51	4·43	12·90	− 8·47	10·19	18·76	− 8·57
Worcester	The Gaoler	0·81	1·14	− 0·33	3·67	2·29	+ 1·38	9·86	9·06	+ 0·80
Wynberg (Convent)	The Mother Superior	1·83	3·28	− 1·45	4·70	6·83	− 2·13	27·10	33·19	− 6·09
Basutoland—										
Maieteng	F. Hodgson	0·01	2·75	− 2·74	5·83	17·00	−11·17	19·19	29·43	−10·24
South-West Africa—										
Tsumeb	Ing. Schetter	0·43	2·48	− 2·05	6·38	23·17	−16·79	11·12	31·38	−20·26
Waterberg	D. Hahn	0·01	1·93	− 1·92	7·25	15·54	− 8·29	10·59	20·80	−10·21
Usakos	Missionary Diehl	0·00	0·46	− 0·46	0·48	3·83	− 3·35	0·48	4·94	− 4·46
Gobabis	Missionary Irle	0·00	1·16	− 1·16	3·95	11·87	− 7·92	7·92	15·84	− 7·92
Windhoek	Observatory	0·00	1·63	− 1·63	5·40	11·50	− 6·10	6·63	14·84	− 8·21
Mariental	Baron v. Esebeck	0·04	0·55	− 0·51	1·38	4·58	− 3·20	3·56	5·84	− 2·28
Heirachabis	Pater Prefect	0·00	0·39	− 0·39	0·60	2·54	− 1·96	1·28	3·17	− 1·89


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
MARCH 1922.
REFERENCE
Nil
0·01 to 0·50
0·51 " 1·00
1·01 " 2·00
2·01 " 3·00
3·01 " 4·50
4·51 " 7·00
7·01 " 10·00
Over 10·00
CAPE OF GOOD HOPE
CAPETOWN
WYNBERG
CAPE AGULHAS
CAPE ST BLAISE
CAPE ST FRANCIS
PORT ELIZABETH
EAST LONDON
PORT ST JOHN
DURBAN
LORENCO MARQUES
KOMATI POORT
WARMBAD
KAKAMAS
KENHARDT
CARNARVON
VICTORIA WEST
CALVINIA
BRITSTOWN
PHILIPSTOWN
VAN WYKS VLEI
PRIESKA
UPINGTON
MAFEKING
PALAPYE

Ventersdorp.—No rain has fallen this month, and slight frosts have occurred in the vlei lands.—W. M. Cheyne.

Lichtenburg.—Poor outlook for winter grazing for cattle. Locusts eating up what little grass there is. Rainfall: 0·04 inch on two days.—J. T. Allman.

Christiana.—A severe winter is predicted owing to drought. Farmers in a bad way for winter forage for animals. Very bad reports from farms surrounding town. Rainfall: Nil.—J. J. Cooke.

Krugersdorp.—The weather during the month was generally pleasant, the days being warm and only chilly after susnset and in the early morning. Several windy days towards the end of month. Rainfall: 0·08 inch on one day.—C. Innes.

Bellsbank (Zoutpansberg).—Very dry and veld giving in for stock. Rainfall: 0·24 inch on one day.—H. A. van Heerden.

Klipplaatsdrift (Standerton).—The mealie crop is ripe. Quite a lot of damage done by worms. Rainfall: Nil.—J. C. Swemmer.

Waaikraal (Rustenburg).—Locusts about, but up to date have done no damage in this neighbourhood. Rainfall: 0·02 inch on one day.—W. Behrens.

Elandsfontein (Potchefstroom).—Not a drop of rain during the month, and if May should follow suit the outlook from the farmers' point of view will be very gloomy. We hope, however, to get some rain for wheat sowing. Rainfall: Nil.—P. Davidtz.

De Wagendrift (Pretoria).—Mealie crop, etc., very poor; local spruits low, and in some cases empty. Very bad outlook for winter, especially for stock. Rainfall: 0·15 inch on two days.—Eric Chapman.

Klippan No. 272 (Lichtenburg).—Pans and dams are empty. During eighteen years' experience this is the very worst drought for western Transvaal. Crops 60 per cent. below 1920. No grass, no water, only locusts and dust. Rainfall: Nil.—P. N. Fischer.

Zandfontein (Bloemhof).—Drought is unprecedented, water is likely to give in, and that would be fatal. Rainfall: Nil.—T. McLetchie.

Hilltop (Barberton).—30th April, between 3 p.m. and 4 p.m., a severe hailstorm. Some stones weighed 2½ oz. Rainfall: 1·59 inch on five days.—Dr. C. Worrall.

SWAZILAND.

Mbabane.—The country is very dry, and there will be a famine amongst the natives in the low country. The sheep farmers have commenced coming into the country with their sheep for winter grazing. A very refreshing rain began at 7 a.m. on the 30th and lasted for about half an hour; it was accompanied by a few hailstones. Rainfall: 1·40 inch on eleven days.—R. C. S. Markham.

ORANGE FREE STATE.

Rugby (Bethlehem).—Mealie crops are at least 45 per cent. below last year's yield—practically all the late mealies having perished from drought and given no cobs, and the earlier mealies having been destroyed by grub. Veld is scarce and grazing unobtainable even at high prices. Large stock are rapidly falling away in condition. No frost had fallen up to the last of the month. There was a short thunderstorm at 4 p.m. on the 21st, lasting for a few minutes, which was accompanied by violent wind, but no rainfall. Rainfall: Nil.—A. C. Glynn-Baker.

Katdoornput (*Bloemfontein*).—Very, very dry. Everybody trekking with big stock. Rainfall: Nil.—C. Mulke.

Newlands (*Fauresmith*).—Drought chronic. Everybody trekking with big stock. Rainfall: Nil.—J. Lombard.

Overdene (*Ficksburg*).—Almost the record dry April, and a record inasmuch as there was no frost recorded; conditions of veld deplorable. Rainfall: 0·03 inch on one day.—H. Thorrold.

Stanleyvale (*Harrismith*).—A very warm month up till the last four days, which were very cold windy days. Could have done with rain for grass, which is very dry. Stock fair; crops fair; a lot of grub about. Rainfall: 0·03 inch on one day.—G. C. Atkins.

Oldenburg (*Harrismith*).—The country is very dry. Rainfall: 0·35 inch on one day.—J. D. Ballot.

Commando Drift (*Hoopstad*).—Crops bad owing to drought and locusts Rainfall: Nil.—South African Police.

Prospect (*Vrede*).—The conditions throughout the month have been very dry. No frost, which is fortunate, as some mealies are backward. Stock healthy, but not in as good condition as is usual at this time of year. Rainfall: 0·01 inch on one day.—T. Pitcairn.

Springbokvlakte (*Vredefort*).—Crops a failure. Rainfall: Nil.—M. E. Brindley.

Mon Repos (*Wepener*).—Drought and locusts; outlook for winter very bad, no winter feed or wheat yet sown. Rainfall: Nil.—Major E. M. Hardiman.

Paardekraal (*Winburg*).—No green crops sown yet. No ground ploughed. Cattle have lost condition owing to wireworm, especially in young cattle. Sheep good, but lambs bad, suffering from worms. Plenty of grass of a sort. Teff and blue-grass hay in plenty. No silage owing to mealie crops dying of drought. Outlook for winter very black. Rainfall: 0·04 inch on one day.—G. S. Lowe.

Natal.

Hlabisa.—Rains are urgently needed to bring on the veld before winter sets in. Rainfall: 1·25 inch on six days.—L. Double.

Maritzburg (*Mental Hospital*).—The month has been very dry. Country suffering slightly from drought. Rainfall: 0·49 inch on seven days.—The Staff.

Dundee.—A very dry month; crops and veld suffering. Quite a severe hailstorm on the 30th at about 1.30 p.m., many stones being the size of large pigeon eggs. Rainfall: 0·87 inch on three days.—West Thorrold.

Stanger.—This has been the calmest month this year. Rainfall: 2·04 inches on seven days.—C. C. Foss.

Cape St. Lucia.—Strong north-easterly winds during month. Stock are healthy and grazing good. Rainfall: 3·06 inches on ten days.—J. Murphy.

Mid-Illovo.—A very warm month. Veld getting brown. Stock going off in condition. Rainfall: 1·25 inch on eleven days.—Lieut.-Colonel J. W. V. Montgomery, C.M.G., D.S.O.

Nottingham Road.—Dry, excellent harvesting weather. Temperature very variable. Two hailstorms (10th and 30th), but not damage. A little horse-sickness. All other stock healthy. Rainfall: 1·15 inch on nine days.—Miss E. Smythe.

Howick.—Very dry month; rain badly needed. Rainfall: 0·51 inch on six days.—T. H. Maby.

Newcastle.—An exceptionally dry month. Rainfall: 3·56 inches on five days.—J. Robbins.

Newcastle (The Academy).—On the whole, weather fine during month. Comparatively small rainfall. Nights and early mornings began to get considerably colder about the 20th. Rainfall: 2·89 inches on three days.—The Mother Superior.

Nkwaleni (Emtonjaneni).—Country very dry. I have never known it so dry at this season. Rainfall: 0·68 inch on four days.—K. W. Young.

Roseleigh (Klip River).—On 26th slight frost, no damage to crops. Rainfall: 0·08 inch on one day.—K. de Jongh.

Edendale (Klip River).—Very dry. Crops gone off at least 25 per cent. during month. All stock in excellent condition. No frost yet. No horse-sickness or blue-tongue during month. Rainfall: 0·10 inch on two days.—T. W. Niland.

Rongpoort (Weenen).—Exceedingly dry. Crops suffering considerably, and veld as brown as in mid-winter. Has been hot for April. No frost. Rainfall: 0·50 inch on three days.—J. H. Bartholomew.

Cape.

Groot Drakenstein.—The maximum temperature on the 4th (104·6 degrees) highest yet experienced in April. Previous highest, 101·2 degrees in 1910. Rainfall: 1·59 inch on five days.—Lionel Baker.

Graaff-Reinet.—Winds moderate. A warm dry month. Rainfall: 0·32 inch on two days.—S. E. D. Treadwell.

Kenhardt.—Continued severe drought. Rainfall: Nil.—R. Seydell.

O'okiep.—Promise of rain invariably spoilt by adverse southerly wind. Rainfall: 0·11 inch on two days.—J. Burrows.

Kimberley.—Dust storms frequent. Rainfall: Nil.—Jno. Acton.

Kokstad.—Dry month. No frost. Welcome rain on the 30th, but not very general. Rainfall: 0·36 inch on two days.—H. D. Coyte.

Somerset East.—Summer temperature unusually prolonged. Rain badly needed. Rainfall: 1·15 inch on six days.—C. Harris.

Vryburg.—Drought severe. Fountains and boreholes giving in. Rainfall: Nil.—H. W. Colleen.

Aliwal North.—Drought serious; rivers low and water supply failing in many places. Rainfall: 0·08 inch on two days.—Alex Alcock.

Bedford.—Following on the shortage of March rainfall, April had all the indications of drought, but the nice rains at the end relieved anxiety for the time being. Rainfall: 1·85 inch on six days.—T. C. Hall.

Queenstown.—Dry month; no veld; prospect for winter feeding serious. Rainfall: 0·68 inch on five days.—H. Holley.

Clanwilliam.—The month holds record of hottest day this season, 106·5 degrees on 4th, on which day the maximum temperature was nearly 30 degrees higher than on the 1st; otherwise this was a very pleasant month, little wind, and two welcome falls of rain. Rainfall: 0·62 inch on two days.—P. E. Scholtz.

Riversdale.—At the end of this month also the corn lands have been ploughed and begin to shine green, but a good soaking rain would do much good to the young seed. Rainfall: 1·23 inch on seven days.—Rev. Carl Prozesky.

Abtonia (*Kuruman*).—Very hot and dry; lack of wind during latter half of month caused great shortage of windmill water. Rainfall: Nil.—A. T. Sitwell.

Rietfontein (*Aliwal North*).—Very dry month. Rainfall: Nil.—A. G. Smith.

Maclear.—Generally very hot month. Oldest inhabitants say driest April in their remembrance. Also remarkable for absence of frost. Rainfall: 0·51 inch on three days.—Dr. W. Mackenzie.

Grassridge (*Cradock*).—Very little wind, and most days no wind until afternoon. Veld dry. Rainfall: 0·41 inch on two days.—S. Whitwham.

Sydney-on-Vaal (*Barkly West*).—Continued drought already being severely felt on surrounding farms. Outlook for live stock during winter is very serious. Considerable amount of cloud appeared during the day in last week of month, but no precipitation whatever took place. Complete absence of frost until early morning of 30th. Rainfall: Nil.—J. G. Richards.

Ceres.—Weather generally on the change towards winter with heavy dews. Severe storm on the morning of the 12th, which lasted only a short time, but blew down lots of fruit. Rainfall: 2·44 inches on six days.—A. Heatlie.

Ovendale (*Willowmore*).—Veld and crops in beautiful condition. Stock excellent. Lambing season a success. Rainfall: 1·44 inch on four days.—P. J. Kilian.

Bucklands (*Herbert*).—Stock in good condition considering the drought. Rainfall: Nil.—A. C. Martin.

Lauriston (*Barkly East*).—Drought very severe; plenty of grass on some farms; springs giving in. Stock in fairly good condition. Rainfall: 0·15 inch on one day.—H. R. Giddy.

Elma (*Vryburg*).—Large swarms of flying locusts are passing almost daily, but we have had none on the farm yet. Mealie and kaffir-corn crops are almost a total failure. Rainfall: Nil.—A. Geiling.

BECHUANALAND.

Mahalapye.—Very dry, hot winds, most trying. Rainfall: Nil.—Miss M. Giles.

Serowe.—The crops are ruined owing to the prolonged drought. Rainfall: Nil.—W. H. Ellam.

BASUTOLAND.

Mafeteng.—Very dry month, the only rainfall recorded being 0·01 inch on 20th. Hot days; cool nights. Dust-storms frequent. Veld dried up. Very little grazing.—F. Hodgson.

WEATHER CHARACTERISTICS FOR THE MONTH OF JUNE.

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 north-west and south, 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 south-south-east from south during May, thus causing a considerable increase in the number of south-south-easterly winds, and a corresponding diminution in those from south. Over this area, moreover, there is a lower percentage of winds from those points of the compass from west-north-west round by north to east-north-east, as well as south and south-west, but an increased percentage of winds from all other directions. Notwithstanding a considerable diminution in the frequency of north-westerly (west-north-west—north-north-west) winds and a slight increase in all other directions (except south-west and south-south-west), 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 west-north-west, as a consequence of a falling off in frequency of north-easterly and south-westerly winds, together with an actual increase of those from north-westerly directions.

C. STEWART,

Chief Meteorologist.

Pretoria.

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. III. **MAY, 1922.** **No. 5.**

MEAN pressure above normal over the western half of the Union; temperature about two degrees lower than usual, the deficit being equally divided between the days and nights: frosts principally during the first week and the middle of the month; an excess of rainfall over the greater part of the Transvaal, the north and north-east of the Free State, Natal, and the south and south-east coastal areas of the Cape Province; a deficiency elsewhere: an unusual number of hailstorms of light intensity; snow in parts of the Free State, Natal, Kaffraria, portions of the north-east and the Karroo, most widely from 14th to 16th; a number of thunderstorms over the centre and east—such were the leading features of the weather of *May*, 1922.

Pressure.—Mean barometric pressure, as shown on the accompanying map, was practically normal in the north-east, but above the average in the west, south, and centre of the Union. The accompanying weather was somewhat abnormal, particularly over the south-west, where it partook more of the fine dry summer type than of the wet cloudy character usually associated with this winter month. Although at times unsettled and showery, the rainfall over this area was considerably below normal. Over the interior the weather was generally fine and dry, but unsettled and cloudy, with rain at times over the east and south-east. Anticyclonic conditions prevailed throughout the month, and low pressure areas appeared on only a few days, viz. over the east on 1st, over the south-west and south on 10th, 23rd, and 24th, and over the south-east and east on 13th to 15th.

Temperature.—The mean temperature of the month (57·9 degrees) was 1·8 degree lower than usual, the difference being equally divided between the days with 69·6 degrees and the nights with 42·6 degrees. A shortage in mean temperature was common to all the Provinces, also to Swaziland and Basutoland, varying from 2·6 degrees in Natal through 2·5 degrees in the Transvaal, and 1·8 degree in the Orange Free State to 1·2 degree in the Cape Province. The deficit in the mean day temperatures was greatest (3·4 degrees) in Natal, where the month's maximum was 72·3 degrees; in the Transvaal the shortage was 2·5 degrees, with a mean day temperature of 69·3 degrees; in the Cape Province the month's maximum was 69·9 degrees, or 1·0 degree lower than

usual; whilst in the Orange Free State the mean of the day readings was 64·7 degrees, only 0·7 degree below normal. On the other hand, the largest deficiency in the night temperature was 3·0 degrees in the Free State, where the mean minimum was 34·6 degrees; in the Transvaal the mean of the night temperatures was 39·9 degrees, or 2·4 degrees lower than normal; in Natal, with a mean minimum temperature of 45·9 degrees, the deficit was 1·9 degree; and in the Cape Province, with 44·7 degrees as the mean of its night temperatures, the shortage was only 1·3 degree. Considering the individual stations, an excess in the mean temperature of the month was practically confined to a few stations on the south and south-east coasts, the excesses being mostly less than a degree, except at the Royal Observatory in the Cape Peninsula and at Port St. Johns in the Transkei, where the month's temperature exceeded the average by 1·4 degree. The only other stations where surplus amounts were experienced were Carnarvon and Stutterheim in the Cape Province, where the excess was 0·2 degree, and Louis Trichardt in the northern Transvaal, where an excess of 0·6 degree was recorded. Elsewhere the mean monthly temperature was sub-normal, mostly by 2–3 degrees, but ranging in the Transvaal from 0·7 degree at Potchefstroom to 5·8 degrees at Barberton; in the Free State from less than half a degree at Ladybrand to 3·0 degrees at Lindley; in Natal from 1·2 degrees at Ladysmith and Weenen to 4·4 degrees at Estcourt; and in the Cape Province from 0·3 degree at Graaff-Reinet to 3·7 degrees at Kokstad in Kaffraria. The day temperatures were mostly below normal, commonly by 3–4 degrees in the Transvaal, but ranging from 1·4 degree at Belfast to 7·1 degrees at Pietersburg; usually by a few tenths of a degree in the Orange Free State, but increasing to 2·9 degrees at Harrismith; usually by 3–4 degrees in Natal, but varying between 1·5 degree at Ladysmith and 5·1 degrees at Estcourt; mostly by much lower amounts in the Cape Colony, generally 2–3 degrees, a number of stations being sub-normal by only a few tenths, however, but with a deficit of 5·4 degrees at Bedford. The mean maxima were above the average in the north and south of the Transvaal; in the central portion of the Free State, with parts of the northern border and northern Karroo in the Cape, as well as along the south coastal area, these excesses were greatest, 2–3 degrees in the south-west and central portions of the Cape Province, and least, a few tenths of a degree, in the Free State. Similarly, the night temperatures were, with few exceptions, much lower than usual, commonly by 1–3 degrees. The deficits were generally about 1–2 degrees in the Cape Province and Natal, but ranging from 0·2 degree at the Royal Observatory and Wynberg in the Cape Province to 4·9 degrees at Clanwilliam, and rising to 5·1 degrees at Dundee in Natal; in the Free State the shortages varied between 0·6 degree at Harrismith and 6·5 degrees at Lindley; and in the Transvaal usually by 2–4 degrees, but falling to 0·3 degree at Louis Trichardt, and rising to 6·5 degrees at Belfast. The stations where the nights were warmer than usual were comparatively few in number, and the excesses small in amount; thus, Pretoria, the only station in the Transvaal, Stanger in Natal, and Hlabisa in Zululand, were warmer than usual by less than half a degree; in the Cape Province surplus amounts of less than a degree were recorded at Vryburg, Sydney's Hope, O'okiep, and Graaff-Reinet; Mossel Bay was warmer than the average by a little more than a degree, and Port St. Johns by 3·4 degrees. The mean warmest station was Komatipoort with a temperature for the month of 66·4 degrees, Port St. Johns following close after with 66·0 degrees. The mean coldest station was Belfast, with 45·5 degrees, a difference of 20·9 degrees. The highest mean maximum was 80·4 degrees at Komatipoort, and the lowest mean minimum 30·4 degrees at Belfast. The highest temperatures of the month were registered on twenty different days,

most widely between the 24th and 26th, whilst the lowest temperatures were registered on only thirteen days, and mostly on the 17th and 18th. The extreme readings for the month were 98·0 degrees at Port Nolloth on the 5th and 15·9 degrees at Lindley on the 17th, showing an extreme monthly range of 82·1 degrees. *Frosts* generally seem to have been less severe than usual, and were mainly confined to the period between 3rd and 20th; the weather was comparatively mild during the last third of the month.

Precipitation.—This month presented certain peculiarities, inasmuch as the Cape Peninsula was mostly under fine summer conditions, with a few days of unsettled showery weather; there was a failure of the usual rains in Namaqualand, as well as a general shortage over the winter-rainfall area; whilst a good portion of the summer-rainfall area experienced an excess of precipitation. Except in the south-west and the north-east, the rainfall was in excess over the Transvaal by amounts varying between a few hundredths and 1⅓ inch (1·31 inch at Pretoria). A small surplus occurred in the north and east of the Free State, whilst at Bloemfontein the rainfall was equal to the average. In the west and south precipitation was subnormal by quantities between 0·10 inch and 0·60 inch. An excess was general in Natal, ranging from half an inch to about 2½ inches. There was, however, a small deficit in Zululand. In the Cape Province a supranormal rainfall was confined to a comparatively narrow belt parallel with the south and south-east coasts from Mossel Bay to Kokstad, portion of the south-west, and to a few stations over the northern border, e.g. Upington and Kuruman. These excesses were mostly small in the south and over the northern border, but exceeded 1 inch over the south-east and Kaffraria, being 1·06 inch at East London and 2·29 inches at Kokstad. Elsewhere there were deficits, increasing from a few hundredths of an inch over parts of the northern border and the northern Karroo to over 1 inch in the south-west, increasing to over 2 inches over the Cape Peninsula. At Wynberg in the last-mentioned area there was a shortage of 2·90 inches. The rainfall was mostly light, and occurred chiefly between the 10th and 15th over the greater part of the western half of the Cape Province, but exceeding 2 inches in places along the south coast and 5 inches in Kaffraria on the 14th. Showers of rain or snow also occurred towards the end of the month, between the 29th and 31st, being heaviest in Natal on the 30th, where quantities of 2–4 inches were recorded in some areas. Similar quantities were registered, but more generally, in that Province on the 15th. Over the Transvaal rain fell over limited areas between the 1st and 3rd, but more widely on the 11th, 30th, and 31st. These latter rains on the 11th, 30th, and 31st also affected the Free State, and were accompanied by widespread thunderstorms, with frequent falls of hail, whilst snow covered the ground at Caledonia (District Harrismith) to a depth of 6 inches on the 31st. Snow also fell over parts of the eastern section of the Cape Province, Kaffraria, and at some stations in the south of Natal on the 15th. The snow attained a depth of 6 inches in the town of Kokstad itself, but was reported as 3 to 5 feet deep (probably in drifts) on surrounding farms; it was also 12 inches deep at Kilcullen (Barkly East), and 5 feet on the Drakensberg Mountains; the subsequent cold caused serious losses in stock, which were in poor condition as a result of drought. Hills to the south-west of Cradock were topped with snow from 17th to 22nd. Hail (apparently mostly "soft hail," of medium size, with occasional larger stones) was a common accompaniment of the thunderstorms of this month, particularly those of the 31st. In Durban the rain was peculiarly local on the 31st: 1·74 inch was registered at the Point and 4 inches at one part of the town. Taken as a whole, although temperature has been lower than usual, there was a marked absence of extremely low temperatures. The frost on the 4th at Nottingham Road (Natal) caused a

tremendous amount of damage to green winter food and young plantations: whilst that on the 5th at Tabert (Ermelo District) is stated to have killed everything. Grazing is generally poor over the greater part of the country, stock falling off in condition in many areas; in some instances cattle, as at Boshofshoop (District Jacobsdal), are dying from poverty, and in Prieska District many farmers have been compelled to kill the lambs to save the ewes. The rains at the middle and end of the month improved matters somewhat in a number of districts, and enabled ploughing operations to be carried out. In Rustenburg Division the cotton crop is described as not unsatisfactory, but from Rugby (Bethlehem) and Heilbron (Orange Free State) the mealie crop being harvested is very disappointing, "falling below the expectations of even the pessimist" in the former area.

The accumulated rainfall since the 1st of July, 1921, is above the average over portions of the Transvaal high veld and of the Zoutpansberg, the greater portion of Natal, the neighbourhood of Harrismith in the Free State, portion of the interior of the Transkei, the southern part of the northern Karroo, the central Karroo, and parts of the southern Karroo, south-west and south coastal areas. The excesses ranged from 1–7 inches in the Transvaal, from a few hundredths to about 14 inches in Natal, was a quarter of an inch at Harrismith, and varied from a few tenths to about 9 inches (8·71 inches at Kokstad) in the Cape Province. Elsewhere there were mostly large deficits, but varying from 0·06 inch at Rooiberg to 12·14 inches at Louis Trichardt in he Transvaal, from 0·08 inch at Kroonstad to almost 10 inches in the southern half of the Free State, about half an inch at a few stations in Natal, and from a few tenths to about 11 inches at Mafeking in the Cape Province, the deficit as a rule decreasing in a south-westerly direction; Wynberg, however, in the Cape Peninsula, is short of the normal by practically 9 inches. At Mafeteng in Basutoland the deficiency amounts to 11·40 inches. A much worse state of affairs is presented by a comparison of the rainfall since the beginning of the year with the normal amounts. Excesses over this period in the Transvaal are small, less than an inch, and limited to a few stations in the high veld; in the Cape Province small surplus amounts are met with in the south-west (exclusive of the Cape Peninsula), but the excesses along the south coast and over the southern Karroo to 1–4½ inches being least in the east inland section. Over the remainder of the country there are mostly large shortages, being greatest over the interior, where they range mostly between 4 and 7 inches. In the Transvaal the deficits range from a third of an inch to 13 inches; in the Free State from 3–4 inches in the north and east to 7–8 inches in the south and west; in Natal from half an inch at Durban to 10·78 inches at Hlabisa in Zululand; and in the Cape Province from a quarter of an inch at Ceres to about 9 inches at Mafeking.

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

C. STEWART,
Chief Meteorologist.

Pretoria.

OBSERVERS' NOTES FOR MAY, 1922.

TRANSVAAL.

Ermelo.—Meteorological conditions during May have been remarkably varied—mild to hard frosts, then a return to mild weather. The country looks brown, and very thin for cattle to graze. An early summer is eagerly expected. Rainfall: 0·83 inch on four days.—Mrs. S. M. Nicolson.

Middelburg.—Warm days and frosty nights obtained during the month, with occasional cold winds from south-east or south-south-west. The days, however, have been mild, and only a few degrees of frost have been recorded—6 degrees on the ground on two occasions, otherwise from 2 to 4 degrees only—but frost occurred to this limited extent on twenty-one out of the thirty-one nights during the month. Nothing like a hard winter has yet manifested itself. However, on the 31st thunderstorms occurred at intervals during the night, with light showers during the day. Rainfall: 1·71 inch on three days.—Dr. H. A. Spencer.

Mosdene (Naboomspruit).—Rather a cold month, the mean of the minimum temperatures being 39·2 degrees as against 43·0 degrees last year. Rainfall: 0·31 inch on four days.—Ernest E. Galpin.

Gemboksfontein (*Middelburg*).—Several cold windy days were experienced during the month. Rainfall: 1·99 inch on five days.—Geo. J. Imrie.

Grootboom (*Rustenburg*).—Thanks to the rains, veld is in good condition. Locusts were still doing damage in the earlier part of the month, and the grass-fires lit to exterminate them often got out of hand. Farmers are reaping maize and cotton crops, the latter not unsatisfactory. Cattle are in very good condition. Rainfall: 0·84 inch on two days.—J. N. van Nouhuys.

Government House (*Pretoria*).—31st May, heavy hail of medium size during night. Crops damaged, gutters and downpipes choked, causing flooding in house. Rainfall: 2·92 inches on three days.—J. Miller.

Tabert (*Ermelo*).—5th May, heavy frost, everything killed. Rainfall: 1·20 inch on three days.—J. Uijs.

Welterreden (*Standerton*).—Farmers busy reaping mealies. Rainfall: 0·65 inch on one day.—D. Lane.

Swaziland.

Croydon.—Dry, badly in need of rain. Grass burned up, but the rain on 30th (1·19 inch) freshened it up. Rainfall: 1·22 inch on two days.—Alex. Brown.

Orange Free State.

Holfontein (*Kroonstad*).—The veld is very poor indeed in the district, and the cattle are falling off in condition very rapidly owing to the severe drought and cold nights. Rainfall: 1·30 inch on two days.—L. C. McInery.

Rugby (*Bethlehem*).—During the first half of the month the weather was exceedingly cold and windy, and stock suffered considerably. Only hoar frosts have fallen during the month. Mealie reaping is now in progress, and the yield is falling below the expectations of even the pessimists. A few isolated cases of gall-sickness have occurred in this vicinity. Rainfall: 1·01 inch on two days.—A. C. Glynn Baker.

Normandale (*Bethulie*).—Very dry, and stock generally doing badly. No grass. Rainfall: 0·27 inch on two days.—D. S. Denyssen.

Lokshoek (*Fauresmith*).—Since 8th May, 1921, we have only had 5·43 inches of rain. Nearly all our neighbours have already trekked with their cattle. The outlook for winter is very black. Rainfall this month: 0·50 inch on two days.—Visser Bros.

Fouriesburg (*Ficksburg*).—We have had very dry weather. This last rain (1·13 inch on 31st) is the first good rain for some time, and will enable ploughing to be commenced. Things are bad here this year. No grass, and stock poor. Crops a partial failure. Rainfall: 1·39 inch on two days.—R. H. Venter.

Stanleyvale (*Harrismith*).—A cool month. Cattle fell off in condition; nearly finished reaping. Rainfall: 1·83 inch on three days.—G. C. Atkins.

Heilbron (*Heilbron*).—Harvesting in progress, but results seem indifferent, and crop appears to be disappointing. Forage crops, more largely sown than last season, appear to be plentiful, and prices low at present. Natural grazing scarce and poor quality. Live stock on the whole not bad, but afraid they will suffer from now on. No outbreaks of disease of any kind during month on commonage. Rainfall: 0·81 inch on two days.—P. A. du P. Naude.

Boshofskop (*Jacobsdal*).—14th, calf died of poverty owing to drought. 19th, cow died, poverty, drought. Rainfall: 0·30 inch on two days.—G. Webster.

Paardekraal (*Winburg*).—Very dry, but still plenty of grass of a sort. Water supply low. Stock in quite good condition. Rainfall: 0·71 inch on two days.—G. S. Lowe.

NATAL.

Ismont (*Mid-Illovo*).—Unusual rainfall, 2·97 inches on eight days, including 2 inches on 14th and 15th, accompanied by southerly gale. Not much frost, and grazing fairly good.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Newcastle (*Convent*).—Intense cold set in at commencement of month, and, with few exceptions, remained so. High winds and cloudy days were frequent. Rainfall: 0·69 inch on two days.—The Mother Superior.

Cedara (*School of Agriculture*).—Cold spell at beginning of month. Mild latter part of month. Rainfall: 1·84 inch on nine days.—The Principal.

Nottingham Road.—After a comparatively mild autumn, the sudden severe frost on the 4th did a tremendous lot of harm to green winter food and young plantations. Every storm was accompanied by hail, which is most unusual. Rainfall: 0·85 inch on ten days.—Miss E. Smythe.

New Hanover.—Unusually warm weather for the time of the year. Rainfall: 3·10 inches on four days.—Mrs. E. M. Herbert.

Newcastle.—Frost appeared early during the month, and much damage was done to mealies and other crops, such as potatoes and millet. Grazing in this district is becoming poor, although stock are still keeping fit. Rainfall: 1·35 inch on three days.—The Gaoler.

Dundee.—Warm weather generally, with threatening rain clouds and little rain. Rainfall: 1·05 inch on six days.—West Thorrold.

Durban (*Point*).—Generally very fine. The rainfall, 8·06 inches on six days, well above the average for a number of years owing to very heavy downpours on the 14th (3·84 inches) and 30th (1·74 inch); over 4 inches were recorded at one part of the town on the latter date. These rains were accompanied by heavy thunderstorms—otherwise little or no lightning. Fair amount of dew. Generally very hazy early morning and clear remainder of day.—The Port Captain.

Estcourt.—Early winter, grazing poor, and cattle generally in thin condition. Rainfall: 0·84 inch on seven days.—A. A. McLean.

Hlabisa.—Weather seasonable, but rain is still needed very much to ensure winter grazing. Rainfall: 1·47 inch on seven days.—L. Double.

Ladysmith.—Clear, cold weather during the greater part of the month. Good rains on the 11th (0·56 inch) and 31st (0·44 inch), but too late to be of any use to crops. Rainfall: 1·06 inch on four days.—D. A. R. Leathern.

Kloofend (*Alexandria*).—Rainfall 3·33 inches on five days (2·40 inches on 15th). This is the heaviest rain for month of May since 1910.—J. D. Cruickshank.

Rongpoort (*Weenen*).—First frost on 3rd, not severe. No severe frosts during the month. Very dry, and late crops suffering from drought. Rainfall: 0·88 inch on six days.—J. H. Bartholomew.

CAPE.

Bedford.—The rains on the 14th (0·88 inch) and 15th (0·23 inch) saved the situation. Even so, rain much below the average, and a shortage of water for this winter is anticipated. Rainfall: 1·58 inch on nine days.—T. C. Hall.

Carnarvon.—District suffering severely from drought. Rainfall: Nil.—A. P. Malherbe.

Clanwilliam.—Scorching east wind, strongest during early morning and forenoon on 3rd, 4th, and 5th. Rainfall: 0·77 inch on four days.—P. E. Scholtz.

Graaff-Reinet.—Winds moderate and variable. Rainfall: 0·97 inch on five days.—S. E. D. Treadwell.

Grahamstown.—Welcome rains on 14th (1·67 inch) and 15th (0·51 inch), enabling winter ploughing and sowing to be done. Rainfall: 2·72 inches on six days.—The Veterinary Research Officer.

Groot Drakenstein.—Beautiful weather prevailed during the month. Days unusually hot during first period, and nights abnormally cold during latter half of month. The mean minimum, 45·0 degrees, is the lowest recorded for May. Rainfall: 5·70 inches on seven days.—Lionel Baker.

Somerset East.—Very dry, rain badly needed. Cold nights, with frequent frosts during second fortnight. Rainfall: 1·03 inch on eight days.—C. Harris.

Mafeking (*Convent*).—Bright cloudless skies almost the whole month, 30th and 31st dark and dull. Sudden thunderstorm on 31st, lasting about fifteen minutes, followed by the usual bright winter weather. Rainfall: 0·21 inch on three days.—The Mother Superior.

Kokstad.—Exceptionally cold May. Heavy fall of snow all day 15th. Did a lot of good to winter feed, etc., but the extreme cold caused serious losses in stock, which, owing to drought, were in poor condition. Snow is still on Mount Currie and Ingeli Mountains on 31st. Snowfall in town 6 inches, on farms from 3 to 5 feet. Rainfall: 3·44 inches on five days.—H. D. Coyte.

O'okiep.—Winter delayed, and farming interests suffering. Rainfall: 0·12 inch on three days.—J. Burrows.

Queenstown.—Dry month, with hoar frost on seven mornings. Rain badly wanted. Rainfall: 0·22 inch on seven days.—H. Holley.

Sydney-on-Vaal (*Barkly West*).—Unusual disturbed atmospheric conditions for this season of the year at end of the month. Light rain fell on 29th and 30th, and heavy thunderstorm passed from west to east, just south of this station in afternoon of the 31st. Rainfall: 0·29 inch on three days.—J. G. Richards.

Great Fish Point (*Bathurst*).—On the night of the 14th we had the nicest rain (1·47 inch) for a long time; the country is nice and green, and all stock doing well. We have had a number of very fine days; very light winds, warm, turning chilly towards evening. Rainfall: 2·73 inches on five days.—H. W. Mantle.

Darling (*Malmesbury*).—Farmers have been able to get on well with ploughing, and the season so far is favourable. Rainfall: 1·93 inch on seven days.—P. H. Drake.

Prieska.—A general drought prevails throughout the district. Stock owners losing heavily in some places, especially now that the lambing season has started. In many instances farmers are compelled to kill the lamb in order to endeavour to save the mother. There is, however, a marked change in the weather of late; now the rain has started, better prospects are anticipated. Rainfall: 0·26 inch on two days.—P. J. Fourie.

Ceres.—Weather generally less wintry than usual. Very little wind, heavy dews, and only moderate frost. Rainfall: 4·66 inches on seven days.—A. Heatlie.

Lovedale.—The month began with ground damp from rains in late April, and very good steady rains fell in the middle of May, keeping the soil moist throughout. Some cold winds, and snow on the mountains. Rainfall: 1·98 inch on eight days.—Charles A. Pilson.

Maclear.—Rain during this month is very unusual. The month has been very mild, and with the unusual amount of moisture obtained a very favourable coming season is expected. Rainfall: 2·10 inches on eight days.—Dr. W. Mackenzie.

Grassridge (*Cradock*).—Nothing unusual to report. Veld very dry. Unable to plough for want of rain. The tops of hills on a range south-west of this station covered with snow from 17th to 22nd. Rainfall: 0·02 inch on one day.—S. Whitwham.

Snyders Kraal (*Murraysburg*).—Droughts severe, stock dying. Rainfall: Nil.—J. van Heerden.

Newyearskraal (*Prieska*).—Fearfully dry; stock in low condition; lost all lambs this year, big sheep still holding out; cattle dying.—Rainfall: 0·65 inch on two days.—S. Louw.

Kilcullen (*Barkly East*).—The winter has been very severe for the month of May. We had a heavy fall of snow which was up to 12 inches deep on the level ground, and more than 5 feet on the Drakensberg Mountains. The loss of sheep buried under snow amounts to nearly 1500; stock have fallen off in condition. Rainfall: 1·10 inch on four days.—O. A. S. Vorster, J.P.

Bechuanaland.

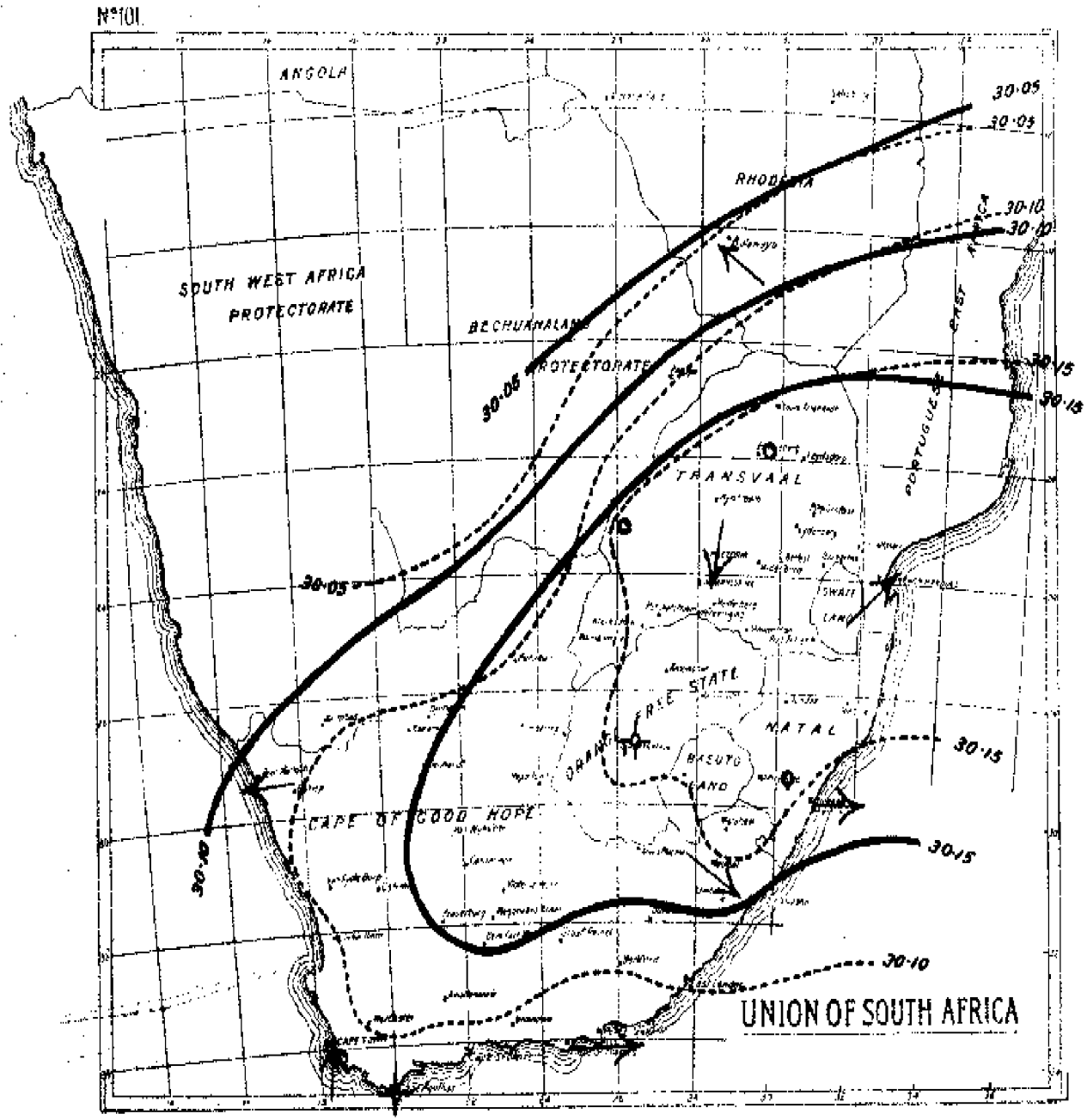
Maun (*N'gamiland*).—Bright sunny weather every day. Prevailing winds south-east and east. Rainfall: Nil.—P. K. Canning.

Basutoland.

Mafeteng.—Very dry and dusty month. Warm sunny days, with cold nights. Nice soft rain fell on the 30th, totalling 0·34 inch. Rainfall: 0·38 inch on two days.—F. Hodgson.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), MAY, 1922

Place.	Observer.	Month—May, 1922. Mean Max.	Month—May, 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
Transvaal—		° F.	° F.	° F.	° F.	° F.	° F.		° F.	
Barberton	Walter Grubb	72·9	50·1	61·5	63·5	− 2·0	83·0	20th	43·0	17th.
Belfast	The Forester	60·6	30·4	45·5	51·3	− 5·8	67·0	11th, 24th, 25th, and 26th	20·0	18th.
Bloemhof	A. Adamson	70·8	35·4	53·1	55·1	− 2·0	80·0	24th	22·0	18th.
Ermelo	Mrs. S. M. Nicolson	65·5	33·8	49·6	52·6	− 3·0	72·0	25th and 26th	24·0	5th.
Johannesburg (Observatory)	The Staff	63·3	43·0	53·2	54·5	− 1·3	69·0	27th	31·2	15th.
Klerksdorp (Strathmore)	Chas. Scott	70·2	35·6	52·9	56·4	− 3·5	77·0	26th	25·0	17th.
Komatipoort	H. J. Evans	80·4	52·4	66·4	68·1	− 1·7	92·0	11th	40·0	19th.
Louis Trichardt	I. J. de Bruin	73·9	47·5	60·7	60·1	+ 0·6	83·0	14th	39·0	16th.
Middelburg	Dr. H. A. Spencer	67·5	34·7	51·1	54·4	− 3·3	75·0	1st	26·0	18th and 19th.
Nylstroom	G. Bakker	70·4	38·7	54·6	58·6	− 4·0	79·5	20th	32·0	16th.
Pietersburg	W. Dempster	66·5	41·8	54·2	58·1	− 3·9	72·0	14th, 24th, 25th, and 26th	35·0	18th and 19th.
Piet Retief	J. Werner	66·7	42·8	54·8	56·9	− 2·1	76·2	24th	36·1	17th.
Pigeonhole	Jno. McCallum	64·1	50·6	57·4	—	—	74·0	1st and 11th	45·0	16th and 17th.
Pilgrims Rest	E. M. Skea	66·9	41·0	54·0	56·4	− 2·4	75·5	23rd	33·0	16th, 17th, and 18th.
Potchefstroom (Exp. Farm)	The Manager	71·9	35·4	53·6	54·3	− 0·7	78·7	27th	23·0	17th.
Pretoria (Meteorological Office)	The Staff	68·6	41·0	54·8	56·7	− 1·9	75·4	26th	33·2	19th.
Standerton		—	—	—	—	—	—	—	—	—
Zeerust	H. Dietrich	69·8	37·5	53·6	56·5	− 2·9	76·7	1st	28·0	18th and 19th.
Swaziland—										
Mbabane	Swaziland Police	67·0	45·5	56·2	59·6	− 3·4	76·0	11th and 26th	37·0	5th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	66·7	34·8	50·8	53·1	− 2·3	74·3	8th	23·0	7th.
Bloemfontein	G. A. Schepers	65·8	36·9	51·4	53·0	− 1·6	73·2	24th	23·4	17th.
Harrismith	The Forester	59·5	35·2	47·4	49·1	− 1·7	66·0	5th, 24th, and 26th	24·0	4th.
Ladybrand	The Forester	65·1	30·1	50·6	51·0	− 0·4	74·0	27th	20·0	17th.
Hudley	J. Collister-Oates	66·5	30·2	48·4	51·4	− 3·0	72·0	2nd, 3rd, and 27th	15·9	17th.
Natal—										
Dundee	West Thorrold	68·2	38·6	53·4	57·9	− 4·5	78·0	25th	30·0	4th, 17th, and 19th.
Durban (Point)	The Port Captain	74·2	57·0	65·6	67·8	− 2·2	80·2	10th	49·6	18th.
Estcourt	A. A. McLean	68·1	36·8	52·4	56·8	− 4·4	77·0	24th	27·0	18th.
Hlabisa	The Gaoler	73·9	56·3	65·1	66·4	− 1·3	84·0	21st	52·0	17th and 18th.
Ladysmith	D. A. R. Leatheru	72·9	39·8	56·4	57·6	− 1·2	83·0	26th	29·0	18th.
Maritzburg (Mental Hospital)	The Staff	71·4	46·7	59·0	61·9	− 2·9	81·8	10th	37·2	17th and 18th.
Stanger	C. C. Foss	75·2	56·5	65·8	67·0	− 1·2	88·5	10th	50·3	17th.
Weenen	The Gaoler	74·5	35·4	55·0	58·6	− 3·6	81·0	10th	27·0	4th and 17th.



May, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.

The dotted lines indicate the normal distribution for May.

AIR TEMPERATURES, MAY, 1922—*continued.*

Place.	Observer.	Month—May, 1922.		Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes.			
		Mean Max.	Mean Min.				Highest.	Date.	Lowest.	Date.
		° F.	° F.	° F.	° F.	° F.	° F.		° F.	
Cape—										
Alfred North	Alex. Alcock	66·3	32·8	49·6	51·8	− 2·2	74·0	25th	22·5	19th and 20th.
Bedford	T. C. Hall	66·2	44·1	55·2	58·7	− 3·5	79·0	9th	30·0	3rd and 20th.
Capetown (Royal Observatory)	The Staff	70·1	50·5	60·3	58·9	+ 1·4	89·0	7th	40·8	16th.
Carnarvon	A. P. Malherbe	67·5	36·0	51·8	51·6	+ 0·2	77·0	5th	25·0	18th and 19th.
Clanwilliam	P. E. Scholtz	74·5	41·9	58·2	60·8	− 2·6	90·2	4th	32·0	23rd.
East London	The Port Captain	72·5	53·3	62·9	62·4	+ 0·5	91·0	24th	45·0	18th.
Graaff-Reinet	S. E. D. Treadwell	70·4	46·1	58·2	58·5	− 0·3	83·3	9th	36·0	27th.
Grahamstown	The Vet. Res. Officer	68·5	42·2	55·4	58·6	− 3·2	84·2	24th	34·0	28th.
Groot Drakenstein	Lionel Baker	71·5	45·0	58·2	58·8	− 0·6	88·4	4th	35·4	23rd.
Kenhardt	R. Seydell	73·3	39·8	56·6	58·4	− 1·8	82·0	22nd	28·0	18th.
Kimberley	J. Acton	70·8	40·9	55·8	55·8	± 0·0	78·0	6th and 24th	31·0	18th.
Kingwilliamstown	L. Clayton	71·0	45·2	58·1	60·8	− 2·7	86·5	24th	36·0	18th.
Kokstad	H. D. Coyte	64·1	35·9	50·0	53·7	− 3·7	74·0	25th	25·8	4th.
Maleding (Convent)	The Mother Superior.	72·2	40·1	56·2	58·6	− 2·4	80·3	20th	31·5	17th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	69·3	54·8	62·0	61·2	− 0·8	84·0	5th, 6th, and 8th	49·0	27th.
Murraysburg		—	—	—	—	—	—	—	—	—
O'okiep	J. Burrows	69·6	49·3	59·4	61·0	− 1·6	70·0	4th	39·0	18th.
Port Elizabeth	The Lightkeeper	69·4	53·1	61·2	62·2	− 1·0	86·0	6th and 9th	46·0	18th and 28th.
Port Nolloth	The Lightkeeper	70·6	46·9	58·8	58·0	+ 0·8	98·0	5th	35·0	20th.
Port St. Johns (Cape Hermes)	The Lightkeeper	73·8	58·3	66·0	64·6	+ 1·4	86·0	5th	51·0	15th.
Queenstown	H. Holley	66·6	38·8	52·7	55·2	− 2·5	77·0	25th	28·0	21st.
Somerset East	C. Harris	68·2	43·3	55·8	58·0	− 2·2	81·0	24th	33·8	20th.
Stutterheim	F. C. Bousfield	69·8	45·8	57·8	57·6	+ 0·2	81·5	5th	37·0	20th.
Sydney's Hope	Rev. S. Rippon	65·8	51·3	58·6	60·6	− 2·0	80·5	24th	43·0	19th and 27th
Uitenhage	H. Inggs	73·6	45·0	59·3	61·8	− 2·5	88·0	6th	36·5	28th.
Umtata	Miss N. Dix Peck	72·8	40·8	56·8	58·3	− 1·5	85·5	25th	33·5	4th and 7th.
Vryburg	H. W. Collen	70·2	36·5	53·4	53·8	− 0·4	78·0	24th	24·0	17th.
Wynberg (Convent)	The Mother Superior.	70·5	50·2	60·4	59·6	+ 0·8	86·8	7th	44·8	17th and 23rd.
Basutoland—										
Maseteng	F. Hodgson	61·9	36·3	49·1	54·4	− 5·3	68·0	7th	22·0	17th.

RAINFALL, MAY, 1922.

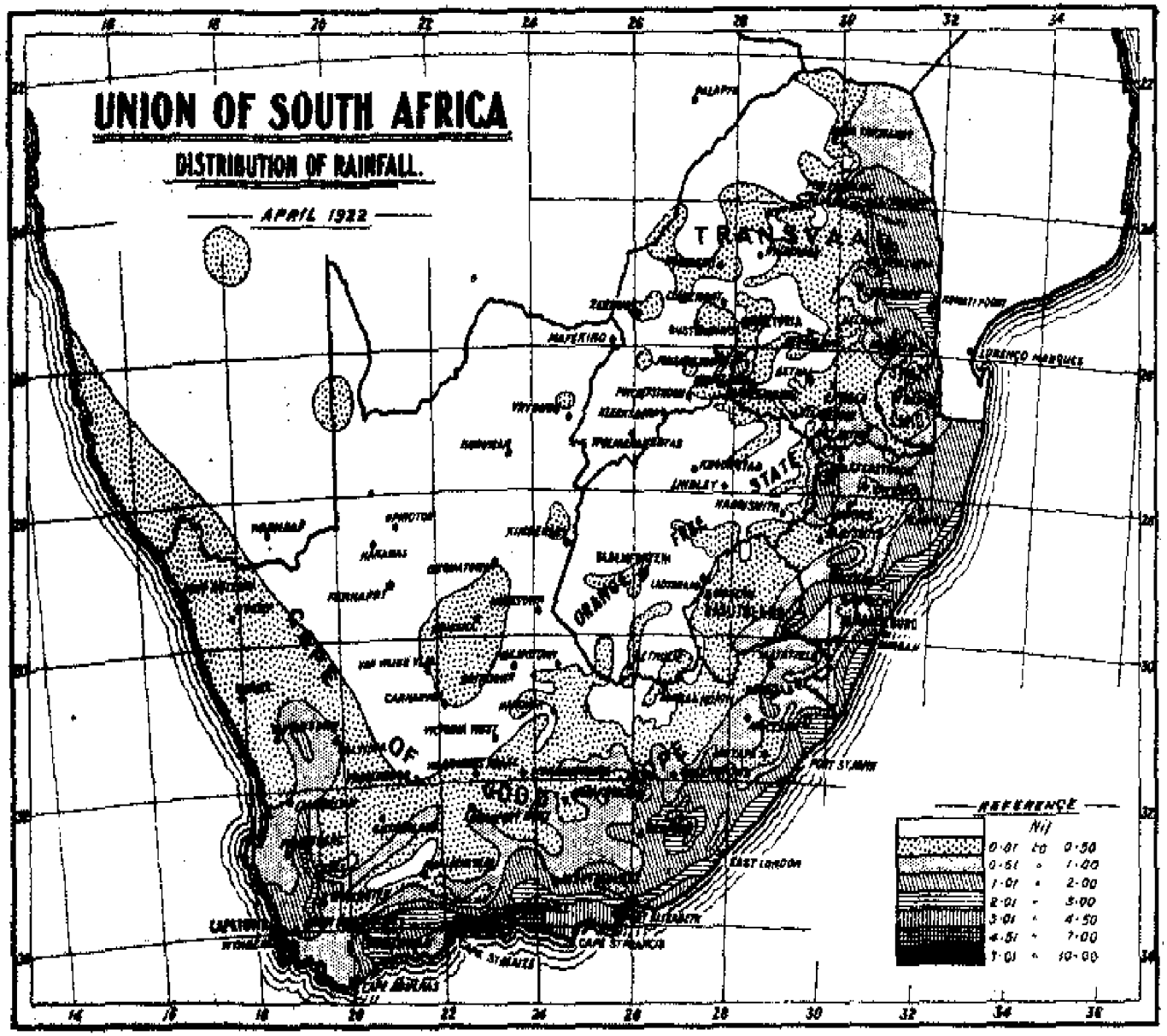
Place.	Observer.	Month. May, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	1·97	1·03	+ 0·94	12·59	20·81	− 8·22	28·47	33·61	− 5·14
Bethal	H. Joubert	1·09	0·69	+ 0·40	15·34	14·83	+ 0·51	28·63	30·35	− 1·72
Belfast	The Forester	1·59	0·54	+ 1·05	17·77	17·04	+ 0·73	34·85	31·89	+ 2·96
Bloemhof	A. Adamson	0·58	0·65	− 0·07	5·43	12·30	− 6·87	10·01	18·62	− 8·61
Claremont	S.A. Police	0·22	0·55	− 0·33	5·18	10·96	− 5·78	15·07	18·12	− 3·05
Brmelo	Mrs. S. Nicolson	0·83	0·59	+ 0·24	12·30	14·69	− 2·39	29·09	29·10	− 0·01
Hanneriteburg	S.A. Police	0·78	2·10	− 1·32	13·03	26·35	−13·32	30·18	40·02	− 9·84
Heidelberg	W. ter Horst	0·70	0·55	+ 0·15	11·45	14·78	− 3·33	21·72	27·69	− 5·97
Johannesburg	The Staff	0·94	0·69	+ 0·25	12·13	16·26	− 4·13	26·92	30·64	− 3·72
Klerksdorp (Strathmore)	C. Scott	0·27	0·68	− 0·41	7·69	13·65	− 5·96	21·32	21·77	− 0·45
Komatipoort	H. J. Evans	0·45	0·88	− 0·43	11·81	16·83	− 4·02	27·72	26·11	+ 1·61
Louis Trichardt	I. de Bruin	0·85	0·89	− 0·04	5·71	18·87	−13·16	19·79	31·93	−12·14
Middelburg	Dr. H. A. Spencer	1·71	0·52	+ 1·19	14·70	15·03	− 0·33	33·52	28·68	+ 4·84
Nylstroom	G. Bakker	0·87	0·23	+ 0·64	8·25	13·78	− 5·53	19·98	23·80	− 3·82
Pietersburg	W. Dempster	1·13	0·22	+ 0·91	7·06	12·16	− 5·10	22·90	21·68	+ 1·22
Piet Retief	J. Werner	0·82	0·57	+ 0·25	11·14	15·30	− 4·16	35·63	30·51	+ 5·12
Pilgrims Rest	E. M. Skea	1·45	1·17	+ 0·28	16·98	26·12	− 9·14	37·30	40·17	− 2·81
Pigeonhole (New Agatha)	J. McCallum	0·68	1·29	− 0·61	12·92	19·44	− 6·52	41·73	34·45	+ 7·28
Potchefstroom (Exp. Farm)	The Manager	0·22	0·72	− 0·50	8·52	12·92	− 4·40	21·40	23·62	− 2·22
Pretoria (Meteorological Office)	The Staff	1·82	0·51	+ 1·31	10·41	17·00	− 6·59	21·19	29·62	− 8·43
Rooiberg	M. Baumann	0·78	0·67	+ 0·11	10·36	13·91	− 3·55	23·80	23·86	− 0·06
Rustenburg	S.A. Police	1·28	0·50	+ 0·78	10·19	14·80	− 4·61	24·74	25·75	− 1·01
Wakkerstroom	T. le Roux	0·59	0·81	− 0·22	12·56	16·94	− 4·38	35·05	31·99	+ 3·06
Zeerust	H. Dietrich	0·35	1·00	− 0·65	7·47	14·90	− 7·43	16·57	23·98	− 7·41
Woodbush	The Forester	0·89	1·74	− 0·85	16·77	46·51	−29·74	50·97	71·60	−20·63
Swaziland—										
Mbabane	Swaziland Police	1·24	1·32	− 0·08	17·09	28·39	−11·31	42·90	49·81	− 6·91
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·29	0·89	− 0·60	3·11	11·38	− 8·27	8·16	17·88	− 9·72
Bloemfontein	G. A. Schepers	0·80	0·80	± 0·00	3·85	11·38	− 7·53	9·26	19·01	− 9·75
Boshof	P. H. v. Rooyen	0·40	0·74	− 0·34	4·64	11·86	− 7·22	9·54	19·22	− 9·68
Harrismith	The Forester	1·43	0·94	+ 0·49	11·50	14·87	− 3·37	28·25	28·00	+ 0·25
Kroonstad	S. R. Northfield	0·53	0·50	+ 0·03	7·01	10·39	− 3·38	21·68	21·76	− 0·08
Ladybrand	The Forester	1·35	1·18	+ 0·17	7·31	15·03	− 7·72	22·96	27·01	− 4·05
Lindley	J. Collister-Oates	0·99	1·12	− 0·13	9·08	13·69	− 4·61	23·52	24·17	− 0·65

RAINFALL, MAY, 1922—*continued.*

Place.	Observer.	Month. May, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Natal—										
Dundee	West Thorrold	1·05	0·86	+ 0·19	14·12	17·77	− 3·65	43·66	31·09	+12·57
Durban (Point)	Port Captain	8·06	2·40	+ 5·66	20·63	21·17	− 0·54	53·02	40·64	+12·38
Estcourt	A. A. McLean	0·84	0·53	+ 0·31	10·07	16·00	− 5·93	28·27	27·80	+ 0·47
Hlabisa	The Gaoler	1·47	1·66	− 0·19	10·88	21·66	−10·78	42·54	42·50	+ 0·04
Howick	The Gaoler	1·57	0·80	+ 0·77	12·13	17·23	− 5·10	32·08	31·54	+ 0·54
Ladysmith	D. A. R. Leathern	1·06	0·77	+ 0·29	14·06	15·85	− 1·79	40·69	27·09	+13·60
Pietermaritzburg	The Staff	1·63	1·19	+ 0·44	9·78	18·34	− 8·56	33·70	33·48	+ 0·22
Stanger	C. C. Voss	3·80	2·04	+ 1·76	14·43	19·18	− 4·75	—	41·39	—
Vryheid	The Gaoler	0·92	0·81	+ 0·11	11·74	19·70	− 4·96	36·15	36·09	− 0·54
Weenen	The Gaoler	0·89	0·64	+ 0·25	12·72	14·54	− 1·82	25·80	26·12	− 0·32
Cape—										
Aliwal North	A. Alcock	0·22	1·08	− 0·86	3·51	12·49	− 8·98	10·79	20·51	− 9·72
Beaufort West	The Gaoler	0·14	0·75	− 0·61	3·87	5·57	− 1·70	9·92	9·10	− 0·82
Bedford	T. C. Hall	1·58	1·58	± 0·00	12·60	14·78	− 2·18	25·07	27·02	− 1·95
Britstown	The Gaoler	0·10	0·75	− 0·65	1·40	7·49	− 6·09	4·78	10·86	− 6·08
Calvinia	The Gaoler	0·99	1·08	− 0·09	1·88	3·29	− 1·41	5·94	6·74	− 0·80
Capetown (Royal Observatory)	The Staff	1·71	3·99	− 2·28	5·93	8·20	− 2·27	19·58	21·09	− 1·51
Ceres	A. Heatlie	4·66	6·06	− 1·40	11·70	11·87	− 0·17	38·08	34·64	+ 3·44
Carnarvon	A. P. Malherbe	0·00	0·68	− 0·68	0·28	5·41	− 5·13	3·83	7·66	− 3·83
Clanwilliam	P. E. Scholtz	0·77	1·38	− 0·61	2·46	2·85	− 0·39	5·78	7·21	− 1·43
East London	A. Downie	3·48	2·42	+ 1·06	14·42	15·25	− 0·83	28·34	31·84	− 3·50
Fraserburg	The Gaoler	0·12	0·64	− 0·52	2·13	4·18	− 2·05	6·45	6·24	+ 0·21
Garies	The Gaoler	0·63	0·72	− 0·09	—	1·61	—	—	4·36	—
Graaff-Reinet	S. E. D. Treadwell	0·97	1·10	− 0·13	3·85	7·47	− 3·62	13·50	13·35	+ 0·15
Groot Drakenstein	Lionel Baker	5·70	4·99	+ 0·71	12·17	11·06	+ 1·11	32·05	29·76	+ 2·29
Griquatown	The Gaoler	0·76	0·83	− 0·07	1·34	9·05	− 7·71	4·94	12·62	− 7·68
Grahamstown	Vet. Research Officer	2·72	2·12	+ 0·60	9·54	12·25	− 2·71	21·13	27·37	− 6·24
Hanover	The Gaoler	—	1·00	—	—	8·55	—	—	12·59	—
Hopetown	The Gaoler	0·63	0·91	− 0·28	1·98	8·45	− 6·47	7·79	12·38	− 4·59
Kenhardt	R. Seydell	0·04	0·40	− 0·36	0·74	3·86	− 3·12	2·03	5·97	− 3·94
Kimberley	J. Acton	0·31	0·73	− 0·42	3·01	10·21	− 7·20	7·02	15·94	− 8·92
Knysna	The Gaoler	3·24	2·32	+ 0·92	15·71	11·17	4·54	31·63	26·66	+ 4·97
Kokstad	H. D. Coyte	3·44	1·15	+ 2·29	13·01	14·88	− 1·87	35·35	26·64	+ 8·71
Kingwilliamstown	L. Clayton	2·72	1·52	+ 1·20	8·60	12·66	− 4·06	21·16	24·41	− 3·25
Kuruman (Abtonia)	A. T. Sitwell	0·85	0·68	+ 0·17	3·50	11·02	− 7·52	6·21	16·13	− 9·92
Mafeking (Convent)	Mother Superior	0·21	0·46	− 0·25	5·19	13·14	− 7·95	10·83	21·46	−10·63
Mossel Bay (Cape St. Blaize)	The Lightkeeper	1·69	1·64	+ 0·05	7·09	7·46	− 0·37	16·66	16·04	+ 0·62
Murraysburg	The Gaoler	0·00	1·02	− 1·02	2·36	6·88	− 4·52	8·50	10·58	− 2·08
Oakiep	J. Burrows	0·12	1·08	− 0·96	0·29	2·75	− 2·46	2·66	6·09	− 3·43

RAINFALL, MAY, 1922—*continued.*

Place.	Observer.	Month. May, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cape—continued—										
Philipstown	The Gaoler	0·13	0·95	− 0·82	2·30	8·66	− 6·36	7·55	13·36	− 5·81
Piquetberg	The Gaoler	1·68	3·01	− 1·33	6·96	6·33	+ 0·63	18·49	17·73	+ 0·76
Port Elizabeth	The Lightkeeper	2·20	2·25	− 0·05	7·75	8·19	− 0·44	23·53	20·56	+ 2·97
Port St. Johns	The Lightkeeper	5·09	2·97	+ 2·12	15·81	22·61	− 6·80	38·31	46·90	− 8·59
Port Nolloth	The Lightkeeper	0·28	0·33	− 0·05	0·70	0·84	− 0·14	1·93	1·95	− 0·02
Prieska	The Gaoler	0·26	0·66	− 0·40	0·90	6·95	− 6·05	5·06	9·44	− 4·38
Queenstown	H. Holley	0·22	0·76	− 0·54	7·19	12·19	− 5·00	18·83	20·80	− 1·97
Steytlerville	The Gaoler	0·75	0·58	+ 0·17	6·05	5·09	+ 0·96	13·31	8·95	+ 4·36
Sutherland	The Gaoler	—	1·25	—	—	4·34	—	—	8·20	—
Swellendam	The Gaoler	1·64	3·19	− 1·55	17·84	14·27	+ 3·57	31·20	30·48	+ 0·78
Sydney's Hope	Rev. S. Rippon	2·81	1·89	+ 0·92	10·73	10·52	+ 0·21	21·24	21·58	− 0·34
Somerset East	C. Harris	1·03	1·41	− 0·38	10·23	12·33	− 2·10	21·87	23·16	− 1·29
Stutterheim	F. C. Bousfield	2·17	1·18	+ 0·99	13·67	15·68	− 2·01	31·86	28·86	+ 3·00
Uitenhage	H. Inggs	2·17	1·26	+ 0·91	8·80	7·50	+ 1·30	20·18	16·55	+ 3·63
Umtata	Miss N. Dix Peek	2·76	1·31	+ 1·45	10·31	13·62	− 3·31	26·32	24·70	+ 1·62
Uniondale	The Gaoler	1·61	1·36	+ 0·25	7·26	5·72	+ 1·54	11·40	12·43	− 1·03
Upington	The Gaoler	0·64	0·54	+ 0·10	1·02	4·92	− 3·90	3·68	6·92	− 3·24
Victoria West	The Gaoler	0·00	0·91	− 0·91	2·02	6·56	− 3·94	10·91	9·69	+ 1·22
Vryburg	H. Collen	0·34	0·66	− 0·32	4·77	13·56	− 8·79	10·53	19·42	− 8·89
Worcester	The Gaoler	0·40	1·71	− 1·31	4·07	4·00	+ 0·07	10·26	10·77	− 0·51
Wynberg (Convent)	The Mother Superior	2·99	5·89	− 2·90	7·69	12·72	− 5·03	30·09	39·08	− 8·99
Basutoland—										
Maseru	F. Hodgson	0·38	1·54	− 1·16	6·21	18·64	−12·43	19·57	30·97	−11·40
South-West Africa—										
Tsumeb	Ing. Schetter	0·01	0·10	− 0·09	11·13	23·27	−12·14	6·30	28·90	−22·51
Waterberg	D. Hahn	0·00	0·29	− 0·29	7·25	15·83	− 8·58	10·59	18·87	− 8·28
Usakos	Missionary Diehl	0·00	0·31	− 0·31	0·48	4·14	− 3·66	0·48	4·48	− 4·00
Gobabis	Missionary Irle	0·03	0·28	− 0·25	3·98	12·15	− 8·07	7·95	14·68	− 6·73
Windhoek	Observatory	0·00	0·21	− 0·21	5·40	11·72	− 6·32	8·63	13·21	− 6·58
Mariental	Baron v. Esebeck	0·66	0·06	+ 0·60	2·04	4·64	− 2·60	4·22	5·29	− 1·07
Hebrachabis	Pater Prefect	0·07	0·15	− 0·08	0·67	2·69	− 2·02	1·35	2·78	− 1·43


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
APRIL 1922
TRANSVAAL
ORANGE FREE STATE
CAPE OF GOOD HOPE
LORENÇO MARQUES
EAST LONDON
CAPE ST FRANCIS
CAPE ST MARIES
CAPE AGULHAS
REFERENCE
Nil
0·01 to 0·50
0·51 " 1·00
1·01 " 2·00
2·01 " 3·00
3·01 " 4·50
4·51 " 7·00
7·01 " 10·00

UPPER AIR RESULTS.

Pretoria. Lat. 25° 45′ S., Long. 28° 12′ E. Height above M.S.L., 1326 metres.

SOUNDING BALLOON.

Ascent No. 2.—Date: 15th May, 1922. Time: 7 hrs. 57 min., G.M.T. Temperature: + 10·6° C. Humidity: 60 per cent. Clouds: Nil. Instrument: Dines No. 465. Free lift: 400 grammes. Maximum temperature of day: + 15·3° C. Minimum temperature of day: + 4·3° C. Weather: Fine (thick haze in valley). Balloon found at farm Roodepoort No. 152. Distance: 160 kilos. Orientation: 90° (N. = 0°; E = 90°, etc.). Greatest height: 14,360 metres. Lowest temperature: − 51·5° C.

* Height above M.S.L.	Pressure.	Temperature.	Gradient $\Delta t/100$ m.	Wind. Direction.	Wind. Velocity.
Metres.	Millibars.	° A.		°	m.p.s.
1,326	867·7	283·6		202	8·8
			0·82		
2,000	800	278·1		188	9·2
2,310	770	276		193	8·2
			0·82		
2,390	762	274·2		193	7·3
2,500	752	274		192	6·2
2,750	729	274	0·38	205	3·3
3,000	708	272·1		206	5·5
			0·86		
3,500	664	267·8		214	6·4
			0·76		
4,000	623	264		235	11·3
			0·52		
4,500	582	261·4		250	23·8
			0·36		
5,000	546	259·6		266	34·3
5,500	512	260·8	0·22	267	36·8
6,000	479	257·4		—	—
6,500	449	254·6	0·65	—	—
7,000	420	250·9		—	—
7,500	392	248·3	0·72	—	—
8,000	366	243·7		—	—
8,500	341	240·2	0·67	—	—
9,000	317	237		—	—
9,500	295	234·1	0·60	—	—
10,000	274	231		—	—
10,500	255	229	0·33	—	—
11,000	236	227·7		—	—
11,500	219	226·2	0·27	—	—
12,000	204	225		—	—
12,150	199	224		—	—
			0·20		
12,500	188	223·5		—	—
13,000	175	223			
13,500	162	222·3	0·11	—	—
14,000	150	221·9		—	—

Wind results from one theodolite; rate of ascent assumed, 183 metres per minute. Owing to haze in valley, balloon could not be seen by second theodolite.

PILOT BALLOON.

Ascent No. 421.
Date: 15th May, 1922.
Time: 9 hrs. 0 min., G.M.T.

Two theodolites; base, 2,447 metres.
Observers: Messrs. C. J. L. Stegmann and P. J. Pepler.
Clouds: 0.
Wind: S.S.W.; 8·8 m.p.s.

Height above M.S.L.	Wind.		Height above M.S.L.	Wind.		Height above M.S.L.	Wind.	
	Direction.	Velocity.		Direction.	Velocity.		Direction.	Velocity.
Metres.	°	m.p.s.	Metres.	°	m.p.s.	Metres.	°	m.p.s.
1,500	222	8·7	3,000	200	9·7	4,500	195	13·1
2,000	222	6·7	3,500	226	6·9	4,660	198	15·2
2,500	202	9·8	4,000	198	9·3			

SOUNDING BALLOON.

Ascent No. 3.
Date: 16th May, 1922.
Time: 7 hrs. 36 min., G.M.T.
Free lift: 400 grammes.

Two theodolites; base, 2,447 metres.
Observers: Messrs. C. J. L. Stegmann and P. J. Pepler.
Clouds: Little cumulus in east.
Wind: Calm.
Weather: Fine.

Height above M.S.L.	Wind.		Height above M.S.L.	Wind.		Height above M.S.L.	Wind.	
	Direction.	Velocity.		Direction.	Velocity.		Direction.	Velocity.
Metres.	°	m.p.s.	Metres.	°	m.p.s.	Metres.	°	m.p.s.
1,500	—	—	4,000	114	3·4	6,500	240	2·2
2,000	—	—	4,500	134	5·0	7,000	110	1·7
2,500	—	—	5,000	124	5·0	7,500	262	10·0
3,000	54	3·7	5,500	133	5·6	7,760	270	20·1
3,500	88	3·3	6,000	174	3·2			

SOUNDING BALLOON.

Ascent No. 4.
Date: 17th May, 1922.
Time: 8 hrs. 0 min., G.M.T.
Free lift: 400 grammes.

Two theodolites: 4th to 8th and 20th to 28th minutes; base, 2447 metres.
Observers: Messrs. P. J. Pepler and O. C. Keese.
Clouds: 0 (thick haze in valley).
Wind: N.W.; 1 m.p.s.
Weather: Fine.

Height above M.S.L.	Wind.		Height above M.S.L.	Wind.		Height above M.S.L.	Wind.	
	Direction.	Velocity.		Direction.	Velocity.		Direction.	Velocity.
Metres.	°	m.p.s.	Metres.	°	m.p.s.	Metres.	°	m.p.s.
1,500	—	—	4,500	250	8·2	7,500	247	24·8
2,000	277	4·0	5,000	227	7·4	8,000	252	26·0
2,500	290	3·8	5,500	226	11·6	8,500	255	24·6
3,000	272	2·2	6,000	242	15·7	9,000	256	25·5
3,500	254	5·3	6,500	235	20·2	9,500	264	28·7
4,000	280	5·3	7,000	242	21·0	9,920	265	32·1

SOUNDING BALLOON.

Ascent No. 5.
Date: 18th May, 1922.
Time: 7 hrs. 45 min., G.M.T.
Temperature: + 13·0° C.
Humidity: 54 per cent.
Instrument: Dines No. 454.

Maximum temperature of day: + 20·1° C.
Minimum temperature of day: + 0·9° C.
Weather: Fine (thick haze in valley).
Balloon found at farm Zusterstroom No. 27.
Distance: 84 kilos.
Orientation: 79°.
Greatest height: 12,370 metres.
Lowest temperature: — 48·5° C.

* Height above M.S.L.	Pressure.	Temperature.	Gradient △t/100 m.	Wind. Direction.	Wind. Velocity.
Metres.	Millibars.	° A.		°	m.p.s.
1,326	872·5	286·9			Calm
			0·40		—
1,500	854	286·2		318	1·1
			0·92		
2,000	806	281·6		289	3·6
2,440	763	277	1·00	280	4·7
2,500	757	276·6		279	4·8
2,720	737	276		262	5·6
			0·06		
2,860	724	277		248	6·6
3,000	710	276·9		242	7·5
3,180	696	276	0·38	240	8·7
3,500	668	275		224	11·4
			0·00		
4,000	628	275		244	9·9
4,220	613	275	0·24	259	10·0
4,500	591	273·8		260	10·6
			0·76		
5,000	552	270		262	12·9
5,500	522	265·4	0·84	270	14·8
6,000	488	261·6		266	14·1
6,500	457	258	0·71	255	16·6
7,000	427	254·5		256	19·5
7,500	399	250·2	0·86	262	21·0
8,000	372	245·9		262	19·8
8,500	348	242·7	0·70	260	19·5
9,000	322	238·9		250	19·8
9,500	300	235·1	0·73	262	20·0
10,000	278	231·6		255	22·5
10,500	258	227·3		258	22·6
			0·68		
10,780	248	225		260	21·9
11,000	239	224·8		260	23·1
11,500	223	224·6		268	22·0
			0·00		
11,930	—	—		279	17·0
12,000	206	224·8		—	—
12,370	195	225		—	—

* Corrections for variation of gravity with height applied.

Two theodolites, 15th to 49th minutes; base, 2447 metres.

PILOT BALLOON.

Ascent No. 422.
Date: 19th May, 1922.
Time: 10 hrs. 30 min., G.M.T.

Two theodolites for first 7 minutes; base, 2447 metres.
Observers: Messrs. P. J. Pepler and C. D. McRae.
Clouds: 2.*
Wind: N.N.W.; 1 m.p.s.
Weather: Fine.

Height above M.S.L.	Wind.		Height above M.S.L.	Wind.		Height above M.S.L.	Wind.	
	Direction.	Velocity.		Direction.	Velocity.		Direction.	Velocity.
Metres.	°	m.p.s.	Metres.	°	m.p.s.	Metres.	°	m.p.s.
1,500	280	4·7	4,000	248	5·1	6,500	262	17·6
2,000	248	2·6	4,500	259	7·9	7,000	255	20·6
2,500	187	2·8	5,000	254	11·6	7,500	263	27·1
3,000	222	2·5	5,500	253	13·5	7,910	262	32·1
3,500	240	3·1	6,000	250	15·9			

* Clouds had appearance of cirrus; but balloon was above them within a few minutes of start.

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MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. III. JUNE, 1922. No. 6.

MEAN PRESSURE considerably lower than usual; temperature about half a degree below normal; an excess of precipitation over the eastern half, together with the more westerly and south-westerly portions of the Union; a deficiency over the northern border, the major portion of the Karroos, and the south coast; unusually widely distributed good rains on 13th to 15th, assuming the form of snow over large areas in the Cape, Free State, and Natal; snow more limited in distribution on 25th–26th; weather generally milder than usual, but with some sharp frosts towards the middle and end of the month; hot winds along the west and south coastal districts, and in Natal—these were the leading features of the weather of June, 1922.

Pressure.—The mean atmospheric pressure during June was considerably lower than usual, the deficiency exceeding a tenth of an inch (·10) over the Transvaal, and decreasing to about 0·05 inch in the north and along the south coast. Fine, bright weather, with haze and morning mists, prevailed over the Transvaal and Free State, except from 11th to 15th, when a spell of cloudy, unsettled weather set in, accompanied by rain and some sleet. Similar conditions were met with in Natal, but with an additional rainy spell between the 20th and 27th. Heavy snow was reported from Barkly East and Kokstad on the 14th and 27th, and with sleet elsewhere. The weather was mostly cloudy and showery over the south-west of the Cape, these unsettled conditions extending frequently to the west, south, and south-east. It will thus be seen that, generally speaking, anti-cyclonic conditions prevailed throughout the greater part of the month, pressure being very high on the 9th, 12th–14th, 23rd–24th, and 26th–30th. Low pressure areas affected the south coast from 2nd to 5th, on 16th–17th and 25th, and passed from south-west to south on 10th–11th.

Temperature during June was, on the whole, lower than usual, the mean of 53·3 degrees being 0·4 degree below normal. This deficit was due to the mean day temperature (66·4 degrees) being 1·2 degree less, whilst the mean night temperature (40·1 degrees) was 0·4 degree greater than the corresponding normals. The largest deviation from normal was in the Cape Province, where the mean of 53·9 degrees was 1 degree less than usual, whereas in other

Provinces the mean monthly temperature was practically normal, the mean for the Free State and Natal (46·5 degrees and 58·0 degrees respectively) *being only one-tenth of a degree less than usual, whilst in the Transvaal the* mean temperatures for the month (52·3 degrees) was a similar amount above the average. The days were considerably cooler than usual in Natal, the Cape, and the Free State, the mean maximum temperatures being 2·2 degrees, 1·9 degree, and 1·6 degree lower than the corresponding normals, 72·9 degrees, 67·1 degrees, and 62·1 degrees. In the Transvaal, however, the days with a mean of 68·3 degrees were 0·3 degree warmer than the average. In Natal and the Orange Free State, on the other hand, the night temperatures (45·3 degrees and 32·4 degrees respectively) were 1·9 degree and 1·4 degree above their normals; in the Cape and the Transvaal the mean minima were both only a *tenth of a degree lower than their corresponding averages (viz., 42·7 degrees* and 36·5 degrees). Considering the individual stations, it is seen that the mean monthly temperature was generally above normal in the Transvaal east of a line drawn from Louis Trichardt in a south-south-westerly direction to Potchefstroom, and below normal to the west. The excess in temperature was mostly between 1 and 2 degrees, although in the east it was less than a degree. There were a few exceptional areas where temperature was sub-normal; thus Pretoria and Mbabane were a tenth of a degree cooler than usual; but the largest deficit was 1·9 degree at Belfast, on the high veld. Deficits in the south-west were mostly between 1 and 2 degrees, but Pietersburg, in the north, *was only 0·4 degree cooler than usual. In the Free State the departures from* normal were small, varying between plus 0·3 degree at Bethulie in the south to minus 0·6 degree in the north centre. In Natal the deviations from the average varied from minus 1·6 degree at Durban, through normal at Weenen, to plus 1·2 degree at Ladysmith. In the Cape Province the temperature of the month was mostly sub-normal by 1–2 degrees, but showed considerable variation in amount even in adjacent areas; thus Umtata was 0·7 degree, whilst Kokstad (both in the Transkei) was 2·6 degrees cooler than usual; again, in Namaqualand, O'okiep showed a deficiency of 2·0 degrees, whilst at Port Nolloth the mean for the month was only 0·8 degree lower than usual. Excessive temperature was experienced at Carnarvon, Stutterheim, Graaff-Reinet, Mossel Bay, Kimberley, and Clanwilliam, varying between an excess of 2 degrees at Graaff-Reinet and 0·1 degree at Clanwilliam. The largest deficit was 3·4 *degrees at Grahamstown. Day temperatures were above the average in the* eastern half of the Transvaal, generally by 1–2 degrees, also at Potchefstroom in the south-west. In the Cape Province an excess in day temperature was shown only at Mossel Bay, Carnarvon, Stutterheim, and Kimberley. In all other parts of the country the mean maximum temperature was lower than usual, mostly by quantities of less than 2 degrees in the Transvaal. Over the Free State the deficits varied between 0·1 degree at Bethulie and 4·6 degrees at Harrismith, and in Natal they ranged from 0·5 degree at Dundee to 4·4 degrees at Pietermaritzburg. In the Cape the deficits were mostly about 2–3 degrees, but ranging from 0·1 degree at the Royal Observatory in the Cape Peninsula to 4·0 degrees at Port St. Johns. Speaking generally, the day temperatures were much lower than usual in the east and south-east of the Cape Province than elsewhere. The nights were warmer than usual over the greater part of the eastern half of the Transvaal, the Free State, and Natal, and portions of the east of the Cape Province, as well as at Clanwilliam in the west and Vryburg in Bechuanaland. The excesses were generally between 0·5 degree and 1·5 degree in the Transvaal, similar in the Free State, but rising to 5·4 degrees at Harrismith; mostly between 2 and 4 degrees in Natal, and varied largely in the Cape Province from 0·1 degree at Kimberley to 4·3 degrees at Graaff-Reinet. Elsewhere there was a deficit generally of 1–2 degrees, but

decreasing to a few tenths of a degree in portions of the different Provinces. The mean warmest station was Stanger (Natal), with a temperature for the month of 64·0 degrees; and the mean coolest Belfast, with 44·8 degrees; a difference of 19·2 degrees. The highest mean maximum was 79·5 degrees at Komatipoort, and the lowest mean minimum 25·5 at Standerton, giving a mean daily range of 54·0 degrees over the Union. The highest temperatures recorded during the month were confined to twelve days, from the 2nd to 6th, 8th to 10th, and 21st to 24th, but were reported most widely on the 23rd; maxima were also fairly commonly registered on the 3rd to 4th, 9th, and 21st. The lowest temperatures occurred on eleven days, viz. 8th to 14th, 16th to 18th, 22nd, 26th to 31st, most widely between the 27th and 30th, more particularly on the 28th. The extreme maximum for the month was 92·5 degrees at Komatipoort on the 4th, closely followed by 92·0 degrees on the 10th at Port Nolloth; the lowest temperature was 17·0 degrees on the 27th at Carnarvon (Cape), the next lowest being 17·5 degrees at Potchefstroom on the 28th. *Frosts* were mostly local during the earlier half of the month, but were more widespread and severe during the last fortnight. Hot winds were reported as having caused a considerable amount of harm to grain in the Riversdale District (Cape).

Precipitation during the month was above the average over practically the whole of the Transvaal, Swaziland, Natal, the north, east, and centre of the Free State, Basutoland, the north-east, south-east Kaffraria, the eastern parts of the central Karroo, the west coastal area, north of Namaqualand, the south-west Cape Peninsula, and the extreme west of the northern Karroo. The excesses were greatest (3–4 inches) in the south-west and south-east of the Cape, and were between 1 inch and 2 inches over parts of the eastern Cape, parts of Natal, the centre and east of the Free State, and the east of the Transvaal, and the north of Bechuanaland. Small deficits, usually of less than ½ inch, occurred in the extreme north, centre, and west-centre of the Transvaal, the south of the Free State, and over a belt lying between 21 degrees and 25 degrees east longitude, extending from Vryburg to the south coast; also at Port Nolloth. The shortages were greatest in the south coastal area. An interesting, although not unusual, feature of the rainfall over the Cape Peninsula was a deficiency of 0·27 inch at the Royal Observatory as compared with an excess of 3·27 inches at Wynberg in the same area. Frequent rains fell over the Peninsula and the south-west of the Cape Province during the month; and mostly light showers over the west and south coasts, being heavy, however, at some places over the former area on the 10th and 25th. Between the 13th and 15th rains were almost general over the Transvaal, most of the Free State, and Natal. During this period snow fell over parts of the Bethlehem, Bloemfontein, Boshof, Edenburg, Harrismith, Philippolis, Rouxville, Smithfield, Thaba 'Nchu, Wepener, and Winburg Districts of the Free State; also over Estcourt, Weenen, Alfred, Lions River, Polela, Ixopo, Mooi River, and Richmond Divisions in Natal; and at stations in the Pearston, Graaff-Reinet, Cradock, Hanover, Britstown, Victoria West, Hay, Aliwal North, Mount Fletcher, Barkly East, Queenstown, Glen Grey, and Molteno Districts in the Cape. On the 25th to 26th precipitation in the form of snow again in the Sutherland, Worcester, Graaff-Reinet, Mount Frere, Fort Beaufort, Flagstaff, Mount Ayliff, Matatiele, Mount Currie, Umzimkulu, Tabankulu Districts of the Cape Province, and over a considerable portion of Natal on the 26th. The Drakensberg was covered with snow during the greater part of the month. At Kokstad the snow lay to a depth of 15 inches in the town, whilst telephone and telegraph wires were down, cutting off all communication for twenty-four hours. This was the severest snowstorm there since that of June, 1902. At New Hanover

(Natal) the heavy snow on the 26th was the first seen in that district since 1869, when the fall was slight. At Mvenyane, in the Matatiele District, the snow was 18 inches deep on the 26th, and 14 inches at Bonapartesfontein (Mount Currie District), and 14½ inches at Glen Hope (Mount Frere), whilst trees were damaged and telegraphic communication suspended at Emfundisweni (Flagstaff), all on the same date—the 26th. On the 14th there was a depth of 14 inches on the level at Kilcullen (Barkly East Division), and 8 inches in the streets of Jamestown (Cape Province) on the 5th. At French Hoek (Cape Province) snow was reported to be lying a foot deep on the 25th.

The rainfall of the middle and end of the month was abnormal for June; thus at Great Fish Point (Bathurst Division) 5·51 inches fell in twenty-seven hours between the 13th and 14th, and this is stated to have been the best rain there for fifteen years or more. Taken as a whole, these rains were very beneficial, filling dams, causing rivers to run, improving the veld considerably, and enabling a considerable amount of ploughing to be carried out, etc. Absolute drought, however, prevailed at some stations in the Potchefstroom, Pretoria, and Zoutpansberg Districts of the Transvaal; also over the west-central Karroo, and the greater part of the northern Border and Bechuanaland.

The accumulated rainfall since the beginning of the current year is above the normal in the south of the west coast area, the south-west and south coast, parts of the southern Karroo, of the south-east and of the north of Kaffraria, also at stations on the Transvaal high veld between Bethal and Belfast, and at Durban. The excess was greatest (3–4 inches) in the south-west and south coast, and from 1–2 inches in the Transvaal. With these exceptions the six months' rainfall is below the average by large amounts. Thus in the Transvaal the deficit was mostly between 3 inches and 8 inches, but rising to 13·29 inches at Louis Trichardt and 29·56 inches at Woodbush, both in the more northerly section of the country. In the Free State the accumulated precipitation was sub-normal by 3–8 inches, the larger amounts occurring in the southern half of the Province. In Natal and Zululand the shortages ranged from 0·53 inch at Ladysmith to 10·54 inches at Hlabisa. In the Cape Province the totals were deficient, mainly by 4–8 inches over Bechuanaland and the more central parts extending to the north-east; the deficiencies generally decreased with nearer approach to the coasts, but rose again to almost 7 inches at Port St. Johns. The excesses in rainfall since the 1st of July, 1921, covered not only practically the same area as during the six months of the present year, but extended into the greater part of Natal, portions of the Karroos and the Transkei, the north and north-east of the Free State, also the south-west, south-east portions of the Zoutpansberg, and the extreme east of the Transvaal. These excesses, although less than an inch in portions of the Karroos, were mostly between 4 inches and 7 inches along the south coast and in the south-west, rising, however, to 10·69 inches at Kokstad in Kaffraria. In Natal the excess in precipitation was about 14 inches at Ladysmith, Dundee, and Durban, but decreased to only 0·28 inch in Zululand. In the Free State the excesses were under ½ inch; whilst in the Transvaal they varied from 2–4 inches over the high veld and at Komatipoort, rising to 7·65 inches at Pigeonhole in the Zoutpansberg, and falling to 0·06 inch at Strathmore in the Klerksdorp District. Elsewhere the total rainfall for the twelve months since the beginning of July, 1921, was below the average. The deficiency varied in amount between 4 inches and 10 inches in the centre and north of the Cape Province, also over part of the north-east and the south-east coastal areas. The deficits decreased southwards and westwards over the Karroo to under ½ inch, but rose to over 3 inches in Namaqualand and from 2–6 inches in the Cape Peninsula. In Natal the shortage was small, being less than ¼ inch at Vryheid and Weenen. In the Free State the minus quantities were largest (8–9½ inches) in the south, west, and centre

also in Basutoland), decreasing to under 3 inches in the east and 0·15 inch at Lindley. In the Transvaal the twelve months' precipitation was below the average generally by 8–10 inches in the south-west, west, and centre; in the north the deficit increased to 12·27 inches at Louis Trichardt and 20·45 inches at Woodbush, whilst in the low veld it decreased to 2–3 inches, increasing again to about 6 inches in Swaziland. Hail occurred at a few stations during the snowstorms of the middle and end of the month, causing some damage to winter crops, as at Barberton. A number of thunderstorms also occurred, a somewhat unusual phenomenon in certain areas at this period of the year. The rains of this month were, on the whole, of considerable benefit to agriculture, particularly in regard to the water-supply, whilst in the Kroonstad District of the Free State cattle and stock generally had improved considerably. In other parts the country still remains very dry, and animals are falling off in condition—even dying from hunger—as in the Vrede, Philippolis, and Winburg Districts.

OBSERVERS' NOTES FOR JUNE, 1922.

TRANSVAAL.

Middelburg.—The weather this month has been cold and frosty at night, with warm days, but often cold winds blowing all day. Only on two occasions were duststorms noted. The degree of cold noted has been above the average, a minimum of 24·0 degrees being the lowest where 15·0 degrees and 18·0 degrees have repeatedly been recorded in June, as has the maximum temperature recorded also been above the average. This, the coldest month in the year, has been milder than usual. The thunderstorms of the 14th came as quite a surprise, the ¾ inch of rain which then fell having only twice been equalled in June in nineteen years. Rainfall: 0·80 inch on two days.—Dr. H. A. Spencer.

Barberton.—The rainfall—1·69 inch on three days—has been a most unusual feature. The rainstorm on the 15th—0·96 inch—was accompanied by fairly heavy hail in places, and some of the winter crops sustained considerable damage.—Walter Grubb.

Piet Retief.—Towards the latter part of the month very heavy frosts were experienced. The country is exceptionally dry. Rainfall: 0·25 inch on three days.—"At 8.30 a.m. on the 28th, whilst taking my usual observations, I noticed a rather peculiar sight. As the sky was about three-quarter clouded there appeared to be an extraordinary illumination through these clouds, in the form and shape of a huge rainbow, but this semicircle (as seen by myself and several others from there) was only of a whitish colour, and this semicircular shape could be seen in a south-westerly direction until nearly 9.30 a.m., and by that time this semicircle could be clearly seen as having been formed by cirrus clouds. I am recording this as it is the first time I have seen this formation here, and at the same time caused a great deal of interest."—J. Werner.

Strathmore (Klerksdorp).—Extreme frosts towards end of month. Rainfall: 0·63 inch on two days.—Chas. Scott.

Pietersburg.—Hot summer weather early portion of month. Several thunderstorms and slight rain. Cold snap from 15th, bitterly cold south wind. All exposed water frozen daily, heavy frost throughout. Rainfall: 0·06 inch on two days.—W. J. Frankleyne.

Gembaksfontein (Middelburg).—The mornings and evenings have been very cold during the month. The ground has been white practically every morning. Rainfall: 0·98 inch on two days.—G. J. Imrie.

Mosdene (*Naboomspruit*).—The rainfall on the 6th (0·25 inch) and 14th (0·20 inch) did considerable harm to mealie crops by wetting the grain in the husks of cobs reaped and piled up awaiting the arrival of a threshing machine. As usually results from a strong south-westerly wind, we had a very cold spell on the 28th, when the minimum temperature dropped to 21·8 degrees. The total rainfall for the year ended 30th June was 22·77 inches, of which 15·28 inches fell before 31st December last, leaving a fall of 7·49 inches only for the half-year now closed. This severe drought has resulted in crops being about 40 per cent. below normal. Rainfall: 0·45 inch on two days.—Ernest E. Galpin.

Lichtenburg.—Very changeable weather. Minimum temperature 17·2 degrees on 28th. Rainfall: 0·80 inch on two days.—J. T. Allman.

Rustenburg.—This has been a cold month, and cattle are getting in low condition on account of the cold weather. Although grass is plentiful in the bushveld, the rivers and fountains there are becoming weak. Locusts are still in the district; large swarms passed over during the month, doing damage to crops of young wheat and oats. Rainfall: 0·26 inch on two days.—H. J. Streatfield.

Weltevreden (*Standerton*).—Heavy frosts from 16th June. Stock looking well. Rainfall: 0·32 inch on one day.—D. Lane.

Doornkloof (*Zoutpansberg*).—Veld in good condition. Rainfall: Nil.—S. M. Ralston.

Orange Free State.

Holfontein (*Kroonstad*).—Very cold nights are now being experienced; the days, however, are nice, and better cannot be expected for the time of year. The cattle and stock in general have picked up well since the recent rains. Rainfall: 0·92 inch on two days.—L. C. McInery.

Dewetsdorp (*Bloemfontein*).—13th, 3 inches of snow; 14th, 3 inches of snow. Fall in some parts of district much heavier. In other parts no snow, but heavy rain. Prospects for early spring very bright and also for lovely harvest. Rainfall: 2·00 inches on three days.—H. Hickman.

Heilbron (*Heilbron*).—The weather has been very mild on the whole, although the nights and mornings have been sharp. The maize crop is being gathered in, and operations are in full swing. One suspected death of cow was reported during the month—subsequently ascertained to be due to anthrax. Grazing is exceedingly scarce—veld almost bare—and stock are in poor condition. Rainfall: 0·73 inch on two days.—P. A. du P. Naude.

Karreepoort (*Philippolis*).—It is terribly dry through the whole district. All animals on the veld are suffering and dying from hunger. Rainfall: 0·08 inch on one day.—E. N. du Preez.

Monaro (*Thaba 'Nchu*).—Good fall of snow on 13th and 14th. No losses in stock. Rainfall: 2·50 inches on three days.—E. G. Foster.

Woudzicht (*Vrede*).—With the exception of a few days the weather has been mild. The last few days heavy frost at night. Rainfall: 0·39 inch on three days.—J. N. Köhler.

Prospect (*Vrede*).—Farmers busy reaping mealies—a poor crop on the whole on account of drought. Cattle look fairly well. Many sheep came badly through the summer, and a good many, especially last year's lambs, are dying. Rainfall: 0·22 inch on one day.—T. Pitcairn.

Paardekraal (*Winburg*).—Rains most welcome. Not much run-off. A fine mild month with usual frosts. No icy blast from south to south-west. Cattle and sheep have fallen off a lot. Rainfall: 1·21 inch on three days.—G. S. Lowe.

NATAL.

Rongpoort (Weenen).—Mild month on the whole, with slight frosts. No ice here till the snowstorm on the night of the 26th. Rainfall: 1·44 inch on three days.—J. H. Bartholomew.

Hlabisa.—The weather has been seasonable, with one or two cold snaps during the month. Rainfall: 0·97 inch on four days.—L. Double.

Ladysmith.—A few very dusty days, but weather otherwise exceptionally fine. Exceptionally heavy rainfall for June—1·48 inch on two days. Rain will benefit grass, but will probably cause slight damage to crops being reaped. Drakensberg covered with snow during greater part of month. River rose approximately 2 feet on 26th.—D. A. R. Leathern.

Maritzburg (Mental Hospital).—The rainfall—2·16 inches in six days—is above the average for the month. Two thunderstorms—an unusual occurrence—during the month.—The Staff.

Dundee.—A most changeable month for June, with an unusual amount of moisture. Rainfall: 1·56 inch on four days.—West Thorrold.

Ismont (Mid-Illovo).—Abnormal rainfall—2·90 inches on seven days including 2·02 inches on 26th and 27th—accompanied by cold south-westerly gale. Minimum temperature 35·0 degrees on 27th, unusually low for this station. Snow visible on hills ten miles (north-west) distant, a good deal south-east of usual belt.—Lieut.-Colonel J. W. V. Montgomery, C.M.G., D.S.O.

Nottingham Road.—Very wet and much snow. Drakensberg has had snow all month. Storm on 27th, started with heavy hail at 9.30 p.m., then snow. Stopped snowing about 2 a.m.: 4½ inches deep. Stock did not suffer, but trees were more broken by the storm last September, when there was 5½ inches. Owing to the wet, green crops frosted in May have returned wonderfully. Rainfall: 2·22 inches on six days.—Miss E. Smythe.

Cape St. Lucia.—Mornings and evenings chilly. A marked feature of the month was the hot winds from 11 a.m. to 3 p.m. on the 4th. Surrounding country is looking parched. Stock are in good condition. Rainfall: 1·01 inch on five days.—J. Murphy.

New Hanover.—Heavy snow on 26th; snow has not been seen in this district since 1869, when there was a slight fall. Rainfall: 2·77 inches on six days.—Mrs. E. M. Herbert.

CAPE.

Queenstown.—Hoar frost on eight mornings; some strong winds from north and north-west. A mild winter to date. Rainfall: 1·12 inch on three days.—H. Holley.

Sydney-on-Vaal (Barkly West).—Sharp frosts followed by warm days. A normal month for this district. Rainfall: 0·11 inch on one day.—J. G. Richards.

Capetown.—This month has been noted for the succession of wet and squally week-ends, the wet weather usually commencing on Friday or Saturday and clearing up on the following Tuesday. Plenty of rain, but upon the whole not stormy. Mornings cold, and plenty of snow on surrounding mountains.—A. Russel Fraser.

Riversdale.—Hot winds have done a great deal of harm to the grain lands, so a good soaking rain is much needed. Rainfall: 0·81 inch on seven days.—Rev. Carl Prozesky.

Aliwal North.—On the whole very mild for June; heavy fall of snow on 14th. Rainfall: 1·72 inch on three days, first fall of any importance this year. Farming prospects considerably improved.—Alex. Alcock.

Bedford.—The rainfall—3·47 inches on six days—is a record for June: 3·06 inches in June, 1902, and 3·00 inches in June, 1884.—Thos. C. Hall.

Clanwilliam.—Strong, parching east wind from early morning of 7th to late at night of 9th; much damage done to orange crop. Atmosphere exceptionally dry during that period. Rainfall: 2·52 inches on ten days.—P. E. Scholtz.

Graaff-Reinet.—Fairly strong northerly winds prevailed during the month. Temperature variable, the highest maximum (80·7 degrees) on the 3rd, and the lowest maximum (50·2 degrees) on the 26th. Rainfall: 0·83 inch on four days.—S. E. D. Treadwell.

Groot Drakenstein.—Rainfall half as much again as normal; both days and nights colder than usual. Temperature fell below 40·0 degrees on eleven occasions, and extreme minimum (32·9 degrees) lowest recorded for June. An exceptionally heavy snowfall occurred on the night of the 25th, mountains thickly coated to bases. In French Hoek, ten miles higher up the valley (station altitude, 836 feet), snow reported a foot deep in streets, but none fell in this part. Heaviest fall since August, 1914. Rainfall: 9·47 inches on seventeen days.—Lionel Baker.

Kenhardt.—Drought getting serious. "Gal in Lamziekte" amongst cattle and small stock spreading. Rainfall: 0·01 inch on one day.—R. Seydell.

Kokstad.—Snow on 13th, and a big snowstorm on the 26th, the heaviest since the blizzard of 1902: 15 inches in town—telegraph and telephone wires down—no telegraphic communication for twenty-four hours—telephones not yet restored. Severe frosts, with ice inside buildings, on 29th and 30th, when 15·0 degrees and 17·0 degrees respectively registered. Rainfall: 2·48 inches on six days.—H. D. Coyte.

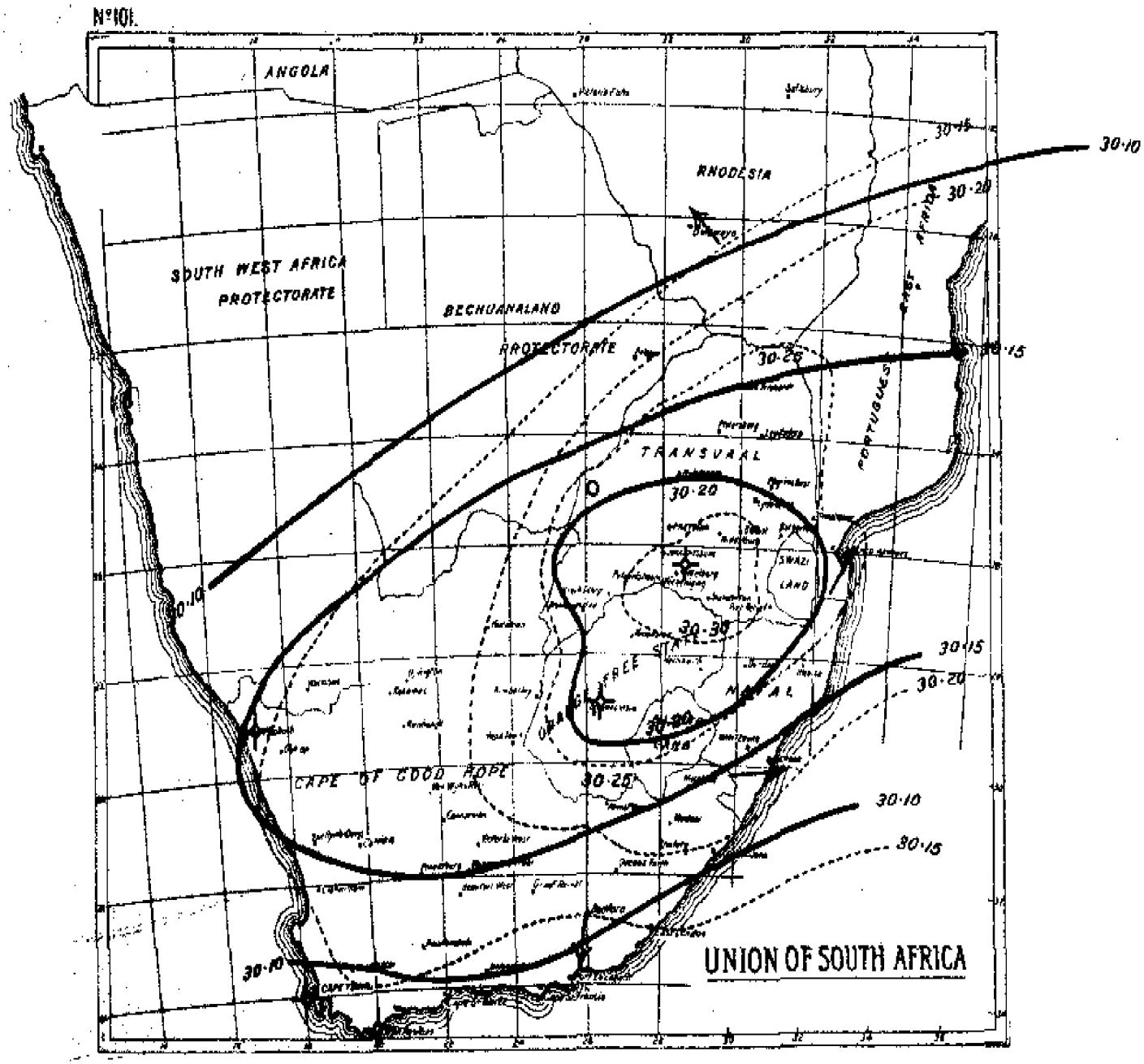
Somerset East.—The unusual rains falling in mid-June (13th, 1·35 inch; 14th, 1·71 inch; and 15th, 0·01 inch; and amounting to 3·07 inches) dispelled fears of drought. The total rainfall—3·51 inches on five days—is exceptional for June. Snow appeared on Boschberg (5000 feet) on 25th June for first time this year. Frequent hot northerly winds during nights and early mornings.—C. Harris.

Vryburg.—Winds variable. On 26th south wind freshened up at 8.40 a.m., and blew strong and cold. Rainfall: 0·17 inch on one day.—H. W. Collen.

Maclear.—Two good snowstorms in month accompanied by favourable weather, making prospects for spring very good. Rainfall: 1·41 inch on five days.—Dr. W. Mackenzie.

Rietfontein (Aliwal North).—Big snowstorm on 14th, largest snowstorm since 1903. Rainfall: 1·80 inch on one day.—A. G. Smith.

Great Fish Point (Bathurst).—5·80 inches of rain on four days fell during June, of which 5·51 inches fell in twenty-seven hours on the 13th to 14th. I am informed by old residents this is the best rain which has fallen in this district for some fifteen years or more. The country is looking grand, all blind rivers are now flowing into the sea, all dams, etc., overflowing. With the exception of the four rainy days, the weather has been fine; very cold at night, especially towards the end of the month.—H. W. Mantle.



June, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a. m.
The dotted lines indicate the normal distribution for June.

Ceres.—Weather generally typical, with very heavy frost on 27th, 28th, 29th, and 30th. Rainfall: 10·58 inches on thirteen days.—A. Heatlie.

Darling (Malmesbury).—A very favourable month; good rains, but not too heavy; and crops doing well. Rainfall: 6·26 inches on eighteen days.—P. H. Drake.

Wynberg Convent (Capetown).—On 3rd heavy rains, strong winds, slates blown off, and large branches of trees blown down. Rainfall: 11·31 inches on sixteen days.—The Mother Superior.

Groot Constantia Wine Farm (Capetown).—Very strong north-west winds on afternoon of 3rd, causing many trees to collapse. Rainfall: 9·71 inches on sixteen days.—A. G. van Reenen.

Lovedale.—Unusually good, steady and soaking rains fell in the middle of the month. Rainfall: 2·02 inches on five days.—Charles A. Pilson.

Vruchtbaar (Wellington).—Cereal crops in fine condition, and fruit trees most promising. Rainfall: 6·00 inches on thirteen days.—P. J. Cillie.

Kilcullen (Barkly East).—The month of June was very severe; we had two snowstorms; on the 14th snow was up to 14·00 inches thick on the level. The ground is now well soaked, and a lot of ploughing can be done this year. Some farmers have lost as many as 300 sheep on account of snowstorms. All stock in very poor condition. Rainfall: 0·70 inch on three days.—O. Vorster, J.P.

BASUTOLAND.

Mafeteng.—Splendid rains, with snow and sleet, fell from 11th to 15th, totalling 2·69 inches. Ploughing for wheat in full swing. Sharp frosts at night. Fine bracing days.—F. Hodgson.

Maseru.—Cold winds every day, and very cold at night. Rainfall: 1·78 inch on three days.—J. G. Green.

WEATHER CHARACTERISTICS FOR THE MONTH OF AUGUST.

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 inches over the Cape Peninsula; 3 inch in the Cape south-western districts; 2 inches along the south coast; 1·5 inch in the south-east of the Cape, along the west coast, and in Zululand; 1 inch in Natal, Basutoland, in the Cape north-eastern districts, and Kaffraria; and less than 1 inch in other parts of the Union.

The mean temperature of the air is now increasing rapidly inland, 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; north-north-west 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 north-east, which constitutes the prevalent direction. In the north of the Cape Province the principal wind is still from east-north-east; over this area there is a decrease in frequency of southerly, south-westerly, and north-westerly winds, but an increase of breezes from directions between north and south-east. Over the Cape Peninsula north-westerly are still the dominant winds, notwithstanding a falling-off in their frequency and an increase in those from 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.

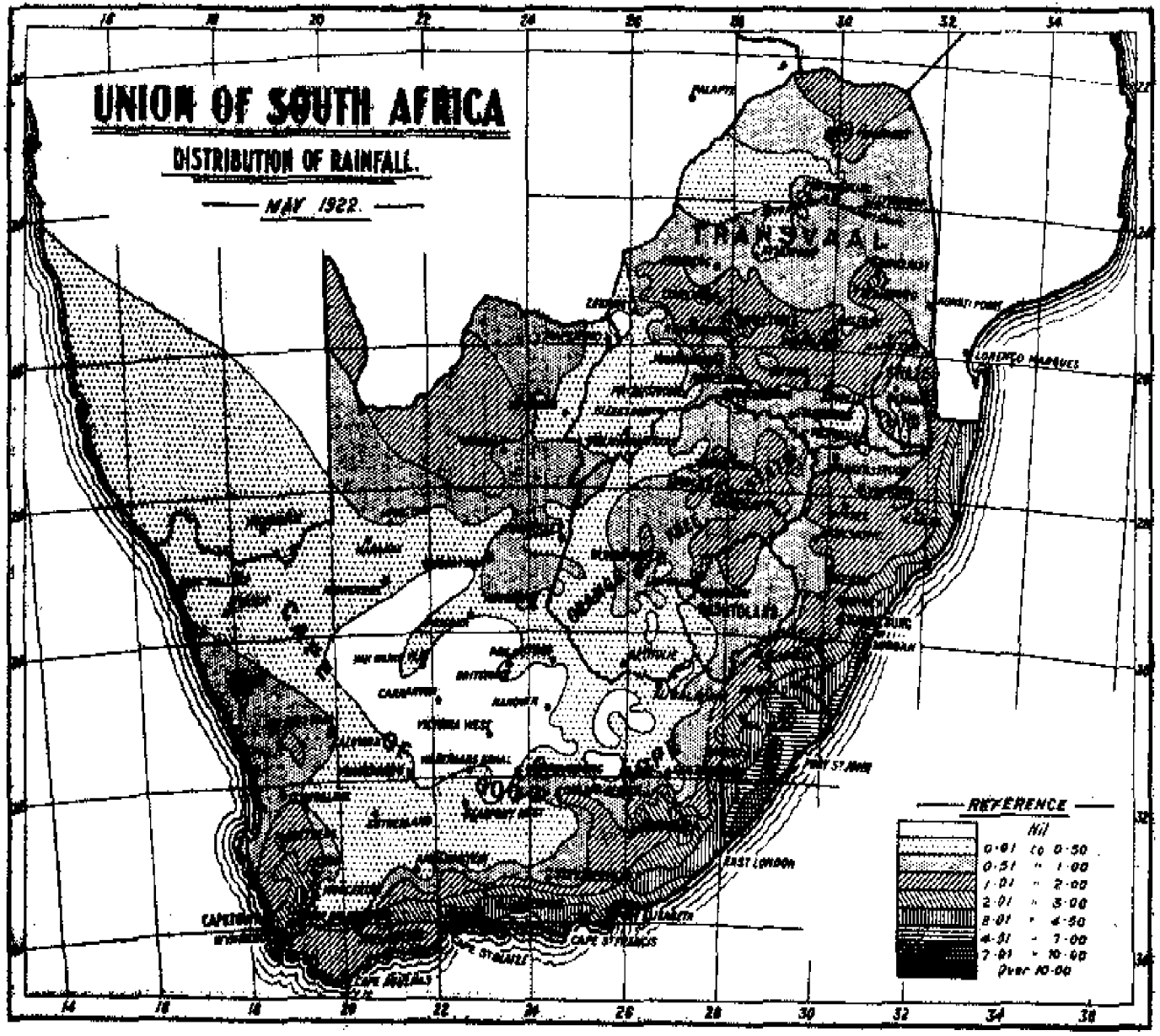
Pretoria.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), JUNE, 1922.

Place.	Observer.	Month—June, 1922. Mean Max.	Month—June, 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
Transvaal—		° F.	° F.	° F.	° F.	° F.	° F.		° F.	
Barberton	Walter Grubb	73·2	49·2	61·2	59·3	+ 1·9	84·0	4th and 5th	40·0	28th.
Belfast	The Forester	62·3	27·4	44·8	46·1	− 1·3	72·0	23rd and 24th	20·0	30th.
Bloemhof	A. Adamson	65·0	31·4	48·2	49·7	− 1·5	74·0	3rd, 23rd, and 24th	21·0	27th.
Ermelo	The Forester	65·5	32·6	49·0	47·4	+ 1·6	75·0	24th	21·5	27th.
Johannesburg (Observatory)	The Staff	60·8	42·0	51·4	50·4	+ 1·0	71·2	23rd	22·8	27th.
Klerksdorp	Chas. Scott	66·2	30·7	48·4	50·3	− 1·9	77·0	6th	20·0	28th.
Komatipoort	H. J. Evans	79·5	48·2	63·8	63·1	+ 0·7	92·5	4th	35·0	18th.
Louis Trichardt	I. J. de Bruin	72·1	45·0	58·6	56·8	+ 1·8	85·0	8th	39·0	17th, 18th, and 28th.
Middelburg	Dr. H. A. Spencer	68·5	31·1	49·8	48·6	+ 1·2	78·0	23rd	24·0	28th and 29th.
Nylstroom	G. Bakker	71·5	36·3	53·9	53·5	+ 0·4	79·0	5th	23·0	28th.
Pietersburg	W. J. Frankleyne	68·1	38·7	53·4	53·8	− 0·4	78·0	6th	29·0	28th.
Piet Retief	J. Werner	68·5	40·4	54·4	54·2	+ 0·2	80·9	28rd	32·0	18th, 22nd, and 28th.
Pigeonhole	Jno. McCallum	65·1	50·4	57·8	—	—	76·0	5th	40·0	16th, 28th, and 30th.
Pilgrims Rest	E. M. Skea	69·5	37·4	53·4	52·2	+ 1·2	81·0	23rd	28·0	28th.
Potchefstroom (Exp. Farm)	The Manager	68·0	30·4	49·2	49·2	± 0·0	78·3	23rd	17·5	28th.
Pretoria (Meteorological Office)	The Staff	67·9	37·1	52·5	52·6	− 0·1	76·1	23rd	26·3	28th.
Standerton	The Town Engineer	65·5	25·5	45·5	45·4	+ 0·1	74·3	24th	18·5	22nd.
Zeerust	H. Dietrich	66·5	32·0	49·2	50·5	− 1·3	78·2	6th	21·1	28th.
Swaziland—										
Mbabane	Swaziland Police	68·2	43·9	56·0	56·1	− 0·1	81·0	23rd	32·0	28th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	60·9	32·8	46·8	46·5	+ 0·3	70·3	23rd	22·5	29th.
Bloemfontein	G. A. Schepers	59·3	34·1	46·7	47·1	− 0·4	67·9	23rd	24·9	27th.
Harrismith	The Forester	56·5	35·7	46·1	45·7	+ 0·4	67·5	22nd	23·0	27th.
Kroonstad	S. R. Northfield	63·0	29·9	46·4	46·6	− 0·2	71·1	22nd	20·2	29th.
Ladybrand	The Forester	59·9	32·7	46·3	46·8	− 0·5	70·0	23rd	21·0	17th.
Lindley	J. Collister Oates	63·2	29·2	46·2	46·8	− 0·6	73·8	21st	18·2	27th.
Natal—										
Dundee	West Thorrold	68·2	36·9	52·6	53·0	− 0·4	80·0	23rd	30·0	22nd, 27th, 29th, and 30th.
Durban (Point)	The Port Captain	71·5	55·1	63·3	64·9	− 1·6	81·6	4th	45·8	27th.
Estcourt	A. A. McLean	67·1	35·3	51·2	51·4	− 0·2	80·0	4th	28·0	30th.
Hlabisa	The Gaoler	71·8	55·0	63·4	63·7	− 0·3	84·0	4th and 8th.	47·0	27th.
Ladysmith	D. A. R. Leathorn	69·3	38·0	53·6	52·4	+ 1·2	80·0	4th	29·0	28th.
Maritzburg (Mental Hospital)	The Staff	69·4	45·8	57·4	57·6	− 0·2	84·0	4th	36·0	30th.
Stanger	Cecil C. Foss	79·8	54·1	64·0	63·5	+ 0·5	88·0	4th	45·5	27th.
Weenen	The Gaoler	71·1	32·9	52·0	52·0	± 0·0	83·0	4th	27·0	30th.

AIR TEMPERATURES, JUNE, 1922—(*continued*).

Place.	Observer.	Month—June, 1922. Mean Max.	Month—June, 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Cape—										
Aliwal North	A. Alcock	59·8	32·1	46·0	46·6	− 0·6	70·5	10th	22·5	8th.
Bedford	T. C. Hall	64·3	43·1	53·7	55·2	− 1·5	76·0	22nd	32·0	28th and 29th.
Capetown (Royal Observatory)	The Staff	62·5	46·4	54·4	55·5	− 1·1	81·4	8th	34·0	26th.
Carnarvon	H. P. Matherbe	59·3	30·8	45·0	44·1	+ 0·9	70·0	9th	17·0	27th.
Clanwilliam	P. E. Scholtz	66·8	43·3	55·0	54·9	+ 0·1	84·3	9th	30·8	28th.
East London	The Port Captain	68·6	49·3	59·0	60·4	− 1·4	83·0	3rd and 24th	42·0	30th.
Graaff-Reinet	S. E. D. Treadwell	67·7	45·3	56·5	54·5	+ 2·0	80·7	3rd	34·5	28th.
Grahamstown	The Vet. Res. Officer	63·7	38·6	51·2	54·6	− 3·4	80·0	3rd	30·0	30th.
Groot Drakenstein	Lionel Baker	62·8	43·2	53·0	54·4	− 1·4	84·3	9th	32·9	27th.
Kathardt	R. Seydell	66·0	33·7	49·8	52·2	− 2·4	70·0	9th	19·0	27th.
Kimberley	Jno. Acton	64·8	36·8	50·8	50·2	+ 0·6	76·0	23rd	25·0	28th.
Kingwilliamstown	L. Clayton	68·3	42·2	65·2	56·6	− 1·4	86·0	3rd	33·5	29th and 30th.
Kokstad	H. D. Coyte	61·6	34·0	47·8	50·4	− 2·6	75·0	4th and 22nd	19·8	29th.
Maleking (Convent)	The Mother Superior	—	36·7	—	53·4	—	—	—	23·0	28th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	66·5	51·1	58·8	58·4	+ 0·4	81·0	9th	40·0	26th.
Murraysburg	—	—	—	—	—	—	—	—	—	—
Oakdale	J. Burrows	60·4	43·7	52·0	54·0	− 2·0	75·0	22nd	33·1	26th.
Port Elizabeth	The Lightkeeper	66·2	49·7	58·0	59·1	− 1·1	78·0	2nd, 3rd, and 22nd	39·0	30th.
Port Nolloth	The Lightkeeper	64·3	44·8	54·6	55·4	− 0·8	92·0	10th	37·0	14th.
Port St. Johns (Cape Hermes)	The Lightkeeper	68·9	54·0	61·9	62·2	− 0·3	77·0	3rd	45·0	27th.
Queenstown	H. Holley	62·6	35·9	49·2	51·2	− 2·0	75·0	10th	25·0	9th and 20th.
Seaforth East	C. Harris	65·5	42·5	54·0	54·0	± 0·0	78·2	9th	31·6	29th.
Stellenbosch	F. C. Bousfield	67·3	44·3	55·8	54·4	+ 1·4	79·1	10th	31·2	29th.
Sydney's Hope	Rev. S. Rippon	62·7	47·5	55·1	57·0	− 1·9	78·0	10th	37·2	26th.
Utenhage	H. Inggs	71·3	41·0	56·2	57·4	− 1·2	83·3	9th and 10th	30·5	30th.
Umtata	Miss N. Dix-Peek	67·5	38·2	52·8	53·5	− 0·7	81·1	9th	29·7	30th.
Vryburg	H. W. Collen	66·1	33·1	49·6	49·7	− 0·1	76·0	22nd	20·0	28th.
Wynberg (Convent)	The Mother Superior	62·7	46·0	54·4	56·2	− 1·8	86·8	10th	36·8	27th.
Basutoland—										
Mafeteng	F. Hodgson	56·4	34·6	45·5	48·0	− 2·5	65·0	10th	23·0	27th.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
MAY 1922.
TRANSVAAL
LOURENCO MARQUES
EAST LONDON
CAPE ST FRANCIS
REFERENCE
Nil
0·01 to 0·50
0·51 " 1·00
1·01 " 2·00
2·01 " 3·00
3·01 " 4·50
4·51 " 7·00
7·01 " 10·00
Over 10·00

RAINFALL, JUNE, 1922.

Place.	Observer.	Month. June, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Transvaal—										
Barberton	W. Grubb	1·69	0·13	+ 1·56	14·28	20·94	− 6·66	30·16	33·74	− 3·58
Bethal	H. Joubert	0·66	0·04	+ 0·62	16·00	14·87	+ 1·13	32·70	30·39	+ 2·31
Ballast	The Forester	1·63	0·11	+ 1·52	19·40	17·15	+ 2·25	36·48	32·00	+ 4·48
Bloemhof	A. Adamson	0·74	0·20	+ 0·54	6·17	12·50	− 6·33	10·75	18·82	− 8·07
Claremont	S.A. Police	0·00	0·01	− 0·01	5·18	10·97	− 5·79	9·89	18·13	− 8·24
Ermelo	The Forester	0·87	0·11	+ 0·76	13·17	14·80	− 1·63	29·96	29·21	+ 0·75
Haenertsburg	S.A. Police	0·00	0·34	− 0·34	13·03	26·69	−13·66	30·18	40·36	−10·18
Heidelberg	W. ter Horst	0·34	0·04	+ 0·30	11·79	14·82	− 3·03	22·06	27·73	− 5·67
Johannesburg (Observatory)	The Staff	0·37	0·09	+ 0·28	12·50	16·35	− 3·85	27·29	30·73	− 3·44
Klerksdorp (Strathmore)	C. Scott	0·63	0·12	+ 0·51	8·32	13·77	− 5·45	21·95	21·89	+ 0·06
Komatipoort	H. J. Evans	1·02	0·16	+ 0·86	12·93	16·99	− 4·06	28·74	26·27	+ 2·47
Louis Trichardt	I. J. de Bruin	0·30	0·43	− 0·13	6·01	19·30	−13·29	20·09	32·36	−12·27
Middelburg	Dr. H. A. Spencer	0·80	0·09	+ 0·71	15·50	15·12	+ 0·38	34·32	28·77	+ 5·55
Nylstroom	G. Bakker	0·42	0·19	+ 0·23	8·67	13·97	− 5·30	20·44	23·99	− 3·55
Pietersburg	W. J. Frankleyne	0·06	0·01	+ 0·05	7·12	12·17	− 5·05	22·96	21·69	+ 1·27
Piet Retief	J. Werner	0·25	0·11	+ 0·14	11·39	15·41	− 4·02	35·88	30·62	+ 5·26
Pilgrims Rest	E. M. Skea	0·94	0·31	+ 0·63	17·92	26·43	− 8·51	38·30	40·48	− 2·18
Pigeonhole (New Agatha)	J. McCallum	0·42	0·05	+ 0·37	13·34	19·49	− 6·15	42·15	34·50	+ 7·65
Potchefstroom (Exp. Farm)	The Manager	0·69	0·07	+ 0·62	9·21	12·99	− 3·78	22·09	23·69	− 1·60
Pretoria (Meteorological Office)	The Staff	0·01	0·06	− 0·05	10·42	17·06	− 6·64	21·20	29·68	− 8·48
Rooiberg	M. Baumann	0·01	0·03	− 0·02	10·37	13·94	− 3·57	23·81	23·89	− 0·08
Rustenburg	S.A. Police	0·26	0·11	+ 0·15	10·45	14·91	− 4·46	25·00	25·86	− 0·86
Standerton	—	—	—	—	—	—	—	—	—	—
Waterstroom	L. le Roux	0·99	0·14	+ 0·85	13·55	17·08	− 3·53	36·04	32·13	+ 3·91
Woodbush I.	The Forester	0·57	0·39	+ 0·18	17·34	46·90	−29·56	51·54	71·99	−20·45
Zoutpan	H. Dietrich	0·36	0·07	+ 0·29	7·83	14·97	− 7·14	16·93	24·05	− 7·12
Swaziland—										
Mbabane	Swaziland Police	1·54	0·37	+ 1·17	18·56	28·76	−10·20	44·36	50·16	− 5·80
Orange Free State—										
Bethulie	J. J. Warlihaugh	0·36	0·58	− 0·22	3·47	11·96	− 8·49	8·52	18·46	− 9·94
Blomfontein	G. A. Schepers	2·05	0·21	+ 1·84	5·90	11·59	− 5·69	11·31	19·22	− 7·91
Boshof	P. H. v. Rooyen	0·24	0·23	+ 0·01	4·88	12·09	− 7·21	9·78	19·45	− 9·67
Harrismith	The Forester	0·36	0·19	+ 0·17	11·86	15·06	− 3·20	28·61	28·19	+ 0·42
Kroonstad	S. R. Northfield	0·54	0·29	+ 0·25	7·55	10·68	− 3·13	22·22	22·05	+ 0·17
Ladybrand	The Forester	1·73	0·33	+ 1·40	9·04	15·36	− 6·32	24·69	27·34	− 2·65
Lindley	J. Collister-Oates	0·67	0·17	+ 0·50	9·75	13·86	− 4·11	24·19	24·34	− 0·15

RAINFALL, JUNE, 1922—(*continued*).

Place.	Observer.	Month. June, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Natal—										
Dundee	West Thorrold	1·56	0·18	+ 1·38	15·68	17·95	− 2·27	45·22	31·27	+13·95
Durban (Point)	Port Captain	2·56	1·12	+ 1·44	23·19	22·29	+ 0·90	55·58	41·76	+13·82
Estcourt	A. A. McLean	1·69	0·26	+ 1·43	11·76	16·26	− 4·50	29·96	28·06	+ 1·90
Illabita	The Gaoler	0·97	0·73	+ 0·24	11·85	22·39	−10·54	43·51	43·23	+ 0·28
Howick	The Gaoler	2·12	0·50	+ 1·62	14·25	17·73	− 3·48	34·20	32·04	+ 2·16
Ladysmith	D. A. R. Leathern	1·48	0·22	+ 1·26	15·54	16·07	− 0·53	42·17	27·31	+14·86
Maritzburg (Mental Hospital)	The Staff	2·16	0·32	+ 1·84	11·94	18·66	− 6·72	35·86	33·80	+ 2·06
Stanger	C. C. Voss	1·77	0·92	+ 0·85	16·20	20·10	− 3·90	—	42·31	—
Vryheid	The Gaoler	0·57	0·20	+ 0·37	15·31	19·90	− 4·59	36·72	36·89	− 0·17
Weenen	The Gaoler	0·51	0·25	+ 0·26	13·23	14·79	− 1·56	26·31	26·37	− 0·06
Cape—										
Aliwal North	A. Alcock	1·72	0·63	+ 1·09	5·23	13·12	− 7·89	12·51	21·14	− 8·63
Beaufort West	The Gaoler	0·18	0·36	− 0·18	4·05	5·93	− 1·88	12·51	9·46	+ 3·05
Bedford	T. C. Hall	3·47	0·95	+ 2·52	16·07	15·73	+ 0·34	26·65	27·97	− 1·32
Britstown	The Gaoler	0·06	0·49	− 0·43	1·46	7·98	− 6·52	4·84	11·35	− 6·51
Calvinia	The Gaoler	2·07	1·00	+ 1·07	3·95	4·29	− 0·34	8·01	7·74	+ 0·27
Capetown (Royal Observatory)	The Staff	4·18	4·45	− 0·27	10·11	12·65	− 2·54	23·76	25·54	− 1·78
Ceres	A. Heatlie	10·58	6·65	+ 3·93	22·28	18·52	+ 3·76	48·66	41·29	+ 7·37
Carnarvon	A. P. Malherbe	0·00	0·36	− 0·36	0·28	5·77	− 5·49	3·83	8·02	− 4·19
Clanwilliam	P. E. Scholtz	2·52	1·38	+ 1·14	4·98	4·23	+ 0·75	8·30	8·59	− 0·29
East London	A. Downie	0·57	1·54	− 0·97	14·99	16·79	− 1·80	28·91	33·38	− 4·47
Fraserburg	The Gaoler	0·13	0·40	− 0·29	2·24	4·58	− 2·34	6·56	6·64	− 0·08
Garies	The Gaoler	1·46	0·84	+ 0·62	2·21	2·45	− 0·24	4·32	5·20	− 0·88
Graaff-Reinet	S. E. D. Treadwell	0·83	0·57	+ 0·26	4·68	8·04	− 3·36	14·33	13·92	+ 0·41
Groot Drakenstein	Lionel Baker	9·47	5·86	+ 3·62	21·64	16·91	+ 4·73	41·52	35·61	+ 5·91
Griquatown	The Gaoler	0·08	0·46	− 0·38	1·42	9·51	− 8·09	5·02	13·08	− 5·06
Grahamstown	Vet. Res. Officer	4·54	1·42	+ 3·12	14·08	14·67	− 0·59	25·67	28·79	− 3·12
Hanover	The Gaoler	0·11	0·53	− 0·42	2·19	9·08	− 6·89	6·88	13·22	− 6·34
Hopetown	The Gaoler	0·18	0·40	− 0·22	2·16	8·85	− 6·69	7·97	12·78	− 4·81
Keuhardt	R. Seydell	0·01	0·27	− 0·26	0·75	4·13	− 3·38	2·04	5·64	− 3·60
Kimberley	J. Acton	0·00	0·32	− 0·32	3·01	10·53	− 7·52	7·02	16·26	− 9·24
Kuyna	The Gaoler	1·99	2·13	− 0·14	17·70	13·30	+ 4·40	33·62	28·79	+ 4·83
Kokstad	H. D. Coyte	2·48	0·50	+ 1·98	15·49	15·38	+ 0·11	37·83	27·14	+10·69
Kingwilliamstown	L. Clayton	1·20	0·85	+ 0·35	9·80	13·51	− 3·71	22·36	25·26	− 2·90
Kuruman (Abiania)	A. T. Sitwell	0·00	0·30	− 0·30	3·60	11·82	− 7·82	6·21	16·43	−10·22
Mafeking (Convent)	The Mother Superior	0·60	0·05	+ 0·55	5·79	13·19	− 7·40	11·43	21·51	−10·08
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·49	1·29	− 0·80	7·58	8·75	− 1·17	17·15	17·33	− 0·18
Murraysburg	The Gaoler	0·00	0·46	− 0·46	2·96	7·94	− 4·98	8·50	11·04	− 2·54
O'okiep	J. Burrows	1·02	1·02	± 0·00	1·31	3·77	− 2·46	3·68	7·11	− 3·43

RAINFALL, JUNE, 1922—(*continued*).

Place.	Observer.	Month. June, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1921.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cape—continued—										
Philipstown	The Gaoler	0·35	0·58	− 0·23	2·65	9·24	− 6·59	7·90	13·94	6·04
Piquetberg	The Gaoler	4·47	3·01	+ 1·46	11·43	9·34	+ 2·09	22·96	20·74	+ 2·22
Port Elizabeth	The Lightkeeper	1·08	1·67	− 0·59	8·83	9·86	− 1·03	24·61	22·23	+ 2·38
Port St. Johns	The Lightkeeper	1·97	1·79	+ 0·18	17·78	24·40	− 6·62	40·28	48·69	− 8·41
Port Nolloth	The Lightkeeper	0·21	0·26	− 0·05	0·91	1·10	− 0·19	2·14	2·21	− 0·07
Prieska	The Gaoler	0·04	0·28	− 0·24	0·94	7·23	− 6·29	5·10	9·72	− 4·62
Queenstown	H. Holley	1·12	0·61	+ 0·51	8·31	12·80	− 4·49	19·95	21·41	− 1·46
Steytlerville	The Gaoler	0·00	0·31	− 0·31	6·05	5·40	+ 0·65	13·31	9·26	+ 4·05
Sutherland	The Gaoler	1·47	1·02	+ 0·45	3·85	5·36	− 1·51	8·63	9·22	− 0·59
Swellendam	The Gaoler	1·72	2·16	− 0·44	19·56	16·43	+ 3·13	32·98	32·64	+ 0·34
Sydney's Hope	Rev. S. Rippon	4·08	1·20	+ 2·88	14·81	11·72	+ 3·09	25·32	22·78	+ 2·54
Somerset East	C. Harris	3·51	0·66	+ 2·85	10·74	12·99	− 2·25	25·38	23·82	+ 1·56
Stutterheim	F. C. Bousfield	0·87	0·81	+ 0·06	14·54	16·49	− 1·95	32·73	29·67	+ 3·06
Uitenhage	H. Inggs	0·90	0·91	− 0·01	9·70	8·41	+ 1·29	21·08	17·46	+ 3·62
Umtata	Miss N. Dix-Peek	1·27	1·04	+ 0·23	11·58	14·66	− 3·08	27·59	25·74	+ 1·85
Uniondale	The Gaoler	0·51	1·15	− 0·64	7·77	6·87	+ 0·90	11·91	13·58	− 1·67
Upington	The Gaoler	0·00	0·11	− 0·11	1·02	5·03	− 4·01	3·68	7·03	− 3·35
Victoria West	The Gaoler	0·13	0·45	− 0·32	2·75	7·01	− 4·26	11·04	10·14	+ 0·90
Vryburg	H. W. Collens	0·17	0·27	− 0·10	4·94	13·83	− 8·89	10·70	19·69	− 8·99
Worcester	The Gaoler	2·35	1·90	+ 0·45	6·42	5·90	+ 0·52	12·61	12·67	− 0·06
Wynberg (Convent)	The Mother Superior	11·31	8·04	+ 3·27	19·00	20·76	− 1·76	41·40	47·12	− 5·72
Basutoland—										
Maseteng	F. Hodgson	2·60	0·72	+ 1·97	8·90	19·36	−10·46	22·26	31·69	− 9·43
South-West Africa—										
Tsumeb	Ing. Schetter	0·00	0·09	− 0·09	6·39	23·36	−16·97	11·13	31·57	−20·44
Waterberg	D. Hahn	0·00	0·06	− 0·06	7·25	15·89	− 8·64	10·59	21·15	−10·56
Usakos	Missionary Diehl	0·00	0·02	− 0·02	0·48	4·16	− 3·68	0·48	5·27	− 4·79
Gobabis	Missionary Irle	0·00	0·09	− 0·09	3·98	12·24	− 8·26	7·95	16·21	− 8·26
Windhoek	Observatory	0·00	0·03	− 0·03	5·40	11·75	− 6·35	6·63	15·08	− 8·45
Mariental	Baron v. Esebeck	0·00	0·04	− 0·04	2·04	4·68	− 2·64	4·22	5·94	− 1·72
Heirachabis	Pater Prefect	0·00	0·25	− 0·25	0·67	2·94	− 2·27	1·35	3·57	− 2·22

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UNION OF SOUTH AFRICA

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Weather Bureau

DEPARTMENT OF IRRIGATION

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

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MEAN pressure slightly higher than usual along the south coast, practically normal elsewhere; mean temperature averaging 1 degree above normal, except in Natal, where it was sub-normal; unusually mild weather with frequent frosts of less severity than usual; continuous or partial drought, except in the south and south-east Cape, and Natal, where rainfall was either normal or in excess; showers of snow during the third week—these were the principal features of the weather of July, 1922.

Pressure.—As shown by the accompanying map, pressure was practically normal in the north and east, but slightly higher—about 0·05 inch—over the south and west. Anticyclonic conditions prevailed practically throughout the month, pressure being generally highest over the Transvaal. The only low pressure experienced occurred on the 30th, when it passed along the south coast. The weather was generally fine and bright with haze and morning mists, although cloudy on a few occasions, with some light showers of rain and sleet in the south-east. The nights were generally cold and frosty over the interior. Over the south-west and south of the Cape, it was cloudy and unsettled on about fifteen days of the month, although the rainfall was considerably below normal in the south-west.

Temperature.—The mean temperature over the Union during July (54·0 degrees) was 1 degree above normal, the excess being practically equally divided between the day (68·6 degrees) and the night temperatures (39·4 degrees). An excess of mean temperature was common to the Transvaal, Orange Free State, and Cape, where their mean temperatures—52·9 degrees, 47·4 degrees, and 55·5 degrees—were respectively 1·5 degree, 0·4 degree, and 1·2 degree above the average; on the other hand, the temperature in Natal (56·5 degrees) was 0·4 degree lower than usual. The mean maximum temperature in the Transvaal (69·7 degrees) was 2·3 degrees above the usual value; in the Free State (63·6 degrees) it was 1·0 degree, and in

the Cape Province, with 68·2 degrees, it was 0·9 degree higher than the corresponding averages. In Natal, on the other hand, the mean day temperature of 71·4 degrees was 1·8 degree less than usual. The mean night or minimum temperatures were above the average in three of the four Provinces; thus, the Cape Province with 42·8 degrees was 1·5 degree, Natal with 41·6 degrees was 0·9 degree, and the Transvaal with 36·1 degrees was 0·6 degree above the corresponding averages. In the Free State, on the other hand, there was a small deficit, the mean minimum of 31·2 degrees being sub-normal by 0·2 degree. It will thus be seen that while both days and nights were warmer than usual in the Cape and Transvaal Provinces, only the days in the Free State and only the nights in Natal had temperatures above the average. At the individual stations the mean temperature for the month was above the average, mostly by 1 to 2 degrees in the Transvaal, greater part of the Free State, and the Cape Province, rising, however, in part of the last-named Province to over 3 degrees. The only exceptional station in the Transvaal was Belfast, where the temperature was 0·7 degree lower than usual. The north of the Free State was also cooler than usual by 0·4 degree to 1 degree. In Natal proper, whilst Ladysmith had a practically normal mean temperature, a deficit prevailed elsewhere, varying between 0·1 degree at Maritzburg and 2·4 degrees at Dundee. At Hlabisa, Zululand, there was an excess of 1·1 degree. Sub-normal temperatures in the Cape Province were mainly confined to the more easterly section, where the deficit was usually less than 1 degree. The temperature of the month was also lower than usual by more than 1½ degree at Port Nolloth in Namaqualand and at Wynberg in the Cape Peninsula. The days were generally 2 to 3 degrees warmer than usual over the Transvaal and the Free State, but the excess in the mean maxima were mostly somewhat less in the Cape Province, about 1 to 2 degrees or even less. In Natal the days were cooler than usual, the deficit varying from 0·6 degree at Dundee to 3·5 degrees at Maritzburg. A deficiency in the day temperatures was experienced at Pietersburg in the Transvaal, where it amounted to 0·8 degree; also at Harrismith in the Free State, where it was 2·2 degrees. The sub-normal monthly temperature in the areas mentioned above in the Cape Province was mainly due to the days being cooler than usual by variable amounts ranging from 0·1 degree at Queenstown to 3·9 degrees at Wynberg. Except in the Free State and parts of the Cape Province, the nights were also warmer than usual by 1 to 3 degrees. In the Transvaal, however, there was a deficiency in the mean minimum temperature of 1 degree at Nylstroom and 3·9 degrees at Belfast; in the Free State the deficit ranged from 0·9 degree at Bloemfontein to 2·6 degrees at Lindley. In Natal the only station showing cold nights was Dundee, where the deficit was 4·3 degrees. In the Cape Province the mean minima were lower than the average in parts of the west, south-west, the Namaqualand coast, Bechuanaland, and the north-east, the shortage being least (0·3 degree) at Groot Drakenstein and greatest (2·8 degrees) at Port Nolloth. It will thus be seen that the weather of July, on the whole, was unusually mild, almost summer-like at intervals throughout the month. The mean warmest station was Hlabisa in Zululand, with a temperature for the month of 65·0 degrees, closely followed by Port St. Johns with 64·9 degrees and Komatipoort with 64·6 degrees. The mean coolest station was Belfast, in the Transvaal high veld, with 44·1 degrees, a difference of 20·9 degrees.

The highest mean day temperature was 81·9 degrees at Komatipoort, and the lowest mean night temperature, 25·4 degrees, at Belfast, showing a mean daily range of 56·5 degrees over the Union. The highest temperature readings were recorded on seventeen days of the month, viz., 1st, 10th, 12th to 16th, 18th, 22nd to 25th, and 27th to 31st, but most widely on the last two

days of the month. Extreme minima for the month were registered at one or more stations each day, except the 10th, 11th, 14th, and 31st, showing no particularly widespread cold spell. These readings were most common on the 1st, 2nd, and 29th. The highest temperature registered was 92·0 degrees at Port Nolloth on the 12th, and the lowest, 16·0 degrees, on the 1st, at Belfast, an extreme range of 76 degrees. As already stated, frosts, although of practically daily occurrence, were by no means so severe as usual. Frequent mists prevailed in the mornings in many parts, particularly the eastern Transvaal and south-west Cape. Owing to the continued drought, the water in springs and rivers is getting very low, in some places insufficient for the watering of stock, whilst there is a great shortage of grazing and other food, particularly on the innermost plateau, owing partly to the failure of the mealie crop. Cattle in this area are reported as having gone off considerably in condition, whilst at Elandsfontein (Richmond Division), in the Cape Province, sheep are reported to be dying daily. On the whole, conditions seem to be most satisfactory in Natal, in parts of which cattle and other stock are stated to be looking well and in good condition.

Precipitation.—Rainfall during the month was confined in the Transvaal to showers in parts of the Barberton, Carolina, Lydenburg, and Middelburg Districts on the 27th–28th, extending into parts of Swaziland; light showers were also experienced in the east of the Free State between the Districts of Philippolis and Harrismith on the 19th and 20th; also in Natal, on the latter date, where precipitation occurred in some areas in connection with thunderstorms. Showers also occurred in some areas in connection with thunderstorms; showers also occurred during the third week of the month over the southern and central Karroos, portions of the northern Karroo, the south-east, north-east of the Cape, and part of Kaffraria; whilst light rain was distributed more uniformly throughout the month over the west coast, Cape Peninsula, the south-west, and along the south coast. Absolute drought prevailed over the rest of the Union during the month. An excess of rainfall was met with only in the south inland to the central Karroo, south-east, and portions of Natal, the north-east, the extreme south of the Free State, and at least part of Basutoland. At most of the stations in the more northerly portion of the area indicated the excesses were very small (generally a few hundredths), but along the south coast and in the south-east the excess increased to 2 to 2½ inches.

The accumulated rainfall since the beginning of the present year (1922) shows large deficits over almost the whole Union, the shortage in the Transvaal varying from 1·78 inch at Ermelo to 30·68 inches at Woodbush, but, generally speaking, was between 4 and 6 inches; over the Free State it varied from 3½ to 8 inches, being 3·34 inches at Harrismith and 8·32 inches at Bethulie; in Natal it ranged from less than half an inch at Ladysmith to 11 inches at Hlabisa in Zululand; in the Cape Province the shortage was mostly between 4 and 6 inches, decreasing in a general way towards the coast, the deficiency here varied from a few hundredths of an inch at Clanwilliam to 9 inches at Vryburg in Bechuanaland. On the other hand, a surplus of precipitation occurred over parts of the south-west, along the south coast, a small portion of the south-east, at Kokstad in the Transkei, at Durban (Natal), and on the Transvaal high veld. The excesses varied considerably along the coastal area, being mostly about 2 to 4 inches, but ranging from 0·43 inch at Piquetberg to 6·27 inches at Knysna. The surplus was small in the Transkei and at Durban, and on the high veld (Transvaal) was 0·39 inch at Middelburg and 1·97 inch at Belfast. Snow fell at some stations, mainly in the north-east of the Cape Province, between the 18th and 20th.

OBSERVERS' NOTES FOR JULY, 1922.

TRANSVAAL.

Barberton.—Mild, dry weather has prevailed throughout the month. Rainfall: 0·01 inch on one day.—Walter Grubb.

Middelburg.—Cold weather with frosts at night has prevailed during the month, the cold biting breeze by day being shown by the low maximum temperatures. The degree of frost has not been so low as usual by several degrees, however, and the winter this year, which may be considered as broken, has been decidedly milder than usual. Each morning, nearly, mists have lain in the surrounding valleys, usually not dense, but occasionally dense, though not so dense as to hide the trees and houses from the air. On the 30th, however, two days after a slight rainfall a dense mist lay over the country, enveloping high and low ground alike until 9 a.m., which would probably have blotted out the earth's surface from the air. It was as dense at Uitkyk—6 miles away and 250 feet higher than Middelburg—as down in the town at the foot of the plateau. Rainfall: 0·06 inch on two days.—Dr. H. A. Spencer.

Pietersburg.—Heavy frosts and ice up to the middle of the month. Few mornings heavy mist overhead till about 10 a.m. Sharp frost last two days—rather unusual for this time of the year. Rainfall: Nil.—W. J. Frankleyne.

Piet Retief.—District in a very dry state. Grass-burning has already begun. Rainfall: Nil.—J. Werner.

Standerton.—On the whole, the weather was very mild; only one day was very unpleasant, the 20th, when a gale blew rather strongly. Rainfall: Nil.—The Town Clerk.

Jakhalsfontein (Pietersburg).—Dry and calm with fresh nights. Grass scarce in the native location. Rainfall: Nil.—Rev. James C. Palmer.

White River (Barberton).—Weather cool and bright throughout the month. Thunderstorms on the evenings of the 26th and 27th. Rainfall: 0·28 inch on two days.—H. P. Pooley.

Mosdene (Naboomspruit).—A rainless and practically cloudless month of bright sunshine, unusually mild for July. Sub-tropical peach trees are in full bloom and other deciduous fruit trees show signs of shooting much earlier than usual. The lowest temperature recorded was 28 degrees on the 1st, as compared with 24·0 degrees on the 7th July last year and still lower temperatures the two previous years. The maximum temperature reached 81 degrees on the 24th, whilst the highest temperature in July last year was only 75·6 degrees.—Ernest E. Galpin.

Gemsbokfontein (Middelburg).—The ground was white with frost the greater part of the month. Rainfall: 0·02 inch on one day.—G. J. Imrie.

Rustenburg.—This has been a very dry month, and in consequence fountains and rivers have become very weak. Cold nights in the beginning of the month; latter part quite warm. Cattle are getting in low condition. Large numbers of locusts are still in the district laying their eggs, which will hatch with the first rains. Crops of wheat and oats are below the average, and have in various places been eaten off by locusts. Citrus crops are now approaching the end; a fair crop has been reaped, and large quantities have been exported this season. Rainfall: Nil.—H. J. Streatfield.

Goedgelegen (Marico).—No rain has fallen this month. It is a very hard year for us farmers; no corn is sown on account of the want of water.—E. M. Cottrell.

Drielaagte (*Rustenburg*).—Locusts very bad. Rainfall: Nil.—H. Hardusck.

Weltevreden (*Standerton*).—Stock in good condition. Rainfall: Nil.—W. Long.

Broederstroom (*Zoutpansberg*).—First time since 1914 that no rain at all has fallen in July.—W. G. Hodgson.

SWAZILAND.

Mbabane.—The country is exceptionally dry; once or twice during the month clouds gathered during the evening which looked like rain, but eventually cleared up. The 20th was a very windy day, the wind-force rising to 7. Rainfall: Nil.—R. C. S. Markham.

Croydon.—Very dry. No grass, so cattle are suffering. Rainfall: 0·04 inch on one day.—Alex. Brown.

ORANGE FREE STATE.

Rugby (*Bethlehem*).—A month of mild weather, which has greatly benefited the stock. Mealie crops have threshed out much below expectations and at least 50 per cent. below 1921 yield. An early spring is required, as there is little or no feeding value in the mealie-stalks this season. Rainfall: Nil.—A. C. Glynn-Baker.

Heilbron (*Heilbron*).—The harvesting of maize is still going; greater portion has been garnered and grain is freely offering. Stock generally are in poor condition. One suspected case reported as anthrax gave negative results; one other case proved to be anthrax. The winter has, on the whole, been a very mild one, only a very few cold snaps being experienced of short duration. Rainfall: Nil.—P. A. du P. Naude.

Paardekraal (*Winburg*).—Ground still fit to plough at end of month. Sheep and cattle have fallen off considerably. Some green grass beginning to show at end of month. Maize crop in this neighbourhood quite 50 per cent. below normal. Rainfall: 0·09 inch on one day.—G. S. Lowe.

Holfontein (*Kroonstad*).—The drought is now becoming very serious. Farmers in neighbourhood are all complaining; some farmers have hardly any water for their animals. The veld is very bad, and unless rains fall next month the outlook will be poor. Rainfall: Nil.—L. C. McInery.

NATAL.

Dundee.—An exceptionally pleasant month for July, the usual north-west wind threatening the last two days of the month. Rainfall: 0·10 inch on one day.—West Thorrold.

Ladysmith.—A very dry month. Weather otherwise extremely pleasant, being cold in the mornings and evenings and warm during the day. Rainfall: 0·15 inch on one day.—D. A. R. Leathern.

Hlabisa.—Rain urgently needed; otherwise the weather has been seasonable during the month. Rainfall: 0·13 inch on two days.—L. Double.

Nottingham Road.—Calm sunny days. Snow at the end of last month has kept the ground damp, and there is a decided spring everywhere. Rainfall: 0·07 inch on two days.—Miss E. Smythe.

Lemont (*Mid-Illovo*).—A warm July. Grass shooting well on burnt patches; cattle looking well. Cold snap on 29th. Rainfall: 0·14 inch on two days.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Rongpoort (*Weenen*).—Pleasant month. Little wind and slight frosts. Rainfall: 0·12 inch on one day.—J. H. Bartholomew.

Edendale (Klip River).—Nice warm days, but cold nights and heavy frosts during month. All stock in good condition. Rainfall: 0·10 inch on one day.—T. W. Niland.

CAPE.

Graaff-Reinet.—Wind moderate, generally from north early mornings and evenings, round to south during the day. Temperature mild, no frost having been recorded, almost summer-heat at times. Rainfall: 0·33 inch on three days.—S. E. D. Treadwell.

Clanwilliam.—Particularly dry month. During the latter half of June and throughout this month there was a misty overcast sky almost every forenoon. Rainfall: 0·46 inch on five days.—P. E. Scholtz.

Bedford.—The weather has been unusually warm this month. Rainfall: 0·53 inch on three days.—T. C. Hall.

Aliwal North.—July has been a very mild month, light frosts at night and fine days. The lowest minimum temperature was 25·5 degrees as compared with 16·0 degrees in July last year. Rainfall: 0·59 inch on two days.—Alex. Alcock.

Groot Drakenstein.—This month has been exceptionally dry, rainfall only a little more than half of the average. Mists were frequent, that on the 23rd lasting the whole day. Rainfall: 2·91 inches on twelve days.—Lionel Baker.

Queenstown.—A month of mild weather. Rain wanted. Rainfall: 0·48 inch on two days.—H. Holley.

O'okiep.—Continued shortage of rain adverse to growing crops. The month's rainfall: 0·10 inch on three days. The aggregate rainfall for the past eleven months is 2·02 inches, and the lowest recorded for the corresponding period since 1882.—J. Burrows.

Kakamas.—Month unusually warm. Drought still prevailing. Rainfall: Nil.—M. J. Oosthuizen.

Riversdale.—A good soaking rain came just in time to refresh the seed-lands. Rainfall: 1·69 inch on eight days.—Rev. Carl Prozesky.

Ceres.—Weather generally unseasonable and far too warm and calm. Rainfall: 2·15 inches on eleven days.—A. Heatlie.

Darling.—Short rainfall for July—2·36 inches on fifteen days—but the light rains have come just nicely and have been better than having too much. The grass is scarce and behind; crops doing well.—P. H. Drake.

Kenhardt.—Drought continues. Gale from north during day on 24th. Rainfall: Nil.—R. Seydell.

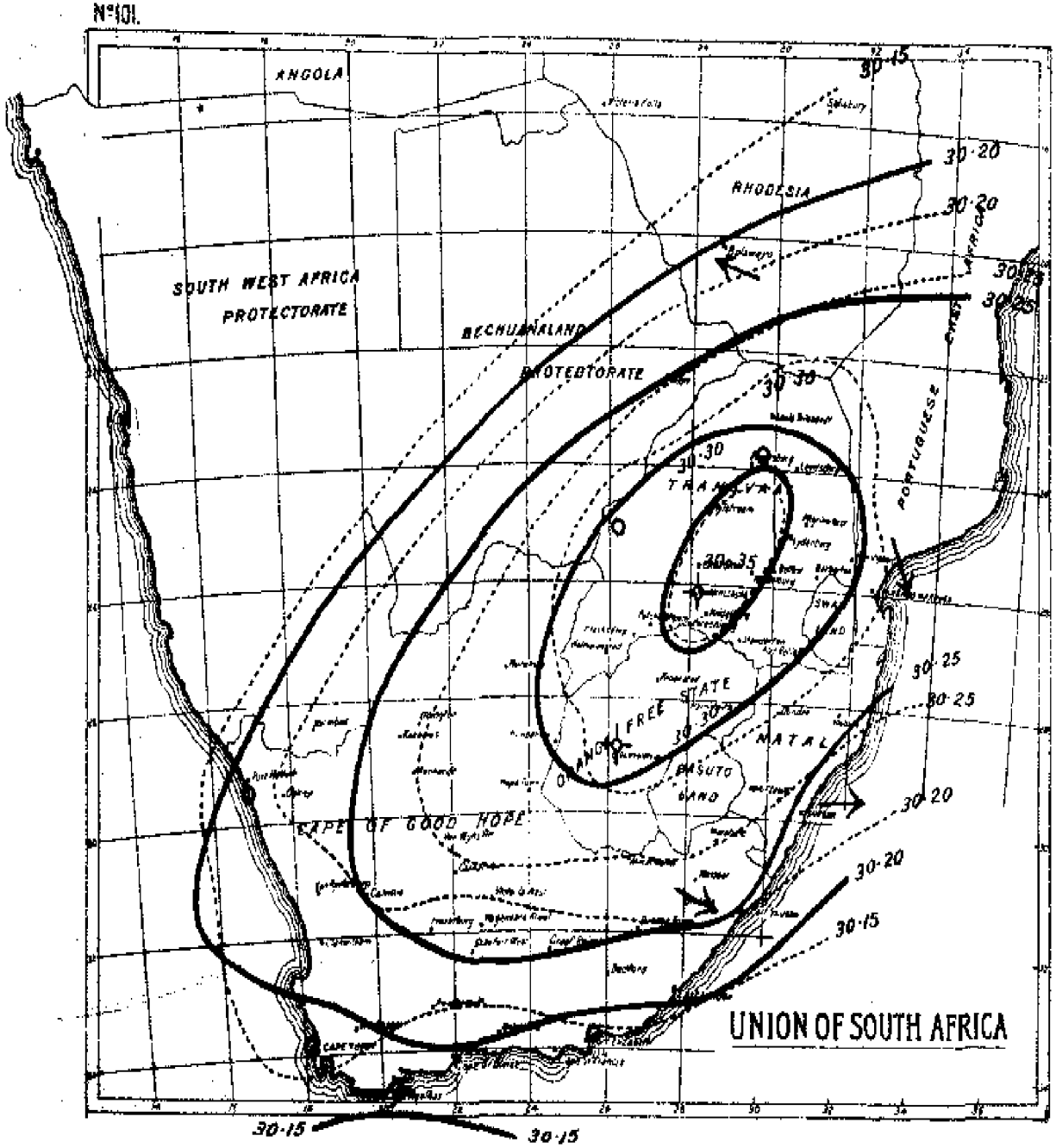
Kingwilliamstown.—The little rain—1·20 inch on three days—came quite as a surprise. The weather was quite warm and an early spring is expected.—L. Clayton.

Mafeking (Convent).—Mild month. Rainfall: Nil.—The Mother Superior.

Uitenhage.—Temperature very variable; hot winds and frosts. Rainfall: 3·24 inches on three days.—H. Inggs.

Elsenburg (Stellenbosch).—This month was comparatively dry—2·54 inches on twelve days, as against 4·75 inches in July last year, and an average of 4·04 inches for this month. Crops made good progress during the month.—D. C. Crawford.

Moira (Uitenhage).—The recent rain has helped the Sundays Valley considerably, and the river, which only lasted about twenty-four hours, has enabled all dams and vleis to be filled. Rainfall: 1·27 inch on three days.—J. H. Champion.



July, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8,30 a.m.
The dotted lines indicate the normal distribution for July.

Elandsfontein (*Richmond*).—Drought very serious; sheep dying daily. Rainfall: Nil.—I. H. Visser.

Sydney-on-Vaal (*Barkly West*).—Very mild month. Drought continued. Rainfall: Nil.—J. G. Richards.

BECHUANALAND.

Mahalapye.—Very dry; generally a wind from 9.30 a.m. till sundown—not steady wind, gusty—sometimes south-east, but mostly north-east or north. Rainfall: Nil.—Miss M. Giles.

BASUTOLAND.

Mafeteng.—Fine, bright, calm days. Cold nights. Nice soaking rain (0·60 inch) on the 19th. Rainfall: 0·60 inch on one day.—F. Hodgson.

SEPTEMBER WEATHER CHARACTERISTICS.

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 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; whilst 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 pionts 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-east, 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.

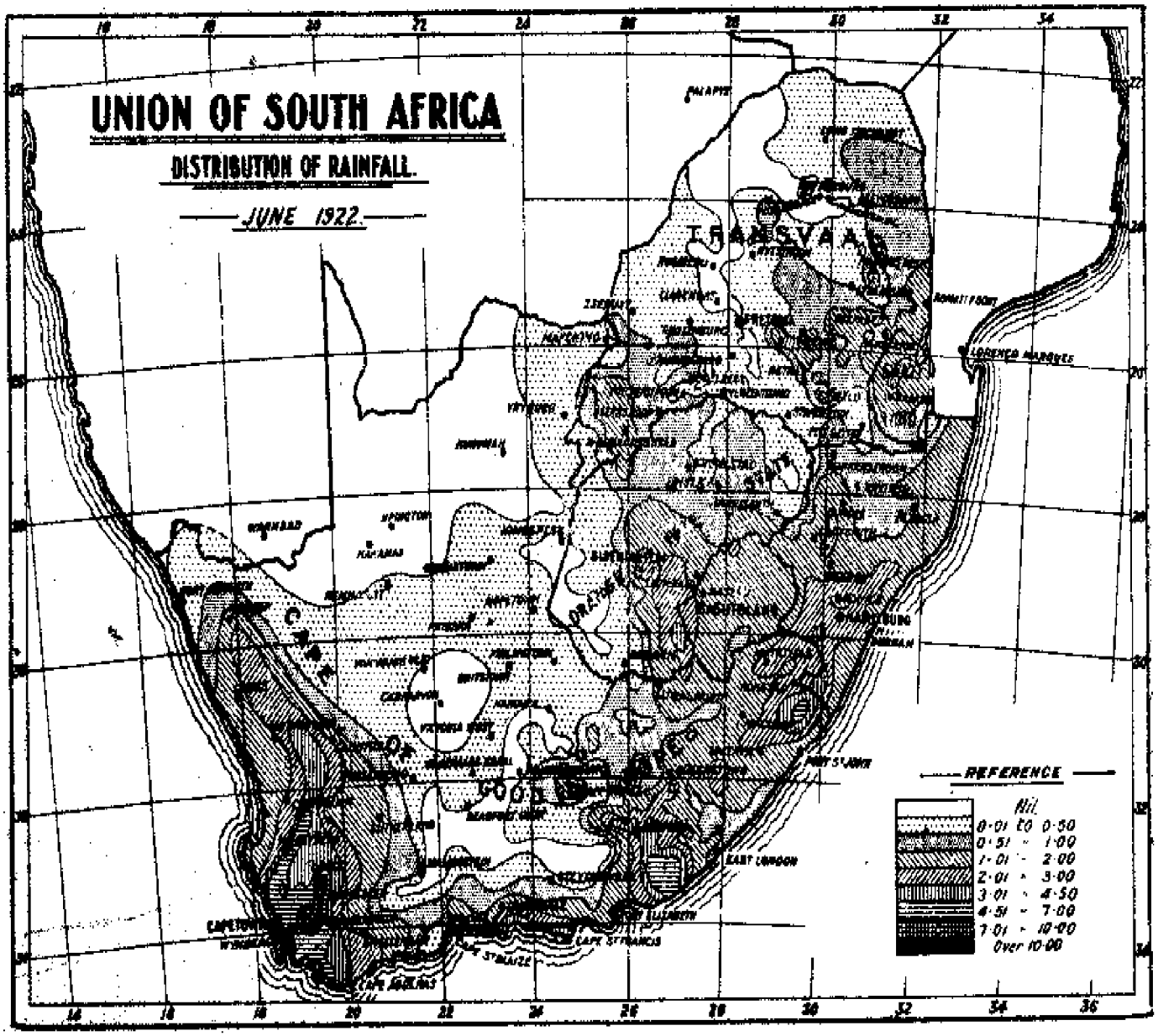
Pretoria.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), JULY, 1922.

Place.	Observer.	Month—July, 1922.		Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes.			
		Mean Max.	Mean Min.				Highest.	Date.	Lowest.	Date.
		° F.	° F.	° F.	° F.	° F.	° F.		° F.	
Transvaal—										
Barberton	Walter Grubb	75·2	48·8	62·0	59·4	+ 2·6	88·0	31st	43·0	1st.
Belfast	The Forester	62·8	25·4	44·1	44·8	− 0·7	71·0	24th	16·0	1st.
Bloemhof	A. Adamson	69·7	32·7	51·2	49·0	+ 2·2	76·0	23rd and 30th	27·0	21st, 22nd, and 23rd.
Ermelo	The Forester	67·9	31·0	49·4	47·0	+ 2·4	75·8	24th	25·0	16th.
Johannesburg (Observatory)	The Staff	63·0	42·5	52·8	50·4	+ 2·4	70·2	31st	36·3	12th.
Klerksdorp (Stratimore)	C. Scott	69·2	31·4	50·3	50·2	+ 0·1	78·0	31st	23·0	22nd.
Komatipoort	H. J. Evans	81·9	47·3	64·6	62·9	+ 1·7	91·0	31st	39·0	16th.
Louis Trichardt	J. J. de Bruin	71·0	44·1	57·6	55·7	+ 1·9	80·0	28th	38·0	18th.
Middelburg	Dr. H. A. Spencer	69·4	29·9	49·6	48·2	+ 1·4	80·0	24th	25·0	1st, 2nd, 3rd, 7th, 16th, 18th, & 24th.
Nylstroom	G. Bakker	71·6	35·1	53·4	52·5	+ 0·9	79·0	24th	29·0	1st.
Pietersburg	W. J. Frankleyfie	68·2	38·4	53·3	52·6	+ 0·7	75·0	22nd, 23rd, 24th, 28th, and 31st	32·0	2nd.
Piet Retief	J. Werner	69·3	40·1	54·7	53·1	+ 1·6	80·0	24th	34·9	16th.
Pigeonhole (New Agatha)	Jno. McCallum	65·5	48·9	57·2	—	—	75·0	28th	44·0	1st and 5th.
Pilgrims Rest	E. M. Skea	70·3	36·5	53·4	51·8	+ 1·6	81·0	24th and 31st	29·5	16th.
Potchefstroom (Exp. Farm)	The Manager	70·5	31·2	50·8	49·0	+ 1·8	78·5	25th	22·7	23rd.
Pretoria (Meteorological Office)	The Staff	69·3	37·8	53·6	51·7	+ 1·9	79·8	24th	31·2	2nd.
Standerton	The Town Clerk	66·5	25·0	45·8	44·6	+ 1·2	73·7	24th	17·5	24th.
Zeerust	H. Dietrich	69·2	32·1	50·6	50·4	+ 0·2	80·0	24th	27·3	3rd and 23rd.
Swaziland—										
Mbabane	Swaziland Police	68·8	43·4	56·1	55·5	+ 0·6	80·0	31st	36·0	1st and 8th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	64·5	33·3	48·9	47·0	+ 1·9	—	—	—	—
Bloemfontein	G. A. Schepers	63·8	32·3	48·0	47·6	+ 0·4	69·4	27th	26·5	21st.
Harrismith	The Forester	59·7	35·2	47·4	46·4	+ 1·0	68·5	24th	27·0	3rd.
Kroonstad	S. R. Northfield	65·7	27·9	46·8	47·2	− 0·4	72·5	31st	21·2	22nd.
Ladybrand	The Forester	63·0	31·4	47·2	46·8	+ 0·4	69·0	24th and 31st	23·0	16th.
Lindley	J. Collister-Oates	65·2	26·8	46·0	47·0	+ 1·0	71·5	24th	19·5	22nd.
Natal—										
Dundee	West Thorrold	69·5	34·5	52·0	54·4	− 2·4	79·0	1st and 31st.	29·0	16th and 17th.
Durban (Point)	The Port Captain	73·1	54·4	63·8	64·6	− 0·8	82·8	18th	48·8	2nd.
Estcourt	A. A. McLean	68·6	33·8	51·1	51·6	− 0·5	77·0	24th and 29th	27·0	1st.
Hlabisa	The Gaoler	74·3	55·7	65·0	63·9	+ 1·1	85·0	31st	50·0	1st.
Ladysmith	D. A. R. Leathern	71·5	34·7	53·1	53·0	+ 0·1	83·0	30th	30·0	1st.
Maritzburg (Mental Hospital)	The Superintendent	71·3	45·7	58·5	58·6	− 0·1	81·0	30th	40·4	29th.
Stanger	C. C. Foss	74·0	54·2	64·1	63·8	+ 0·3	83·1	18th	48·0	1st.
Weenen	The Gaoler	71·3	32·1	51·7	52·3	− 0·6	78·0	31st	27·0	1st, 4th, 13th, 15th, & 16th.

AIR TEMPERATURES, JULY, 1922—(*continued*).

Place.	Observer.	Month—July, 1922. Mean Max.	Month—July, 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
		° F.	° F.	° F.	° F.	° F.	° F.		° F.	
Cape—										
Alfred North	Alex. Alcock	63·7	30·5	47·1	46·4	+ 0·7	71·0	30th	25·5	8th, 9th, and 29th.
Bedford	T. C. Hall	66·2	43·8	55·0	54·5	+ 0·5	74·5	14th	33·0	9th.
Capetown (Royal Observatory)	The Staff	63·6	48·4	56·0	54·8	+ 1·2	78·8	12th	38·1	25th.
Carnarvon	A. P. Malherbe	64·9	31·8	48·4	47·0	+ 1·4	71·0	28th	22·0	8th.
Clanwilliam	P. E. Scholtz	70·2	39·0	54·6	54·2	0·4	83·0	12th and 28th	33·8	26th.
East London	The Port Captain	72·2	50·7	61·4	60·0	+ 1·4	88·0	30th	44·0	26th.
Graaff-Reinet	S. E. D. Treadwell	71·0	46·4	58·7	53·1	+ 5·6	80·3	30th	34·0	9th.
Grahamstown	The Vet. Res. Officer	67·7	41·2	54·4	54·8	+ 0·4	82·2	30th	32·0	27th.
Groot Drakenstein	Lionel Baker	64·2	43·9	54·0	54·0	+ 0·0	80·0	12th	35·4	26th.
Kenhardt	R. Seydell	71·5	36·7	54·1	51·3	+ 2·8	80·0	23rd	36·0	25th, 27th, and 28th.
Kimberley	C. A. Ashford	70·2	37·5	53·8	50·6	+ 3·2	78·0	30th	29·0	20th.
Kingwilliamstown	L. Clayton	70·6	43·0	56·8	57·3	− 0·5	83·0	30th	35·0	29th.
Kokstad	H. D. Coyte	64·6	32·7	48·7	48·9	− 0·2	77·0	31st	25·0	1st.
Mafeking (Convent)	The Mother Superior	73·3	37·1	55·2	53·6	+ 1·6	80·1	25th	32·0	2nd and 3rd.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	67·0	52·7	59·8	57·9	+ 1·9	83·0	15th	48·0	26th and 28th.
Murraysburg	—	—	—	—	45·9	—	—	—	—	—
O'okiep	J. Burrows	68·2	45·8	57·0	53·2	+ 3·8	76·0	20th	36·0	19th.
Port Elizabeth	The Lightkeeper	68·2	50·7	59·4	58·8	+ 0·6	84·0	13th	44·0	12th.
Port Nolloth	The Lightkeeper	63·9	42·5	53·2	55·0	− 1·8	92·0	12th	33·0	27th.
Port St. Johns (Cape Hermes)	The Lightkeeper	72·7	57·1	64·9	61·5	+ 3·4	81·0	10th and 16th	50·0	29th.
Queenstown	H. Holley	65·8	35·5	50·6	51·4	− 0·8	73·0	30th	26·0	29th and 30th.
Somerset East	C. Harris	68·1	42·8	55·4	54·2	+ 1·2	79·0	30th	33·1	9th.
Stutterheim	F. C. Bousfield	70·1	45·9	58·0	54·8	+ 3·2	79·0	14th and 30th	36·0	29th.
Sydney's Hope	Rev. S. Rippon	65·5	48·5	57·0	56·0	+ 1·0	78·0	30th	42·0	8th and 9th.
Uitenhage	H. Inggs	73·0	42·9	58·0	57·4	+ 0·6	85·0	30th	34·5	12th.
Umtata	Miss N. Dix-Peek	72·2	38·5	55·4	54·0	+ 1·4	83·0	30th and 31st	31·8	1st.
Vryburg	H. W. Collen	68·8	30·1	49·4	48·9	+ 0·5	75·0	29th	23·0	21st and 22nd.
Wynberg (Convent)	The Mother Superior	60·9	47·9	54·4	56·0	− 1·6	79·5	12th and 14th	41·0	5th.
Basutoland—										
Maseteng	F. Hodgson	59·4	34·5	47·0	48·4	− 1·4	66·0	27th	30·0	2nd and 29th.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
JUNE 1922.
TRANSVAAL
REFERENCE
Nil.
0·01 to 0·50
0·51 " 1·00
1·01 " 2·00
2·01 " 3·00
3·01 " 4·50
4·51 " 7·00
7·01 " 10·00
Over 10·00
LORENZO MARQUES
EAST LONDON
PORT ST JOHN
CAPE ST FRANCIS
CAPE ST BLAIZE
CAPE AGULHAS
CAPETOWN
WINDHOEK
WARMBAD
KAKAMAS
VICTORIA WEST
CARNARVON
PALAPYE
ZEERUST
MAFEKING
VRYBURG
KIMBERLEY
HARRISBURG
DURBAN
PORT ELIZABETH

RAINFALL, JULY, 1922.

Place.	Observer.	Month. July, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—							
Barberton	W. Grubb	0·01	0·64	− 0·63	14·29	21·58	− 7·29
Bethal	H. Joubert	0·00	0·18	− 0·18	16·00	15·05	+ 0·95
Belfast	The Forester	0·00	0·28	− 0·28	19·40	17·43	+ 1·97
Bloemhof	A. Adamson	0·00	0·21	− 0·21	6·17	12·71	− 6·54
Claremont	S.A. Police	0·00	0·05	− 0·05	5·18	11·02	− 5·84
Ermelo	The Forester	0·00	0·15	− 0·15	13·17	14·95	− 1·78
Haenertsburg	S.A. Police	0·00	0·78	− 0·78	13·03	27·47	− 14·44
Heidelberg	W. A. ter Horst	0·00	0·34	− 0·34	11·79	15·16	− 3·37
Johannesburg (Observatory)	The Staff	0·00	0·33	− 0·33	12·50	16·68	− 4·18
Kierksdorp (Strathmore)	Chas. Scott	0·00	0·21	− 0·21	8·32	13·98	− 5·66
Komatipoort	H. J. Evans	0·23	0·36	− 0·13	14·29	17·35	− 3·06
Louis Trichardt	I. J. de Bruin	0·02	0·66	− 0·64	6·03	19·96	− 13·93
Middelburg	Dr. H. A. Spencer	0·06	0·05	+ 0·01	15·56	15·17	+ 0·39
Nylstroom	G. Bakker	0·00	0·21	− 0·21	8·67	14·18	− 5·51
Pietersburg	W. J. Frankleyne	0·00	0·29	− 0·29	7·12	12·46	− 5·34
Piet Retief	J. Werner	0·00	0·34	− 0·34	11·39	15·75	− 4·36
Pilgrims Rest	E. M. Skea	0·08	0·44	− 0·36	18·00	26·87	− 8·87
Pigeonhole (New Agatha)	J. McCallum	0·00	1·30	− 1·30	13·34	20·79	− 7·45
Potchefstroom (Experimental Farm)	The Manager	0·00	0·18	− 0·18	9·21	13·17	− 3·96
Pretoria (Meteorological Office)	The Staff	0·00	0·27	− 0·27	10·42	17·33	− 6·91
Roolberg	M. Baumann	0·00	0·39	− 0·39	10·37	14·33	− 3·96
Rustenburg	H. J. Streatfield	0·00	0·51	− 0·51	10·45	15·42	− 4·97
Standerton	Town Clerk	0·00	0·29	− 0·29	—	15·72	—
Wakkerstroom	L. le Roux	0·00	0·40	− 0·40	13·55	17·48	− 3·93
Woodbush	The Forester	0·00	1·12	− 1·12	17·34	48·02	− 30·68
Zeerust	H. Dietrich	0·00	0·27	− 0·27	7·83	15·24	− 7·41
Swaziland—							
Mbabane	Swaziland Police	0·00	0·71	− 0·71	18·62	29·47	− 10·85
Orange Free State—							
Bethulie	J. J. Wardhaugh	0·55	0·38	+ 0·17	4·02	12·34	− 8·32
Bloemfontein	G. A. Schepers	0·00	0·56	− 0·56	5·90	12·15	− 6·25
Boshof	H. Roberts	0·00	0·31	− 0·31	4·88	12·40	− 7·52
Harrismith	The Forester	0·04	0·18	− 0·14	11·90	15·24	− 3·34
Kroonstad	S. R. Northfield	0·00	0·37	− 0·37	7·55	11·05	− 3·50
Ladybrand	The Forester	0·23	0·44	− 0·21	9·27	15·80	− 6·53
Lindley	J. Collister-Oates	0·00	0·36	− 0·36	9·75	14·22	− 4·47
Natal—							
Dundee	W. Thorrold	0·10	0·17	− 0·07	15·78	18·12	− 2·34
Durban (Point)	The Port Captain	0·19	0·76	− 0·57	23·38	23·05	+ 0·33
Estcourt	A. A. McLean	0·10	0·15	− 0·05	11·86	16·41	− 4·55
Hlabisa	The Gaoler	0·13	0·62	− 0·49	11·98	23·01	− 11·03
Howick	The Gaoler	0·12	0·16	− 0·04	14·87	17·89	− 3·52
Ladysmith	D. A. R. Leathern	0·15	0·09	+ 0·06	15·69	16·16	− 0·47
Maritzburg (Mental Hospital)	The Staff	0·15	0·14	+ 0·01	12·09	18·80	− 6·71
Stanger	C. C. Voss	0·42	0·69	− 0·27	16·62	20·79	− 4·17
Vryheid	The Gaoler	0·00	0·29	− 0·29	15·31	20·19	− 4·88
Weenen	The Gaoler	0·14	0·10	+ 0·04	13·37	14·89	− 1·52
Cape—							
Aliwal North	A. Alcock	0·59	0·42	+ 0·17	5·82	13·54	− 7·72
Beaufort West	The Gaoler	0·34	0·24	+ 0·10	4·39	6·17	− 1·78
Bedford	T. C. Hall	0·53	0·82	− 0·29	16·60	16·55	+ 0·05
Britstown	The Gaoler	0·16	0·21	− 0·05	1·62	8·19	− 6·57
Calvinia	The Gaoler	0·26	0·83	− 0·57	4·21	5·12	− 0·91
Capetown (Royal Observatory)	The Staff	2·33	3·55	− 1·22	12·44	16·20	− 3·76
Ceres	A. Heatlie	2·15	5·74	− 3·59	24·43	24·26	+ 0·17
Carnarvon	A. P. Malherbe	0·00	0·19	− 0·19	0·28	5·96	− 5·68
Clanwilliam	P. R. Scholtz	0·46	1·25	− 0·79	5·44	5·48	− 0·04
East London	A. Downie	2·14	1·09	+ 1·05	17·13	17·88	− 0·75
Fraserburg	The Gaoler	0·00	0·26	− 0·26	2·24	4·34	− 2·00
Garies	The Gaoler	0·04	0·81	− 0·77	2·25	3·26	− 1·01
Graaff-Reinet	S. E. D. Treadwell	0·33	0·44	− 0·11	5·01	8·48	− 3·47
Groot Drakenstein	Lionel Baker	2·91	5·02	− 2·11	24·55	21·93	+ 2·62

RAINFALL, JULY, 1922—(*continued*).

Place.	Observer.	Month. July, 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cape (continued)—							
Griquatown	The Gaoler	0·00	0·17	— 0·17	1·42	9·68	— 8·26
Grahamstown	Vet. Res. Officer	3·67	1·14	+ 2·53	7·75	15·81	— 8·06
Hanover	The Gaoler	0·00	0·37	— 0·37	2·19	9·45	— 7·26
Hopetown	The Gaoler	0·00	0·25	— 0·25	2·16	9·10	— 6·94
Kenhardt	R. Seydell	0·00	0·14	— 0·14	0·75	4·27	— 3·52
Kimberley	C. A. Ashford	0·00	0·25	— 0·25	3·01	10·78	— 7·77
Knysna	The Gaoler	4·09	2·22	+ 1·87	21·79	15·52	+ 6·27
Kokstad	H. D. Coyte	0·21	0·20	+ 0·01	15·70	15·58	+ 0·12
Kingwilliamstown	L. Clayton	1·20	0·99	+ 0·21	11·00	14·50	— 3·50
Kuruman (Abtonia)	A. T. Sifwell	0·00	0·39	— 0·39	3·50	11·71	— 8·21
Mafeking (Convent)	Mother Superior	0·00	0·37	— 0·37	5·79	13·56	— 7·77
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·81	1·18	— 0·37	8·39	9·93	— 1·54
Murraysburg	W. H. Rose-Innes	0·03	0·29	— 0·26	2·39	7·63	— 5·24
O'okiep	J. Burrows	0·10	0·84	— 0·74	1·41	4·61	— 3·20
Philipstown	The Gaoler	0·00	0·22	— 0·22	2·65	9·46	— 6·81
Piquetberg	The Gaoler	1·04	2·70	— 1·66	12·47	12·04	+ 0·43
Port Elizabeth	The Lightkeeper	2·56	1·86	+ 0·70	11·39	11·72	— 0·33
Port St. Johns	The Lightkeeper	0·20	0·93	— 0·73	17·98	25·23	— 7·25
Port Nolloth	*The Lightkeeper*	*0·03*	*0·56*	*— 0·53*	*0·93*	*1·66*	*— 0·73*
Prieska	The Gaoler	0·00	0·17	— 0·17	0·94	7·40	— 6·46
Queenstown	H. Holley	0·48	0·53	— 0·05	8·79	13·33	— 4·54
Steytlerville	The Gaoler	0·95	0·16	+ 0·79	7·00	5·56	+ 1·44
Sutherland	The Gaoler	0·06	0·82	— 0·76	3·91	6·18	— 2·27
Swellendam	The Gaoler	1·47	2·08	— 0·61	21·03	18·51	+ 2·52
Sydney's Hope	Rev. S. Rippon	2·29	0·86	+ 1·43	17·10	12·58	+ 4·52
Somerset East	C. Harris	1·33	0·79	+ 0·54	12·07	13·78	— 1·71
Stutterheim	F. C. Bousfield	0·39	0·56	— 0·17	14·93	17·05	— 2·12
Uitenhage	H. Inggs	3·24	0·66	+ 2·58	12·94	9·07	+ 3·87
Umtata	Miss N. Dix-Peek	1·44	0·53	+ 0·91	13·02	15·19	— 2·17
Unionddale	The Gaoler	1·64	0·95	+ 0·69	9·41	7·82	+ 1·59
Upington	The Gaoler	0·00	0·10	— 0·10	1·02	5·13	— 4·11
Victoria West	The Gaoler	0·00	0·25	— 0·25	2·75	7·26	— 4·51
Vryburg	H. Collens	0·00	0·15	— 0·15	4·94	13·98	— 9·04
Worcester	The Gaoler	0·64	1·75	— 1·11	7·06	7·65	— 0·59
Wynberg (Convent)	The Mother Superior	5·26	7·21	— 1·95	24·26	27·97	— 3·71
Basutoland—							
Mafeteng	F. Hodgson	0·60	0·58	+ 0·02	9·50	19·94	— 10·44
South-West Africa—							
Tsumeb	Ing. Schetter	0·00	0·02	— 0·02	6·39	16·80	— 10·41
Waterberg	D. Hahn	0·00	0·00	± 0·00	7·25	14·96	— 7·71
Omaruru	The Postmaster	0·00	0·01	— 0·01	6·26	9·27	— 3·01
Usakos	Rev. Diehl	0·00	0·00	± 0·00	0·48	4·24	— 3·76
Duesternbrook	I. Matthiessen	0·00	0·01	— 0·01	8·36	10·09	— 1·73
Gobabis	Rev. Irle	0·00	0·02	— 0·02	3·98	11·82	— 7·84
Gr. Witvley	B. Rueckert	0·00	0·01	— 0·01	3·[illegible]	11·2[illegible]	— 7·63
Maltahöhe	E. Just	0·00	0·02	— 0·02	1·40	5·22	— 3·27
Voigtsgrund	A. Voigts	0·00	0·01	— 0·01	1·95	4·59	— 2·64
Gibeon	Rev. Spellmeyer	0·00	0·04	— 0·04	2·54	4·82	— 2·28
Bethany	Rev. Peter	0·00	0·01	— 0·01	1·94	3·39	— 1·45
Aus	F. Ernl	0·00	0·28	— 0·28	2·57	3·32	— 0·75
Heirachabis	Rev. Father Eder	0·00	0·01	— 0·01	0·67	3·53	— 2·86
Windhoek	Observatory	0·00	0·01	— 0·01	5·40	10·94	— 5·54

8486—20/11/22—800

UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. III. AUGUST, 1922. No. 8.

MEAN pressure considerably below the average; temperature higher than usual in the eastern half of the Union, but subnormal in the south and western half; an excess of rainfall over the greater part of the country, but with a deficiency along the south and south-east coasts, in portions of the northern Karroo, the west of the Free State, the northern border, and Gordonia; strong, boisterous north-west winds and dust-storms rising to a gale in places between 18th and 22nd, with hot winds in Natal; some snow and numerous hail storms in the Cape Province on 20th, principally in the Free State and north-east of the Cape Province on 6th to 7th; succeeded by cold winds and low temperatures, particularly on 22nd; frosts of less intensity than usual, principally during the early half of the month, fairly general on the 22nd; wide-spread rains between 23rd and 26th, with some heavy thunderstorms;—such were the more prominent features of the weather of August, 1922.

Pressure.—Mean barometric pressure was everywhere below normal, being about one-tenth of an inch lower than usual over the east and centre, and about half a tenth elsewhere. There were frequent indications of the presence of the equatorial low over the interior to the north of the Union, whilst depressions lay over the south and south-east on 1st to 2nd, 4th to 5th, 19th to 20th, and on the south on 10th, 29th, to 30th. The barometric readings were abnormally low on the morning of the 20th, when a pressure of 29·45 inches was recorded at Mossel Bay. This depression was accompanied by strong north to west winds, rising to a gale in places, with clouds of dust persisting throughout the greater part of the day, over practically the whole Union, whilst snow and sleet or hail fell at a number of the higher stations, and on the mountains in the south-west, southern and central Karroo, the southern parts of the northern Karroo, and part of the north-east of the Cape. Damage to trees, roofs of buildings, etc., was reported from stations as far apart as Prieska, Kimberley, Umtata, etc. This strong wind persisted during part of the 21st at some stations in the east and north of the Transvaal and in Natal, causing damage to outbuildings at Pietersburg. Hot winds occurred during this period in Natal. This storm was preceded by strong north-westerly winds between the 17th and 19th, at stations in Natal, Basutoland and part of the Free State.

JAN 22 1923
Weather Bureau

Temperature.—On the mean of all stations the temperature for the month was the same as usual (56·4), the deficit of 1·2 degree in the mean day temperature (69·6 degrees) being neutralized by an excess of 1·3 degree in the mean night temperature (43·2 degrees). A supra-normal mean temperature was common to three Provinces: the Transvaal (with 57·8 degrees) being 1·6 degree, the Free State (with 52·1 degrees) being 0·9 degree, and Natal (with 62·3 degrees) being 0·2 degree above the corresponding averages; whilst the Cape (with 54·9 degrees) was 1·2 degree cooler than usual. The mean day temperature in the Transvaal (73·2 degrees) was 0·7 degree higher, but below the average over the other Provinces; thus the Orange Free State (with a mean maximum of 66·8 degrees) was 0·6 degree, Natal (with 74·3 degrees) was 2·2 degrees, and the Cape (with 66·6 degrees) was 2·4 degrees below normal. Except in the Cape Province, where the mean minimum temperature (43·2 degrees) was normal, the nights were considerably warmer than usual, Natal, with a mean minimum of 50·3 degrees, being 2·6 degrees, whilst the corresponding mean for the Transvaal (42·4 degrees) and for the Orange Free State (37·4 degrees) were both 2·4 degrees higher than usual.

Considering the various stations separately, it is seen that west of 24° E. Long. the temperature for the month was subnormal, the deficit varying between 2·2 degrees at the Royal Observatory, Capetown, and 4·2 degrees at Clanwilliam. Deficits of almost equal amounts were also common over the south-east of the Cape, whilst shortages of less than one degree occurred in the central and southern portions of Natal, and the south of the Free State. Excesses in the monthly temperature occurred over the Transvaal, Swaziland, the Free State, Basutoland, parts of Natal, the Transkei, the north-east of the Cape, the south of Bechuanaland, the northern Border, and part of the east-central Karroo. These excesses were mostly small, less than half a degree in the centre and west of the Transvaal, parts of Natal, the south-east and north-east of the Cape. The surplus elsewhere was mostly between 1 and 2 degrees, but increased to amounts between 2 and 4 degrees in the Transkei, the south, east, and extreme north of the Transvaal, the north-east of the Free State, and the south of Bechuanaland. In the Free State temperature was mostly slightly more than 1 degree in excess of the normal, but rose to 2·2 degrees at Harrismith, in the north-east of that Province.

The day temperatures were below the average over the Cape Province (with the exception of the east of Kaffraria), in Natal, the east and south of the Free State, Basutoland, the centre and west parts of the north of the Transvaal. The deficits were large in the west-south-west and south-east of the Cape, being frequently 5–6 degrees lower than usual, and rising to 6·7 degrees at Uitenhage. Over the northern Karroo they lay between 2·5 and 3·5 degrees, but decreased to one degree or less in the east central Karroo, the north-east and parts of the south-east and Transkei. In Natal shortages in the mean maximum were general, varying from 1·3 degree at Ladysmith to 3·6 degrees at Hlabisa (Zululand). In the Free State, the eastern and northern portions showed deficits varying between 0·2 degree at Lindley and 2·7 degrees at Bethulie. In the Transvaal, the days were cooler than usual by small amounts up to half a degree over the southerly portions of the high veld, but by larger amounts (1½ to 2½ degrees) over the centre, south-west, west, and part of the north, as also in the adjoining parts of Bechuanaland. Elsewhere excessive mean maxima were experienced, that is to say, over the north-east, east, and south of the Transvaal, the centre and north of the Free State, the south of Bechuanaland, the northern Border, and the east of Kaffraria. These excesses were small, less than a degree, in the south of the Transvaal, but increasing to 2–4·5 degrees in the east; in the Free State they varied between 0·6 degree

and 1·3 degree; in Bechuanaland and the east of Kaffraria the excess was about 3½ degrees, but only 1·2 degree at Kimberley. Nights were also cooler than usual over the western half of the Cape by amounts varying from 1·7 degree at Wynberg in the Cape Peninsula to 4·5 degrees at Carnarvon; smaller deficits of a few tenths to 1½ degree also occurred over parts of the south and south-east, at Belfast and Pietersburg in the Transvaal and at Mafeking. Elsewhere the nights were warmer than usual, mostly by 2–4 degrees over the Transvaal, but increasing to 6·4 degrees at Bloemhof; over the Free State by 1–2 degrees, but reaching 6·1 degrees at Harrismith; usually by 2–4 degrees in Natal, but falling to only 0·6 degree at Weenen. The highest temperatures were recorded on eighteen days of the month, usually at only a few stations, but most widely over the Transvaal, Free State, Natal, and the east of the Cape on the 30th. The lowest temperatures were most generally recorded on the 22nd, when practically the whole Union was affected, although extremes for the month were registered at a few stations on nine other dates. The mean warmest station was Komati Poort, with a temperature of 69·6 degrees, and the coolest Carnarvon, with 47·8 degrees for the month, a difference of 21·8 degrees. The highest mean maximum was 85·4 degrees at Komati Poort, and the lowest mean minimum 31·8 degrees at Belfast. The extremes recorded were 96 degrees at Komati Poort on the 18th and 19·0 degrees at Lindley (O.F.S.) on the 22nd, an extreme range of 77·0 degrees. Regarded as a whole, the weather of August was comparatively mild and free from the frequent low temperatures so liable to occur at this period of the year. "Uncommonly" sharp frosts, however, were reported from Pietersburg during the first half of the month, whilst temperatures below freezing-point were common to all the Provinces on the 22nd, when young green and fruit blossoms were destroyed at Nottingham Road and Weenen in Natal.

Precipitation.—A deficiency in rainfall during the month was limited to the centre and west of the Free State, part of the northern Border, Gordonia, the south of Bechuanaland, the south and east of the northern Karroo, the south coast, southern Karroo, and part of the south-east, and apparently practically the whole of South-West Africa. "Nil" returns were received for a number of stations in South-West Africa and the west of the Free State, whilst the deficits varied from a few hundredths of an inch to 1·91 inch at East London. Elsewhere precipitation was above normal, the excesses being small over the central portions of the Cape, but rising to between 1 and 2 inches in the west, south-west, parts of the south-east and north-east of the Cape, and even over 3 inches at Ceres in the south-west and at Port St. Johns, in Kaffraria. In Natal the surplus amounts were mostly between 1 and 2 inches, but approached 3 inches at Stanger and decreased to slightly over three-quarters of an inch at Weenen. In the Free State the supra-normal amounts varied from 0·11 inch at Ladybrand to 1·49 inch at Bethulie. In the Transvaal, the excesses were mostly between 1 and 2 inches, but rose to more than 3½ inches at Pretoria and Potchefstroom, but fell below an inch in the extreme north, on the greater part of the high veld and the south-west, being only 0·34 inch at Bloemhof. The only station in South-West Africa reporting rainfall was Aus, where 1·86 inch fell, being 1·48 inch in excess of normal. Rain fell at frequent intervals over the west, south-west, and south-east of the Cape, and a few light showers or drizzle over the rest of the Cape Province, particularly during the first and last weeks. Rain fell over the eastern Transvaal on the 6th, and over Natal on the 6th and 7th, with scattered showers over the Free State on the same dates. The most general and beneficial rains, however, occurred between the 23rd and 27th, being reported from all Provinces during the whole or part of this period. Light showers of snow, in some cases 3 inches

deep, occurred over the south and east of the Free State and portions of the north-east of the Cape between the 6th and 7th, and over parts of the south-west, including Table Mountain, in the Cape Peninsula, on the 20th, as well as at some of the higher stations on mountain tops in the southern and central Karroo and the south of the northern Karroo. The fall is stated to have been a record at Ceres on this date. Hail fell at a number of stations in the Cape Province, but no damage is reported.

The accumulated rainfall since the beginning of the year is in excess over very limited areas, viz., the west of the northern Karroo, the southern portion of the west coast district, south-west south coast, southern Karroo, Bedford in the south-east, and Kokstad in Kaffraria. In Natal an excess is met with at Durban and Ladysmith, whilst in the Transvaal a similar state of affairs is confined to the more easterly portion of the high veld. The excesses increased southwards, from 0·78 inches at Calvinia to 4·11 inches at Groot Drakenstein; along the south coast they lay mostly between 2 and 4 inches, being greatest (4·85 inches) at Knysna. In Natal the surplus amounts varied from 1½ inch at Ladysmith to 2·76 inches at Durban. In the Transvaal the excess over the high veld was between 1¾ and 2¾ inches. Elsewhere the total rainfall for the eight months was below the average usually by large amounts, 4–9 inches over the interior of the Cape Province, the west and south of the Free State, parts of Natal and Zululand, the east of the Transvaal and Swaziland. In the last-mentioned Province, the deficit increases to 13 inches at Louis Trichardt, and almost 29 inches at Woodbush. The shortages in the Transvaal generally decrease in a westerly and southerly direction, varying from less than 1 inch to over 3 inches. In the Free State there was a shortage of only 2–3 inches in the northern half, as compared with 6–8 inches in the southern half of that Province. In Natal the eight months' precipitation was sub-normal, usually by 1–3 inches, but rising to 5·37 inches at Maritzburg and 9·54 inches at Hlabisa in Zululand. Broadly speaking, the deficiency in the Cape decreases from the interior towards the coast, being, e.g. 9·15 inches at Vryburg, 6·22 inches at Prieska, 2·65 inches at Fraserburg, and 0·09 inch at Worcester. Although there is a belt of excess rainfall in the south-west, the Cape Peninsula showed a deficiency of between 3 and 4 inches. The gross total for the two months July and August generally exceeds the normal amounts, the excesses being commonly less than an inch, but rising to over 3 inches in parts of the centre and west of the Transvaal. A sub-normal rainfall for this period, however, was experienced over the Cape Peninsula, the south-west, the southern portions of the northern Karroo, and portions of Bechuanaland, the northern Border, Gordonia, and the centre and west of the Free State. The deficits were generally varied between 1·32 inch at Mossel Bay and 0·01 inch at Philipstown. The mildness of the month, in conjunction with the good rains towards the end of the month, have had a beneficial effect on the veld, which was becoming green again, thus affording pickings for cattle, which were in poor condition in many districts; fruit trees were in full blossom, and ploughing began in a number of districts. Dust storms accompanied by high wind occurred on several days of the month, the most widespread being that on the 20th, which caused damage to crops, roofs of buildings, trees, and even the street electric lamps at Kimberley. Trees were also blown down at Umtata on the same date.

OBSERVERS' NOTES FOR AUGUST, 1922.

TRANSVAAL.

Middelburg.—A mild spring month with cold nights during the first three weeks. Then came cloudy weather and rain, beginning usually in the very early morning and continuing until about 11 a.m.; this lasted for four days,

and owing to the absence of sun nearly all sank into the ground. The result is evident in the greening up of the veld and the early blossoming of all fruit trees. One inch and a third fell during this period and has enabled ploughing to be begun in parts of the district. Rainfall: 1·35 inch on four days.—Dr. H. A. Spencer.

Piet Retief.—A very severe gale was experienced on the 20th, having commenced at about 10 p.m. and lasted until 1 p.m. on the 21st, causing slight damage to crops. Having had some good, soaking rains the country is beginning to look green. Rainfall: 1·50 inch on five days.—J. Werner.

Pietersburg.—Uncommonly sharp frosts up to the middle of the month. Terrific duststorms doing damage to out buildings, etc., on 21st. Very welcome steady rains fell during two days (25th and 26th). Rainfall: 1·70 inch on two days.—W. J. Frankleyne.

Standerton.—Bright, warm days with breezes were main features of the month, and the warm thundershowers proved most beneficial to whole district. Rainfall: 1·94 inch on five days.—W. J. Madge.

Carolina.—Fairly strong and continuous windstorms. Rainfall: 1·11 inch on four days.—G. F. Mijnhardt.

Lichtenburg.—Changeable weather, high winds, duststorms, and frost. Rainfall: 1·00 inch on two days will be very beneficial to stock which are now in poor condition.—J. T. Allman.

Strathmore (Klerksdorp).—Usual windy month. Rainfall: 1·28 inch on three days.—Chas. Scott.

Wakkerstroom.—After the beautiful rain (1·50 inch) on the 23rd there has been a decided change in the temperature, and spring is here. Peach and other trees are in full bloom. On the whole, live stock are in poor condition, but in the estern portion of this district the grass is green and coming on well owing to early rains and a much warmer climate. Rainfall: 2·17 inches on six days.—Louis le Roux.

Mosdene (Waterburg).—The rainfall of 2·06 inches on two days is more than double any previously recorded in August during the past five years, and will do an immense amount of good. The promise of early green pasturage is particularly welcome after the very dry season we have passed through. The month has been particularly mild, the mean of the minimum temperature being 42·1 as against 35·5 last year.—Ernest E. Galpin.

Krugersdorp.—The weather for month was somewhat mild, but unsettled and cloudy at times. First rains (0·63 inch) of season fell on night of the 23rd. Some winds and duststorms, also hoar frosts; heavy dews. Rainfall: 0·95 inch on four days.—J. G. Tamblyn.

Rustenburg.—General rains fell throughout the district the latter part of the month amounting to 1·66 inch on three days, but more fell in the northern or bushveld part. Cattle have fallen off in consequence of the rain, but as the grass is now getting green they will soon pick up. The crops are looking well and a fair crop is anticipated.—H. J. Streatfield.

Christiana.—Nothing unusual to report except that rain is badly wanted. Cattle are in a very poor condition. Rain was expected, but unfortunately, did not come. Rainfall: 0·04 inch on two days.—J. J. Cooke.

Driehoogte (Rustenburg).—The drought was getting serious for all stock; warm rains 23rd to 26th, no losses. Rainfall: 2·70 inches on four days.—H. Hardwick.

Groeneboom (*Rustenburg*).—In the neighbourhood veld suffered greatly from veld fires. The rains in the latter part of the month are repairing the damage at favourable speed. On the 22nd locusts were still flying about in little swarms. Cattle are in fair condition. Rainfall: 2·74 inches on two days.—F. N. van Nouhuys.

Malelane (*Barberton*).—Two inches of rain in first two hours on 25th: record for August, as far as our records go. Rainfall: 2·70 inches on two days.—G. A. P. Hobson.

SWAZILAND.

Mbabane.—The rain during this month has helped the grass on considerably and the cattle are able to get good pickings from the new burns, it has also enabled the sheep farmers to commence moving back with their flocks to their farms on the high veld. Rainfall: 2·31 inches on six days.—R. C. S. Markham.

ORANGE FREE STATE.

Sterkstroom (*Boshof*).—During the month we had not a drop of rain. The veld is very dry; large stock have left the district since April for better grazing, sheep still hold out, though very poor in some cases. The outlook for the farmer is very gloomy if rain does not come soon.—J. B. Moolman.

Stanleyvale (*Harrismith*).—Very windy at beginning of month—good ending. Grass coming in; stock fair; ploughing commenced. Rainfall: 1·50 inch on five days.—G. C. Atkins.

Woudzicht (*Vrede*).—With the exception of a couple of cold days, the weather has been very fine. Rainfall: 1·40 inch on three days.—J. N. Köhler.

Paardekraal (*Winburg*).—Rainfall: 0·41 inch on three days. Green pickings for sheep; cattle thin but strong.—G. S. Lowe.

Prospect (*Vrede*).—With the exception of a few windy days, the weather has been remarkably mild. The splendid, gentle rains beginning on the 23rd were very welcome as the feed in mealie lands was practically exhausted. During and after the rain the weather was remarkably warm for the season, and there were no deaths among the stock, which are looking fairly well. Rainfall: 1·17 inch on four days.—T. Pitcairn.

Kroonstad.—Windy and dusty most of month. Rainfall: 1·80 inch on three days.—S. R. Northfield.

NATAL.

Nottingham Road.—Windy. Frost on the 22nd destroyed all young grass and much fruit blossom which was forward owing to the damp winter.—Miss E. Smythe.

Mid-Illovo.—Extremes in temperature. Nice rains—3·58 inches on twelve days—including 2·13 inches on afternoon and night of 6th. Good pickings on green veld. Strong gale on 21st.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Newcastle (*Convent*).—The weather this month was exceedingly changeable; frequent windy days. A cold day was experienced on the 22nd. Very moderate towards end of month.—The Mother Superior.

Newcastle (*Gaol*).—After a dry spell with hot and strong winds we had a nice rain on the 6th (0·74 inch). Wind continuing till the 23rd, when very welcome rains fell amounting to 1·80 inch over three days. The grass is now looking nice and green, with another week of warm weather grass will be plentiful for stock—big and small. Farmers are starting to get ready for the summer crops. Rainfall: 2·54 inches on five days.—The Gaoler.

Port Shepstone.—Wind and weather very changeable during the month; a good deal of light rains, off and on. Rainfall: 1·84 inch on ten days.—E. K. Andreason.

New Hanover.—An unusually mild and damp month; flowers which do not generally appear till September are in full flower. Rainfall: 2·54 inches on six days.—Mrs. Ethel M. Herbert.

Paulpietersburg.—Sharp frost on 22nd following heavy northerly winds. Rainfall: 3·36 inches on five days.—A. A. Carter.

Hlabisa.—The weather has been seasonable in this district during the month. Rainfall: 2·58 inches on five days.—L. A. Double.

Dundee.—A fine spring month, unusual warm rains. Veld very much advanced; all fruit trees showing heavy blossom, and everything points to an exceptionally good spring. Rainfall: 1·82 inch on two days.—West Thorrold.

Ladysmith.—Dry, hot winds during the first and third weeks of the month tended to dry things up very considerably, but good rains on the 6th (1·11 inch). 23rd (0·61 inch), and 24th (0·79 inch) have improved matters, and the country is beginning to look quite green. The fruit trees have all been in blossom, and so far the fruit crop promises well. Rainfall: 2·71 inches on seven days.—D. A. R. Leathern.

Maritzburg (Mental Hospital).—Frost doing damage to garden crops.—The Superintendent.

Edendale (Klip River).—A lovely early spring and heaps of grass for all stock. Ploughing going strong. Rainfall: 3·10 inches on five days.—T. W. Niland.

Rong Poort (Weenen).—Earliest spring experienced for many years. Plenty of grass for small stock and pickings for cattle. Sharpest black frost of the winter on the 22nd—cut the young grass back. Rainfall: 2·15 inches on five days.—J. H. Bartholomew.

CAPE.

Ceres.—Rainfall: 8·96 inches on fifteen days, well above the average, but warm sunny days in between. Weather generally less windy for August, and fair amount of frost. Record snowfall on 20th.—A. Heatlie.

Rietfontein (Aliwal North).—Very windy month on the whole, especially the 24th. Good rainfall—1·28 inch on four days—for month.—A. G. Smith.

Willowmore.—Typical August weather, plenty of wind and dust. Rainfall: 0·28 inch on four days.—Mrs. B. M. Hemens.

Riversdale.—The grain lands are in healthy condition. Rainfall: 0·94 inch on seven days.—Rev. Carl Prozesky.

Aliwal North.—On the whole, August has been mild with several days of strong winds. Rainfall: 1·83 inch on seven days, as compared with 0·03 inch in August, 1921.—Alex Alcock.

Bedford.—The leading feature this month was the extraordinary low barometer on the 20th—the lowest on record for Bedford. Rainfall: 1·44 inch on six days.—T. C. Hall.

Graaff-Reinet.—Winds generally from the north, at times warm and dusty, occasionally veering round to South. A mild month for August. Rainfall: 0·93 inch on three days.—S. E. D Treadwell.

Kimberley.—Duststorms frequent; 20th, strong gale from 6 to 10 p.m. damage to buildings, trees, and electric street lamps. Rainfall: 0·10 inch on one day.—Jno. Acton.

Groot Drakenstein.—A cold, cheerless month, with an excess of rainfall and unusually little sunshine. The mean maximum 60·3 is the lowest recorded for August for twenty-four years. Crops backward. Rainfall mostly came from the West, and was cold with snow on mountains. Rainfall: 6·50 inches on thirteen days.—Lionel Baker.

Kenhardt.—Good rains have been reported from several outlying farms on the 28th in the north-east of the district; these reports, however, are often exaggerated and should be accepted with caution until further confirmation. No rain was registered at Kenhardt on that date. Rainfall: 0·20 inch on two days.—R. Seydell.

Mafeking (Convent).—Two particularly bad duststorms—1·19 inch of rain followed that of the 24th. Not for many years has such dust been experienced here. Rainfall: 1·31 inch on three days.—The Mother Superior.

Queenstown.—Rain fell on eight days, when 1·90 inch was recorded; the greatest fall, including snow, being on the 6th, when 0·90 inch was registered. This is the best August rainfall since 1896. On the whole, a mild month; snow fell in town one day, six days hoar frost, three days with strong west wind to gale, one day duststorm. Veld assuming a green tinge towards end of month; ploughing going on on drylands.—H. Holley.

Somerset East.—The windy weather at the end of July continued well into August. Snow fell on the 5th. The minimum temperature (31·2 degrees) on the 22nd was the lowest this year. The last week was mild. Rainfall: 1·40 inch on six days.—C. Harris.

Stutterheim.—Weather very mild; pasturage improving rapidly; fruit trees blossoming; stock improving in condition. Rainfall: 1·98 inch on twelve days.—F. C. Bousfield.

Umtata.—20th: Wind increased to strong gale; trees, etc., blown down during night. Rainfall: 2·58 inches on five days.—Miss Norine Dix-Peek.

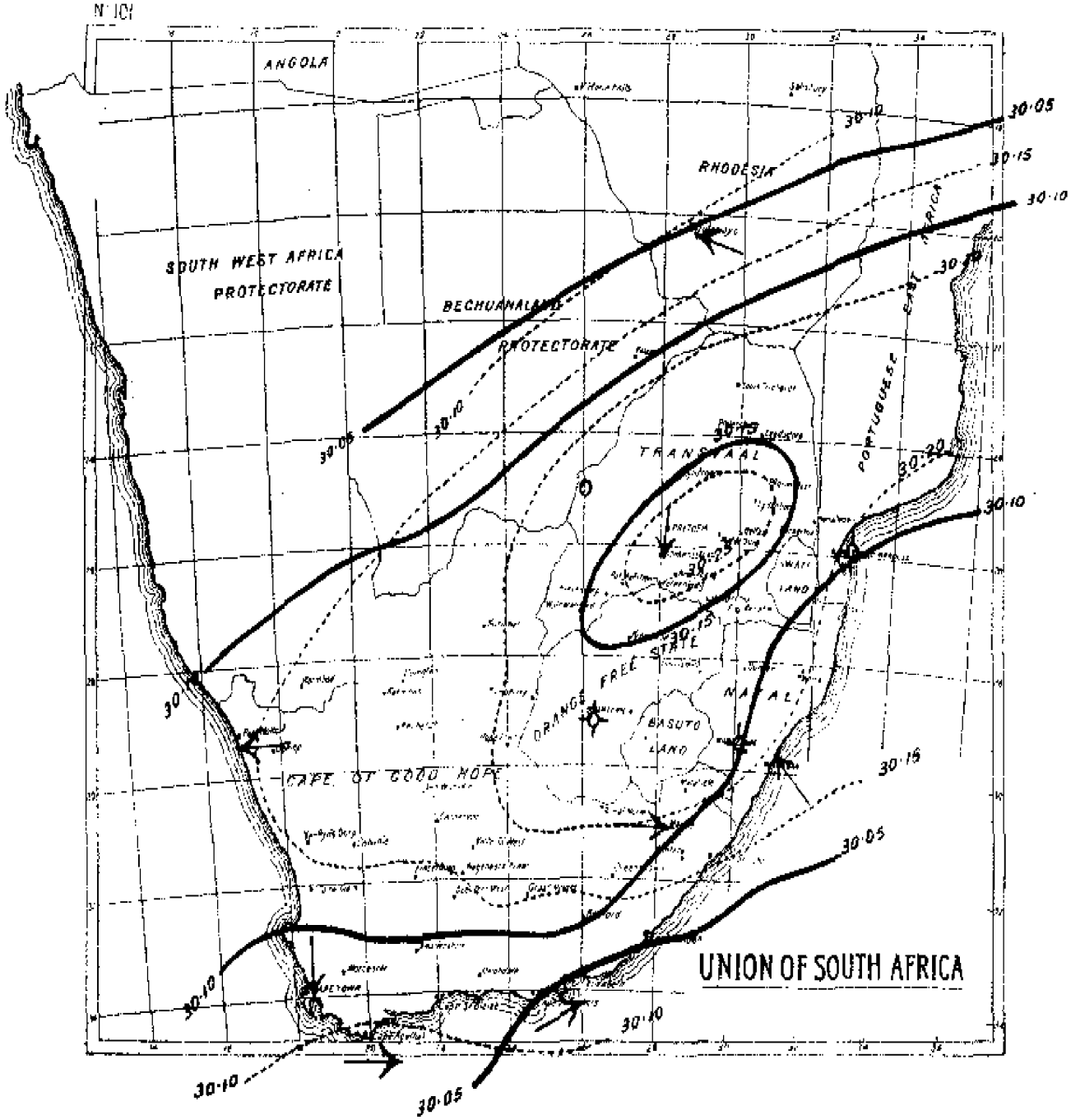
Vryburg.—Strong winds prevailed from 19th, varying from north to west. Good rains are reported from all quarters immediately surrounding Vryburg. *Rainfall: 0·15 inch on one day.—H. W. Collen.*

Sydney-on-Vaal (Barkly West).—Sudden changes of temperature whenever wind veered to south, causing big range of temperature in extremely short periods. Rain badly needed to renew veld. Several days of high north to north-west winds, which are just those which lift the dust. River still flowing, but low; no rises recorded yet since up-country rains. Rainfall: 0·02 inch on one day.—J. G. Richards.

Grassridge (Cradock).—Rainfall: 0·52 inch on three days. Karroo veld improved; good feed for small stock. Prevailing winds, north and north-west. Towards end of month misty mornings, but fine clear days. Flow of river, normal.—S. Whitwham.

Prieska.—20th, 9 a.m.: A very severe duststorm began from north-west, blowing with tremendous force; branches of trees, roof of outbuilding, etc., blown off; no severe damage. Rainfall: 0·41 inch on three days.—J. Fourie.

Clanwilliam.—Rain on the last two days of the previous month and at frequent intervals during this month were very welcome, and saved the situation, which looked very gloomy indeed towards the end of last month. A very excellent season is now expected, for though the total rainfall up to the prese n



August, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8,30 a.m.

(The dotted lines indicate the normal distribution for August.)

has not been at all high, it has been so evenly distributed, and fell generally so softly, that it has been most beneficial. During this month again the sky was on several days either wholly or partially overcast. This presumably contributed towards keeping the soil moist. Rainfall: 2·17 inches on nine days.—P. E. Scholtz.

O'okiep.—Plentiful rain; wettest August recorded in forty-seven years. Rainfall: 2·62 inches on nine days.—J. Burrows.

Darling (Malmesbury).—An ideal spring month, with most seasonable rains. July and August have been, however, colder than normal, and the veld is backward. Crops very fine and promising, but also backward. Worms have done considerable damage in a few instances. Rainfall: 3·33 inches on fifteen days.—P. H. Drake.

Bechuanaland.

Palapye Road.—Very welcome rain on 26th, amounting to 0·72 inch. Nice rains have also fallen at Macloutsie. Rainfall: 0·72 inch on one day.—Thos. W. Shaw.

Serowe.—Great scarcity of water and grazing. Cattle falling off in condition. Rainfall: 0·55 inch on three days.—W. H. Ellam.

Mahalapye.—Rainfall: 1·13 inch on three days; fourth time since 1912 that rain has fallen in August: 1914, 0·20 inch; 1917, 0·52 inch; 1918, 0·89 inch.

Basutoland.

Maseru.—August was a bad month for duststorms in town. Some nights cold and frosty. The peach trees are covered with black lice, and little black ants. The wheat is looking well in the district. For the time of the year, the cattle are in good condition. Rainfall: 0·52 inch on six days.—J. G. Green.

Mafeteng.—Wheat crop very promising; stock in fair condition; every promise of a good season. Rainfall: 1·42 inch on five days.—F. Hodgson.

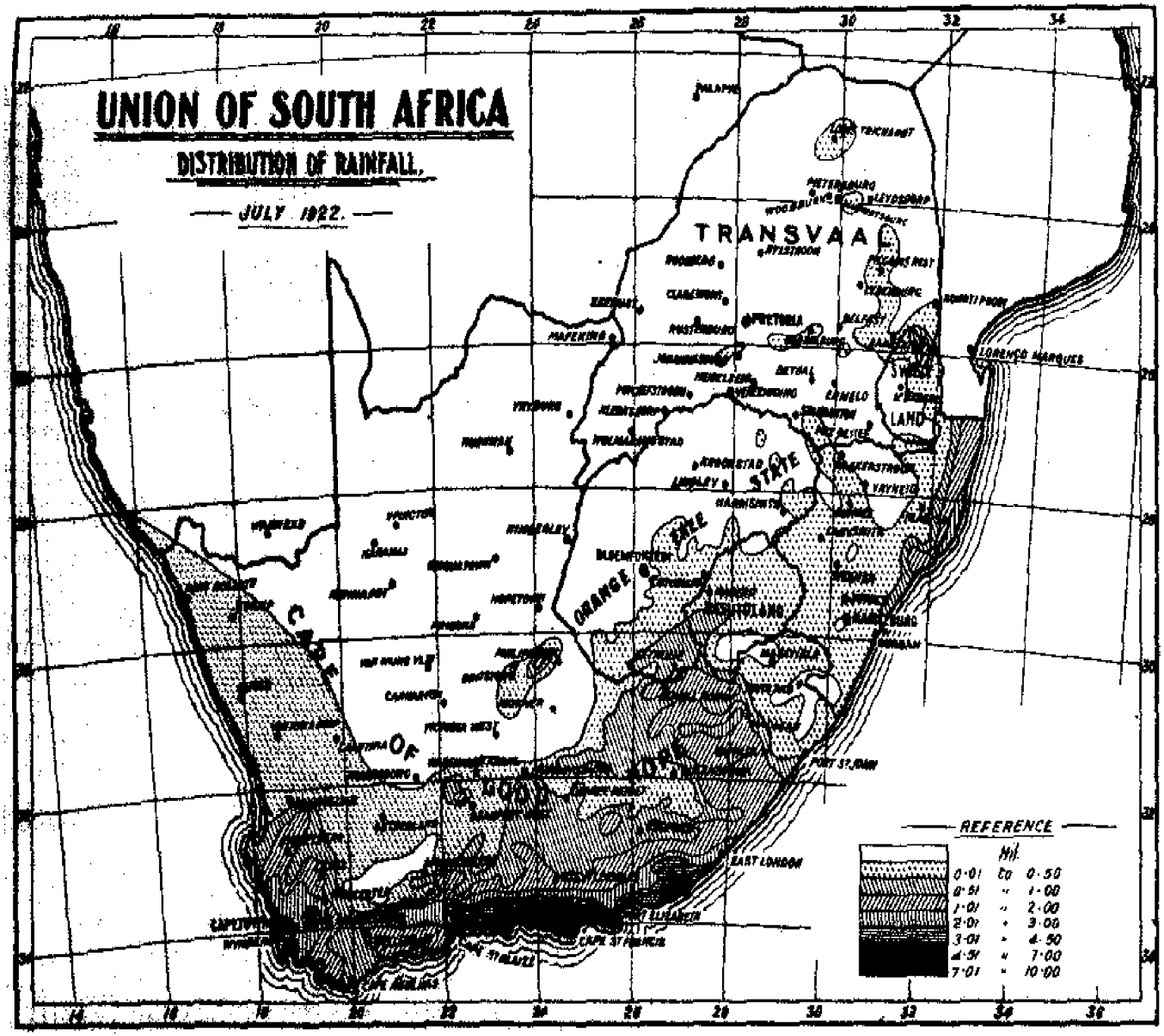
OCTOBER WEATHER CHARACTERISTICS.

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 inches; 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 east 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-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.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
JULY 1922.
TRANSVAAL
ORANGE FREE STATE
CAPE OF GOOD HOPE
LORENCO MARQUES
EAST LONDON
PORT ST JOHN
REFERENCE
Mil.
0·01 to 0·50
0·51 " 1·00
1·01 " 2·00
2·01 " 3·00
3·01 " 4·50
4·51 " 7·00
7·01 " 10·00

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), AUGUST, 1922.

Station.	Observer.	Month—Aug., 1922. Mean Max.	Month—Aug., 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Transvaal—										
Barberton	Walter Grubb	78·4	53·8	66·1	63·4	+ 2·7	89·0	18th	46·0	8th.
Belfast	The Forester	67·2	31·8	49·5	49·5	± 0·0	80·0	30th	20·0	13th.
Bloemhof	A. Adamson	73·1	41·5	57·3	53·9	+ 3·4	84·0	19th and 29th	26·0	22nd.
Ermelo	The Forester	71·6	37·2	54·1	52·5	+ 1·6	83·5	30th	27·0	12th and 22nd.
Johannesburg (Observatory)	The Staff	65·0	44·7	54·8	54·6	+ 0·2	74·8	30th	28·0	7th.
Klerksdorp (Strathmore)	Chas. Scott	72·0	38·9	56·4	55·5	− 0·1	83·0	30th	22·0	22nd.
Komatipoort	H. J. Evans	85·4	53·8	69·6	67·4	+ 2·2	96·0	18th	43·0	8th and 22nd.
Louis Trichardt	I. F. de Bruin	78·1	51·0	64·6	60·0	+ 4·6	85·0	13th, 30th, and 31st	45·0	14th.
Middelburg	Dr. H. A. Spencer	72·2	36·5	54·4	53·8	+ 0·6	83·0	30th	25·0	13th.
Nylstroom	G. Bakker	75·4	41·6	58·2	58·0	+ 0·2	87·0	30th	30·0	22nd.
Pietersburg	W. J. Frankleyne	72·5	43·4	58·0	57·6	+ 0·4	84·0	19th	37·0	4th, 8th, and 13th.
Piet Retief	J. Werner	72·1	45·6	58·8	56·9	+ 1·9	86·0	30th	33·5	22nd.
Pigeehoek (New Agatha)	Jno. McCallum	70·1	52·5	61·3	—	—	85·0	19th	43·0	21st.
Pilgrim's Rest	E. M. Skea	74·4	44·9	59·6	55·9	+ 3·7	87·0	30th	33·0	8th.
Potchefstroom (Exp. Farm)	The Manager	73·2	38·6	55·9	53·8	+ 2·1	85·2	29th	23·9	22nd.
Pretoria (Meteorological Office)	The Staff	71·3	43·0	57·2	56·7	+ 0·5	81·6	19th	32·7	7th.
Standerton	The Town Clerk	70·4	34·5	52·4	50·0	+ 2·4	85·8	30th	19·5	22nd.
Zoeerust	H. Dietrich	72·8	40·8	56·8	56·6	+ 0·2	84·0	19th	28·0	22nd.
Swaziland—										
Mbabane	Swaziland Police	72·2	49·1	60·6	58·4	+ 2·2	87·0	20th	39·0	4th and 22nd.
Orange Free State—										
Bethulie	J. J. Wardhaugh	65·2	37·7	51·4	52·0	− 0·6	78·0	30th	25·0	22nd.
Bloemfontein	G. A. Schepers	68·2	38·0	53·1	51·9	+ 1·2	80·2	30th	22·5	22nd.
Harrismith	The Forester	62·6	39·7	51·2	49·0	+ 2·2	79·0	30th	24·0	22nd.
Kroonstad	S. R. Northfield	69·9	36·8	53·4	52·2	+ 1·2	83·0	30th	19·2	22nd.
Ladybrand	The Forester	65·7	37·2	51·4	51·2	+ 0·2	74·0	17th and 19th	21·0	22nd.
Lindley	J. Collister-Oates	68·9	35·1	52·0	51·0	+ 1·0	83·0	30th	19·0	22nd.
Natal—										
Dundee	West Thorrold	72·7	43·5	58·1	58·3	− 0·2	88·0	30th	29·0	22nd.
Durban (Point)	The Port Captain	72·8	58·6	65·7	66·0	− 0·3	89·2	20th	50·6	22nd.
Estcourt	A. A. Nolan	72·5	39·9	56·2	56·9	− 0·7	83·0	30th	25·0	22nd.
Hlabisa	The Gaoler	74·3	57·4	65·8	65·6	+ 0·2	85·0	16th and 30th	49·0	22nd.
Ladysmith	D. A. R. Leathern	75·8	48·3	59·8	59·4	+ 0·4	86·0	29th and 30th	30·0	22nd.
Maritzburg (Mental Hospital)	The Superintendent	73·9	51·2	62·6	62·4	+ 0·2	91·4	30th	36·0	22nd.
Stanger	C. G. Foss	75·4	58·5	66·9	65·2	+ 1·7	95·1	5th	50·1	22nd.
Weenen	The Gaoler	75·0	39·2	57·1	58·0	− 0·9	88·0	31st	28·0	21st and 22nd.

AIR TEMPERATURES, AUGUST, 1922—(*continued*).

Station.	Observer.	Month—Aug. 1922. Mean Max.	Month—Aug. 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Cape—										
Albany North	Alex. Alcock	66·5	35·7	51·1	50·9	+ 0·2	77·0	30th	22·5	22nd.
Bathurst	T. C. Hall	66·0	49·7	54·8	57·0	− 2·2	80·0	15th and 29th	32·5	23rd.
Capetown (Royal Observatory)	The Staff	60·2	46·5	53·4	55·6	− 2·2	68·9	25th	39·0	7th.
Carnarvon	A. P. Malherbe	63·1	32·6	47·8	51·2	− 3·4	73·0	27th and 28th	21·0	22nd.
Clanwilliam	F. E. Scholtz	64·7	38·5	51·6	55·8	− 4·2	77·0	26th	32·5	22nd.
East London	The Port Captain	69·5	50·8	60·2	60·9	− 0·7	86·0	4th	38·0	22nd.
Grand Rhine	S. H. D. Treadwell	69·1	44·3	56·7	55·5	+ 1·2	83·8	4th	34·0	21st.
Graaff-Reinet	The Vet. Res. Officer	64·8	41·0	52·9	56·4	− 3·5	82·4	15th	29·6	22nd.
Grootfontein	Lionel Baker	60·3	42·9	51·6	54·4	− 2·8	73·3	25th	36·4	7th.
Kenhardt	R. Seydell	69·1	37·3	53·2	55·8	− 2·6	85·0	28th	30·0	7th and 22nd.
Kimberley	J. Acton	72·5	40·4	56·4	55·5	+ 0·9	84·0	19th, 29th, and 30th	30·0	21st and 22nd.
Kingwilliamstown	L. Clayton	68·9	44·7	56·8	59·5	− 2·7	87·0	4th	34·0	22nd.
Kokstad	H. D. Coyte	67·6	40·3	54·0	49·8	+ 4·2	84·0	30th	24·8	22nd.
Malmesbury (Convent)	The Mother Superior	73·7	43·3	58·5	59·7	− 1·2	85·0	29th	25·0	7th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	63·6	50·2	56·9	58·0	− 1·1	74·0	9th	40·0	21st.
Murraysburg	—	—	—	—	48·4	—	—	—	—	—
O'okiep	J. Burrows	59·9	40·2	50·0	53·8	− 3·8	73·3	14th	31·6	6th.
Port Elizabeth	The Lightkeeper	64·6	49·3	57·0	59·3	− 2·3	77·0	4th	40·0	21st.
Port Nolloth	The Lightkeeper	59·7	43·1	51·4	54·2	− 2·8	74·0	7th	37·0	6th, 24th, and 28th.
Port St. Johns (Cape Hermes)	The Lightkeeper	71·3	56·9	64·1	61·6	+ 2·5	91·0	5th	47·0	22nd.
Queenstown	H. Holley	66·9	40·8	53·8	53·4	+ 0·4	83·0	30th	31·0	14th and 23rd.
Somerset East	C. Harris	65·5	43·0	54·2	56·6	− 2·4	80·4	4th and 15th	31·2	22nd.
Stellenbosch	F. C. Bousfield	68·5	44·8	56·6	56·2	+ 0·4	82·0	29th	35·6	23rd.
Sydney's Hope	Rev. S. Hippon	63·1	45·6	54·4	56·3	− 1·9	78·0	4th	34·0	21st.
Uitenhage	H. Inggs	68·9	42·9	55·9	59·4	− 3·5	85·5	4th	30·2	22nd.
Umtata	Miss N. Dix-Peck	71·1	43·3	57·2	57·0	+ 0·2	88·8	29th	28·9	22nd.
Vryburg	H. W. Collen	73·1	37·9	55·5	52·7	+ 2·8	84·0	30th	24·0	22nd.
Wynberg (Convent)	The Mother Superior	59·8	46·1	53·0	56·6	− 3·6	71·5	25th	38·5	21st.
Basutoland—										
Maseteng	F. Hodgson	63·9	38·7	51·0	50·1	+ 0·9	76·0	30th	23·0	21st.

RAINFALL, AUGUST, 1922.

Station.	Observer.	Month. Aug., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	1·00	0·21	+ 0·79	15·29	21·79	− 6·50	1·01	0·85	+ 0·16
Bethal	H. Joubert	1·30	0·48	+ 0·82	17·30	15·53	+ 1·77	1·30	0·66	+ 0·64
Belfast	The Forester	1·09	0·28	+ 0·81	20·49	17·71	+ 2·78	1·09	0·56	+ 0·53
Bloemhof	A. Adamson	0·53	0·19	+ 0·34	6·70	12·90	− 6·20	0·53	0·40	+ 0·13
Claremont	S.A. Police	0·74	0·30	+ 0·44	5·92	11·32	− 5·40	0·74	0·35	+ 0·39
Ermelo	The Forester	1·09	0·29	+ 0·80	14·26	15·24	− 0·98	1·09	0·44	+ 0·65
Haenertsburg	S.A. Police	1·97	0·20	+ 1·77	15·00	27·67	−12·67	1·97	0·98	+ 0·99
Heidelberg	W. A. ter Horst	1·12	0·34	+ 0·78	12·91	15·50	− 2·59	1·12	0·68	+ 0·44
Johannesburg (Observatory)	The Staff	1·32	0·58	+ 0·74	13·82	17·26	− 3·44	1·32	0·91	+ 0·41
Klerksdorp (Strathmore)	C. Scott	1·28	0·18	+ 1·10	9·60	14·16	− 4·56	1·28	0·39	+ 0·89
Komatipoort	H. J. Evans	1·31	0·21	+ 1·10	14·47	17·56	− 3·09	1·54	0·57	+ 0·97
Louis Trichardt	I. J. de Bruin	0·98	0·18	+ 0·80	7·01	20·14	−13·13	1·00	0·84	+ 0·16
Middelburg	Dr. H. A. Spencer	1·35	0·34	+ 1·01	16·91	15·51	+ 1·40	1·41	0·39	+ 1·02
Nylstroom	G. Bakker	2·23	0·24	+ 1·99	10·90	14·42	− 3·52	2·23	0·45	+ 1·78
Pietersburg	W. J. Frankleyne	1·70	0·15	+ 1·55	8·82	12·61	− 3·79	1·70	0·44	+ 1·26
Piet Retief	J. Werner	1·50	0·43	+ 1·07	12·89	16·18	− 3·29	1·50	0·77	+ 0·73
Pilgrims Rest	E. M. Skea	1·69	0·42	+ 1·27	19·69	27·29	− 7·60	1·77	0·86	+ 0·91
Pigeonhole (New Agatha)	J. McCallum	1·55	0·51	+ 1·04	14·89	30·23	−15·34	1·55	1·38	+ 0·17
Potchefstroom (Exp. Farm)	The Manager	3·92	0·21	+ 3·71	13·13	13·38	− 0·25	3·92	0·39	+ 3·53
Pretoria (Meteorological Office)	The Staff	3·92	0·34	+ 3·58	14·34	17·67	− 3·33	3·92	0·61	+ 3·31
Rooiberg	M. Baumann	3·37	0·53	+ 2·84	13·74	14·86	− 1·12	3·37	0·92	+ 2·45
Rustenburg	H. Streatfield	1·66	0·21	+ 1·45	12·11	15·63	− 3·52	1·66	0·72	+ 0·94
Standerton	Town Clerk	1·94	0·51	+ 1·43	—	16·23	—	1·94	0·80	+ 1·14
Wakkerstroom	*L. le Roux*	*2·17*	*0·67*	*+ 1·50*	*15·72*	*18·15*	*− 2·43*	*2·17*	*1·07*	*+ 1·10*
Woodbush	The Forester	2·61	0·75	+ 1·86	19·95	48·77	−28·82	2·61	1·87	+ 0·74
Zeerust	H. Dietrich	1·55	0·17	+ 1·38	9·38	15·41	− 6·03	1·55	0·44	+ 1·11
Swaziland—										
Mbabane	Swaziland Police	2·31	0·64	+ 1·67	20·93	30·11	− 9·18	2·31	1·35	+ 0·96
Orange Free State—										
Bethulie	J. J. Wardhaugh	1·95	0·46	+ 1·49	5·97	12·80	− 6·83	2·50	0·84	+ 1·66
Bloemfontein	G. A. Schepers	0·16	0·21	− 0·05	6·06	12·36	− 6·30	0·16	0·77	− 0·61
Boshof	P. H. v. Rooyen	0·00	0·66	− 0·66	4·88	13·06	− 8·18	0·00	0·97	− 0·97
Harrismith	The Forester	1·97	0·65	+ 1·32	13·87	15·89	− 2·02	2·01	0·83	+ 1·18
Kroonstad	S. R. Northfield	1·80	1·00	+ 0·80	9·35	12·05	− 2·70	1·80	1·37	+ 0·43
Ladybrand	The Forester	0·52	0·41	+ 0·11	9·79	16·21	− 6·42	0·75	0·85	− 0·10
Lindley	J. Collister-Oates	1·47	0·38	+ 1·09	11·22	14·60	− 3·38	1·47	0·74	+ 0·73
Natal—										
Dundee	West Thorrold	1·82	0·71	+ 1·11	17·60	18·83	− 1·23	1·92	0·88	+ 1·04
Durban (Point)	The Port Captain	3·64	1·21	+ 2·43	27·02	24·26	+ 2·76	3·83	1·97	+ 1·86

RAINFALL, AUGUST, 1922—(*continued*).

Station.	Observer.	Month. Aug., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Natal—(continued).										
Estcourt	A. A. McLean	2·27	0·56	+ 1·71	14·13	16·97	− 2·84	2·37	0·71	+ 1·66
Hlabisa	The Gaoler	2·58	1·09	+ 1·49	14·56	24·10	− 9·54	2·71	1·71	+ 1·00
Howick	The Gaoler	2·32	0·84	+ 1·48	16·69	18·73	− 2·04	2·44	1·00	+ 1·44
Ladysmith	D. A. R. Leathern	2·71	0·74	+ 1·97	18·46	16·96	+ 1·50	2·86	0·83	+ 2·03
Maritzburg (Mental Hospital)	The Staff	2·28	0·94	+ 1·34	14·37	19·74	− 5·37	2·43	1·08	+ 1·35
Stanger	C. C. Foss	4·11	1·19	+ 2·92	20·73	21·98	− 1·25	4·53	1·88	+ 2·65
Vryheid	The Gaoler	2·80	0·73	+ 2·07	18·11	20·92	− 2·81	2·80	1·02	+ 1·78
Weenen	The Gaoler	1·50	0·71	+ 0·79	14·87	15·60	− 0·73	1·64	0·81	+ 0·83
Cape—										
Aliwal North	A. Alcock	1·83	0·73	+ 1·10	7·65	14·27	− 6·62	2·42	1·15	+ 1·27
Beaufort West	The Gaoler	0·54	0·32	+ 0·22	4·93	6·49	− 1·56	0·88	0·56	+ 0·32
Bedford	T. C. Hall	1·44	1·07	+ 0·37	18·04	17·62	+ 0·42	1·97	1·89	+ 0·08
Britstown	The Gaoler	0·30	0·18	+ 0·12	1·92	8·37	− 6·45	0·46	0·39	+ 0·07
Calvinia	The Gaoler	2·55	0·86	+ 1·69	6·76	5·98	+ 0·78	2·81	1·69	+ 1·12
Capetown (Royal Observatory)	The Staff	3·71	3·43	+ 0·28	16·15	19·63	− 3·48	6·04	6·08	− 0·04
Ceres	A. Heathe	8·96	5·87	+ 3·09	33·39	30·13	+ 3·26	11·11	11·61	− 0·50
Carnarvon	A. P. Malherbe	0·00	0·31	− 0·22	0·37	6·27	− 5·90	0·09	0·50	− 0·41
Clanwilliam	P. E. Schottz	2·17	1·15	+ 1·02	7·61	6·63	+ 0·98	2·63	2·40	+ 0·23
East London	A. Downie	1·18	2·09	− 1·91	18·31	19·97	− 1·66	3·32	3·18	+ 0·14
Fraserburg	The Gaoler	0·28	0·33	− 0·05	2·52	5·17	− 2·65	0·28	0·59	− 0·31
Garies	The Gaoler	2·01	0·79	+ 1·22	4·26	4·05	+ 0·21	2·05	1·60	+ 0·45
Graaff-Reinet	S. E. D. Treadwell	0·93	0·58	+ 0·35	5·94	9·06	− 3·12	1·26	1·02	+ 0·24
Groot Drakenstein	Lionel Baker	6·50	5·01	+ 1·49	31·05	26·94	+ 4·11	9·41	10·03	− 0·62
Griquatown	The Gaoler	0·27	0·15	+ 0·12	1·69	9·83	− 8·14	0·27	0·32	− 0·05
Grahamstown	Vet. Res. Officer	0·91	1·63	− 0·72	8·66	17·44	− 8·78	4·58	2·77	+ 1·81
Hanover	The Gaoler	0·16	0·33	− 0·17	2·35	9·78	− 7·43	0·16	0·70	− 0·54
Hopetown	The Gaoler	0·61	0·24	+ 0·37	2·77	9·34	− 6·57	0·61	0·49	+ 0·12
Kenhardt	R. Seydell	0·20	0·12	+ 0·08	0·95	4·39	− 3·44	0·20	0·26	− 0·06
Kimberley	J. Acton	0·10	0·18	− 0·08	3·11	10·96	− 7·85	0·10	0·43	− 0·33
Knysna	The Gaoler	1·25	2·67	− 1·42	23·04	18·19	+ 4·85	5·34	4·89	+ 0·45
Kokstad	H. D. Coyte	1·97	0·64	+ 1·33	17·07	16·22	+ 1·45	2·18	0·84	+ 1·34
Kingwilliamstown	L. Clayton	2·11	1·11	+ 1·00	13·11	15·61	− 2·50	3·31	2·10	+ 1·21
Kuruman (Abtonia)	A. T. Sitwell	0·04	0·09	− 0·05	3·54	11·80	− 8·26	0·04	0·48	− 0·44
Mafeking (Convent)	The Mother Superior	1·31	0·15	+ 1·16	7·10	13·71	− 6·61	1·31	0·52	+ 0·79
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·56	1·51	− 0·95	8·95	11·44	− 2·49	1·37	2·69	− 1·32
Murraysburg	W. H. Rose Innes	0·17	0·40	− 0·23	2·56	8·03	− 5·47	0·20	0·69	− 0·49
O'okiep	J. Burrows	2·62	1·01	+ 1·61	4·03	5·62	− 1·59	2·72	1·85	+ 0·87
Phillipstown	The Gaoler	0·50	0·29	+ 0·21	3·15	9·75	− 6·60	0·50	0·51	− 0·01
Piquetberg	The Gaoler	4·51	2·95	+ 1·56	16·98	14·99	+ 1·99	5·55	5·65	− 0·10

RAINFALL, AUGUST, 1922—(*continued*).

Station.	Observer.	Month. Aug., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cape—(continued).										
Port Elizabeth	The Lightkeeper	0·85	2·18	− 1·33	12·24	13·90	− 1·66	3·41	4·04	− 0·63
Port St. Johns (Cape Hermes)	The Lightkeeper	5·33	1·91	+ 3·42	23·31	27·24	− 3·93	5·53	2·84	+ 2·69
Port Nolloth	The Lightkeeper	1·06	0·27	+ 0·79	1·99	1·93	+ 0·06	1·09	0·83	+ 0·26
Prieska	The Gaoler	0·41	0·17	+ 0·24	1·35	7·57	− 6·22	0·41	0·34	+ 0·07
Queenstown	H. Holley	1·90	0·61	+ 1·29	10·69	13·94	− 3·25	2·38	1·14	+ 1·24
Steytlerville	The Gaoler	0·37	0·48	− 0·11	7·37	6·04	+ 1·33	1·32	0·64	+ 0·68
Sutherland	The Gaoler	1·93	0·86	+ 1·07	5·84	7·04	− 1·20	1·99	1·69	+ 0·30
Swellendam	The Gaoler	2·32	2·47	− 0·15	23·35	20·98	+ 2·37	3·79	4·55	− 0·76
Sydney's Hope	Rev. S. Rippon	1·48	1·22	+ 0·26	18·58	13·80	+ 4·78	3·77	2·08	+ 1·69
Somerset East	C. Harris	1·40	0·97	+ 0·43	13·47	14·75	− 1·28	2·73	1·76	+ 0·97
Stutterheim	F. C. Rousfield	1·98	1·01	+ 0·97	16·91	18·06	− 1·15	2·37	1·57	+ 0·80
Uitenhage	H. Inggs	0·50	1·17	− 0·67	13·44	10·24	+ 3·20	3·74	1·83	+ 1·91
Untata	Miss N. Dix Peck	2·58	0·77	+ 1·81	15·60	15·96	− 0·36	4·02	1·30	+ 2·72
Uniondale	The Gaoler	0·47	1·36	− 0·89	9·88	9·18	+ 0·70	2·11	2·31	− 0·20
Uplington	The Gaoler	0·03	0·07	− 0·04	1·05	5·20	− 4·15	0·03	0·17	− 0·14
Victoria West	The Gaoler	0·17	0·27	− 0·10	2·92	7·53	− 4·61	0·17	0·52	− 0·35
Vryburg	H. Collen	0·15	0·26	− 0·11	5·09	14·24	− 9·15	0·15	0·41	− 0·26
Worcester	The Gaoler	2·09	1·59	+ 0·50	9·15	9·24	− 0·09	2·73	3·34	− 0·61
Wynberg (Convent)	The Mother Superior	7·46	7·55	− 0·09	31·72	35·52	3·80	12·72	14·76	− [illegible]
Basutoland—										
Mafeteng	F. Hodgson	1·42	0·89	+ 0·53	10·92	20·83	− 9·91	2·02	1·47	+ 0·55
South-West Africa—										
Tsumeb	Ing. Schetter	0·00	0·01	− 0·01	6·39	16·81	− 10·42	0·00	0·03	− 0·03
Waterberg	D. Hahn	0·00	0·06	0·06	7·25	15·02	− 7·77	0·00	0·06	− 0·06
Omaruru	The Postmaster	0·00	0·06	− 0·06	6·26	9·27	− 3·01	0·00	0·01	− 0·01
Okahandja	Rev. Diehl	*0·00*	*0·00*	− *0·00*	*0·48*	*4·24*	− *3·76*	*0·00*	*0·00*	− *0·00*
Otjiseruubrook	L. Matthiessen	0·00	0·05	− 0·05	8·36	10·14	− 1·78	0·00	0·06	− 0·06
Gobabis	Rev. Irle	0·00	0·08	− 0·08	3·98	11·90	− 7·92	0·00	0·10	− 0·10
Gr. Witvley	B. Rueckert	0·00	0·02	− 0·02	3·60	11·25	− 7·65	0·00	0·03	− 0·03
Windhoek	Observatory	0·00	0·08	− 0·08	5·40	11·02	− 5·62	0·00	0·09	− 0·09
Maltahöhe	E. Just	0·00	0·00	− 0·00	1·49	5·22	− 3·73	0·00	0·02	− 0·02
Voigtsgrund	A. Voigts	0·00	0·03	− 0·03	1·95	4·62	2·67	0·00	0·04	− 0·04
Gibeon	Rev. Spellmeyer	0·00	0·01	− 0·01	2·54	4·83	− 2·29	0·00	0·05	− 0·05
Bethany	Rev. Peter	0·00	0·02	− 0·02	1·94	3·41	− 1·47	0·00	0·03	− 0·03
Aus	F. Erni	1·86	0·38	+ 1·48	4·43	3·70	+ 0·73	1·86	0·66	+ 1·20
Heirachabis	Rev. Father Eder	0·00	0·07	− 0·07	0·67	3·60	− 2·93	0·00	0·08	− 0·08

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MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. III. SEPTEMBER, 1922. No. 9.

MEAN barometric pressure higher than usual in the west, south, and centre, normal elsewhere; days and nights warmer than usual; high temperatures during the third and fourth weeks; low temperatures, below freezing, mostly at the beginning of the month, but locally towards the end of the month; unusually dry weather even over the winter rainfall area, where some new minimum records were set up; absolute drought over South-West Africa, parts of the south-west, northern, and central Karroos and northern border of the Cape, Bechuanaland, portions of the west and north of the Transvaal, and of the south and west of the Free State; frequent mists along the south-west and south-central areas; fairly general rains during the last few days of the month; an excess of precipitation over limited areas of the south-central and eastern Transvaal, the north-west of Natal, parts of the south and south-east Cape, and the south of the northern Karroo; strong winds, with accompanying duststorms; and some destructive hailstorms;—these were the most noteworthy features of the weather of September, 1922.

Pressure.—Mean pressure during September was practically normal over the eastern half of the country, but slightly higher than usual over the centre and in the south. Fine weather conditions prevailed during the greater part of the month, high pressure areas being present practically every day, usually over the west and east. Pressure was relatively low over the northern and central areas on 5th, 7th, 12th to 16th, 23rd, 24th, and 26th to 30th; whilst "lows" lay over the east on 6th, over the south coast on 12th and 13th, over the south-east on 22nd and 28th, and over the south-west on the 30th.

Temperatures.—The temperature of the Union as a whole during September was 62·2 degrees, or 1·3 degree, higher than the normal. The excess was practically equally divided between the mean maximum, or day, temperature (75·8 degrees) and the mean minimum, or night, temperature (48·6 degrees), which were respectively 1·2 degree and 1·4 degree higher than the corresponding normal. An excess in mean monthly temperature was shown by the Orange Free State (59·8 degrees), the Cape Province (61·3 degrees), and the Transvaal (63·4 degrees), which were respectively 2·0 degrees, 1·8 degree, and 0·9 degree

above the corresponding averages. In Natal, however, the mean for the month (64·7 degrees) was 0·4 degree less than usual, owing to the mean maximum (77·5 degrees) being 1·6 degree lower, whilst the mean minimum (52·1 degrees) was only 0·9 degree higher than the normal. Two-thirds of the excess shown by the Free State was due to the days, which, with 75·2 degrees, were 2·7 degrees, whilst the nights, with 44·4 degrees, were only 1·3 degree warmer than usual. Practically the reverse obtained in the Transvaal, where the mean day temperature of 78·1 degrees was only 0·5 degree, whilst the mean night temperature of 48·6 degrees was 1·2 degree, above normal. Over the Cape Province the surplus of 1·8 degree was almost equally divided between the days and nights, the mean maximum (74·1 degrees) being 2·0 degrees, and the mean minimum (48·6 degrees) being 1·7 degree higher than the corresponding averages. Considering the individual stations, mean temperature during September was subnormal by about half a degree over the high veld, centre and north of the Transvaal, in Swaziland, and mostly by 1–2 degrees in the interior of Natal. Elsewhere temperature was higher than usual, usually by 2–3 degrees. The excess, however, showed a general tendency to increase in amount from east to west over the Transvaal and Free State, and from the coast to the interior of the Cape Province. Thus, proceeding from east to west, along the south of the Transvaal, Piet Retief showed an excess of 0·5 degree; Standerton, 1·6 degree; Potchefstroom, 2·9 degree, and Bloemhof, 4·8 degrees. In the Free State, Harrismith showed a surplus of 0·4 degree, Ladybrand of 3·6 degrees, Bloemfontein of 3·3 degrees, increasing to 4·0 degrees at Kimberley, near its western borders. In the Cape Province the excess was 0·7 degree at East London, 1·2 degree at Bedford, 2·5 degrees at Somerset East, and 4·8 degrees at Graaff-Reinet. Generally speaking, the excess in mean temperature varied between a few tenths and one degree at coast stations. Both days and nights were warmer than usual, except in the north-eastern half of the Transvaal and in Natal, and a few stations in the Cape Province. In the last-mentioned Province, the mean maxima were everywhere below normal by amounts varying between 0·3 degree at Stanger and 2·8 degrees at Estcourt, whilst the mean minima were supra-normal by 1½ to 3½ degrees, except at Dundee, Estcourt, and Weenen, where they were about 1½ degree lower than usual. Small deficits of a few tenths of a degree also occurred at Grahamstown in the south and east, Kenhardt in the northern border, and Groot Drakenstein in the south-west. In the Transvaal deficits of 1–3 degrees in the day temperatures occurred at Komatipoort, Middelburg, Pretoria, Nylstroom, and Pietersburg, and the nights were cooler than usual at Belfast, Louis Trichardt, and Nylstroom, the deficiency in mean minimum temperature being least (0·7 degree) at the last-mentioned, and greatest (3·7 degrees) at the second of these stations. The only stations in the Cape showing mean maxima lower than usual are Kingwilliamstown in the south-east, Port St. Johns in Kaffraria, and Wynberg in the Cape Peninsula. The warmest station during the month was Komatipoort, with a mean for the month of 73·1 degrees, Stanger in Natal and Hlabisa in Zululand coming next with 68·0 degrees. The coolest station was Belfast in the Transvaal, with a temperature of 54·4 degrees, the next in order being Harrismith (O.F.S.), with 55·0 degrees. There was therefore a difference of 18·7 degrees in the month's temperature over all stations. The highest mean maximum was 86·5 degrees at Komatipoort, and the lowest mean minimum 38·2 degrees, at Belfast. The highest temperatures were recorded on seventeen days of the month, and principally on the 23rd in the Transvaal, on the 16th in Natal and the Free State, and the 19th in the Cape Province. The lowest temperatures occurred almost generally on the 7th and 8th, whilst a few were recorded on seven other dates, principally the 1st and 24th, and then almost entirely in the Cape. The highest temperature

(104·0 degrees) occurred at Komatipoort on the 23rd, the only other station exceeding 100 degrees being Graaff-Reinet, in the Cape, where 100·3 degrees was recorded on the 20th. The lowest temperature was 25·0 degrees at Murraysburg (Cape Province) and Belfast (Transvaal Province) on the 1st and 8th respectively. There was thus an extreme range of 79 degrees during the month. Temperatures below freezing-point occurred on 1st, 7th, and 8th. Radiation frosts were infrequent, and do not appear to have caused much damage.

Precipitation was in excess over very limited areas in the Transvaal, Natal, and the Cape Province. Thus, in the Transvaal, small surplus amounts between one-quarter and three-quarters of an inch were recorded over a roughly triangular patch extending from Komatipoort through Barberton to Pretoria, thence south-east to Wakkerstroom, the maximum excess being 1·26 inch at Piet Retief. In Natal the only station showing an excess was Dundee, with 0·53 inch above normal, although the rainfall at Ladysmith was equal to the average. In the Cape Province surplus amounts occurred at a few stations in the south-east, in the south of the northern Karroo, the neighbourhood of Graaff-Reinet in the east central Karroo, Knysna on the south coast, also at Garies and Port Nolloth in Namaqualand. These excesses were very small, the largest amount being 0·36 inch at Stutterheim. Elsewhere precipitation was below normal, usually by quantities between a quarter and half an inch, but increasing to 1·34 inch at Woodbush. In the Free State the deficits were somewhat larger, but varying between 0·04 inch at Harrismith and 1·54 inch at Ladybrand. Natal showed a still greater range, the minus quantities varying between 0·20 inch at Estcourt and 2·46 inch at Stanger. In the Cape Province the largest shortages were experienced over the south-west, where they ranged from slightly over an inch to more than 4 inches at Wynberg; over the rest of the Province the deficits were mostly between a quarter and three-quarters of an inch. Absolute drought prevailed over a large portion of the interior, including South-West Africa, the major portion of the northern Karroo, northern Border, central Karroo, Bechuanaland, portion of the south-west of the Cape, of the west and north of the Transvaal, and the south and west of the Free State. Light rains fell over the Cape Peninsula, west and south coasts, and part of the south-west during the first half of the month, and slight local showers over the interior; between the 5th and 7th light rains were more general over the eastern half of the country, affecting a large portion of the Free State. Showers also occurred in the Transvaal and the east and north-east of the Free State on the 10th and 11th; but the largest quantities were recorded over the eastern half of the country between the 26th and 30th, accompanied by thunderstorms and strong winds, and occasionally hail. Considerable damage to grass and fruit, etc., was done by these hailstorms. Thus at Zwartkopjes, in the Heidelberg Division of the Transvaal, stones measuring 1⅜ inch in diameter broke windows facing east and south, whilst at Dundee (Natal) the fruit was practically ruined, and roofs leaked, owing to the choking up of the guttering. The shortage of rain was severely affecting crops in the south-west of the Cape, where, however, conditions were favourable for the blossoming of fruit, which promised to be exceptionally abundant over most of the country. Owing to the drought, however, stock were dying in some areas and getting low in condition in others. A particularly heavy windstorm, said to have been unprecedented during the last forty years, occurred at Vaalbank (District Bethal) on the afternoon of the 29th, uprooting and breaking down trees. The accumulated rainfall since the beginning of the year was above the average over very limited areas, the most noteworthy extremes being in the south of the Cape Province, where the surplus amounts ranged from 0·42 inch at Uniondale

to 5·10 inches at Knysna. An excess was also recorded at a few stations in the south-west and west, the south-west of the northern Karroo, portions of the south-east, and Kaffraria. In Natal, supra-normal quantities are limited to the neighbourhood of Durban and Ladysmith, whilst excess of two to three inches occurred over the Transvaal high veld. With these exceptions the rainfall during these nine months was below normal, the deficits being least in the south-west Cape, but increasing to 5–8 inches over the Peninsula, 5–9½ inches in the interior, the sub-normal quantities being greatest in Bechuanaland, the northern Border, and the northern Karroo, although a shortage of 9·30 inches is also shown at Grahamstown in the south-east. In the Free State the deficits are between 7 and 8 inches in the southern half, decreasing to 2–4 inches in the north. In the Transvaal, the sub-normal quantities were mostly between 2 and 6 inches, but exceeded 13 inches at Haenertsburg and Louis Trichardt and 30 inches at Woodbush. A much more satisfactory state of affairs is shown by a comparison of the totals since the 1st July with corresponding normal quantities. In this case, an excess is shown over the greater part of the Transvaal, including Swaziland, Kaffraria, the north-east and south-east of the Cape, the neighbourhood of Knysna, portions of the southern and central Karroo, the west of the northern Karroo and plateau of Namaqualand, also the north-east and south of the Free State and the north of Bechuanaland. The excesses were greatest over the south-east Cape, the south of the Transkei, the higher portions of Natal, and over a roughly triangular area in the Transvaal, having its base between Wakkerstroom and Komatipoort, and the apex about Rooiberg in the western Transvaal. Over these areas the excess was mostly between 1½ and 2 inches, but rose to 3½ inches at Pretoria. Over the remainder of the areas showing surplus amounts, the supra-normal quantities varied from a few hundredths of an inch to one inch, but rose to 2·94 inches at Potchefstroom, in the south-west of the Transvaal. In Natal the excesses are mostly about 1½ inch, but ranging from 0·11 inch at Maritzburg to 2·03 inches at Ladysmith. In the Free State the surplus was about one inch over the limited areas indicated above. In the Cape Province the plus amounts were largest, exceeding 2 inches in the south of the Transkei, but decreased to about 1¼ inch in the south-east, and to a few hundredths in the central Karroo. The deficits over the rest of the country were generally under an inch, varying from about a third of an inch over the south of the innermost plateau to nearly one inch in parts of Bechuanaland, and exceeding one inch in the centre of the Free State. These sub-normal amounts were largest in the south-west of the Cape, where they varied between 2·16 inches at Piquetberg and 6·05 inches at Wynberg in the Peninsula.

MUDDY RAIN AT STUTTERHEIM.

Writing under date 3rd September, Mr. F. C. Bousfield gives the following account of this somewhat peculiar occurrence at Stutterheim :—

"On the 30th August, rain started at 5 p.m., left off at 9 p.m.; for the first half-hour every drop that fell was mud. Under separate cover I am sending you rain collected in a china dish. I put the dish out about half an hour after the mud started to fall; the mud gradually disappeared as the rain continued. There were no signs of a duststorm during the day; in fact, the sky was very clear during the day up to the time the clouds appeared. Muddy rain has not fallen here before to my knowledge."

An examination of this sample of rain by the Government Chemist, Pretoria, showed that it contained 0·14 per cent. by weight of sediment which appeared to be clay or dust.

OBSERVERS' NOTES FOR SEPTEMBER, 1922.

TRANSVAAL.

Barberton.—Dry, warm weather, with occasional very hot days, have characterized the weather this month. Several heavy showers, with thunder and lightning, occurred at the end of the month. Rainfall: 1·64 inch on five days.—Walter Grubb.

Bloemhof.—Excessive duststorms throughout the month; worst experienced. Rainfall: Nil.—A. Adamson.

Klerksdorp.—Very dry month, with great windstorms. Rainfall: Nil.—Chas. Scott.

Middelburg.—The weather has been bright and genial throughout the month, with but one night's frost. A good rain fell during the second week, amounting in three days to just over an inch, which was sufficient to enable farmers to commence ploughing thus early. The winter drought finally broke in the last week of the month, when for five days rain fell, and threatened in larger amounts to the extent of just under an inch. Exceptional rains may be said to have fallen this month, for during nineteen years an amount of over an inch has only fallen on two occasions in September (1906, 1·42 inch; 1917, 1·36 inch), whilst the month's rainfall yielded 1·93 inch on eight days.—Dr. H. A. Spencer.

Pietersburg.—Bright weather, rather hot; rain badly needed. Rainfall: 0·03 inch on one day.—W. J. Frankleyne.

Piet Retief.—Heavy soaking rains for two days, 2·27 inches (29th and 30th), well distributed. Rainfall: 2·38 inches on six days.—J. Werner.

Standerton.—Bright warm days; much thunder in neighbourhood, Standerton, however, only getting tail-ends. In each case thunderstorms were preceded by light to strong gales. Rainfall: 0·66 inch on four days.—W. J. Madge.

Ermelo.—The weather during month has been mild in general.—A. Douglas.

Wakkerstroom.—With 1·51 inch on three days, the grass and crops should do well. Cattle on townlands are generally in a poor condition, but will begin to improve from now. The fruit trees are laden with fruit.—Louis le Roux.

Sabie.—Less water in Sabie River than I have known for last ten years. Rainfall: 0·53 inch on five days.—W. Lea.

Lichtenburg.—Veld very dry; cattle losing condition. Small swarms flying locusts still about; numerous swarms of young locusts—voetgangers—being dealt with by farmers and locust officers. Rainfall: 0·10 inch on one day.—J. T. Allman.

Zwartkopjes (Heidelberg).—An exceptionally heavy hailstorm passed about 7 p.m. on the 30th, lasting about three minutes. Stones measured 1⅝ inch in diameter. Nearly all windows facing east and some facing south broken on station, and numbers of hares killed on veld. Rainfall: 2·00 inches on six days.—E. Taylor.

Jakhalsfontein (Pietersburg).—Generally strong winds and dry, dusty weather. The latter part of month cloudy, and inclined towards rain. Rainfall: 0·21 inch on two days.—Rev. James C. Palmer.

Mosdene (Naboomspruit).—One of the driest Septembers we have experienced for a long time. As a consequence, live stock and grazing are in a very bad condition. Towards the end of the month it worked up for rain, and a fall of 0·25 inch was recorded on the last two days of the month. Total rainfall since 1st August, 1922: 0·25 inch.—J. H. Summers.

Bell's Bank (*Zoutpansberg*).—Very dry; stock very poor; famine amongst natives already in progress. Weather very promising just now. Rainfall: 0·11 inch on one day.—H. A. van Heerden.

Elandsfontein (*Potchefstroom*).—Very dry, but on 1st October we had 0·42 inch, which was very welcome, and will help a little. Rainfall: 0·27 inch on three days.—P. Davidtz.

Hlabane Ranch (*Barberton*).—The weather during first part of the month was very warm and droughty, the 21st, 22nd, and 23rd being exceptionally hot days, with no breeze or wind. The 29th and 30th were both rainy days. The farmers are now planting mealies; the natives planted mealies last month, but they did not thrive well on account of the warm, dry weather. Rainfall: 2.37 inches on six days.—H. B. Trollip.

Karreefontein (*Bloemhof*).—Hot, dry month and north-west winds; much dust. Rainfall: Nil.—H. Robinson.

Rooikoppen (*Standerton*).—Locusts reported near Elmtree; rain badly needed; quarter-evil prevalent among young stock. Rainfall: 0·88 inch on five days.—J. Wilson.

Thornkloof (*Witwatersrand*).—The observer has never known such continuous north-easterly winds as during this month, with almost an entire absence of westerly winds. Rainfall: 1·43 inch on six days.—W. Eastwood.

Vaalbank (*Bethal*).—On 29th September a terrible wind storm started at 5.10 p.m., and lasted till 6 p.m., which uprooted and broke down trees. Big willow trees were broken down to the ground. A neighbour told me he has been here for forty years, and has never seen the like of it. Several roofs were blown down at Kinross Station. Rainfall: 1·14 inch on five days.—J. Spitz.

Weltevreden (*Standerton*).—Rain just in time to bring on grass for stock, which are looking fairly well. Rainfall: 1·10 inch on four days.—D. Lane.

SWAZILAND.

Matendela.—A dry month on the whole, and hot; the grass dried off rather dangerously, and ploughing had to be knocked off. Rainfall: 1·22 inch in four days.—H. Parry.

NATAL.

Dundee.—After practically a month's drought, which was beginning to tell on the young spring grass, the month ended in a very severe hailstorm from the south. Fortunately, there was no wind, but the hail was in such quantities that flat roofs and gutters were soon packed, resulting in very many leaky roofs in town. The fruit crop, which promised so well, is practically ruined: over 4,000 apricots the size of large marbles were battered off one tree in my own garden. Rainfall: 1·74 inch on three days.—West Thorrold.

Estcourt.—Soaking rains needed; grazing backward. Heavy hailstorms in different parts of country during month, none in district; rivers very low. Rainfall: 0·68 inch on three days.—A. A. McLean.

Hlabisa.—The rains towards the end of the month were most welcome. The veld had become very parched and dry during the winter months. Rainfall: 1·38 inch on five days.—L. A. Double.

Ladysmith.—Very dry weather during greater part of month, and rain badly needed. A very welcome rain fell on the last day of the month, and weather seems to promise more rain. Heavy hailstorms reported from some parts of district on 30th, and fruit crops badly damaged. Very little hail fell in Ladysmith, however, and no damage was done. Rainfall: 0·81 inch on five days.—D. A. R. Leathern.

Maritzburg (Mental Hospital).—September has been much drier than usual; only 0·56 inch on four days fell during the month. The country is suffering from drought, and feeding for stock is scarce.—The Staff.

Stanger.—Very windy practically every day, calm most nights. Rainfall: 0·96 inch on three days.—Cecil C. Foss.

Mid-Illovo.—Insufficient rainfall, 1·28 inch on four days; ploughing hindered, and veld eaten off. Maximum temperature, 98·0 degrees on 16th, and minimum, 46·0 degrees, on 24th.—Lieut.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Newcastle (Gaoler).—The weather during the month has been fine. We have had a few heavy thunderstorms and a little hail, but no damage done. So far the country looks fresh and green, and plenty of grass for cattle. Crops are doing well. Rainfall: 0·94 inch on seven days.—The Gaoler.

Newcastle (Convent).—On the whole the weather, though warmer, was changeable. Several cold spells were experienced; very unsettled towards end of month; changes very sudden. Rainfall: 0·95 inch on five days.—The Mother Superior.

Nottingham Road.—Best spring that has been for some years; the veld is splendid in spite of frosts. All storms had hail in them. Rainfall: 0·86 inch on nine days.—Miss E. Smythe.

Cape St. Lucia.—Veld drying up, and cattle falling off in condition. Rainfall: 0·99 inch on six days.—J. Murphy.

Cape Province.

Aliwal North.—September has been disappointing: only 0·42 inch on four days. Rain not having fallen, veld and crops are suffering.—Alex. Alcock.

Bedford.—The main feature of the month has been perhaps the violent changes of temperature. Although spring set in early, the fruit trees are behaving erratically: individual trees blossoming a little at times, so that you have fair sized fruit, blossom, and bare stems all in evidence. I do not remember anything like it before. Rainfall: 2·25 inches on nine days.—Thos. C. Hall.

Clanwilliam.—With the exception of a very light fall of 0·04 inch on the 5th, no rain fell during this month. The result is that grain sown late in the season is becoming very dry, and the chances of its maturing properly are very remote. Grain sown early is promising well. The veld also is becoming very dry. Mountaineers who ascended the Cedar Mountains during the month report that the mountains are very dry. On fourteen days in the month there was mist in the morning, or sky overcast, and on several occasions the haze hung on the whole day or until late in the day. Maximum thermometer reached 90·0 degrees on two occasions, and on the 24th the minimum registered 35·0 degrees.—P. E. Scholtz.

Graaff-Reinet.—Winds light and variable; unusually warm month, temperature reaching 100·3 degrees on 20th. Rainfall: 1·21 inch on five days.—S. E. D. Treadwell.

Groot Drakenstein.—Rainfall: 1·02 inch on five days—less than one-third of the average, whilst temperature was considerably above. A very favourable blossoming period for fruit trees, blossom being remarkably profuse this year. Vines also look well.—Lionel Baker.

Kenhardt.—Continued drought. Rainfall: Nil.—R. Seydell.

Kingwilliamstown.—I do not think that the wheat crop will be very good this season: first full of lice, now getting full of rust. Rainfall: 1·78 inch on nine days.—L. Clayton.

Murraysburg.—On the whole a very dry month; drought beginning to become very severely felt. Rainfall: 0·66 inch on two days.—W. H. Rose Innes.

Queenstown.—Maximum temperature for month higher than usual; hoar frost on four mornings; country dry, rain wanted. Rainfall: 0·32 inch on five days.—H. Holley.

Somerset East.—A warm September, following upon good winter rains, has resulted in fine pasturage. Rainfall: 1·63 inch on eight days.—C. Harris.

Vryburg.—North and north-west winds almost invariably strengthened between 9 and 10 a.m. to half gales, and quietening to calm at sundown. Drought severe, although local showers reported in various varts of the district. Rainfall: Nil.—H. W. Colleen.

Grassridge (Cradock).—Rain on two occasions; total precipitation for month, 1·32 inch. The Karroo mixed veld is looking well, and stock generally looking much better. Flying locusts (large swarm) passed over on the 13th. The winds during month have been variable.—S. Whitwham.

Rietfontein (Aliwal North).—Dry month; rain wanted for crops; cold snap at end of month. Rainfall: 0·15 inch on two days.—A. J. Smith.

Elsenburg (Stellenbosch).—The month was very dry: 0·52 inch on three days as against an average of 2·68 inches. This has had a serious effect in the planting of summer crops, especially tobacco.—D. C. Crawford.

Ceres.—Rainfall: 0·31 inch on four days—lowest ever recorded for September. Weather generally has suddenly turned to spring, with heavy dews.—A. Heatlie.

Abtonia (Kuruman).—Very hot and dry; strong winds from north and north-east during day and from south during night. Rainfall: Nil.—A. T. Sitwell.

The Towers (Malmesbury).—Rain badly needed for crops and veld. Driest September on record. Rainfall: 0·38 inch on one day.—Fred. J. Duckett.

Roodebloem (Graaff-Reinet).—A good rain is very much needed; all prospects of a wheat crop are gone; stock still in good condition. Rainfall: 1·04 inch on three days.—A. E. Murray.

Theefontein (Hanover).—Young fruit exceptionally abundant and promising; no insect pests so far. Stock pery voor; loss of winter lambs heavy. Rainfall: 0·02 inch on one day.—E. Murray.

Bucklands (Herbert). Very warm; stock dying owing to drought. Rainfall: Nil.—A. Martin.

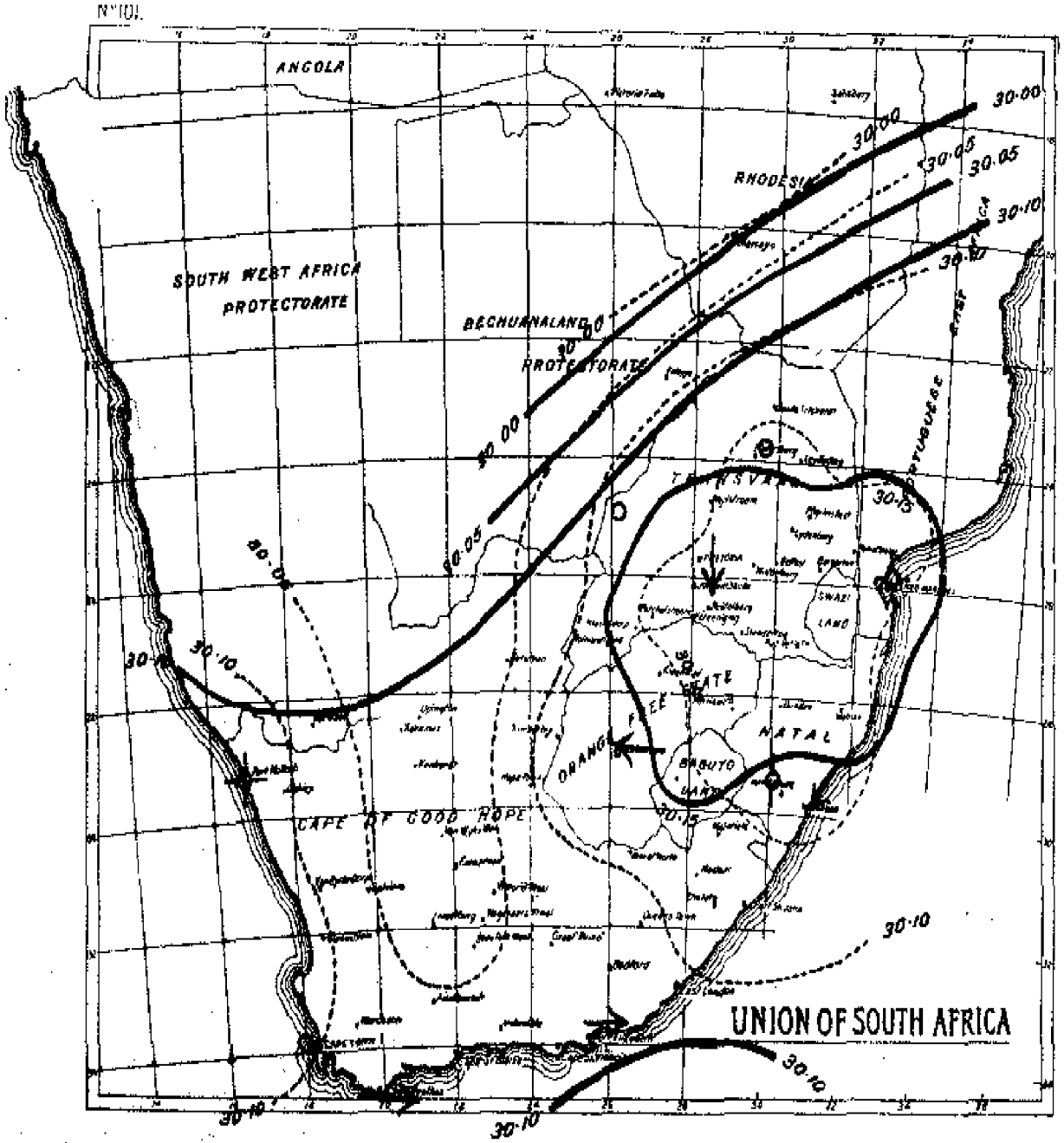
Basutoland.

Mafeteng.—Very dry month, the only rain recorded being 0·03 inch on 28th. Hot days; more rain badly needed; crops looking fairly well, considering the lack of rain.—F. Hodgson.

Maseru.—The wheat crops getting bad in some places on account of lice. Rainfall: 0·09 inch on two days.—J. G. Green.

Bechuanaland.

Serowe.—High winds; cloudy days; general indication of rain. Rainfall: Nil.—W. H. Ellam.



September, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for September.

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, except 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.

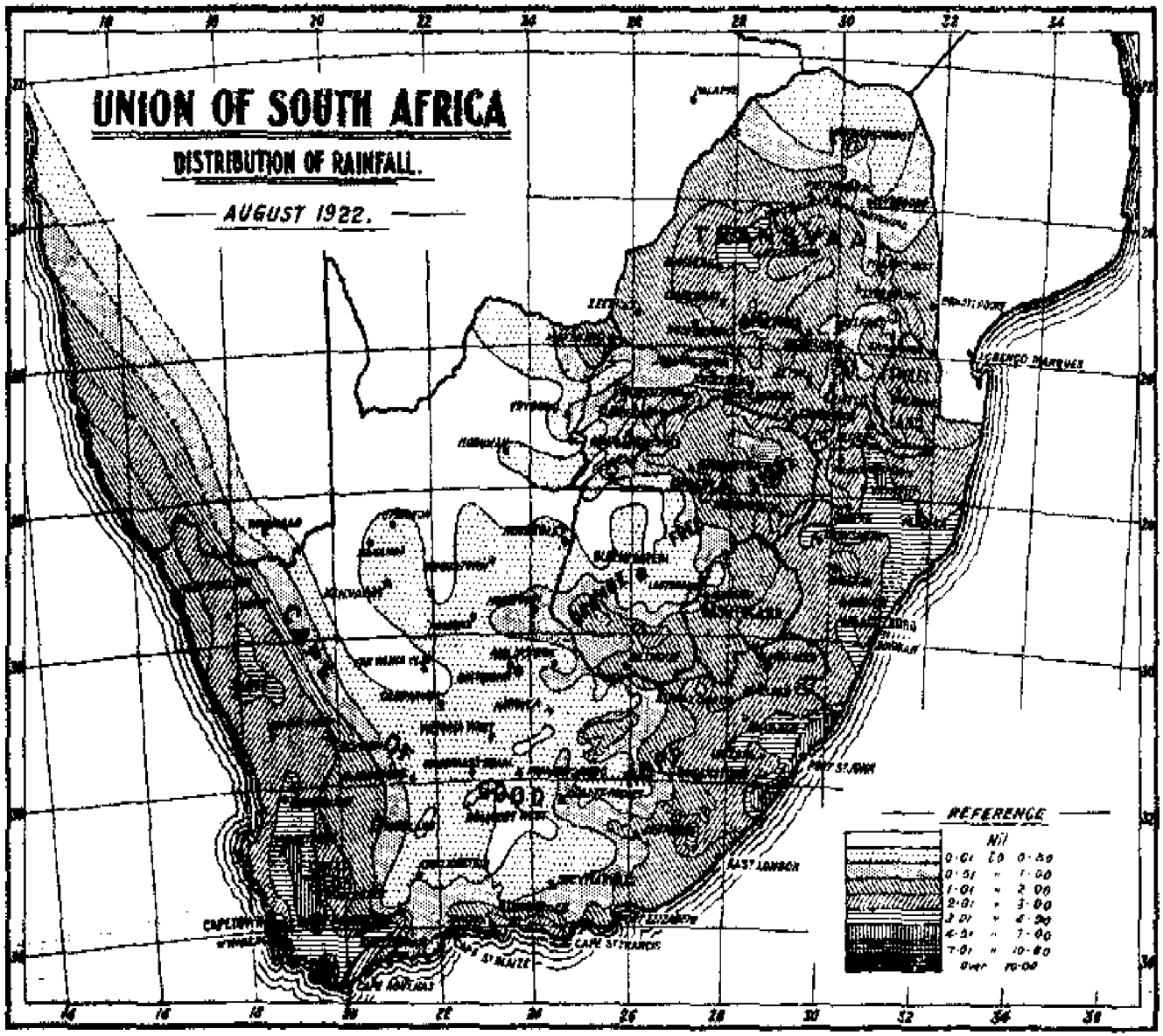
The highest mean daily temperature is now experienced over the northern borders of the Cape Province, where the normal is 72 degrees. In Natal and the eastern Transvaal a mean temperature of 71 degrees may be anticipated, and on the west-central Karroo, 69 degrees; on the southern Karroo, 68 degrees; 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 and north-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
DISTRIBUTION OF RAINFALL.
AUGUST 1922.
REFERENCE
Nil
0·01 to 0·50
0·51 " 1·00
1·01 " 2·00
2·01 " 3·00
3·01 " 4·50
4·51 " 7·00
7·01 " 10·00
Over 10·00
LOURENCO MARQUES
PORT ST JOHN
EAST LONDON
CAPE ST FRANCIS
ST BLAIZE
CAPE AGULHAS

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), SEPTEMBER, 1922.

Station.	Observer.	Month—Sept., 1922.		Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes.			
		Mean Max.	Mean Min.				Highest.	Date.	Lowest.	Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Transvaal—										
Barberton	Walter Grubb	81·4	55·9	68·6	66·6	+ 2·0	97·0	24th	48·0	8th.
Belfast	The Forester	70·5	38·2	54·4	55·1	− 0·7	80·0	23rd	25·0	8th.
Bloemhof	A. Adamson	82·7	50·5	66·6	61·8	+ 4·8	90·0	26th	35·0	1st.
Bruntis	The Forester	73·3	43·7	58·5	58·6	− 0·1	84·5	23rd	36·0	11th.
Johannesburg (Observatory)	The Staff	72·0	48·5	60·2	59·1	+ 1·1	80·8	23rd	34·5	7th.
Klerksdorp (Strathmore)	Chas. Scott	80·7	48·0	64·4	63·3	+ 1·1	89·0	27th	34·0	7th.
Komatipoort	H. J. Evans	86·5	59·7	73·1	72·7	+ 0·4	104·0	23rd	49·0	8th.
Louis Trichardt	I. J. de Bruin	79·4	51·3	65·4	66·0	− 0·6	92·0	23rd	45·0	8th, 11th, 13th and 20th.
Middelburg	Dr. H. A. Spencer	76·3	43·7	60·0	60·2	− 0·2	86·0	23rd	34·0	8th.
Nylstroom	G. Bakker	78·7	47·7	63·2	64·5	− 1·3	88·0	23rd	38·0	8th.
Pietersburg	W. J. Frankleyne	76·2	48·7	62·4	62·8	− 0·4	88·0	23rd	40·0	8th.
Piet Retief	J. Werner	72·5	50·3	61·4	60·9	+ 0·5	86·0	16th and 26th	39·0	8th.
Pigeonhole (New Agatha)	Jno. McCallum	71·3	52·8	62·0	—	—	84·0	23rd	45·0	7th.
Pilgrims Rest	E. M. Skea	74·6	47·4	61·0	60·5	+ 0·5	87·0	23rd	34·5	8th.
Potchefstroom (Exp. Farm)	The Manager	81·1	47·0	64·0	61·1	+ 2·9	88·2	27th	34·1	7th and 8th.
Pretoria (Meteorological Office)	The Staff	76·4	49·4	62·9	63·4	− 0·5	85·0	23rd	40·6	7th.
Standerton	The Town Clerk	75·5	40·0	58·2	56·6	+ 1·6	83·0	26th	29·5	7th.
Zeerust	H. Dietrich	81·1	49·7	65·4	63·4	+ 2·0	90·9	27th	39·0	8th.
Swaziland—										
Mbabane	Swaziland Police	72·4	48·5	60·4	61·2	− 0·8	87·0	22nd and 23rd	39·0	8th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	76·8	46·1	61·4	58·2	+ 3·2	86·0	20th	31·5	7th.
Bloemfontein	G. A. Schepers	77·6	47·3	62·4	59·1	+ 3·3	84·6	16th and 26th	31·9	7th.
Harrismith	The Forester	69·0	41·1	55·0	54·6	+ 0·4	78·0	23rd	30·0	7th.
Kroonstad	S. R. Northfield	78·0	45·7	61·8	60·6	+ 1·2	86·7	26th	31·7	8th.
Ladybrand	The Forester	74·0	43·6	58·8	55·2	+ 3·6	80·0	16th	31·0	7th.
Lindley	J. Collister-Oates	75·7	42·4	59·0	59·0	+ 0·0	84·0	16th	28·4	7th.
Natal—										
Dundee	West Thorrold	75·8	46·0	60·9	63·0	− 2·1	90·0	23rd	35·0	7th and 8th.
Durban (Point)	The Port Captain	74·5	61·0	67·8	67·6	+ 0·2	79·4	21st	53·8	8th.
Estcourt	A. A. McLean	75·8	44·8	60·3	62·4	− 2·1	87·5	10th	35·0	8th.
Hlabisa	The Gaoler	77·2	58·8	68·0	66·7	+ 1·3	95·0	22nd	54·0	8th.
Ladysmith	D. A. R. Leathern	81·3	48·8	65·0	65·0	+ 0·0	93·0	23rd and 30th	37·0	7th.
Maritzburg (Mental Hospital)	The Staff	76·0	53·3	64·6	65·2	− 0·6	93·2	16th	40·8	8th.
Stanger	C. C. Foss	77·5	58·6	68·0	66·6	+ 1·4	99·5	16th	50·7	19th.
Weenen	The Gaoler	81·6	45·2	63·4	64·6	− 1·2	94·0	16th	35·0	7th.

AIR TEMPERATURES, SEPTEMBER, 1922—(*continued*).

Station.	Observer.	Month—Sept., 1922. Mean Max.	Month—Sept., 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Cape—										
✓ Alfred North	Alex. Alcock	75·7	42·1	58·9	56·7	+ 2·2	85·0	20th	30·5	7th.
Bedford	T. C. Hall	72·9	46·6	59·8	58·6	+ 1·2	93·0	19th	35·0	7th.
✓ Capetown (Royal Observatory)	The Staff	66·2	50·2	58·2	57·0	+ 1·2	77·2	17th	42·3	1st.
✓ Carnarvon	A. P. Malherbe	76·4	40·7	58·6	54·2	+ 4·4	86·0	19th and 20th	27·0	1st.
✓ Clanwilliam	P. E. Scholtz	76·2	44·1	60·2	59·6	+ 0·6	90·5	11th	35·0	24th.
East London	The Port Captain	69·5	55·5	62·5	61·8	+ 0·7	77·0	2nd	47·0	1st.
✓ Graaff-Reinet	S. E. W. Treadwell	80·2	49·6	64·9	60·1	+ 4·8	100·3	20th	35·4	24th.
✓ Grahamstown	The Vet. Res. Officer	72·0	45·1	58·6	58·2	+ 0·4	92·4	19th	34·2	1st.
Groot Drakenstein	Lionel Baker	70·8	47·9	59·4	58·3	+ 1·1	84·4	10th and 30th	40·2	7th.
✓ Kenhardt	R. Seydell	83·4	45·8	64·6	61·5	+ 3·1	94·0	19th, 20th, and 30th	34·0	1st.
✓ Kimberley	Jno. Acton	82·7	50·1	66·4	62·4	+ 4·0	90·0	26th	38·0	6th.
✓ Kingwilliamstown	L. Clayton	73·9	50·5	62·2	61·8	+ 0·4	93·5	19th	40·5	1st.
✓ Kokstad	H. D. Coyte	73·1	43·3	58·2	56·8	+ 1·4	87·0	18th	32·9	8th.
Mafeking (Convent)	The Mother Superior	82·2	51·2	66·7	62·7	+ 4·0	90·2	27th	38·7	6th.
✓ Mossel Bay (Cape St. Blaize)	The Lightkeeper	66·0	53·7	59·8	58·4	+ 1·4	72·0	2nd	48·0	7th.
Murraysburg	W. H. Rose Innes	75·2	37·8	56·5	53·6	+ 2·9	89·2	19th	25·0	1st.
✓ O'okiep	J. Burrows	73·6	48·9	61·2	58·8	+ 2·4	90·7	19th	34·0	6th.
✓ Port Elizabeth	The Lightkeeper	66·9	53·9	60·4	59·7	+ 0·7	76·0	12th	47·0	7th.
✓ Port Nolloth	The Lightkeeper	60·7	46·5	53·6	54·7	− 1·1	84·9	24th	37·0	9th.
✓ Port St. Johns (Cape Hermes)	The Lightkeeper	70·9	59·7	65·3	64·0	+ 1·3	77·0	18th and 19th	53·0	8th and 24th.
✓ Queenstown	H. Holley	76·0	45·2	60·6	58·2	+ 2·4	91·0	20th	30·0	7th.
Somerset East	C. Harris	74·6	47·8	61·2	58·7	+ 2·5	92·6	19th	36·0	24th.
✓ Stellenbosch	F. C. Bousfield	74·8	49·6	62·2	57·8	+ 4·4	93·2	19th	36·0	7th.
Stutterheim	Rev. S. Rippon	70·3	50·8	60·6	59·0	+ 1·6	90·8	19th	40·0	24th.
Tarkastad	H. Inggs	75·2	48·6	61·8	61·2	+ 0·6	97·5	19th	38·5	7th.
✓ Uitenhage	Miss N. Dix-Peck	74·7	47·9	61·3	60·4	+ 0·9	92·2	3rd	38·3	7th.
✓ Vryburg	H. W. Colleen	82·5	46·8	64·6	62·6	+ 2·0	90·0	27th	33·0	6th.
Wynberg (Convent)	The Mother Superior	67·0	49·9	58·4	58·2	+ 0·2	78·8	10th	44·0	1st.
Basutoland—										
Maseteng	F. Hodgson	71·5	44·7	58·1	55·8	+ 2·3	79·0	16th	29·0	7th.

RAINFALL, SEPTEMBER, 1922.

Station.	Observer.	Month. Sept., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	1·64	0·90	+ 0·74	16·93	22·69	− 5·76	2·65	1·75	+ 0·90
Bethal	H. Joubert	0·99	0·55	+ 0·44	18·29	16·08	+ 2·21	2·29	1·21	+ 1·08
Belfast	The Forester	0·52	0·96	− 0·44	21·01	18·67	+ 2·34	1·61	1·52	+ 0·09
Bloemhof	A. Adamson	0·00	0·96	− 0·96	6·70	13·86	− 7·16	0·53	1·36	− 0·83
Clarewood	S.A. Police	0·00	0·05	− 0·05	5·92	11·37	− 5·45	0·74	0·40	+ 0·34
Ermelo	W. Douglas	1·20	0·62	+ 0·58	15·46	15·86	− 0·40	2·29	1·06	+ 1·23
Hoedspruit	S.A. Police	0·00	0·97	− 0·97	15·00	28·64	− 13·64	1·97	1·95	+ 0·02
Heidelberg	W. A. ter Horst	0·37	0·84	− 0·47	13·28	16·34	− 3·06	1·49	1·52	− 0·03
Johannesburg (Observatory)	The Staff	0·61	0·86	− 0·25	14·43	18·12	− 3·69	1·93	1·77	+ 0·16
Klerksdorp (Strathmore)	C. Scott	0·00	0·49	− 0·49	9·00	14·05	− 5·05	1·28	0·88	+ 0·40
Komatipoort	H. J. Evans	0·95	0·46	+ 0·49	16·42	18·02	− 2·60	2·49	1·03	+ 1·46
Louis Trichardt	I. J. de Bruin	0·29	0·54	− 0·25	7·36	20·68	− 13·38	1·29	1·38	− 0·09
Middelburg	Dr. H. A. Spencer	1·93	0·52	+ 1·41	18·84	16·03	+ 2·81	3·34	0·91	+ 2·43
Nylstroom	G. Bakker	0·29	0·57	− 0·28	11·19	14·99	− 3·80	2·52	1·02	+ 1·50
Pietersburg	W. J. Frankleyne	0·03	0·30	− 0·27	8·85	12·91	− 4·06	1·73	0·74	+ 0·99
Piet Retief	J. Werner	2·38	1·12	+ 1·26	15·27	17·30	− 2·03	3·88	1·89	+ 1·99
Pilgrims Rest	E. M. Skea	0·34	1·02	− 0·68	20·03	28·31	− 8·28	2·11	1·88	+ 0·23
Pigeonhole (New Agatha)	J. McCallum	0·65	0·72	− 0·07	15·54	30·95	− 15·41	2·20	2·10	+ 0·10
Potchefstroom (Exp. Farm)	The Manager	0·06	0·65	− 0·59	13·19	14·03	− 0·84	3·98	1·04	+ 2·94
Pretoria (Meteorological Office)	The Staff	0·65	0·38	+ 0·27	14·99	18·05	− 3·06	4·57	0·99	+ 3·58
Rustenburg	M. Baumann	0·19	0·24	− 0·05	13·93	15·10	− 1·17	3·56	1·16	+ 2·40
Rustenburg	H. J. Streatfield	0·22	2·52	− 2·30	12·33	18·70	− 6·37	1·88	3·79	− 1·91
Standerton	The Town Clerk	0·66	0·75	− 0·09	...	16·98	...	2·60	1·55	+ 1·05
Wakkerstroom	L. le Roux	1·51	0·92	+ 0·59	17·23	19·07	− 1·84	3·68	1·99	+ 1·69
Woodbush	The Forester	0·28	1·62	− 1·34	20·23	50·39	− 30·16	2·89	3·49	− 0·60
Zeerust	H. Dietrich	0·05	0·30	− 0·25	9·43	15·71	− 6·28	1·60	0·74	+ 0·86
Swaziland—										
Mbabane	Swaziland Police	2·87	1·64	+ 1·23	23·80	31·75	− 7·95	5·18	2·99	+ 2·19
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·01	0·73	− 0·72	5·98	13·53	− 7·55	2·51	1·57	+ 0·94
Bloemfontein	G. A. Schepers	0·06	0·68	− 0·62	6·12	13·04	− 6·92	0·22	1·45	− 1·23
Boshof	P. H. v. Rooyen	0·00	1·06	− 1·06	4·88	14·12	− 9·24	0·00	2·03	− 2·03
Harrismith	The Forester	0·79	0·83	− 0·04	14·66	16·72	− 2·06	2·80	1·66	+ 1·14
Kroonstad	S. R. Northfield	0·28	0·88	− 0·60	9·63	12·93	− 3·30	2·08	2·25	− 0·17
Ladybrand	The Forester	0·10	1·64	− 1·54	9·89	17·85	− 7·96	0·85	2·49	− 1·64
Lindley	J. Collister-Oates	0·14	0·89	− 0·75	11·36	15·49	− 4·13	1·61	1·63	− 0·02
Natal—										
Dundee	West Thorrold	1·74	1·21	+ 0·53	19·84	20·64	− 0·70	3·66	2·09	+ 1·57
Durban (Point)	The Port Captain	2·07	2·56	− 0·49	29·09	26·82	+ 2·27	6·90	4·53	+ 1·37

RAINFALL, SEPTEMBER, 1922—(*continued*).

Station.	Observer.	Month. Sept., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Natal—(continued).										
Estcourt	A. A. McLean	0·68	0·88	− 0·20	14·81	17·85	− 3·04	3·05	1·59	+ 1·46
Hlabisa	The Gaoler	1·38	2·42	− 1·04	15·94	26·52	−10·58	4·09	4·13	− 0·04
Howick	The Gaoler	0·22	1·74	− 1·52	16·91	20·47	− 3·56	2·66	2·74	− 0·08
Ladysmith	D. A. R. Leathern	0·81	0·81	± 0·00	19·21	17·71	+ 1·50	3·67	1·64	+ 2·03
Maritzburg (Mental Hospital)	The Staff	0·56	1·80	− 1·24	14·93	21·54	− 6·61	2·99	2·88	+ 0·11
Stanger	Cecil C. Foss	0·96	3·42	− 2·46	21·69	25·40	− 3·71	5·49	5·30	+ 0·19
Vryheid	The Gaoler	0·97	1·44	− 0·47	19·08	22·36	− 3·28	3·77	2·46	+ 1·31
Weenen	The Gaoler	0·73	0·98	− 0·25	15·60	16·58	− 0·98	2·37	1·79	+ 0·58
Cape—										
Aliwal North	A. Alcock	0·42	0·89	− 0·47	8·07	15·16	− 7·09	2·84	2·04	+ 0·80
Beaufort West	The Gaoler	0·45	0·71	− 0·26	5·38	7·20	− 1·82	1·33	1·27	+ 0·06
Bedford	T. C. Hall	2·25	1·95	+ 0·30	20·29	19·57	+ 0·72	4·22	3·84	+ 0·38
Bitterstown	The Gaoler	0·00	0·62	− 0·62	1·92	8·99	− 7·07	0·46	1·01	− 0·55
Calvinia	The Gaoler	0·62	0·62	∓ 0·00	7·38	6·60	+ 0·78	3·43	2·31	+ 1·12
Capetown (Royal Observatory)	The Staff	0·87	2·26	− 1·39	17·02	21·89	− 4·87	6·91	9·24	− 2·33
Ceres	A. Heatlie	0·31	4·16	− 3·85	33·70	34·29	− 0·59	11·42	15·87	− 4·45
Carnarvon	A. P. Malherbe	0·05	0·27	− 0·22	0·42	6·54	− 6·12	0·14	0·77	− 0·63
Clanwilliam	P. E. Scholtz	0·04	0·78	− 0·74	7·65	7·41	+ 0·24	2·67	3·18	− 0·51
East London	A. Downie	1·84	3·23	− 1·39	20·15	23·20	− 3·05	5·10	6·41	− 1·25
French Hoek (Driefontein)	The Forester	3·22	4·68	− 1·46	50·59	66·05	−15·46	20·43	26·69	− 6·26
Fraserburg	The Gaoler	0·41	0·33	+ 0·08	2·93	5·50	− 2·57	0·69	0·92	− 0·23
Garies	The Gaoler	0·54	0·48	+ 0·06	4·80	4·53	+ 0·27	2·59	2·08	+ 0·51
Graaff-Reinet	S. E. D. Treadwell	1·21	1·11	+ 0·10	7·15	10·17	− 3·02	2·47	2·13	+ 0·34
Groot Drakenstein	Lionel Baker	1·02	3·28	− 2·26	32·07	30·22	+ 1·85	10·43	13·31	− 2·88
Griquastown	The Gaoler	0·07	0·37	− 0·30	1·76	10·20	− 8·44	0·34	0·86	− 0·52
Grahamstown	Vet. Res. Officer	2·04	2·56	− 0·52	10·70	20·00	− 9·30	6·62	5·33	+ 1·29
Hanover	The Gaoler	0·04	0·62	− 0·58	2·39	10·40	− 8·01	0·20	1·32	− 1·12
Hopetown	The Gaoler	0·00	0·44	− 0·44	2·77	9·78	− 7·01	0·61	0·93	− 0·32
Kenhardt	R. Seydell	0·00	0·20	− 0·20	0·95	4·59	− 3·64	0·20	0·46	− 0·26
Kimberley	J. Acton	0·00	0·57	− 0·57	3·11	11·53	− 8·42	0·10	1·00	− 0·90
Kayana	The Gaoler	3·23	2·98	+ 0·25	26·27	21·17	+ 5·10	8·57	7·87	+ 0·70
Kokstad	H. D. Coyte	0·30	1·36	− 1·06	17·97	17·58	+ 0·39	2·48	2·20	+ 0·28
Kingwilliamstown	L. Clayton	1·78	1·87	− 0·09	14·89	17·48	− 2·59	5·09	3·97	+ 1·12
Kuruman (Abtonia)	A. T. Sitwell	0·00	0·50	− 0·50	3·54	12·30	− 8·76	0·04	0·98	− 0·94
Mafeking (Convent)	The Mother Superior	0·00	0·50	− 0·50	7·10	14·21	− 7·11	1·31	1·02	+ 0·29
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·34	1·74	− 1·40	9·29	13·18	− 3·89	1·71	4·43	− 2·72
Murraysburg	W. H. Rose Innes	0·66	0·63	+ 0·03	3·22	8·66	− 5·44	0·86	1·32	− 0·46
Oudtshoorn	J. Burrows	0·22	0·64	− 0·42	4·25	6·26	− 2·01	2·94	2·49	+ 0·45
Philipstown	The Gaoler	0·00	0·65	− 0·65	3·15	10·40	− 7·25	0·50	1·16	− 0·66

RAINFALL, SEPTEMBER, 1922—(*continued*).

Station.	Observer.	Month. Sept., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cape—(continued).										
Piquetberg	The Gaoler	0·20	2·26	− 2·06	17·18	17·25	− 0·07	5·75	7·91	− 2·16
Port Elizabeth	The Lightkeeper	0·79	2·32	− 1·53	13·03	16·22	− 3·19	4·20	6·36	− 2·16
Port St. Johns (Cape Hermes)	The Lightkeeper	4·17	4·26	− 0·09	27·48	31·50	− 4·02	9·70	7·10	+ 2·60
Port Nolloth	The Lightkeeper	0·18	0·06	+ 0·12	2·17	1·99	+ 0·18	1·27	0·89	+ 0·38
Prieska	The Gaoler	0·00	0·25	− 0·25	1·35	7·82	− 6·47	0·41	0·59	− 0·18
Queenstown	H. Holley	0·32	0·97	− 0·65	11·01	14·91	− 3·90	2·70	2·11	+ 0·59
Steytlerville	The Gaoler	0·00	0·72	− 0·72	7·37	6·76	+ 0·61	1·32	1·36	− 0·04
Sutherland	The Gaoler	0·00	0·68	− 0·68	5·84	7·72	− 1·88	1·99	2·36	− 0·37
Swellendam	The Gaoler	1·69	2·84	− 1·15	25·04	23·82	+ 1·22	5·48	7·39	− 1·91
Sydney's Hope	Rev. S. Rippon	1·62	2·02	− 0·40	20·20	15·82	+ 4·38	5·39	4·10	+ 1·29
Somerset East	C. Harris	1·63	1·74	− 0·11	15·10	16·49	− 1·39	4·36	3·50	+ 0·86
Stutterheim	F. C. Bousfield	2·30	1·94	+ 0·36	19·21	20·00	− 0·79	4·67	3·51	+ 1·16
Uitenhage	H. Inggs	1·54	2·18	− 0·64	14·08	12·12	+ 2·56	5·28	4·01	+ 1·27
Umtata	Miss N. Dix Peck	1·41	1·80	− 0·39	17·91	17·76	+ 0·75	5·43	3·10	+ 2·33
Uniondale	The Gaoler	1·10	1·38	− 0·28	10·08	10·50	+ 0·42	3·21	3·59	− 0·38
Upington	The Gaoler	0·00	0·17	− 0·17	1·05	5·37	− 4·32	0·03	0·34	− 0·31
Victoria West	The Gaoler	0·10	0·54	− 0·44	3·02	8·07	− 5·05	0·27	1·06	− 0·79
Vryburg	H. Collens	0·00	0·36	− 0·36	5·09	14·60	− 9·51	0·15	0·77	− 0·62
Worcester	The Gaoler	0·09	1·31	− 1·31	9·15	10·55	− 1·40	2·73	4·65	− 1·92
Wynberg (Convent)	The Mother Superior	0·87	4·88	− 4·01	32·59	40·40	− 7·81	13·59	19·64	− 6·05
Basutoland—										
Mafeteng	F. Hodgson	0·03	1·44	− 1·41	10·95	22·27	− 11·32	2·05	2·91	− 0·86
South-West Africa—										
Tsumeb	Ing. Schetter	0·00	0·18	− 0·18	6·30	16·90	− 10·60	0·00	0·21	− 0·21
Waterberg	D. Hahn	0·00	0·07	− 0·07	7·25	15·09	− 7·84	0·00	0·13	− 0·13
Omaruru	The Postmaster	0·00	0·08	− 0·08	6·26	9·35	− 3·09	0·00	0·09	0·09
Usakos	Rev. Diehl	0·00	0·09	− 0·09	0·48	4·33	− 3·85	0·00	0·09	0·09
Duisternbrook	I. Matthiessen	0·00	0·12	− 0·12	8·36	10·26	− 1·90	0·00	0·18	− 0·18
Gobabis	Rev. Irbe	0·00	0·13	− 0·13	3·98	12·03	− 8·05	0·00	0·23	− 0·23
Gr. Witvley	B. Rueckert	0·00	0·15	− 0·15	3·60	11·40	− 7·80	0·00	0·18	− 0·18
Windhoek	Observatory	0·00	0·10	− 0·10	5·40	11·12	− 5·72	0·00	0·19	− 0·19
Maltahoehe	H. Just	0·00	0·06	− 0·06	1·49	5·28	− 3·79	0·00	0·08	− 0·08
Voigtsgrund	A. Voigts	0·00	0·12	− 0·12	1·95	4·74	− 2·79	0·00	0·16	− 0·16
Gibeon	Rev. Spellmeyer	0·00	0·10	− 0·10	2·54	4·93	− 2·39	0·00	0·15	− 0·15
Bethany	Rev. Peter	0·00	0·06	− 0·06	1·94	3·47	− 1·53	0·00	0·09	− 0·09
Aus	F. Erni	0·00	0·28	− 0·28	4·43	3·98	+ 0·42	1·86	0·94	+ 0·92
Heirachabis	Rev. Father Eder	0·00	0·00	− 0·00	0·67	3·60	− 2·93	0·00	0·08	− 0·08

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MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. III. OCTOBER, 1922. No. 10.

PRACTICALLY normal atmospheric pressure; temperature slightly higher than usual in the Cape, but lower than the average in Natal, almost normal elsewhere; considerable fluctuations in temperature, showing alternate warm and cool spells, occasional comparatively light frosts at the beginning and end of the month; frequent strong, squally winds with dense duststorms; frequent light rains, causing an excess of precipitation over the greater part of the Transvaal, the north-east of the Orange Free State, Natal, and small portions of the Cape; numerous hailstorms occasioning considerable damage to fruit, crops, etc., in the Transvaal, Natal, and Free State; absolute drought or deficient rainfall in the south-west Transvaal, the south and west of the Free State, and the greater part of the Cape Province; light showers of snow on the 7th in parts of the east central Karroo, these were the outstanding features of the weather of October, 1922.

Pressure.—As may be seen from the accompanying map, the mean atmospheric pressure for the month was practically normal over the east, west, and centre, but slightly higher than usual along the south coast. High pressure areas were present throughout the month, appearing in the west and south-west, moving to east and south-east. The equatorial "low" was in evidence during the greater part of the month and at times of considerable intensity. Several "lows" moved along the coast, lying over the south-west to south and south-east on the 3rd to 4th and 6th to 7th; over the south to south-east on the 13th to 14th and 29th; over the south-east on 19th; and over the east on the 21st.

Temperature.—The mean temperature of October, 1922 (64·2 degrees) was only 0·2 degree in excess of the normal, the mean maximum (77·1 degrees) being the same as usual, so that the surplus was entirely due to the mean minimum (51·7 degrees) being 0·3 degree in excess of the average. The greatest variation from the average conditions occurred in Natal, where the mean temperature (67·0 degrees) was lower than usual by one degree, the mean day temperature (77·8 degrees) being 2·6 degrees below and the mean night temperature (56·3 degrees) being 0·6 degree above the corresponding averages. In the Cape

Province, the mean day temperature (75·9 degrees) and the mean night temperature (50·7 degrees) were 0·9 and 0·2 degree respectively above the corresponding normal values, so the mean monthly temperature (63·3 degrees) showed an excess of 0·6 degree over the average. In the case of the Transvaal, the deficiency of 0·7 degree in the mean day temperature (78·7 degrees) and the surplus of 0·8 degree in the mean night temperature (53·1 degrees) almost balanced each other, so that the temperature of the month (65·9 degrees) was only a tenth of a degree above normal. In the Orange Free State the small deficit of one-tenth of a degree in mean temperature (62·2 degrees) was due to the shortage of 0·5 degree in the mean minimum (47·5 degrees), being 0·2 degree greater than the excess of the mean maximum (77·0 degrees) over normal. An examination of the variations over the country shows that in the Transvaal the month was warmer than usual at Komatipoort, also in the north and to the south-west of a line joining Johannesburg and Zeerust. The excess in these areas was usually half a degree or less, but rose to 1·2 degree at Zeerust (Mafeking in the adjoining area of Bechuanaland being similarly affected to the extent of plus 1·8 degree), whilst the surplus rose almost to four degrees at Bloemhof. Over the centre, east, and south-east of the Transvaal, also Swaziland, the month's temperature was below the average by amounts ranging from one-tenth to slightly more than one degree. A similar deficiency was experienced in the north and north-east of the Free State and affected the greater part of Natal, where the deficits lay between 2 and 3 degrees in the higher portions in the west and north-west, but decreasing to one degree at Maritzburg and half a degree at Durban. A small excess of 0·4 degree was recorded at Stanger, and a much larger surplus of 2·1 degrees at Hlabisa, in Zululand. An excess of mean temperature occurred over the remainder of the Free State, Basutoland, and practically the whole of that portion of the Cape Province east of a line joining Bethulie and Port Elizabeth. The surplus amounts were generally between 1 and 2 degrees, but showed a considerable range in the Free State, having only 0·4 degree at Ladybrand in the east, but rising to 2·6 degrees at Bethulie in the extreme south. Small surplus amounts under one degree were met with in Namaqualand and the northern border, but larger excesses (1–2½ degrees) occurred in the south-west and along the south coast, whilst Graaff-Reinet in the east-central Karroo was 2·5 degrees warmer than usual. A sub-normal temperature occurred over the greater portion of the interior, and the west coastal area as well as the southern portion of Bechuanaland, the shortages ranging from 0·3 degree at Vryburg to 3·3 degrees at Murraysburg. Both days and nights were cooler than usual over the southern portion of the northern Karroo, centre of the west coastal area, part of the south-east of the Cape, in the higher western parts of Natal, the north-east of the Free State, and at Belfast on the Transvaal high veld. On the other hand, the mean maximum and minimum temperatures were both higher than the corresponding normals at Johannesburg, in the west and south-west of the Transvaal, the north of Bechuanaland, the centre and south of the Free State, the north-east part of the south-east of the Cape, the interior of Kaffraria, on the Namaqualand plateau, the south coast, and Zululand. The days alone were cooler than the average over the centre, east, and south-east of the Transvaal, Swaziland, the lower and coastal areas in Natal, the coast of Kaffraria, and parts of the south-east of the Cape, as well as the north and east of the Free State. On the other hand, the nights were cooler and the days warmer than normal in the north and part of the south-west of the Transvaal, the south of Bechuanaland, the coast of Namaqualand, and parts of the south-west of the Peninsula in the Cape Province. The excesses in day temperatures were mostly between 2 and 4 degrees in the Free State, the east and south-west of the Cape, north and south-west of the Transvaal,

and less than a degree elsewhere. The nights were usually warmer than the average by one degree or less, but by 2–4 degrees in the south-west Transvaal, Zululand, and the east of the central Karroo. The deficits in the mean maxima were usually larger than the excesses, usually 1–3 degrees, but reaching 4 degrees in Natal, and 5·8 degrees at Harrismith in the Free State. The shortages in the mean minima were commonly between 1 and 2 degrees, but rose to 5 degrees at Murraysburg, in the northern Karroo. The mean warmest station was Komatipoort, with a temperature of 76·3 degrees, and the coolest Harrismith (Orange Free State), with 53·4 degrees, a difference of 22·9 degrees. The highest mean maximum was 89·1 degrees at Komatipoort and the lowest mean minimum 38·8 degrees at Harrismith. The highest temperatures were recorded on sixteen days of the month, principally on the 19th and 20th over the northern half of the Union and between the 26th and 29th over the south. The lowest readings were registered on thirteen days, most widely on the 8th, but also over wide areas between the 24th and 27th. Temperatures of 100·0 degrees or over were confined to four stations, viz., Komatipoort, Stanger, Port Nolloth, and Uitenhage, the extreme being 107·0 degrees on the 20th and 21st at the first-mentioned station. Temperatures at or below freezing point were recorded at eight stations, distributed over the Transvaal, Free State, and Cape Provinces, the lowest being 24·0 degrees on the 8th at Harrismith. There was thus an extreme range of 83 degrees during the month. The frosts at the end of the first and beginning of the second week and towards the end of the month caused some damage to crops, particularly succulents, the effect being possibly aggravated by the high temperatures which usually preceded the sudden drop in temperature.

Precipitation during the month was exceptionally frequent and in excess of the normal amounts over the centre, east, and south-east of the Transvaal, Swaziland, the north-east of the Free State, the greater part of Natal, new records being established for this month at a number of stations. Small excesses also occurred at some stations in Kaffraria, the east-central Karroo, the neighbourhood of Knysna, and in Namaqualand. The excess amounts were greatest: 3–5 inches over the south-east of the Transvaal, also at Belfast, on the high veld; whilst in Natal, Durban showed the large surplus of 6·23 inches, or 76 per cent. more than the average was collected during the month. A marked contrast to these moist conditions was presented by the west, north, and south-west of the Transvaal, the south and west of the Free State, and the greater part of the Cape Province, where the month's precipitation was generally considerably below normal, decreasing to absolute drought. A few stations in Natal also experienced a shortage of precipitation, parts of Wolmaransstad and Christiana in the Transvaal, and the west of the Free State. A total absence of rain was reported from some stations in the Bloemhof and Wolmaransstad divisions of the Transvaal, the south and west of the Orange Free State, parts of the east-central Karroo, the greater part of the northern Karroo, the northern border, and part of the north-east of the Cape. Light showers fell at intervals over the remainder of the Cape Province, with some heavy showers in the north-east on the 6th, 30th, and 31st. In the east of the Transvaal, rain fell on twenty-three days of the month over the Carolina division, but on only five days in the west over the Bloemhof, Lichtenburg, and Wolmaransstad divisions. Rainfall in Natal was just as frequent as in the eastern Transvaal, but was considerably less frequent in the north-east of the Free State. Most of the rain was associated with thunderstorms of exceptional severity, killing cattle at Bethal on the 16th. Hailstorms were also particularly numerous, being frequently accompanied by violent winds, and caused considerable damage to crops, windows, calves, sheep, and goats, etc., in Natal

Free State, and Transvaal. A somewhat unusual feature of these hailstorms was that they occurred during the early morning hours, apparently just as often as during the afternoons and evenings. In a number of cases the hail continued to lie on the ground all night, causing the surrounding landscape to appear as in mid-winter after a snowstorm. The joint effect of wind and hail has been to destroy in many areas what promised to be abundant fruit crops, leaving practically nothing on the trees. Snow was reported as occurring at Pearston and New Bethesda on the 7th. Heavy rains caused floods on some of the rivers; e.g. at Bethal on the 16th, after a fall of 1·31 inch, all the spruits were overflowing and many cattle were drowned, whilst others were killed by lightning. At Standerton, the river rose nine feet after a fall of 1·47 inch on the 31st; at Kilcullen (Division Barkly East), the Sterkspruit was running bank-high after a fall of 1·24 inch on the 31st.

Taken as a whole, the month, notwithstanding the destruction wrought by storms, was favourable to agriculture in the east of the Transvaal, Natal, and the north-east of the Free State, enabling early ploughing and planting to be carried out and causing a marked improvement in the veld. In some districts, however, the rainfall, although in excess of the average, occurred in too small quantities and distributed over too many days to moisten the parched ground sufficiently for ploughing to be carried out. In the western Transvaal and the south and west of the Free State, cattle, sheep, etc., are stated to be either dying or going off considerably in condition owing to the protracted drought and consequent absence of pasture, whilst water supplies are giving out. In the Cape Province, crops are being affected by the drought, except in those parts where irrigation is carried out.

Duststorms usually accompanied by northerly to north-westerly winds were of frequent occurrence, particularly in the areas suffering from total or partial drought.

The accumulated rainfall since the beginning of the year is in excess over only very limited portions of the country. The largest continuous area is that extending from Middelburg and Belfast, on the high veld, to the south-eastern border of the Transvaal; a second but smaller area is that between Dundee and Ladysmith in Natal, to Harrismith in the Free State. The excesses in these areas are greatest, 3–6 inches, on the Transvaal high veld, but decrease to 2–3 inches in the south-east of the Transvaal and in Natal, being least (0·20 inch) at Harrismith. The largest excess of 8½ inches is met with at Durban, whilst smaller surplus amounts varying between a few tenths and 2 inches occur in small portions of the Transkei, of the south-east and of the south coast, also in the east-central Karroo, Namaqualand, Calvinia, and Groot Drakenstein. At Knysna, however, the excess rises to 5–6 inches. Elsewhere, large shortages, commonly of 5–10 inches, have been experienced during the last ten months in the north-east, the northern Karroo, northern border of the Cape Province, also in Bechuanaland, Basutoland, the south and west Free State, and the west and south-west of the Transvaal. The deficits generally decrease towards the coast and towards the north-east of the Free State and the centre of the Transvaal, but increase again in the north and east of the latter Province, being 7·41 inches at Pilgrims Rest, 14·63 inches at Louis Trichardt, and 30·33 at Woodbush. The deficiency is also large in the south-east of the Cape, being almost 4 inches at East London and Kingwilliamstown, and exceeding 11 inches at Grahamstown. The shortages are mostly less than 2 inches in the south-west, but rise to over 5 inches at the Royal Observatory (Capetown) and 10 inches at Wynberg in the Cape Peninsula.

A similar state of affairs is shown by the total rainfall for the four months July–September, the excesses and deficits being of course smaller than for the ten months. The most noteworthy difference is an extension of the area with

surplus rainfall northwards, eastwards, and even westwards in the south of the Transvaal, even Zeerust showing a plus amount of 0·40 inch. The whole of the stations in Natal also show totals exceeding the normal amounts. The deficits for this period are greatest (mostly by 2–5 inches) over the south-west of the Cape and in the Cape Peninsula, where Wynberg falls 8¼ inches short of its average.

In South-West Africa the quantities recorded during October were mostly less than one inch, but ranging from 0·02 inch at Bethany in the south to 3·18 inches at Tsumeb in the north; absolute drought pervailed over an area north-east of Windhoek and in the more southerly portions of the territory.

The ten month's totals are mostly 2–9 inches less than usual at all stations, except Aus, which shows a surplus of 0·35 inch. For the four months, however, about two-thirds of the stations show small excesses less than an inch, except Tsumeb, which exceeds its normal by 2·04 inches. Shortages were confined to the stations stretching east and west along a line north of Windhoek and in the easterly portions of the south.

OBSERVERS' NOTES FOR OCTOBER, 1922.

TRANSVAAL.

Pretoria (Municipal Western Plantation).—The little hail we have had during the month did no damage, not even to young seedlings in nursery. Rainfall: 3·33 inches on twelve days.—W. H. Foster.

Zwartkopjes (Heidelberg).—The lightning storms this month have been of exceptional severity. Rainfall: 3·25 inches on fourteen days.—E. Taylor.

Pomona Estates, Kempton Park (Pretoria).—A very trying month for gardeners and orchardists. Frequent hail, exceptional changes from hot to cold weather, and heavy gales have cleared fruit trees of crops which promised so well in early spring; many gardens in the vicinity have been cleared of all crops. Rainfall: 4·29 inches on thirteen days.—H. H. John.

Mosdene (Naboomspruit).—In comparison with that of the previous year the mean minimum for October this year shows a decrease of 0·8 degree, due to a few cold days experienced towards the end of the month. Good rains have enabled ploughing and planting to be commenced early this summer. Rainfall: 3·27 inches on nine days.—J. H. Summers.

Gemboksfontein (Middelburg).—Hailstorms have been very local. A heavy hailstorm fell in a portion of this plantation on the evening of the 3rd over an area only of approximately 200 acres. At 9 a.m. the following morning the hail was lying thick—the size of large peas. The weather has been very changeable, the maximum temperature dropping from 84·0 to 59·4 and 50·1 on the 22nd, 23rd, and 24th. Rainfall: 5·21 inches on twelve days.—G. J. Imrie.

Jakhalsfontein (Pietersburg).—Generally very hot; heavy electrical disturbances towards end of month. Rainfall: 3·07 inches on six days.—Rev. James C. Palmer.

Barberton.—The rainfall, which started very early in the month, was above the average. The fluctuations of temperatures have been very great, ranging from 98° to 47°. The rains have been generally accompanied by thunder and lightning. Rainfall: 3·44 inches on nine days.—Walter Grubb.

Bethal.—On the 16th much hail and rain (1·31 inch) fell in the district with much damage to fruit and trees. Many cattle were drowned as all spruits were overflowing. Several head of cattle were killed by lightning this month. Rainfall: 5·11 inches on fourteen days.—H. F. M. Joubert.

Middelburg.—The month of October this year has been fairly temperate, only a few early hot days having been experienced and then tempered by a cool wind. The rain has been up to the average for the month. The country is now thoroughly greened over and everything growing well. Rainfall: 3·80 inches on thirteen days.—Dr. H. A. Spencer.

Pietersburg.—Heat and drought; small rainfall during early portion of month soon evaporated. Veld poor; stock suffering; crops nil. Violent thunderstorm accompanied by high wind, 9 p.m., 31st. Heavy damage to fruit. Several large blue gums uprooted. Rainfall: 2·54 inches on six days.—W. J. Frankeyne.

Pigeonhole (New Agatha).—Normal, rains good, and good planting month. Rainfall: 4·35 inches on sixteen days.—Jno. McCallum.

Bloemhof.—Blinding duststorms of terrific violence throughout month. Wells drying up and continued drought. Rainfall: 0·31 inch on three days.—A. Adamson.

Lichtenburg.—Locust-hatching still prevalent, but locust officers report destruction well in hand except northern area. Very little ploughing done due to poor rainfall. Rainfall: 1·31 inch on five days.—J. T. Allman.

Piet Retief.—Heavy rains during month: 7·32 inches on fifteen days. Severe hailstorms experienced on 29th, close vicinity to Piet Retief, doing damage to crops.—J. Werner.

Standerton.—On the 24th frost in a very mild form was noticed in parts of the town, though nothing was registered. Thunderstorms were very frequent during the month. It is noticed that hail appears with each storm both during the night and day. The river is in flood, having risen 9 feet after the rain (1·47 inch) registered on the 31st. Rainfall: 7·08 inches on sixteen days.—W. J. Madge.

Wakkerstroom.—The hail at the beginning of the month did a lot of damage to the fruit crop, but there is still a prospect of a fairly good year. Slight frosts have nipped the young mealies and pumpkins. There is an abundance of grass, and cattle generally are looking well. Rainfall: 8·34 inches on sixteen days.—F. J. Grant.

Wolhuterskop (Rustenburg).—I have to report especially on a very severe hailstorm which occurred on the evening of 4th. It was accompanied and preceded by a hurricane from the south and lasted between twenty and thirty minutes, say from 8 p.m. to 8.30 p.m. The hailstones ranged in size from walnuts to marbles, and naturally very great damage has been done to standing crops, which are practically destroyed, and to the local fruit crop just forming on the trees. Lasting as it did such a long time, and travelling with such a high wind, it must have covered a very large area or long stretch of country. I have recorded 2·47 inches of rain, but I fancy the rain-gauge must have filled up very rapidly, and after that there was of course no record. For a long time after the storm ceased, the countryside, as revealed by flashes of lightning, was white with hail as if snow had fallen.—J. C. P. Maynard.

Davel (*Bethal*).—Generally excessive rain; temperature changes suddenly to very cold, making operations very difficult. Rainfall: 10·34 inches on fifteen days.—H. A. Wollenburg.

Hendrikspan (*Bethal*).—Record rainfall at Hendrikspan since 1913 for month of October. Rainfall: 6·52 inches on twelve days.—Theo Jooste.

Tweekoppiesfontein (*Marico*).—Country very dry; cattle suffering. Rainfall: 2·18 inches on five days.—H. Page.

Shenfield (*Potchefstroom*).—8th, light frost damaging crops slightly. Rainfall: 0·78 inch on three days.—A. Lucas.

Elandsfontein (*Potchefstroom*).—The latter part of the month was very dry and the outlook for the crops very poor. Rainfall: 2·54 inches on nine days.—P. Davidz.

Honingnestkranz (*Pretoria*).—1st, considerable lightning; exceedingly heavy wind and hail, damage to fruit and stock, killing sheep and goats. Rainfall: 3·67 inches on ten days.—H. Ellis.

Glen Shiel (*Pietersburg*).—October, 1922: Distinguished this year by the extraordinary variation in temperature, the 18th and 19th being very hot while on the 28th there was sufficient frost in the valleys to damage maize and vegetables. There was not much mist, and good rains at intervals have much benefited the country, grass being good. Rainfall: 4·09 inches on thirteen days.—J. Swinburne.

Weltevreden (*Standerton*).—This month has been remarkable for the number of hailstorms, particularly on the 30th, breaking through iron roofs, killing calves, sheep, goats, and fowls, etc. Rainfall: 7·17 inches on thirteen days.—D. Lane.

Vogelfontein (*Rustenburg*).—Worst drought experienced since 1902. Cattle dying by the dozen, water on farm giving out, all stock very thin. Rainfall: 0·34 inch on three days.—Capt. H. M. Fothergill.

Spreeuwfontein (*Bloemhof*).—Fearful duststorms, mostly from north-west to south-east. Rainfall: 0·05 inch on one day.—J. M. Wessels, J.P.

Vlyer Farm (*Potchefstroom*).—Exceptionally dry month, with heavy drying winds. Rainfall: 0·28 inch on two days.—G. Haggett.

Kingsdown (*Bethel*).—16th, 2·52 inches accompanied by hailstorm; crops damaged; all fruit destroyed. Rainfall: 6·78 inches on ten days.—P. Spitz.

Groenenboom (*Rustenburg*).—Veld is in fair condition where no voetgangers have been through. Where locusts have hatched or have travelled over, the condition of the veld is very bad, no grass having been left. Cattle: Still in fair condition, though falling off. In many instances they are feeding on trees and low bush. The drought is very severe, precipitation in too small quantities divided over too many days. Crops: No crops have been put in yet. Sowing and ploughing are kept back by the drought and the work attached to the killing of locust swarms. Crops put in after the August rains have been eaten off by locust. Locusts are doing a lot of damage. A few flying swarms have already passed the station, heading south-east. A great amount of poisoning has been done. Still new hatchings are coming out. The outlook, with drought and locusts on hand, is very depressing. Rainfall: 0·90 inch on seven days.—F. van Nouhuys.

Just-in-Time (*Bloemhof*).—Terribly dry. Rainfall: Nil.—A. V. Maree.

Settlers (*Waterberg*).—1st, big windstorm; did a lot of damage; came from south. Rainfall: 1·97 inch on 7 days.—M. S. P. Williams.

Swaziland.

Hlatikulu.—On Saturday, the 21st October, a phenomenal storm occurred at Hlatikulu. At about 2 p.m. the storm appeared to be approaching from the south-south-west and to be passing south of Hlatikulu; thunder was heard but the lightning was not violent. At 3.30 p.m. the storm appeared to have swung round and approached from the east, when heavy rain commenced. After about twenty minutes of rain, hail began to fall, at first in small quantities and then in a continuous downpour of such intensity as to make conversation impossible in the ordinary dwelling-houses, even when shouting was resorted to. The stones increased in size until they reached an average of about 1½ inch. Hail finished at about 5 p.m., when the whole countryside was covered with hailstones to a depth of about two inches and had the same appearance as that after a snowstorm. Thunder and lightning was very intense immediately after the hail, one house being struck in the vicinity. The storm moved in a south-westerly direction and was followed by the heavy mist usual at this station. The rainfall registered on the morning of 22nd was 1·81 inch, but the actual fall must have been considerably more than this, as a large number of stones must have rebounded out of the top of the rain-gauge. *Rainfall:* 9·39 inches on seventeen days.—J. Hope.

Matendelo.—A good seasonable month; grass and stock in good condition. A marked feature this month was the number of furious windstorms. They were generally connected with some local or distant storm, probably causing sudden alteration in balance of pressure. Rainfall: 4·48 inches on nine days.—Herbert Parry.

Matapa.—Rain this month much above the October average for last twelve years, which is 3·99. Rainfall: 6·96 inches on fifteen days.—A. R. Torrens.

Orange Free State.

Holfontein (*Kroonstad*).—An exceptionally good month, farmers all busy ploughing. Stock in general have picked up well since the recent rains. The hailstorm on the 6th, although the biggest experienced here for some years, did not do much damage; hail size of walnuts; slight damage to orchards, but very little damage in nursery to small plants. Rainfall: 2·47 inches on six days.—L. C. McInery.

Tembani (*Fauresmith*).—Position still more serious than reported last month. Heavy sandstorms almost every day. Cattle dying on every farm and sheep fast losing condition. No crops of any kind. Rainfall: Nil.—M. F. Schickerling.

Wildealspoort (*Fauresmith*).—Veld now in a very poor condition. Rainfall: Nil.—M. Blakeney.

Jansdeel (*Harrismith*).—Stock in good condition. Crops improving very slowly. Rainfall: 2·23 inches on three days.—J. J. Uijs.

Stanleydale (*Harrismith*).—A very good month all round for stock and crops. Rainfall: 4·57 inches on eight days.—G. C. Atkins.

Heilbron.—Rain spread over the month in small quantities. Grazing is still very scanty and stock generally are still in poor condition. No stock diseases during month. The hailstorm experienced on 4th October was remarkable for the fact that the very large stones broke up as they struck the ground. They were of the consistency of snowballs lightly pressed. Had they been hard, like the very small stones, a great deal of damage must have ensued. The late frost experienced during the night 6th–7th also caused damage to young plants, but nothing much to young fruit. Rainfall: 2·84 inches on eleven days.—P. A. du P. Naude.

Karreepoort (Philippolis).—The drought still continues. Stock are starving and dying in numbers every day; if rain does not fall before the end of year very few animals will be left alive in this part of the district. Rainfall: Nil.—E. N. du Preez.

NATAL.

Kloofend (Alexandria).—Heaviest fall for October since 1917. Rainfall: 10·65 inches on seventeen days; on 31st, 5·12 inches fell.—J. A. Cruickshank.

Rongpoort (Weenen).—Pleasant month; dry at times and grass withering. Rain only got to the depth of ploughing on the 31st. Grass very short. Rainfall: 3·27 inches on twelve days.—J. H. Bartholomew.

Paulpietersburg.—Terrific hailstorm on evening of 22nd, causing considerable damage to fruit and kitchen gardens. Unusual white brilliance of setting sun on the 19th and 26th. Rainfall: 8·74 inches on eighteen days.—A. A. Carter.

Ladysmith.—Excellent rains during the month, 4·09 inches on fourteen days; hot winds during middle of month dried things up considerably, but the following rains have improved matters wonderfully. Stock generally are in good condition. Hailstorms during the early part of the month did considerable damage to fruit crops in the outlying districts, but very little hail has fallen in or near Ladysmith.—D. A. R. Leathern.

Maritzburg (Mental Hospital).—Fine rains have fallen during the month and drought completely broken. Rainfall: 4·65 inches on fourteen days.—The Staff.

Hillcrest.—An exceptionally rainy month. Except for the deluge of October, 1918, the rain of this month is the heaviest I have recorded for October. Rainfall: 9·79 inches on twenty-two days.—Arthur J. Armfield.

Durban (Point).—Generally cloudy and hazy. Heavy thunderstorms on the 1st and 30th, doing considerable damage locally. Generally windy; moderate gales on nine days. Very little dew. Rainfall: 11·38 inches on sixteen days.—The Port Captain.

Newcastle.—The month opened out with good rains, and we have had good steady rains right through the month. The veld is looking fresh, and green grass for stock is now plentiful; stock looking well. Crops in the ground are doing well; fruit is promising. Every one is busy gardening, and the farmers are hard at turning over their fields for the summer crops. Rainfall: 7·71 inches on fourteen days.—The Gaoler.

Hlabisa.—The weather has been seasonable, with good prospects for the farmers this coming season owing to the early rains. Rainfall: 6·22 inches on eleven days.—L. Double.

Dundee.—A very stormy month for October, bad hailstorms on the 1st and 2nd reported from outside town. Extremes of heat and cold, but on the whole a good month for farmers. Rainfall: 7·02 inches on fifteen days.—West Thorrold.

Nottingham Road.—Crops flourishing in spite of cold spring rains. Numerous hailstorms. Rainfall: 4·06 inches on eighteen days.—Miss E. Smythe.

Howick.—Great damage done by hail to crops in gardens on 1st. Rainfall: 4·63 inches on fourteen days.—H. Maby.

Mid-Illovo.—Rainfall: 5·32 inches on twenty days; badly needed. Ploughing on hard soils only possible after welcome rains on the 21st, 0·17 inch; 22nd, 1·21 inch; and 23rd, 0·87 inch. Cold snap on 24th and 25th.—Lieut.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

CAPE.

Darling (Malmesbury).—Conditions normal, but September, particularly October, have been a little dry and crops are feeling a distinct shortage of "latter rain," but are, nevertheless, all round good. Rainfall: 1·08 inch on eight days.—P. H. Drake.

Sydney-on-Vaal (Barkly West).—Very hot; very windy days. Rain on 22nd (0·15 inch) was insufficient and did nothing to relieve the terrible drought. Veld grazing does not exist and only thing growing is slangkop, a poisonous weed, which is killing those cattle which have survived the drought. Rainfall: 0·15 inch on one day.—J. G. Richards.

Willowmore.—A very windy month with numerous duststorms. Rain badly needed. Big range in maximum temperature: 95·0 on 27th and 28th; 49·0 on 7th. Rainfall: 0·17 inch on two days.—(Mrs.) Beatrice Maud Hemens.

Grootfontein (Middelburg).—Early oats and wheat crops in ear; fruit under irrigation looking fine. No sign yet of insect pests. Rainfall: 0·02 inch on one day.—E. J. van Meerten.

Kenhardt.—Continued drought. Rainfall: Nil.—R. Seydell.

Rietfontein (Aliwal North).—Very dry month; exceptionally windy and cold; wheat crop very much damaged by drought. Rainfall: 0·98 inch on five days.—A. G. Smith.

Aliwal North.—October has been a month of drying winds. Rainfall: 0·70 inch on four days, most of which (0·51 inch) fell on last two days of month. A good soaking rain needed.—Alex. Alcock.

Groot Drakenstein.—Two cold periods occurred, 6th–8th and 13th–17th, and an abnormally hot one during the last week. On the 26th, a hot northwind blew and thermometer remained above 95 degrees for six or seven hours. Rainfall: 1·29 inch on eight days.—Lionel Baker.

Clanwilliam.—The little rain that fell in the beginning of the month did not do much good to grain crops and veld, both of which have been suffering from drought. Harvesting has been started with about the 20th of the month, and crops will be far below what was expected in August. The veld is already becoming dry, and losses in live stock may be expected before the next winter rains set in. The hot days on the 25th–28th appear to have done much damage to the orange crop. Rainfall: 0·19 inch on two days.—P. E. Scholtz.

Kingwillaimstown.—The latter end of this month gave us a sample of summer, starting with 98·5 on the 27th, 95·0 on 28th, and 93·5 on 29th, then a cold snap set in. Rainfall: 1·31 inch on seven days.—L. Clayton.

Mafeking (Convent).—Duststorm in the afternoon at 5.30 of the 31st lasted about half an hour. The red dust driven by a northerly wind was so thick that lights had to be turned on in the school. A few drops of rain followed. Rainfall: 0·69 inch on four days.—The Mother Superior.

Murraysburg.—Considerable cold weather throughout the month and very little rain. Drought becoming very serious and considerable numbers of farmers have trekked southwards seeking green pasturage for stock. Rainfall: 0·06 inch on one day.—W. H. Rose Innes.

Vryburg.—A few drops of rain fell at various times, but not enough to register. Very high winds from north-north-west and west. Duststorms almost daily, generally starting about 10 a.m. and quietening down towards sunset. Large swarms of flying locusts. Drought very severe; cattle and small stock dying of poverty and eating slangkop; donkeys and horses dying from sand-ball. Rainfall: 0·04 inch on one day.—H. W. Collen.

Queenstown.—A month of dry hot weather; good soaking rains much needed. Rainfall: 0·52 inch on six days.—H. Holley.

Graaff-Reinet.—Winds light, generally from south, frequently blowing from north-north-west in early morning and changing to south. Summer heat during greater part of month; country dry. Rainfall: 0·31 inch on five days.—S. E. D. Treadwell.

Somerset East.—The rain (1·46 inch) which fell during the last three days of the month was badly needed. Rainfall: 2·30 inches on seven days.—C. Harris.

Bedford.—The main feature of the weather has been the variability and extreme ranges of temperature, ranging practically from mid-summer to mid-winter. There was a frost on the morning of the 24th, and two days later 92° in the shade. The rains (1·34 inch) on the last three days relieved local anxiety as to length of dry spell. Rainfall: 2·00 inch on nine days.—T. C. Hall.

Carnarvon.—Country suffering very severely from drought. Rainfall: Nil.—A. P. Malherbe.

Abtonia (Kuruman).—Rain badly wanted; stock falling off in condition; slangkop bad in district. Rainfall: 0·06 inch on one day.—A. T. Sitwell.

O'okiep.—Crops generally helped by the rainfall (0·43 inch) on the 6th. Harvest prospects very good. Rainfall: 0·59 inch on five days.—J. Burrows.

Kakamas (Kenhardt).—Drought severe; lamb sickness increasing; irrigated crops fine. Rainfall: Nil.—M. J. Oosthuizen.

North Cliff (Cathcart).—Exceptionally dry; cattle very poor; sheep good. Rainfall: 0·60 inch on three days.—Sinclair Arnold.

Lauriston (Barkly East).—Most terrible storm on the 6th, accompanied by hail, violent thunder, and lightning. Damage done to fruit and vegetables. Rainfall: 4·58 inches on four days.—H. R. Giddy.

Tongkloof (Tarkastad).—A very dry month; no food for stock, and water very scarce; dams all dry. Rainfall: 0·20 inch on one day.—W. J. van Heerden.

Kilcullen (*Barkly East*).—October ended with a very heavy rainfall, almost the heaviest that was ever experienced during this time of the year. The Sterkspruit river is up to its banks this morning. An inch and a quarter was registered yesterday, and farmers are sure to have lost heavily in young lambs as the rain lasted over eight hours; the ground is very well soaked. About a week ago a severe frost damaged crops very badly, but after yesterday's rain, standing crops promise very well. Stock, small and large, have picked up in condition. Rainfall: 2·74 inches on five days.—O. A. S. Voster, J.P.

BECHUANALAND.

Serowe.—Extraordinary cold snap from 25th to 27th. Rainfall: 1·0 inch on three days.—W. H. Ellam.

BASUTOLAND.

Mafeteng.—Hot and dry month; duststorms frequent. Nice rain (0·82 inch) on 6th, but latter part of month very dry. Rain badly needed; wheat crop withering for lack of rain; veld drying up rapidly and very little grazing. Thunderstorms all around on many days, but only light showers fell locally. Gardening operations hopeless; water supply restricted. Rainfall: 1·60 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 the heaviest precipitation; then follow 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 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-west 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 most numerous during this month,

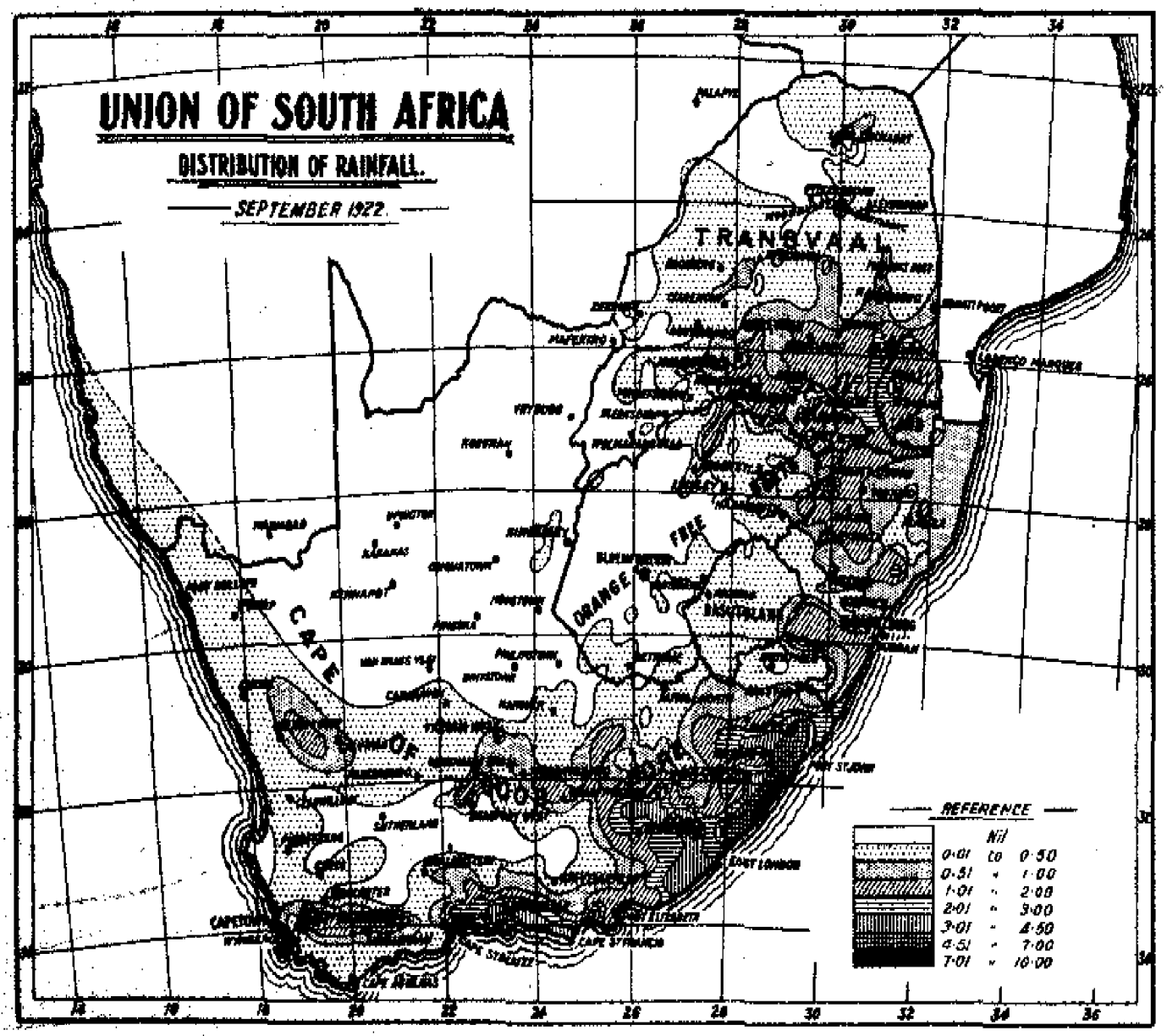
showing a large increase over those from the same direction during November. A similar, although smaller, increase is found in connection with winds from the eastern half of the compass—an increase mainly at the expense of those from points between south and west-south-west. At East London, on the other 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.

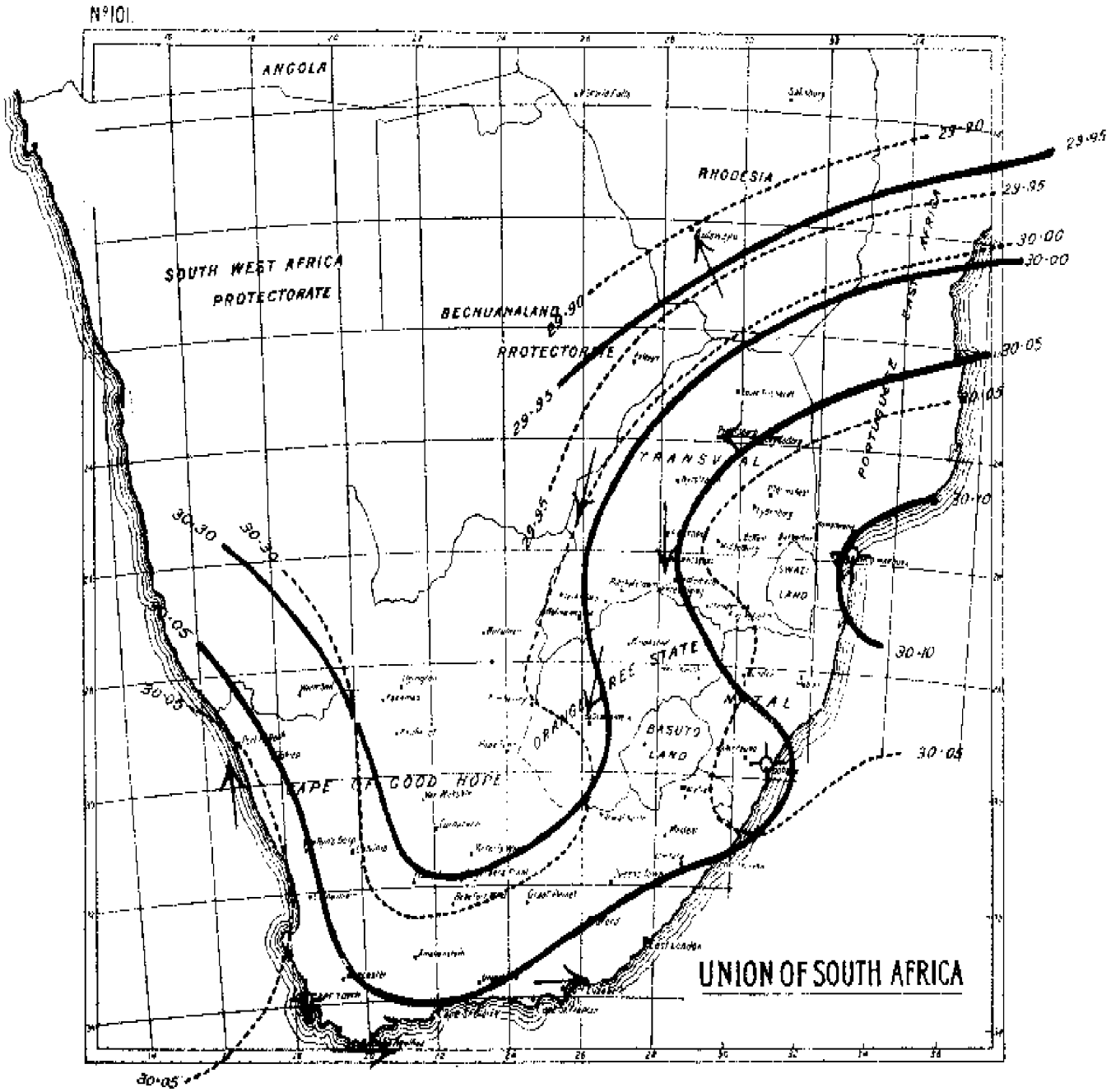
In the Transvaal the hours of bright sunshine should be about 60 per cent. of the total number possible, and in the Cape about 78 per cent. over the northern borders, 74 per cent. over the south-east, and 70 per cent. over the south-west.

C. STEWART,

Chief Meteorologist.

Pretoria.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
SEPTEMBER 1922.
TRANSVAAL
ORANGE FREE STATE
CAPE OF GOOD HOPE
REFERENCE
Nil
0·01 to 0·50
0·51 " 1·00
1·01 " 2·00
2·01 " 3·00
3·01 " 4·50
4·51 " 7·00
7·01 " 10·00



October, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.

The dotted lines indicate the normal distribution for October

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AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), OCTOBER, 1922.

Station.	Observer.	Month—Oct., 1922.		Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes.			
		Mean Max.	Mean Min.				Highest.	Date.	Lowest.	Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Transvaal—										
Barberton	Walter Grubb	79·5	58·0	68·8	68·9	− 0·1	98·0	21st	47·0	26th.
Belfast	The Forester	70·6	44·4	57·5	58·1	− 0·6	83·0	21st and 30th	28·0	27th.
Bloemhof	A. Adamson	85·5	54·3	69·9	66·0	+ 3·9	97·8	19th	37·0	8th.
Ermelo	W. Douglas	72·0	47·5	59·8	60·8	− 1·0	85·0	20th	37·0	26th.
Johannesburg (Observatory)	The Staff	72·8	50·8	61·8	61·4	+ 0·4	84·4	20th	35·8	8th.
Klerksdorp (Strathmore)	Chas. Scott	83·7	52·7	68·2	68·0	+ 0·2	94·0	19th	35·0	8th.
Komatipoort	H. F. Evans	89·1	63·5	76·3	76·0	+ 0·3	107·0	20th and 21st	51·0	27th.
Louis Trichardt	I. J. de Bruin	80·5	55·0	67·8	67·2	+ 0·6	96·0	29th, 22nd, and 29th	45·0	9th, 17th, and 26th.
Middelburg	Dr. H. A. Spencer	77·4	50·1	63·8	64·0	− 0·2	90·0	30th	37·0	27th.
Nylstroom	G. Bakker	81·6	54·7	68·2	69·2	− 1·0	92·0	20th	38·5	27th.
Pietersburg	W. J. Frankleyne	79·5	55·3	67·4	66·9	+ 0·5	92·0	20th and 30th	42·0	27th.
Piet Retief	J. Werner	72·9	52·8	62·8	63·9	− 1·1	87·2	21st	43·2	26th.
Pigeonhole (New Agatha)	Jno. McCallum	73·5	54·9	64·2	—	—	88·0	20th	45·0	25th.
Pilgrims Rest	E. M. Skea	75·3	51·8	63·6	64·1	− 0·5	92·0	21st	36·0	27th.
Potchefstroom (Exp. Farm)	The Manager	83·1	49·8	66·4	64·8	+ 1·6	93·7	19th	34·0	8th.
Pretoria (Meteorological Office)	The Staff	78·8	54·3	66·6	67·6	− 1·0	90·5	21st	42·6	8th.
Standerton	The Town Clerk	75·7	47·7	61·7	61·8	− 0·1	86·0	19th	34·8	8th.
Zeerust	H. Dietrich	83·9	56·6	70·2	69·0	+ 1·2	95·8	22nd	42·8	8th.
Swaziland—										
Mbabane	Swaziland Police	72·8	53·0	62·9	63·3	− 0·4	92·0	20th	41·0	27th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	81·7	49·0	65·4	62·8	+ 2·0	91·8	29th	33·0	8th.
Bloemfontein	G. A. Schepers	80·3	51·1	65·7	63·3	+ 2·4	92·8	19th	33·1	8th.
Harrismith	The Forester	67·9	38·8	53·4	59·7	− 6·3	82·0	19th and 20th	24·0	8th.
Kroonstad	S. R. Northfield	79·6	51·1	65·4	65·8	− 0·4	91·1	19th	34·2	8th.
Ladybrand	The Forester	75·3	47·6	61·4	61·0	+ 0·4	88·0	19th	31·0	8th.
Lindley	J. Collister-Oates	77·2	47·4	62·3	61·6	+ 0·7	88·8	19th	31·0	8th.
Natal—										
Dundee	West Thorrold	76·0	50·5	63·2	66·0	− 2·8	91·0	19th and 20th	41·0	27th.
Durban (Point)	The Port Captain	75·2	63·1	69·2	69·7	− 0·5	86·2	17th	55·2	24th.
Estcourt	A. A. McLean	77·4	50·6	64·0	67·0	− 3·0	94·0	19th	42·0	11th.
Hlatikulu	The Gaoler	78·5	60·7	69·6	67·5	+ 2·1	92·0	14th	52·0	25th.
Ladysmith	D. A. R. Leathern	81·0	53·1	67·5	69·8	− 2·3	97·0	20th	44·0	26th.
Maritzburg (Mental Hospital)	The Staff	77·4	55·5	66·4	67·4	− 1·0	94·2	19th	45·0	26th.
Stanger	C. C. Foss	78·2	60·6	69·4	69·0	+ 0·4	101·7	13th	53·0	27th.

AIR TEMPERATURES, OCTOBER, 1922—(*continued*).

Station.	Observer.	Month—Oct., 1922. Mean Max.	Month—Oct., 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Cape—										
Aliwal North	Alex. Alcock	79·0	46·5	62·8	61·0	+ 1·8	90·0	19th	31·5	8th.
Bedford	T. C. Hall	75·4	47·7	61·6	61·6	± 0·0	96·0	27th	34·0	24th.
Capetown (Royal Observatory)	The Staff	71·0	52·2	61·6	60·7	+ 0·9	93·1	26th	44·2	6th.
Carnarvon	A. P. Malherbe	78·2	44·2	61·2	62·9	− 1·7	89·0	9th and 13th	32·0	8th.
Clanwilliam	P. E. Scholtz	79·5	48·1	63·8	64·6	− 0·8	98·0	27th	37·2	8th.
East London	The Port Captain	72·9	57·8	65·4	63·8	+ 1·6	84·0	29th	50·0	9th, 17th, and 18th.
Graaff-Reinet	S. E. D. Treadwell	81·7	50·6	66·2	63·7	+ 2·5	99·2	27th and 28th	37·2	24th.
Grahamstown	The Vet. Res. Officer	71·9	45·7	58·8	60·7	− 1·9	95·2	29th	34·8	24th.
Groot Drakenstein	Lionel Baker	74·7	50·3	62·5	61·1	+ 1·4	98·3	26th	39·0	17th.
Kenhardt	R. Seydell	84·9	50·7	67·8	67·5	+ 0·3	98·0	19th	36·0	8th.
Kimberley	Jno. Acton	84·3	52·9	68·6	68·2	+ 0·4	98·0	19th	32·0	8th.
Kingwilliamstown	L. Clayton	75·6	51·3	63·4	64·5	− 1·1	98·5	27th	42·5	18th.
Kokstad	H. D. Coyte	73·4	46·6	60·0	58·0	+ 2·0	89·6	19th	36·8	26th.
Mafeking (Convent)	The Mother Superior	86·4	56·8	71·6	69·8	+ 1·8	96·4	21st	41·5	8th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	69·0	56·0	62·5	61·4	+ 1·1	81·0	27th	46·0	7th.
Murraysburg	W. H. Rose Innes	76·9	41·0	58·5	61·8	− 3·3	89·0	28th	30·0	24th.
Oakiep	J. Burrows	74·9	49·7	62·3	61·6	+ 0·7	90·2	18th	36·4	7th.
Port Elizabeth	The Lightkeeper	69·2	56·4	62·8	62·0	+ 0·8	78·0	27th and 28th	47·0	27th.
Port Nolloth	The Lightkeeper	65·8	48·9	57·4	57·2	+ 0·2	100·0	25th	42·0	17th and 23rd.
Port St. Johns (Cape Hermes)	The Lightkeeper	73·6	61·3	67·2	65·4	+ 1·8	86·0	12th	55·0	23rd and 24th.
Queenstown	H. Holley	79·9	48·8	64·4	62·2	+ 2·2	95·0	28th	43·0	11th and 17th.
Somerset East	C. Harris	74·9	48·7	61·8	62·3	− 0·5	93·6	27th	38·6	24th.
Stellenbosch	F. C. Bousfield	78·7	49·7	61·7	60·2	+ 1·5	96·5	27th and 28th	39·3	9th.
Sydney's Hope	Rev. S. Rippon	71·1	51·1	61·1	59·8	+ 1·3	97·0	27th	42·5	16th.
Uitenhage	H. Inggs	77·2	51·4	64·3	64·4	− 0·1	101·7	12th	42·5	25th.
Umtata	Miss N. Dix-Peck	76·2	51·2	63·2	62·2	+ 1·0	96·0	28th	41·9	25th.
Vryburg	H. W. Collen	85·8	52·8	69·3	69·6	− 0·3	95·0	19th	36·0	9th.
Wynberg (Convent)	The Mother Superior	72·0	52·3	62·2	59·8	+ 2·4	94·0	26th	44·8	7th.
Basutoland—										
Mafeteng	F. Hodgson	73·9	48·6	61·2	59·8	+ 1·4	85·0	19th	33·0	8th.

RAINFALL, OCTOBER, 1922.

Station.	Observer.	Month. Oct., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	3·44	2·80	+ 0·64	20·37	25·49	− 5·12	6·09	4·55	+ 1·54
Bethal	H. Joubert	5·21	3·44	+ 1·77	23·50	19·52	+ 3·98	7·50	4·65	+ 2·85
Belfast	The Forester	7·11	3·20	+ 3·91	28·12	21·87	+ 6·25	8·72	4·72	+ 4·00
Bloemhof	A. Adamson	0·31	1·14	− 0·83	7·01	15·00	− 7·99	0·84	2·50	− 1·66
Claremont	S.A. Police	2·47	1·31	+ 1·16	8·39	12·68	− 4·29	3·21	1·71	+ 1·50
Ermelo	W. Douglas	8·72	3·57	+ 5·15	24·18	19·43	+ 4·75	11·01	4·63	+ 6·38
Hazeltenburg	S.A. Police	—	—		—	—		—	—	—
Heidelberg	W. A. ter Horst	3·04	2·57	+ 0·47	16·32	18·91	− 2·59	4·53	4·09	+ 0·44
Johannesburg (Observatory)	The Staff	3·14	2·74	+ 0·40	17·57	20·86	− 3·29	5·07	4·51	+ 0·56
Klerksdorp (Strathmore)	C. Scott	0·92	1·77	− 0·85	10·52	16·42	− 5·90	2·20	2·65	− 0·45
Komatipoort	H. J. Evans	1·84	1·91	− 0·07	17·26	19·93	− 2·67	4·33	2·94	+ 1·39
Louis Trichardt	I. J. de Bruin	1·39	2·64	− 1·25	8·69	23·32	−14·63	2·68	4·02	− 1·34
Middelburg	Dr. H. A. Spencer	3·80	2·76	+ 1·04	22·64	18·79	+ 3·85	7·14	3·67	+ 3·47
Nylstroom	G. Bakker	3·23	2·14	+ 1·09	14·42	17·13	− 2·71	5·75	3·16	+ 2·59
Pietersburg	W. J. Frankleyne	2·54	1·94	+ 0·60	11·39	14·86	− 3·46	4·27	2·68	+ 1·59
Piet Retief	J. Werner	7·32	4·26	+ 3·06	22·59	21·56	+ 1·03	11·20	6·15	+ 5·05
Pilgrims Rest	E. M. Skea	3·02	2·20	+ 0·82	23·05	30·51	− 7·46	5·13	4·08	+ 1·05
Pigeonhole (New Agatha)	J. McCallum	4·35	2·92	+ 1·43	19·89	33·87	−13·98	6·55	5·02	+ 1·53
Potchefstroom (Exp. Farm)	The Manager	2·34	2·29	+ 0·05	15·53	16·32	− 0·79	6·32	3·33	+ 2·99
Pretoria (Meteorological Office)	The Staff	3·22	2·77	+ 0·45	18·21	20·82	− 2·61	7·79	3·76	+ 4·03
Roodberg	M. Baumann	1·68	1·65	+ 0·03	15·61	16·75	− 1·14	5·24	2·81	+ 2·43
Rustenburg	H. J. Streatfield	1·71	2·52	− 0·81	14·04	18·70	− 4·66	3·59	3·79	− 0·20
Standerton	The Town Clerk	7·08	3·53	+ 3·55	—	20·51	—	9·68	5·08	+ 4·60
Wakkerstroom	F. Grant	8·34	3·98	+ 4·36	25·57	23·05	+ 2·52	12·02	5·97	+ 6·05
Woodbush	The Forester	4·46	4·63	− 0·17	24·69	55·02	−30·33	7·35	8·12	− 0·77
Zeerust	H. Dietrich	1·29	1·75	− 0·46	10·72	17·46	− 6·74	2·89	2·49	+ 0·40
Swaziland—										
Mbabane	Swaziland Police	9·76	4·39	+ 5·37	33·56	36·14	− 2·58	14·94	7·38	+ 7·56
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·06	1·24	− 1·18	6·04	14·77	− 8·73	2·57	2·81	− 0·24
Bloemfontein	G. A. Schepers	0·65	1·70	− 1·05	6·77	14·74	− 7·97	0·87	3·15	− 2·28
Boshof	P. H. v. Rooyen	0·42	1·21	− 0·79	5·30	15·33	−10·03	0·42	3·24	− 2·82
Harrismith	The Forester	5·65	3·39	+ 2·26	20·31	20·11	+ 0·20	8·45	5·05	+ 3·40
Kroonstad	S. R. Northfield	2·72	2·29	+ 0·43	12·35	15·22	− 2·87	4·80	4·54	+ 0·26
Ladybrand	The Forester	2·91	2·58	+ 0·33	12·80	20·43	− 7·63	3·76	5·07	− 1·31
Lindley	J. Collister-Oates	3·54	2·27	+ 1·27	14·90	17·76	− 2·86	5·15	3·90	+ 1·25
Natal—										
Dundee	West Thorrold	7·02	3·13	+ 3·89	26·36	23·17	+ 3·19	10·68	5·22	+ 5·46
Durban (Point)	The Port Captain	11·38	5·15	+ 6·23	40·47	31·97	+ 8·50	17·28	9·68	+ 7·60

RAINFALL, OCTOBER, 1922—(*continued*).

Station.	Observer.	Month. Oct., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Natal—(continued).										
Estcourt	A. A. McLean	3·19	2·29	+ 0·90	18·00	20·14	− 2·14	6·24	3·88	+ 2·36
Hlabisa	The Gaoler	6·22	5·06	+ 1·16	22·16	31·58	− 9·42	10·21	9·19	+ 1·12
Howick	The Gaoler	4·63	3·04	+ 1·59	21·54	23·51	− 1·97	7·29	5·78	+ 1·51
Impetyne	The Forester	3·69	6·26	− 2·57	—	—	—	—	—	—
Ladysmith	D. A. R. Leathern	4·09	2·66	+ 1·43	23·30	20·37	+ 2·93	7·76	4·30	+ 3·46
Maritzburg (Mental Hospital)	The Staff	4·65	3·14	+ 1·51	19·58	24·68	− 5·10	7·64	6·02	+ 1·62
Stanger	Cecil C. Foss	5·78	5·20	+ 0·58	27·47	30·60	− 3·13	11·27	10·50	+ 0·77
Vryheid	The Gaoler	4·41	4·23	+ 0·18	23·49	26·59	− 3·10	8·18	6·69	+ 1·49
Weenen	The Gaoler	1·79	2·37	− 0·58	17·39	18·95	− 1·56	4·16	4·16	± 0·00
Cape—										
Aliwal North	A. Alcock	0·70	1·51	− 0·81	8·77	16·67	− 7·90	3·54	3·55	− 0·01
Beaufort West	The Gaoler	0·19	0·64	− 0·45	5·57	7·84	− 2·27	1·52	1·91	− 0·39
Bedford	T. C. Hall	2·00	2·59	− 0·59	22·29	22·16	+ 0·13	6·22	6·43	− 0·21
Britstown	The Gaoler	0·00	0·64	− 0·64	1·02	9·63	− 7·71	0·46	1·50	− 1·04
Calvinia	The Gaoler	0·36	0·52	− 0·16	7·74	7·12	+ 0·62	3·79	2·83	+ 0·96
Capetown (Royal Observatory)	The Staff	1·49	1·72	− 0·23	18·51	23·61	− 5·10	8·10	10·96	− 2·86
Ceres	A. Heatlie	0·83	3·73	− 2·90	34·53	38·02	− 3·49	12·25	19·60	− 7·35
Carnarvon	A. P. Malherbe	0·00	0·48	− 0·48	0·42	7·02	− 6·60	0·14	1·25	− 1·11
Clanwilliam	P. E. Scholtz	0·19	0·61	− 0·42	7·84	9·02	− 1·18	2·86	3·79	− 0·93
East London	A. Downie	2·80	3·73	− 0·93	22·95	26·93	− 3·98	7·96	10·14	− 2·18
French Hoek (Driefontein)	The Forester	1·50	2·46	− 0·96	52·09	68·51	− 16·42	21·93	29·15	− 7·22
Fraserburg	The Gaoler	0·00	0·35	− 0·35	2·93	5·85	− 2·92	0·69	1·27	− 0·58
Grahamstown	Vet. Res. Officer	1·18	3·12	− 1·94	11·88	23·12	− 11·24	7·80	8·45	− 0·65
Garies	The Gaoler	0·50	0·32	+ 0·18	5·30	4·85	+ 0·45	3·09	2·40	+ 0·69
Graaff-Reinet	S. E. D. Treadwell	0·31	1·16	− 0·85	7·46	11·33	− 3·87	2·78	3·29	− 0·51
Groot Drakenstein	Lionel Baker	1·29	2·76	− 1·47	33·36	32·98	+ 0·38	11·72	16·07	− 4·35
Griquatown	The Gaoler	0·00	0·73	− 0·73	1·76	10·93	− 9·17	0·34	1·42	− 1·08
Hanover	The Gaoler	0·37	0·74	− 0·37	2·76	11·14	− 8·38	0·57	2·06	− 1·49
Hopetown	The Gaoler	0·00	0·77	− 0·77	2·77	10·55	− 7·78	0·61	1·70	1·09
Kenhardt	R. Seydell	0·00	0·38	− 0·38	0·95	4·97	− 4·02	0·20	0·84	− 0·64
Kimberley	J. Acton	0·35	1·12	− 0·77	3·46	11·65	− 8·19	0·45	2·12	− 1·67
Knysna	The Gaoler	3·36	2·85	+ 0·51	29·63	24·02	+ 5·61	11·93	10·72	+ 1·21
Kokstad	H. D. Coyte	2·88	2·03	+ 0·85	20·85	19·61	+ 1·24	5·36	4·23	+ 1·13
Kingwilliamstown	L. Clayton	1·31	2·52	− 1·21	16·20	20·00	− 3·80	6·40	6·49	− 0·09
Kuruman (Abtonia)	A. T. Sitwell	0·06	0·45	− 0·39	3·60	12·75	− 9·15	0·10	1·43	− 1·33
Mafeking (Convent)	The Mother Superior	0·69	1·54	− 0·85	7·79	15·75	− 7·96	2·00	2·56	− 0·56
Mossel Bay (Cape St. Blaize)	The Lightkeeper	1·34	1·67	− 0·33	10·63	14·85	− 4·22	3·05	6·10	− 3·05
Murraysburg	W. H. Rose Innes	0·06	0·67	− 0·61	3·28	9·33	− 6·05	0·92	1·99	− 1·07
O'okiep	J. Burrows	0·59	0·45	+ 0·14	4·84	6·71	− 1·87	3·53	2·94	+ 0·59
Philipstown	The Gaoler	0·20	0·85	− 0·65	3·35	11·25	− 7·90	0·70	2·01	− 1·31

RAINFALL, OCTOBER, 1922—(*continued*).

Station.	Observer.	Month. Oct., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cape—(continued).										
Piquetberg	The Gaoler	0·70	1·78	− 1·08	17·88	19·03	− 1·15	6·45	9·69	− 3·24
Port Elizabeth	The Lightkeeper	1·52	2·26	− 0·74	14·55	18·88	− 4·33	5·72	8·62	− 2·90
Port St. Johns (Cape Hermes)	The Lightkeeper	7·09	6·13	+ 0·96	34·57	37·63	− 3·06	16·79	13·23	+ 3·56
Port Nolloth	The Lightkeeper	0·21	0·11	+ 0·10	2·38	2·10	+ 0·28	1·48	1·00	+ 0·48
Prieska	The Gaoler	0·00	0·48	− 0·48	1·35	8·50	− 7·15	0·41	1·07	− 0·66
Queenstown	H. Holley	0·52	1·61	− 1·09	11·53	16·52	− 4·99	3·22	3·72	− 0·50
Steytlerville	The Gaoler	0·38	0·80	− 0·42	7·75	7·56	+ 0·19	1·70	2·16	− 0·46
Sutherland	The Gaoler	0·00	0·62	0·62	5·84	8·34	− 2·50	1·99	2·98	− 0·99
Swellendam	The Gaoler	1·84	3·18	− 1·34	26·88	27·00	− 0·12	7·32	10·57	− 3·25
Sydney's Hope	Rev. S. Rippon	1·36	2·52	− 1·16	21·56	18·34	+ 3·22	6·75	6·62	+ 0·13
Somerset East	C. Harris	2·30	2·18	+ 0·12	17·40	18·67	− 1·27	6·66	5·68	+ 0·98
Stutterheim	F. C. Bousfield	2·02	2·07	− 0·05	21·83	22·97	1·14	7·29	6·48	+ 0·81
Uitenhage	H. Inggs	1·39	2·02	− 0·63	16·37	14·44	+ 1·93	6·67	6·03	+ 0·64
Umtata	Miss N. Dix Peck	2·34	2·47	− 0·13	19·35	20·23	− 0·88	7·77	5·57	+ 2·20
Uniondale	The Gaoler	0·23	1·49	− 0·96	11·21	11·75	− 0·54	3·44	4·78	− 1·34
Upington	The Gaoler	0·00	0·56	− 0·56	1·05	5·93	− 4·88	0·03	0·90	− 0·87
Victoria West	The Gaoler	0·00	0·60	− 0·60	3·02	8·67	− 5·65	0·27	1·66	− 1·39
Vryburg	H. Collens	0·04	0·96	− 0·92	5·13	15·56	− 10·43	0·19	1·73	− 1·54
Worcester	The Gaoler	0·61	1·17	− 0·56	9·76	11·72	− 1·96	3·34	5·82	− 2·58
Wynberg (Convent)	The Mother Superior	1·10	3·55	− 2·45	33·69	43·95	− 10·26	14·69	23·19	− 8·50
Basutoland—										
Mafeteng	F. Hodgson	1·60	2·00	− 0·40	12·55	24·27	− 11·72	3·65	4·91	− 1·26
South-West Africa—										
Tsumeb	Ing. Schetter	3·18	0·93	+ 2·25	9·57	17·92	− 8·35	3·18	1·14	+ 2·04
Waterberg	D. Hahn	1·25	0·36	+ 0·89	8·50	15·45	− 6·95	1·25	0·49	+ 0·76
Omaruru	The Postmaster	0·88	0·27	+ 0·61	7·14	9·62	− 2·48	0·88	0·36	+ 0·52
Usakos	Rev. Diehl	0·38	0·08	+ 0·30	0·86	4·41	− 3·55	0·38	0·17	+ 0·21
Duesternbrook	J. Matthiessen	0·17	0·28	− 0·11	8·53	10·56	− 2·03	0·17	0·46	− 0·29
Gobabis	Rev. Irbe	0·16	0·43	− 0·27	4·15	12·46	− 8·31	0·16	0·66	− 0·50
Gr. Witvley	B. Raeckert	0·00	0·48	− 0·48	3·60	11·88	− 8·28	0·00	0·66	− 0·66
Windhoek	Observatory	0·75	0·37	+ 0·38	6·15	11·79	− 5·64	0·75	0·56	+ 0·19
Maltahoehe	E. Just	0·45	0·13	+ 0·32	1·94	5·41	− 3·47	0·45	0·21	+ 0·24
Voigtsgrund	A. Voigts	1·02	0·22	+ 0·80	2·97	4·96	− 1·97	1·02	0·38	+ 0·64
Gibeon	Rev. Spellmeyer	0·62	0·19	+ 0·43	3·16	5·12	− 1·96	0·62	0·34	+ 0·28
Bethany	Rev. Peter	0·02	0·19	− 0·17	1·96	3·66	− 1·70	0·02	0·28	− 0·26
Aus	F. Ernst	0·00	0·10	− 0·10	4·43	4·08	+ 0·35	1·86	1·04	+ 0·82
Heirachabis	Rev. Father Eder	0·00	0·13	− 0·13	0·67	3·73	− 3·06	0·00	0·21	− 0·21

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. III. **NOVEMBER, 1922.** **No. 11.**

THE leading features of the weather of November, 1922, may be summarized as follows: Atmospheric pressure below the average over the east and interior, about normal elsewhere; temperature half a degree lower than usual, with exceptionally cool days, but nights warmer than usual; rainfall above the average over the greater part of the Union, particularly in the south-east Cape, but deficient over the south-west Cape, the central portions of the northern Karroo, the Northern Border, Gordonia, Bechuanaland, together with the west and north centre of the Transvaal, with parts of the coasts of Natal and Kaffraria, and in Zululand; absolute drought in portions of the south-west of the Transvaal; frequent and occasionally exceptionally severe thunderstorms, particularly in the east of the Transvaal, causing considerable rise in rivers; numerous hailstorms, causing considerable damage to crops, window-panes, etc.; in some areas some destructive windstorms; a cold snap towards the end of the month, particularly on the 24th, when snow lay on the Drakensberg and on the mountains round Bedford.

Pressure.—The mean barometric pressure for November, as may be seen from the accompanying map, was practically normal in the west and south, but lower than usual by about five-hundredths of an inch in the east and over the interior. The equatorial tongue of low pressure was present throughout the month, and coastal "lows" lay over the south-west to south on the 8th to 9th and 27th to 28th, over the south on the 13th, and over south to south-east on the 18th to 19th and 22nd to 23rd. High-pressure areas were present on fifteen days of the month. Generally speaking, the weather was cloudy and unsettled over the Transvaal, Natal, as well as over the south and south-east of the Cape, rain, with thunderstorms, occurring on twenty-two days in some areas, being with some heavy falls particularly during the first week. Over the Free State and central Cape it was generally fine, but with good, light rains and occasional heavy falls particularly during the second half of the month; over the west and south-west of the Cape only a few cloudy days, with light showers, were experienced.

Temperature.—The mean temperature of the month over all stations (66·9 degrees) was half a degree lower than usual, the deficits being due to the days with a mean of 78 degrees, being 2 degrees cooler than usual, whilst the excess of 0·9 degree in the mean night temperature (55·8 degrees) was insufficient to counterbalance this shortage. The only Province showing an excess in the temperature for the month was the Transvaal, where the excess of 0·6 degree was entirely due to the mean minimum temperature (56·3 degrees) being 1·2 degree higher than usual, whereas the mean maximum (80·1 degrees) was normal. A deficiency in the month's temperature was common to the three other Provinces, the greatest deficiency being shown by Natal, where the mean of 69·6 degrees was 1·8 degree lower than the average; the Cape coming next with a temperature of 65·5 degrees minus 0·9 degree as compared with the normal; the shortage was least (0·7 degree) over the Free State, where the mean monthly temperature for November was 65·8 degrees. Similar conditions prevailed over all three Provinces, the days being cooler and the nights warmer than usual: thus, in Natal the mean maximum (80·5 degrees) was 4·2 degrees lower, but the mean minimum (58·8 degrees) only 0·9 degree warmer than the corresponding averages; in the Cape the mean day temperature (75·9 degrees) was 2·6 degrees lower, and the mean night temperature (55 degrees) only 0·7 degree higher than usual; whilst in the Free State the mean night temperature (53·5 degrees) was supra-normal by the same amount as in the east of the Cape—the days with 78·2 degrees were only 2·1 degrees below normal. The individual stations in Swaziland, the Transvaal, and the adjoining portion of Bechuanaland had a temperature above the average, except along the more northerly portion of the high veld and in the Pretoria district. The excesses were greatest in east, north, and south-west Transvaal, and ranged from 0·2 degree at Ermelo, Heidelberg, and Zeerust to 2·3 degrees at Komatipoort. The deficits were half a degree or less, except at Pretoria, where the shortage was 1·4 degree. Over the remainder of the Union temperature was almost generally sub-normal, frequently by a few tenths of a degree, but increasing to 2–2½ degrees in the south of the Free State and Basutoland to 3–4 degrees in the centre, south-east, and west of the Cape Province. Over the Cape Peninsula and the south-west of the Cape Province, however, the mean temperature was higher than usual by 0·6–2·4 degrees; an excess of 0·8 degree was also experienced at Kenhardt, of 0·2 degree at East London, and 1 degree at Stanger in Natal; whilst temperature conditions were normal at Ladybrand in the Free State and Graaff-Reinet. Conditions were too diverse over the adjoining areas to admit of any general statement being made as to the relationship existing between the day and night temperatures and their corresponding normals. Thus both mean maxima and minima were above the average over a limited area in the eastern Transvaal, low veld, and Swaziland, portions of the south-west of the Transvaal, the south of Bechuanaland, the Cape Peninsula, and at Kenhardt in the northern border of the Cape Province. A contrary state of affairs—that is to say, both days and nights colder than usual—prevailed at Johannesburg, the higher portions of Natal, the east of Kaffraria, portions of the south-east Cape, and south-west, the east-central Karroo, the centre of the northern Karroo, and along the west coastal area, including the Namaqualand plateau. The days were warmer and the nights colder than usual in the north of the Transvaal, also at isolated stations on the high veld, the east of the Free State, and at Estcourt in Natal. Days cooler and nights warmer than the average were the conditions prevailing at the stations over the remainder of the country, the deficits in the mean maximum being very large (4–8 degrees and even 10 degrees), particularly in Natal, Basutoland, and the east-central Karroo, and the west coast; in the Free State the shortages

were between 2 and 4 degrees, but decreased to less than 1 degree in the Transvaal. The excesses in the mean minima were usually much smaller than the deficits in the maxima, commonly less than a degree, but rising to between 3 and 4 degrees at various stations in the Transvaal, Natal, and Cape Provinces. The mean warmest station was Komatipoort, with a mean temperature for the month of 79·2 degrees; whilst the coolest station was Port Nolloth, with 59 degrees, a difference of 20·2 degrees. The highest mean maximum was 91 degrees, at Komatipoort; and the lowest mean minimum was 44·2 degrees, at Murraysburg. The highest temperatures for the month were registered on thirteen days, most widely between the 17th and 19th, also on the 11th; whilst the lowest temperatures, although occurring on a similar number of days, were mainly confined to two cool spells, viz., on the 6th to 8th, when minimum occurred over the Transvaal and parts of Natal and Free State, and between the 24th and 26th over the major portion of the Cape and portions of the other Provinces. Temperatures of 100 degrees or over were confined to Komatipoort, Ladysmith, and Weenen, the highest being 107·5 degrees on the 23rd at the first-named station; whilst the lowest was 31 degrees at Murraysburg on the 25th, an extreme range of 76·5 degrees during the month.

Precipitation during the month was below normal over parts of the northern and western Transvaal, Bechuanaland, the west of the Northern Border, the more southerly portions of the northern Karroo, the south-west, west coast, and Cape Peninsula, the north coast of Natal, and in Zululand. The shortages were mostly small, considerably under an inch, but exceeded this amount at a few stations in the Cape and Transvaal, e.g. Ceres in the south-west, Kuruman in Bechuanaland. Elsewhere precipitation was in excess mostly by less than 1 inch in the north and south-west of the Transvaal, increasing to 1–3 inches in the south and east, also over the Free State, but increasing to almost 5 inches at Komatipoort and Harrismith. In Natal the surplus was mostly between 2 and 3 inches, but ranging from 0·33 inch at Estcourt to 4·90 inches at Pietermaritzburg. In the Cape Province the excesses were small, usually less than half an inch over the west and centre of the northern and central Karroo, but increased to 2–4 inches towards the east and south, reaching the maximum surplus of 14·32 inches at East London and about 8 inches at Kingwilliamstown and Grahamstown. These large excesses were mainly caused by exceptionally heavy rains on the 4th to 15th, when, with a falling barometer and an east-south-easterly gale, 6·03 inches were recorded in twenty-four hours. The wind continued to be south-easterly till about 4 p.m. on the 5th, when it veered through south to south-west, from which direction it continued all night to the morning of the 6th, when 4·45 inches were registered; these amounts were preceded by 0·25 inch on the 3rd, and succeeded by 1·70 inch on the 6th and 0·46 inch on the 7th, making a total of 12·89 inches for five days. This was an exceptionally wet period along the southern littoral and particularly in the south-east, where quantities of 2–8 inches in one period of twenty-four hours were frequent in East London, Kingwilliamstown, Stutterheim, Albany and Peddie, Stockenstroom and Fort Beaufort and Alexandria Divisions. Several of the gauges overflowed, so that some totals given are less than the actual amounts. As a rule, the maximum amounts were recorded on the 4th, but at some stations on the 5th. As types of the quantities recorded, the following may be given—Filter beds: East London, 3rd, 0·25; 4th, 6·69; 5th, 6·05; 6th, 1·36; 7th, 0·41; total, 14·76 inches. Chiselhurst, 3rd, 0·50; 4th, 7·50; 5th, 11·84; 6th, 1·60; 7th, 0·50; total, 21·94 inches. Rabula (Division Kingwilliamstown), 3rd, 0·97; 4th, 10·10; 5th, 1·90; 6th, 1·96; 7th, 0·45; total, 15·38 inches. Evelyn

Valley, 3rd, 3·75; 4th, 13·20 (gauge running over at 6 a.m., 2 inches assumed to have been lost, but not included); 5th, 3·15; 6th, 4·75; 7th, 1·68; total, 26·51 inches. No details of any damage due to flooding are given, but the gale accompanying this rain (which was associated with severe thunderstorms) was sufficiently strong to uproot trees at Grahamstown and Slaai Kraal, and caused much damage at Doorn (Division Cathcart) on the 5th. During this period the Buffalo River came down, the rivers in the neighbourhood of Isidenge were abnormally flooded. On the 3rd there was a flood in the Zwartkop River (Uitenhage), the water being 5 feet over the causeway on the 5th. The Observer at Riversdale states: "The rain must have been very heavy in the mountains, as the river (Kafferkuils River) is flooded, streaming through the town, preventing any vehicle from crossing." At Groot Drakenstein, Mr. Lionel Baker reports: "During the exceptionally severe thunderstorm (for this part of the country) on the 3rd, very heavy rain fell in parts of the valley; the Berg River rose 4–5 feet, and brought down more sediment than I have ever known before." The Observer at Dunbrody states that the White River and Bezuidenhout River were high on the 5th. That heavy rain was not confined to the south coast on these days is shown by the report that on the 4th the Vaal River at Standerton rose 32 feet, due apparently to widespread rains of 1–2 inches in the upper portion of the catchment. All rivers in the Piet Retief District were in flood the greater part of the month. The Fish River at Grassridge (Cradock) is stated to have been in spate on two occasions, 5th to 7th and 21st to 23rd, running six days in all; the maximum height reached 8 feet. From Lauriston (Barkly East), Mr. H. R. Giddy reports: "We had a perfect washout on the 21st (4·75 inches). The rivers overflowed their banks and carried away miles of fencing. Several dams burst. Thunder and lightning were most terrific. I have been farming here for over forty years, and it was the most violent storm that I have experienced. Great damage was done to crops." Not only were the falls recorded during these five days (3rd to 7th) exceptionally heavy, but the totals for the month were unprecedented at many stations during the period for which observations are available. Thus, at Evelyn Valley, where the average annual rainfall for the thirty-four years (1887–1920) amounts to 72·06 inches, the actual total for November, 1922, was 34·43 inches, or 48 per cent. of the average annual amount, and this without making any allowance for the overflow on the morning of the 5th; the nearest approach to this total was 20·66 inches in November, 1903, whilst the largest amount previously recorded in any month was 22·90 inches in October, 1917. Compared with the fall of 13·20 inches on the 4th, actually recorded, the next largest amount was 11·33 inches on the 10th October, 1905. Again, at East London, where the average yearly total is 33·63 inches since 1882, the nearest approach in the same month to the total of 17·43 inches for November of the current year was 10·63 inches in November, 1893, whilst the largest total for any month was 11·71 inches in October, 1905. On the other hand, the total of 6·69 inches on the 4th November, 1922, has been exceeded by the 9·05 inches that were also measured on the 10th October, 1905. The month was remarkable for the large number of days on which rain fell, exceeding twenty at stations in the south-east of the Cape and Kaffraria, and varying from nineteen in the Carolina District to twelve in the Bloemhof District in the Transvaal. Rain was also frequent over Natal and in the Free State, the frequency decreased from east to west in a manner similar to that in the Transvaal. Although the rains during the month improved conditions somewhat in the west and south-west and north of the Transvaal, they were too light in character to thoroughly saturate the ground, so that only a limited amount of ploughing and sowing could be carried out; much more rain is required before the drought can be regarded as broken.

Similar remarks may be applied to Bechuanaland and the Northern Border and Gordonia. On the other hand, complaints are made from some stations in the more easterly parts of the Union that the ground was too wet for ploughing and planting; the excessive rain caused damage to crops already growing and to garden produce, whilst the cold weather gave a serious check to the growth of crops and veld, whilst hundreds of cattle are stated to have died in the Lichtenburg Division through poverty, also of large and small stock in Bechuanaland. Thunder and hail storms were frequent throughout the month, occasionally accompanied by strong winds, causing considerable damage to fruit crops, the trees in some instances being practically stripped of all fruit. Snow lay on the Drakensberg during the cold snap of the 24th to 25th, and also on the mountains round Bedford. It is reported from Stanger that some hail falling on the 6th in the neighbourhood measured 4 inches in diameter. Although the rainfall was large in the east, the distribution of excess and deficit quantities in the accumulated rainfall since the beginning of the year remains practically the same as in October, only a few stations in the east and centre of the Transvaal, the south-east and south of the Cape having had minus converted into plus quantities. Whilst the deficits remain practically the same in the south-west Transvaal, they have increased in amount in the west Transvaal, also over Bechuanaland, Gordonia, and the greater part of the northern Karroo and the south-west Cape, including the Peninsula. The totals for the five months, beginning 1st July, show excesses over slightly increased area in the Transvaal, the whole of Natal, the north, north-east, and south of the Free State, whilst in the Cape the *plus* area has extended westwards and northwards into the north-east section, the east of the northern Karroo, and of the central Karroo. These excesses are commonly from 3–6 inches, but exceed these amounts at a few stations in each of the Provinces, rising to 12–14 inches at East London. The deficits were mostly less than an inch over the northern Karroo and the western Transvaal, but was between 1 and 2½ inches in Bechuanaland. In the south-west of the Cape the deficits were much larger, being 3·90 inches at Piquetberg and 8·40 inches at Ceres, whilst in the Peninsula, Wynberg shows a shortage of 9·78 inches.

In South-West Africa, judging from the few records available, absolute drought prevailed throughout the month over the country south of Windhoek, whilst small quantities of less than 1 inch fell to the north of that station. Windhoek itself had a rainfall of 1·77 inch, a quantity exceeded only by Tsumeb in the north with 2·04 inches. These amounts were all sub-normal, except at Tsumeb and Windhoek, where the plus amounts were 0·17 and 0·36 inch respectively. Except at Aus in the south, where the total since the 1st January was a quarter of an inch in excess of normal, the accumulated rainfall since the 1st January was less than usual, ranging in amount from 1·88 inch at Bethany to 9·06 inches at Gobabis. A comparison of the actual totals for the five months since 1st July shows a slightly improved state of affairs, six out of fourteen stations being in excess of normal, although only by small quantities of less than three-quarters of an inch, except at Tsumeb, where the excess reached 2·21 inches. The deficiencies were also small, being mostly less than half an inch.

OBSERVER'S NOTES FOR NOVEMBER, 1922.

TRANSVAAL.

Mosdene (*Naboomspruit*).—The rainfall (3·29 inches on nine days) for the month has been considerably less than that of November last year (7·65 inches). Fortunately, slight showers at the beginning and in the middle of the month

have just enabled the ploughing and planting to be continued. The ground, however, has never been really wet, and the grass is beginning to wilt.—J. H. Summers.

Standerton.—Heavy thunderstorms with slight hail were very frequent. The Vaal River rose 32 feet on the 4th. On the 24th and 25th the weather was quite like winter. Rainfall: 6·51 inches on fourteen days.—W. J. Madge.

Lichtenburg.—Country still dry. Mealie planting much below normal. Veld fair. Severe hailstorm north of town on 16th, but as this part is sparsely populated little damage was done. Rainfall: 2·11 inches on ten days.—J. T. Allman.

Gemboksfontein (Middelburg).—Nice showers fell throughout the month. A cold snap was experienced on the evening of the 24th, which continued throughout the next day. Rainfall: 6·69 inches on eighteen days.—Geo. J. Imrie.

Jakhalsfontein (Pietersburg).—Exceptional electrical disturbances during the latter half of the month. No damage in the immediate neighbourhood. Rainfall: 3·45 inches on ten days.—James C. Palmer.

Christiana.—Welcome rains, registering 2·74 inches, on four days, fell during the month. The country around is beginning to look brighter, much more rain is required to have any effect on pasturage.—J. J. Cooke.

Pietersburg.—Very hot and dry; small rainfall—3·56 inches on ten days—soon evaporated. Crops withered. Violent hailstorms in several parts of the district.—W. J. Frankleyne.

Piet Retief.—On the 1st an extraordinary severe hailstorm occurred; hail up to 1½ inch diameter was measured. Severe lightning practically throughout the month; one fatality—an European. All rivers were in flood the greater part of month. Rainfall: 6·63 inches on fifteen days.—J. Werner.

Bloemhof.—Violent duststorms throughout month. Fine light showers have made little or no difference to drought. Rainfall: 1·86 inches on nine days.—A. Adamson.

Strathmore (Klerksdorp).—Only local showers. Rainfall: 2·48 inches on thirteen days.—C. Scott.

Middelburg.—The weather during the month has been exceptionally temperate, with a low mean temperature of 65·7 degrees only; this is the lowest recorded here in twenty years. Rains have been well distributed throughout the month, and above the average in quantity by 2·42 inches, the average fall for the month being 5·29 inches. This has been exceeded four times in twenty years: In 1909, 8·13 inches; in 1914, when 8·32 inches fell; in 1917, when 8·18 inches fell; and in 1922, when 7·71 inches fell. In the first and last weeks of the month the barometer fell to an exceptionally low level, rising again without any apparent justification for the fall, for very little rain fell, and the wind was never more than moderate to fresh, though a varying amount of devastation upon farms in the surrounding districts was caused by hailstorms, none fell in town.—Dr. H. A. Spencer.

Du Toitspruit (*Potchefstroom*).—Plenty of heavy rainclouds very often, but no rain. The little grazing has now nearly disappeared. Drought all round, and worse towards Ventersdorp. Rainfall: 1·20 inches on six days.—J. A. P. Ortlepp.

Waaikraal No. 206 (*Rustenburg*).—Very dry; no ploughing possible; no mealies put in as yet. Rainfall: 4·68 inches on eleven days.—H. Behrens.

Weltevreden (*Standerton*).—Almost too much rain for mealie growers. Transport suspended owing to flooded spruits, etc. Stock looking well. Rainfall: 6·82 inches on ten days.—D. Lane.

Wolmaransstad.—Heavy duststorms have been prevalent throughout the district. Very little ploughing, and only some parts of the district have been done. Cattle in poor condition. Good soaking rains urgently required. Rainfall: 1·23 inches on six days.—H. W. Kluiver.

Groenboom (*Rustenburg*).—The rains that fell in the beginning of the month were very welcome and improved the veld considerably after its destruction by locusts. For agriculture the precipitation has been very insufficient, the time for cotton planting going past, and no growth in the young crop that is above ground. Veld is also in need of rains, the latter part of this month being dry, and with high temperatures in daytime. Cattle are looking well. Locusts have either been killed or have flown away, after the 10th no more locusts have passed the station (voetgangers). Huge swarms of flying locusts have been passing in south-south-easterly directions in the earlier part of the month. Some of the native trees, especially the "sering," are devastated by caterpillars this spring, some being entirely deprived of their leaves. Rainfall: 2·56 inches on eight days.—F. N. van Nouhuys.

Davel (*Bethal*).—Remarkably cold for this time of the year; south and east winds at night, making the air cold. Crops very backward. Rainfall: 5·66 inches on thirteen days.—H. A. Wollenberg.

Makouwskop No. 83 (*Bloemhof*).—We have had such destructive westerly winds that the veld could not grow. Rainfall: 1·66 inches on eight days.—W. Hallett.

Melrose (*Bloemhof*).—Owing to the drought the cattle in the district are in very poor condition. Veld very short. The rains came just in time. Rainfall: 3·00 inches on seven days.—C. J. Combrink.

Weltevreden (*Carolina*).—On the 6th, hurricane smashed trees, etc.; hail and wind terrific. Trees torn up by roots, most of fruit knocked off. Rainfall: 7·86 inches on eighteen days.—L. H. Muter.

Busby (*Ermelo*).—Record rainfall for any November on Busby. Rainfall: 9·66 inches on eighteen days.—A. Lunt.

Mimosa (*Lichtenburg*).—Very little ploughing done owing to the drought. Hundreds of cattle have died through poverty. The farmers are downhearted, and the prospects are very poor. From January last to the 5th December only 3·85 inches of rain fell. Rainfall: 0·16 inches on one day.—K. M. Prinsloo.

SWAZILAND.

Matendela.—A good farming month all round. Rain well distributed. Live stock and crops in good condition. Rainfall : 4·09 inches on seven days.—H. Parry.

ORANGE FREE STATE.

Doornplaats (Bloemfontein).—Veld still very bare. Grass roots dead, and grass coming up from seed. Rainfall : 5·16 inches on seven days.—C. G. Ortel.

Stanleyvale (Harrismith).—A fairly nice month, but lands got a bit too wet. Stock suffering from gall-sickness. Crops at a standstill. Rainfall : 7·99 inches on fifteen days.—G. C. Atkins.

Prospect (Vrede).—Plenteous rains this month. Ploughing and planting have, however, not been much interrupted, as much of the rain fell at night. Veld splendid. Mealie crop promises well so far, but grows slowly, as ground is cold. All kinds of stock look well. Rainfall : 6·27 inches on seventeen days.—T. Pitcairn.

Woudzicht (Vrede).—From 21st to 28th November all lands too wet for any work ; impossible to plough. Rainfall : 8·93 inches on fourteen days.—J. N. Kohler.

Paardekraal (Winburg).—An excellent month. All stock have improved rapidly. Nights were rather cold during last week of month. Rainfall : 3·66 inches on ten days.—G. S. Lowe.

NATAL.

Rongpoort (Weenen).—Ideal ploughing month. Cold snap like last year. No hail so far this spring. Rainfall : 5·38 inches on fourteen days.—J. H. Bartholomew.

Stanger.—Thunderstorms within a few miles of Stanger nearly every afternoon. Some of the hail on the 6th measured 4 inches in diameter, but only the size of rice in Stanger. Rainfall : 4·83 inches on seventeen days.—Cecil C. Foss.

Newcastle.—There were several hailstorms at the beginning of the month, but no damage was done. Everything looks fresh and green. Rainfall : 8·58 inches on seventeen days.—The Gaoler.

Mid-Illovo.—Misty and cold. Maximum temperature 89 degrees on the 28th, minimum temperature 49 degrees on 24th, 25th, and 30th. Strong gales on night of 15th and afternoon of 28th, with thunderstorm and a little hail. Number of wet days has hampered mealie planting. A lot of thunder during month. Rainfall : 5·84 inches on eighteen days.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Nottingham Road.—Snow on the Drakensberg on the 24th, and very cold, otherwise good weather for agriculture. Fruit and flowers two weeks earlier than usual. Stock healthy ; a few cases of three-days sickness in cattle. Rainfall : 4·73 inches on nineteen days.—Miss E. Smythe.

Dundee.—A very cold month for November, and a good growing month. Rainfall : 5·49 inches on sixteen days.—West Thorrold.

Ladysmith.—Good rains well distributed during the month. Grass has come on well, and stock are in good condition. Hail reported from several parts of district, but very little has fallen in or near Ladysmith, and the fruit crop promises well. Rainfall: 5·20 inches on sixteen days.—D. A. R. Leathern.

CAPE.

Bedford.—There was snow on the mountains in the district on the 24th. The main feature, however, was the constant rain, registering 7·98 inches on twenty-one days, compared with the previous highest of 6·52 inches in 1894.—Thos. C. Hall.

Grootfontein (*Middelburg*).—Drought seems to be broken. Days still hot, but evenings cool. Early crops ripening. Fruit exceedingly plentiful all over the district. Veld looking fine after rains. Storage dams all catching water. Grootfontein storage dam has 10 feet of water (full capacity 20 feet). Sheep and cattle picking up after drought, although still in poor condition. Rainfall: 2·26 inches on eleven days.—E. J. van Meerten.

Uitenhage.—Good rainfall this month, much wind, sometimes gales and thunderstorms. Flood in Zwartkops River on 3rd, 5 feet over causeway. Rainfall: 6·17 inches on eleven days.—Herbert Inggs.

Abtonia (*Kuruman*).—High winds and dust. Some good rains have fallen in district. Stock suffering from drought. Rainfall: 0·41 inches on two days.—A. T. Sitwell.

Willowmore.—A cool month, with several hot days. Great range in maximum temperature, 60·0 degrees on 24th, 96·0 degrees on 27th. Rainfall: 1·07 inches on five days.—Mrs B. M. Hemens.

Vryburg.—Drought very severe, though rains are reported from various parts of the district. Losses in stock both large and small, through poverty, and eating slangkop. Rainfall: 1·33 inches on seven days.—H. W. Collen.

Somerset East.—The good rains at the close of October have been followed by an exceptional cool and wet November. The rainfall, 7·80 inches on seventeen days, has been soft, except for a heavy thunder and hail storm, which did considerable damage in town gardens on the 27th.—C. Harris.

Mafeking (*Convent*).—The drought still continues, though rain—1·77 inches on nine days—fell during the month.—The Mother Superior.

Kingwilliamstown.—The rainfall, 10·44 inches on seventeen days, is the highest we have had for twenty-seven years. The rain has damaged a lot of farmers' crops.—L. Clayton.

Kenhardt.—Another month with practically no rain, only 0·05 inch on one day; outlook very black, cattle and sheep dying in big numbers.—R. Seydell.

Groot Drakenstein.—Rain fell in light showers only. Weather uniformly cool, with the exception of two or three days. The most unusual feature was the amount of cloudiness, with cool westerly winds. Mean amount of cloud at 8.30 a.m., 5·4, against previous highest 4·9 in 1903. Sunshine, 36·35 hours below average. During the exceptionally severe thunderstorm (for this part

of country) on the 3rd, very heavy rain fell in parts of valley, and the Berg River rose 4 feet to 5 feet, and brought down more sediment than I have ever known before. Rainfall: 0·95 inches on seven days.—Lionel Baker.

Graaff-Reinet.—Winds moderate and variable. This has been an unusually cool month, with only one warm night. Rains have been partial, some parts of district have had too much and others nothing to speak of. Rainfall: 2·52 inches on ten days.—S. E. D. Treadwell.

Aliwal North.—A few hot days, and strong wind on several occasions. The first good rains for a long time. Rainfall: 6·04 inches on thirteen days.—Alex. Alcock.

Jansenville.—Many overcast and very windy days. Rainfall: 1·13 inches on six days.—E. H. Egan.

Rietfontein (Aliwal North).—Good rains, but too late to save majority of wheat crop. Extensive ploughing for mealies. Sudden changes of temperature. Rainfall: 4·52 inches on twelve days.—A. G. Smith.

Grassridge (Cradock).—Veld is now getting green. River has been in spate on two occasions, running six days in all, maximum height reached 8 feet. Judging from volume of water in river, heavy rain must have fallen further north. Rainfall: 2·62 inches on ten days.—S. Whitwham.

Elsenburg (Stellenbosch).—The rainfall, 0·95 inch in six days, has been fair, though not quite up to the average (1·23 inch). The south-easterly winds were strong during the first fortnight of the month, and tended to accentuate the damage done during the previous month and September. Rainfall: 0·95 inch on six days.—D. C. Crawford.

Dunbrody.—Cold weather for this time of year. Rainfall: 3·84 inches on eleven days.—Rev. Father Lallemand.

Riversdale.—The harvest below middling; the rain came, in most cases, too late. Rainfall: 2·22 inches on eleven days.—Rev. Carl Prozesky.

Darling.—Nothing special to report—rather cool and changeable; a good harvest, reaped under quite favourable conditions. Rainfall: 0·37 inch on five days.—P. H. Drake.

Ceres.—Weather generally unseasonable and cooler than last month. Lots of dew. Rainfall: 0·81 inch on four days.—A. Heatlie.

Sydney-on-Vaal (Barkly West).—Just sufficient rain to start grass in sandy veld and bushes coming into leaf on kopjes. Drought not absolutely broken, much more rain badly needed here. Rainfall: 1·17 inch on seven days.—J. G. Richards.

Clanwilliam.—There was no feature this month calling for special reference, except perhaps that the south-south-westerly wind blew fairly strong on several afternoons during the month. Rainfall: 0·23 inch on five days.—P. E. Scholtz.

Tussenbeide (Caledon).—An abundant rainfall for this month, doing much damage to crops and gardens; rust also prevalent. Rainfall: 6·09 inches on six days.—S. de Wet.

Vineyard (Albert).—Crops moderate; rain came too late. Stock looking very well. Rainfall: 4·12 inches on nine days.—C. J. Haar.

Contest, Bolotwa (Queenstown).—Drought was very serious, dry land crops entirely burned up beyond recovery. Showers in early part of month started grass but it was dried up again by the 19th as bad as ever. Grand rains from the 19th onwards, every prospect of a good mealie crop. Rains came in good time for ploughing. Veld coming on very nicely. Rainfall: 5·21 inches on thirteen days.—I. A. Spence.

Lauriston (Barkly East).—We had a perfect washout on the 21st (4·75 inches). The rivers overflowed their banks and carried away miles of fencing. Several dams burst. Thunder and lightning was terrific. I have been farming here for over forty years, and it was the most violent storm that I have experienced. Great damage was done to crops. Rainfall: 0·95 inch on fifteen days.—H. R. Giddy.

Basutoland.

Leribe.—Crops were looking fine till 28th, when heavy hail came and destroyed nearly all the crops, but I believe they will revive again. The thunderstorms this year were not so severe as those of last year. Rainfall: 5·81 inches on sixteen days.—J. Ramonster.

Mafeteng.—Splendid rains fell during the month, totalling 6·05 inches on thirteen days. Thunderstorms prevalent, but no hail worth mentioning. Almost continuous rains from 18th to 23rd. Country looking beautiful. Veld growing well, and stock improving rapidly. There will be a partial wheat crop. Hot days and cool nights throughout the month.—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 inches 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

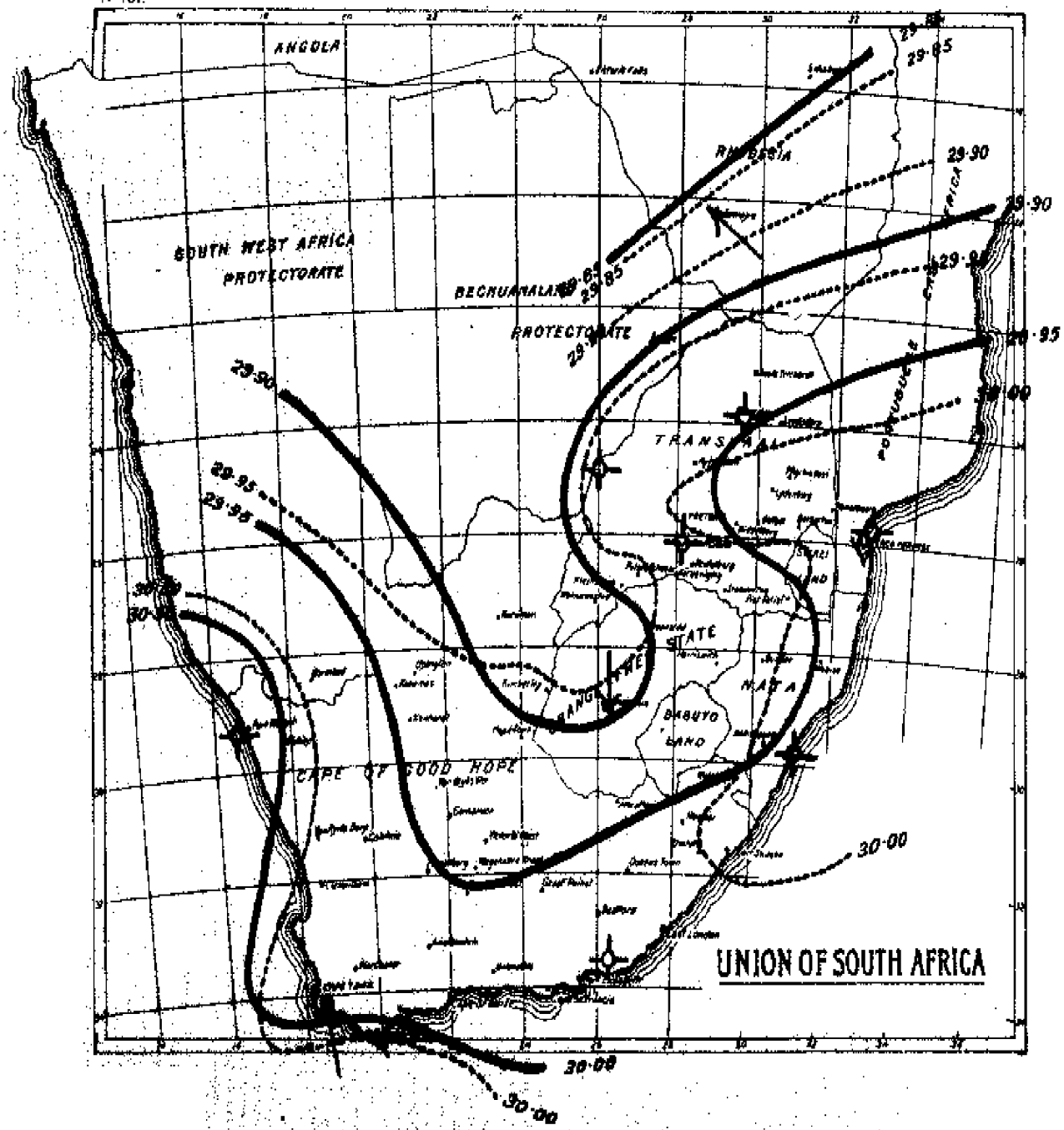
south-south-west, south-west, and west-south-west are collectively more numerous than those from the north-north-east, north-east, and east-north-easterly directions; whilst over the Cape Peninsula south continues to be the prevalent wind-direction. Compared with December, there is at Johannesburg a 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 in the south-east of the Cape about 48 per cent. of the total possible hours of bright sunshine should be enjoyed.

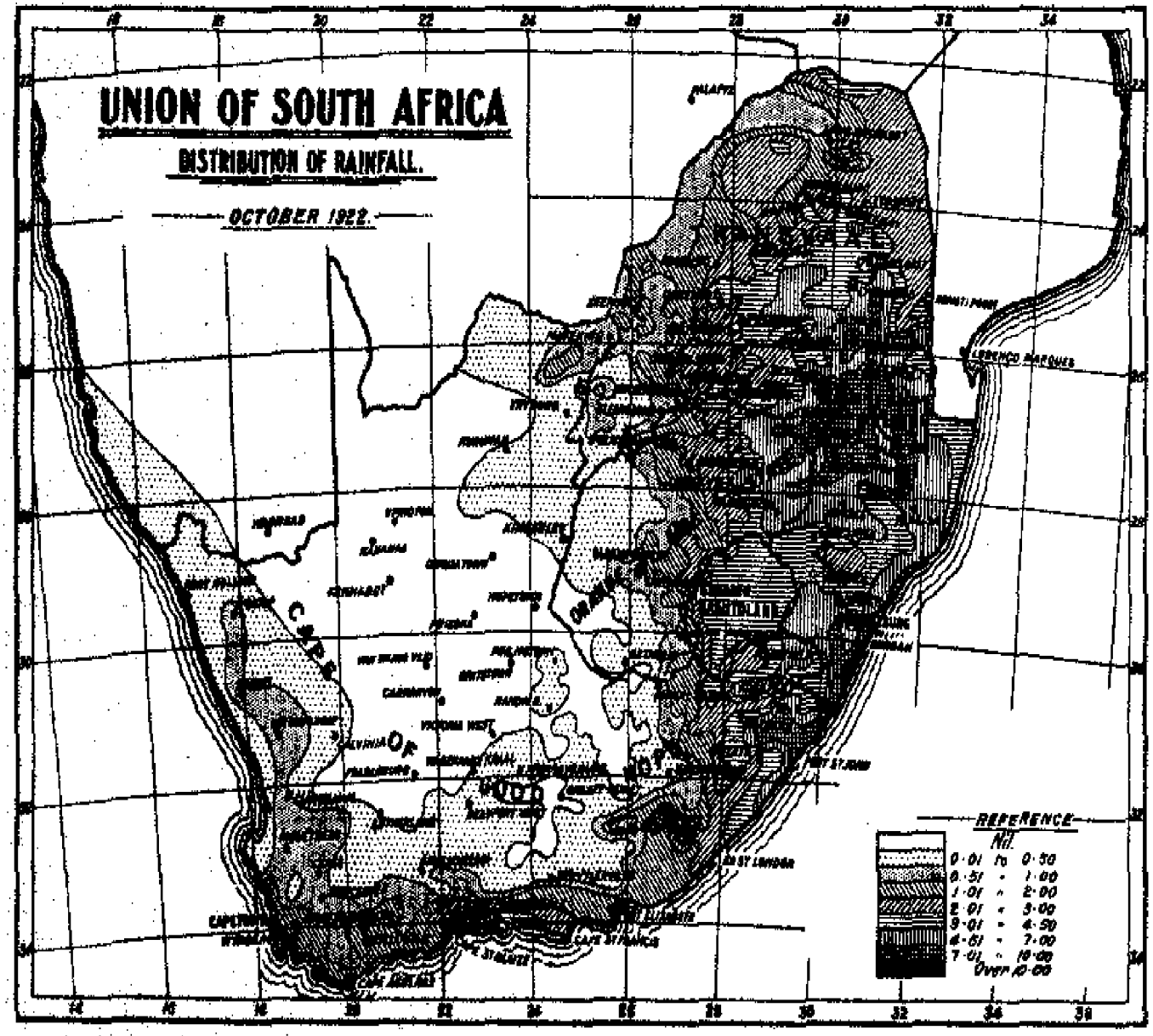
C. STEWART,
Chief Meteorologist.

Pretoria.

N°101.



November, 1902. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for November.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
OCTOBER 1922.
REFERENCE
Nil.
0·01 to 0·50
0·51 " 1·00
1·01 " 2·00
2·01 " 3·00
3·01 " 4·50
4·51 " 7·00
7·01 " 10·00
Over 10·00

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), NOVEMBER, 1922.

Station.	Observer.	Month—Nov., 1922.		Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes.			
		Mean Max.	Mean Min.				Highest.	Date.	Lowest.	Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Transvaal—										
Barberton	Walter Grubb	81·7	60·8	71·2	69·8	+ 1·4	93·0	19th	53·0	1st.
Belfast	The Forester	72·5	46·9	59·7	60·2	− 0·5	82·0	17th	33·0	6th.
Bloemhof	A. Adamson	86·2	58·8	72·2	70·4	+ 1·8	98·0	18th	50·0	26th.
Brits	The Forester	74·0	50·7	62·4	62·2	+ 0·2	84·0	17th	42·0	25th and 27th.
Johannesburg (Observatory)	The Staff	73·0	52·6	62·8	63·0	− 0·2	81·2	10th	44·5	25th.
Klerksdorp (Strathmore)	Chas. Scott	84·5	57·1	70·8	70·8	± 0·0	94·0	11th and 17th	47·0	8th.
Komatipoort	B. J. Fothergill	91·0	67·4	79·2	76·9	+ 2·3	107·5	23rd	58·0	25th.
Louis Trichardt	*I. J. de Bruin*	*83·3*	*57·6*	*70·4*	*69·0*	+ 1·4	*96·0*	*17th*	*48·0*	*10th.*
Middelburg	Dr. H. A. Spencer	78·1	53·3	65·7	65·8	− 0·1	89·0	14th	43·0	7th.
Nylstroom	G. Bakker	82·9	57·4	70·2	69·9	+ 0·3	91·5	17th and 20th	47·0	8th.
Pietersburg	W. J. Franklyne	80·1	58·3	69·2	68·5	+ 0·7	93·0	17th	52·0	7th.
Piet Retief	J. Werner	74·7	56·1	65·4	64·1	+ 1·3	89·1	19th	46·0	26th.
Pigeonhole (New Agatha)	Jno. McCallum	74·3	58·0	66·2	—	—	85·0	17th	51·0	26th.
Pilgrims Rest	R. M. Skea	77·4	55·4	66·4	65·9	+ 0·5	88·5	23rd	47·0	7th.
Potchefstroom (Exp. Farm)	The Manager	83·3	56·0	69·6	67·5	+ 2·1	94·7	10th	44·3	8th.
Pretoria (Meteorological Office)	The Staff	78·6	57·1	67·8	69·2	− 1·4	86·6	11th	45·1	6th.
Standerton	The Town Clerk	76·2	52·6	64·4	64·2	+ 0·2	87·8	11th	41·3	8th.
Zeerust	H. Dietrich	84·6	59·8	72·2	72·0	+ 0·2	93·5	20th	48·6	6th.
Swaziland—										
Mbabane	Swaziland Police	76·8	56·1	66·4	64·6	+ 1·8	89·0	3rd	46·0	25th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	78·7	53·3	66·0	68·1	− 2·1	95·0	10th and 11th	42·0	24th.
Bloemfontein	G. A. Schepers	79·7	55·4	67·6	67·7	− 0·1	93·7	11th	45·1	7th.
Harrismith	The Forester	69·4	—	—	62·3	—	84·0	19th	—	—
Kroonstad	S. R. Northfield	79·5	55·8	67·6	67·7	− 0·1	92·3	10th	45·2	26th.
Ladybrand	The Forester	75·7	50·7	63·2	63·2	± 0·0	88·0	11th	42·0	7th and 25th.
Lindley	J. Collister-Oates	77·3	52·4	64·8	65·9	− 1·1	89·0	11th	44·0	26th.
Natal—										
Dundee	West Thurrold	77·5	54·3	65·9	69·0	− 3·1	92·0	19th	44·0	6th.
Durban (Point)	The Port Captain	77·3	65·6	71·4	72·8	− 1·4	83·2	22nd and 23rd	57·6	25th.
Estcourt	A. A. McLean	76·6	55·1	65·8	70·4	− 4·6	92·0	19th	47·0	6th.
Hlabisa	The Gaoler	80·2	63·1	71·6	69·6	− 2·0	90·0	19th	56·0	25th and 26th.
Ladysmith	D. A. R. Leathern	83·5	57·5	70·5	73·4	− 2·9	101·0	19th	48·0	6th.
Maritzburg (Mental Hospital)	The Staff	78·2	59·0	68·6	69·1	− 0·5	91·0	19th	52·0	25th.
Richmond	C. C. Foss	80·7	64·2	72·4	71·4	+ 1·0	94·2	19th	56·0	25th.
Weenen	The Gaoler	89·7	55·9	72·8	73·6	− 0·8	100·0	19th	43·6	1st.

AIR TEMPERATURES, NOVEMBER, 1922—(*continued*).

Station.	Observer.	Month—Nov., 1922. Mean Max.	Month—Nov., 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Cape—										
Alfred North	Alex. Alcock	78·0	51·4	64·7	65·4	− 0·7	93·0	11th	42·5	7th.
Bedford	T. C. Hall	72·0	52·1	62·1	63·0	− 0·9	97·0	18th	42·0	25th.
Capetown (Royal Observatory)	The Staff	74·6	56·0	65·3	64·2	+ 1·1	93·4	27th	48·0	14th.
Carnarvon	A. P. Malherbe	79·5	49·5	64·6	67·6	− 3·0	92·0	18th	38·0	24th.
Clanwilliam	P. E. Scholtz	79·2	51·8	65·2	69·4	− 4·2	98·5	27th	42·5	24th.
East London	The Port Captain	71·9	60·0	66·0	65·8	+ 0·2	79·0	10th and 17th	52·0	26th.
Graaff-Reinet	S. N. D. Treadwell	78·5	55·7	67·1	67·1	± 0·0	99·2	18th	42·3	24th and 25th.
Grahamstown	The Vet. Res. Officer	72·2	52·0	62·1	64·1	− 2·0	94·0	18th	38·6	25th.
Great Drakenstein	Lionel Baker	76·4	53·7	65·0	64·4	+ 0·6	99·0	27th	45·0	30th.
Kenhardt	R. Seydell	88·3	56·1	72·2	71·4	+ 0·8	99·0	22nd	46·0	24th.
Kimberley	Jno. Acton	85·1	57·8	71·4	73·2	− 1·8	98·0	18th	42·0	14th.
Kingwilliamstown	L. Clayton	73·1	56·0	64·6	67·8	− 3·2	92·0	18th	47·0	25th.
Kokstad	H. D. Coyte	71·8	50·4	61·1	63·5	− 2·4	88·0	19th	41·2	24th.
Malakia (Convent)	The Mother Superior	86·6	59·9	73·2	72·6	+ 0·6	96·0	17th	45·0	6th.
Mossel Bay (Cape St. Blaise)	The Lightkeeper	69·1	58·4	63·8	64·8	− 1·0	76·0	2nd	50·0	24th.
Murraysburg	W. H. Rose Innes	78·4	44·2	61·3	65·1	− 3·8	93·0	18th	31·0	25th.
O'okiep	J. Burrows	75·0	49·3	62·2	64·2	− 2·0	93·0	27th	40·2	24th.
Port Elizabeth	The Lightkeeper	68·7	58·9	63·9	65·1	− 1·3	79·0	13th	52·0	24th.
Port Nolloth	The Lightkeeper	67·1	50·8	59·0	58·0	+ 1·0	92·0	25th	44·0	30th.
Port St. Johns (Cape Hermes)	The Lightkeeper	73·9	63·3	68·6	68·7	− 0·1	79·0	3rd and 13th	56·0	24th and 25th.
Queenstown	H. Holley	77·5	53·9	65·7	66·8	− 1·1	94·0	18th	42·0	24th.
Somerset East	C. Harris	72·4	52·0	62·2	66·4	− 4·2	91·0	18th	41·4	25th.
Stutterheim	F. C. Hounfield	72·3	53·5	62·9	63·8	− 0·9	92·3	18th	43·2	25th.
Sydney's Hope	Rev. S. Rippon	68·7	53·3	61·0	62·2	− 1·2	90·2	17th	45·2	3rd and 23rd.
Uitenhage	H. Inggs	78·9	56·9	65·4	66·0	− 0·6	90·2	18th	43·0	25th.
Umtata	Miss N. Dix Peck	74·5	50·4	65·4	66·5	− 1·1	93·0	18th	46·5	24th.
Vryburg	H. W. Collen	87·3	57·8	72·6	71·2	+ 1·4	97·0	18th	47·0	30th.
Wynberg (Convent)	The Mother Superior	73·6	55·5	64·6	62·2	+ 2·4	92·8	27th	48·8	15th.
Basutoland—										
Maseteng	F. Hodgson	78·9	51·7	62·8	65·3	− 2·5	88·0	11th	42·0	7th.

RAINFALL, NOVEMBER, 1922.

Station.	Observer.	Month. Nov., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	5·36	3·67	+ 1·69	25·73	29·18	− 3·45	11·45	8·24	+ 3·21
Bethal	H. Joubert	7·38	5·35	+ 2·03	30·88	24·87	+ 6·01	14·88	10·00	+ 4·88
Belfast	*The Forester*	7·54	4·19	+ 3·35	35·66	26·06	+ 9·60	16·26	8·91	+ 7·35
Bloemhof	A. Adamson	1·86	1·79	+ 0·07	8·87	16·79	− 7·92	2·70	4·29	− 1·59
Claremont	S.A. Police	1·97	2·21	− 0·24	10·36	14·89	− 4·53	5·18	3·92	+ 1·26
Ermelo	The Forester	5·92	4·79	+ 1·13	30·10	24·22	+ 5·88	16·93	9·42	+ 7·51
Haenertsburg	S.A. Police	4·78	3·40	+ 1·38	22·73	35·11	−12·38	9·70	8·42	+ 1·28
Heidelberg	W. A. ter Horst	6·56	4·68	+ 1·88	22·88	23·59	− 0·71	11·09	8·77	+ 2·32
Johannesburg (Observatory)	The Staff	5·22	5·05	+ 0·17	22·79	25·91	− 3·12	10·29	9·56	+ 0·73
Klerksdorp (Strathmore)	C. Scott	2·48	2·41	+ 0·07	13·00	18·83	− 5·83	4·68	5·06	− 0·38
Komatipoort	D. J. Fothergill	7·38	2·54	+ 4·84	24·64	22·47	+ 2·17	11·71	5·48	+ 6·23
Louis Trichardt	*I. J. de Bruin*	3·41	3·04	+ 0·37	12·10	26·36	−14·26	6·09	7·06	− 0·97
Middelburg	Dr. H. A. Spencer	7·71	5·29	+ 2·42	30·35	24·08	+ 6·27	14·85	8·96	+ 5·89
Nylstroom	G. Bakker	2·80	2·98	− 0·18	17·22	20·11	− 2·89	8·55	6·14	+ 2·41
Pietersburg	W. J. Frankleyne	3·56	2·59	+ 0·97	14·95	17·44	− 2·49	7·83	5·27	+ 2·56
Piet Retief	J. Werner	6·63	4·06	+ 2·57	29·22	25·62	+ 3·60	17·83	10·21	+ 7·62
Pilgrims Rest	E. M. Skea	7·23	4·11	+ 3·13	30·28	34·62	− 4·34	12·36	8·19	+ 4·17
Pigeonhole (New Agatha)	J. McCallum	4·88	3·47	+ 1·41	24·77	27·92	− 3·15	11·43	8·43	+ 3·00
Potchefstroom (Exp. Farm)	The Manager	4·03	3·11	+ 0·92	19·56	19·43	+ 0·13	10·35	6·44	+ 3·91
Pretoria (Meteorological Office)	The Staff	7·31	4·68	+ 2·63	25·52	25·50	+ 0·02	15·10	8·44	+ 6·66
Roodberg	M. Baumann	3·54	3·99	− 0·45	19·15	20·74	− 1·59	8·78	6·80	+ 1·98
Rustenburg	A. Streatfield	2·98	2·88	+ 0·10	17·02	21·58	− 4·56	6·57	6·67	− 0·10
Standerton	The Town Clerk	6·51	5·12	+ 1·39	—	25·63	—	16·19	10·20	+ 5·99
Wakkerstroom	—	—	—	—	—	—	—	—	—	—
Woodbush	*The Forester*	5·08	5·69	− 0·61	29·77	60·71	−30·94	12·43	13·83	− 1·40
Zeerust	H. Dietrich	2·26	3·35	− 1·09	12·98	20·81	− 7·83	5·15	5·84	− 0·69
Swaziland—										
Mbabane	Swaziland Police	7·33	6·53	+ 0·80	40·89	42·67	− 1·78	22·27	13·91	+ 8·36
Orange Free State—										
Bethulie	J. J. Wardhaugh	4·18	1·29	+ 2·89	10·22	16·06	− 5·84	6·75	4·10	+ 2·65
Bloemfontein	G. A. Schepers	3·56	1·75	+ 1·81	10·33	16·49	− 6·16	4·43	4·90	− 0·47
Boshof	*P. H. v. Rooyen*	3·46	2·10	+ 1·36	8·76	17·43	− 8·67	3·88	5·34	− 1·46
Harrismith	The Forester	8·55	3·86	+ 4·69	28·86	23·97	+ 4·89	17·00	8·91	+ 8·09
Kroonstad	S. R. Northfield	4·94	3·11	+ 1·83	17·29	18·33	− 1·04	9·74	7·65	+ 2·09
Ladybrand	The Forester	4·37	3·57	+ 0·80	17·17	24·00	− 6·83	8·13	8·64	− 0·51
Lindley	J. Collister-Oates	5·93	2·97	+ 2·96	20·83	20·73	+ 0·10	11·08	6·87	+ 4·21
Natal—										
Dundee	West Thorrold	5·49	3·49	+ 2·00	31·85	26·66	+ 5·19	16·17	8·71	+ 7·46
Durban (Point)	The Port Captain	7·23	4·86	+ 2·37	47·70	36·83	+ 10·87	24·51	14·54	+ 9·97

RAINFALL, NOVEMBER, 1922—(*continued*).

Station.	Observer.	Month. Nov., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Natal—(continued).										
Estcourt	A. A. McLean	3·48	3·15	+ 0·33	21·48	23·29	− 1·81	9·72	7·03	+ 2·69
Hlabisa	The Gaoler	5·38	5·48	− 0·10	27·54	37·06	− 9·52	15·69	14·67	+ 1·02
Howick	The Gaoler	6·12	3·90	+ 2·22	27·66	27·41	+ 0·25	13·41	9·68	+ 3·73
Impetyne	The Forester	—	9·84	—	—	60·64	—	—	29·60	—
Ladysmith	D. A. R. Leathern	5·20	2·53	+ 2·67	28·50	22·90	+ 5·60	12·96	6·83	+ 6·13
Maritzburg (Mental Hospital)	The Staff	8·98	4·08	+ 4·90	28·56	28·76	− 0·20	16·62	10·10	+ 6·52
Stanger	Cecil C. Foss	4·83	5·46	− 0·63	32·30	36·06	− 3·76	16·10	15·96	+ 0·14
Vryheid	The Gaoler	7·41	4·26	+ 3·15	30·90	30·85	+ 0·05	15·59	10·95	+ 4·64
Weenen	The Gaoler	4·26	3·44	+ 0·82	21·65	22·39	− 0·74	8·42	7·60	+ 0·82
Cape—										
Aliwal North	A. Alcock	6·04	1·85	+ 4·19	14·81	18·52	− 3·71	9·58	5·40	+ 4·18
Beaufort West	The Gaoler	1·21	0·74	+ 0·47	6·78	8·58	− 1·80	2·73	2·65	+ 0·08
Bedford	T. C. Hall	7·98	2·89	+ 5·09	30·27	25·05	+ 5·22	14·20	9·32	+ 4·88
Britstown	The Gaoler	0·51	0·78	− 0·27	2·43	10·41	− 7·98	0·97	2·43	− 1·46
Calvinia	The Gaoler	0·72	0·40	+ 0·32	8·46	7·52	+ 0·94	4·51	3·23	+ 1·28
Capetown (Royal Observatory)	The Staff	0·44	1·07	− 0·63	18·95	24·68	− 5·73	8·84	12·03	− 3·19
Ceres	A. Heatlie	0·81	1·86	− 1·05	35·34	39·88	− 4·54	13·06	21·46	− 8·40
Carnarvon	A. H. Malherbe	0·76	0·52	+ 0·24	1·18	7·54	− 6·36	0·90	1·77	− 0·87
Clanwilliam	P. E. Scholtz	0·23	0·39	− 0·16	8·07	8·41	− 0·34	3·09	4·18	− 1·09
East London	A. Downie	17·43	3·11	+14·32	40·38	30·04	+10·34	25·39	13·25	+12·14
French Hoek (Driefontein)	The Forester	2·09	2·39	− 0·30	54·18	70·90	−16·72	24·02	31·54	− 7·52
Fraserburg	The Gaoler	—	0·42	—	—	6·27	—	—	1·69	—
Grahamstown	Vet. Res. Officer	11·51	3·10	+ 8·41	23·39	26·22	− 2·83	19·31	11·55	+ 7·76
Garles	The Gaoler	0·30	0·23	+ 0·07	5·60	5·08	+ 0·52	3·39	2·63	+ 0·76
Graaff-Reinet	S. E. D. Treadwell	2·52	1·24	+ 1·28	9·98	12·57	− 2·59	5·30	4·53	+ 0·77
Groot Drakenstein	Lionel Baker	0·95	1·66	− 0·70	34·31	34·63	− 0·32	12·67	17·72	− 5·05
Griquatown	The Gaoler	1·18	0·84	+ 0·34	2·94	11·77	− 8·83	1·52	2·26	− 0·74
Hanover	The Gaoler	3·27	1·01	+ 2·26	6·03	12·15	− 6·12	3·84	3·07	+ 0·77
Hopetown	The Gaoler	1·69	1·11	+ 0·58	4·46	11·66	− 7·20	2·30	2·81	− 0·51
Kenhardt	R. Seydell	0·05	0·26	− 0·21	1·00	5·23	− 4·23	0·25	1·10	− 0·85
Kimberley	J. Acton	2·94	1·53	+ 1·41	6·40	14·18	− 7·78	3·39	3·65	− 0·26
Knysna	The Gaoler	3·82	2·38	+ 1·44	33·45	26·40	+ 7·05	15·75	13·10	+ 2·65
Kokstad	H. D. Coyte	5·39	3·39	+ 2·00	26·24	23·00	+ 3·24	10·75	7·62	+ 3·13
Kingwilliamstown	L. Clayton	10·44	2·53	+ 7·91	26·64	22·53	+ 4·11	16·84	9·02	+ 7·82
Kuruman (Abtonia)	A. T. Sitwell	0·41	1·42	− 1·01	4·01	14·17	−10·16	0·51	2·85	− 2·34
Mafeking (Convent)	The Mother Superior	1·77	2·36	− 0·59	9·56	18·11	− 8·55	3·77	4·92	− 1·15
Mossel Bay (Cape St. Blaize)	The Lightkeeper	3·15	1·14	+ 2·01	13·78	15·99	− 2·21	6·20	7·24	− 1·04
Murraysburg	W. H. Rose Innes	0·52	0·80	− 0·38	3·80	10·13	− 6·33	1·44	2·79	− 1·35
O'okiep	J. Burrows	0·13	0·23	− 0·10	4·97	6·94	− 1·97	3·66	3·17	+ 0·49
Phillipstown	The Gaoler	1·21	1·17	+ 0·04	4·56	12·42	− 7·86	1·91	3·18	− 1·27

RAINFALL, NOVEMBER, 1922—(*continued*).

Station.	Observer.	Month. Nov., 1922.	Normal.	Difference from Normal.	From 1st Jan., 1922.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cape—(continued).										
Piquetberg	The Gaoler	0·45	1·01	− 0·56	18·33	20·04	− 1·71	6·90	10·70	− 3·80
Port Elizabeth	The Lightkeeper	5·74	2·07	+ 3·67	20·29	20·55	− 0·26	11·46	10·69	+ 0·77
Port St. Johns (Cape Hermes)	The Lightkeeper	5·05	5·21	− 0·16	39·62	42·84	− 3·22	21·84	18·44	+ 3·40
Port Nolloth	The Lightkeeper	0·01	0·02	− 0·01	2·39	2·12	+ 0·27	1·49	1·02	+ 0·47
Prieska	The Gaoler	0·95	0·64	+ 0·31	2·30	8·94	− 6·64	1·36	1·71	− 0·35
Queenstown	H. Holley	6·38	2·04	+ 4·34	17·91	18·56	− 0·65	9·60	5·76	+ 3·84
Steytlerville	The Gaoler	1·96	0·86	+ 1·10	9·71	8·42	+ 1·29	3·66	3·02	+ 0·64
Sutherland	The Gaoler	0·59	0·46	+ 0·13	6·43	8·80	− 2·37	2·58	3·44	− 0·86
Swellendam	The Gaoler	5·08	2·58	+ 2·50	31·96	29·58	+ 2·38	12·40	13·15	− 0·75
Sydney's Hope	Rev. S. Rippon	6·17	2·43	+ 3·74	27·73	20·77	+ 6·96	12·92	9·05	+ 3·87
Somerset East	C. Harris	7·80	2·31	+ 5·49	28·20	20·98	+ 7·22	14·46	7·99	+ 6·47
Stutterheim	F. C. Bousfield	9·39	3·02	+ 6·37	31·22	25·99	+ 5·23	16·68	9·50	+ 7·18
Uitenhage	H. Inggs	6·17	1·38	+ 4·79	22·54	15·82	+ 6·72	12·84	7·41	+ 5·43
Umtata	Miss N. Dix Peck	5·35	2·53	+ 2·82	24·70	22·76	+ 1·94	13·12	8·10	+ 5·02
Umtondale	The Gaoler	1·62	1·07	+ 0·55	12·88	12·82	+ 0·01	5·06	5·95	− 0·89
Uniondale	The Gaoler	0·37	0·47	− 0·10	1·42	6·40	− 4·98	0·40	1·37	− 0·97
Victoria West	The Gaoler	0·43	0·58	− 0·15	3·45	9·25	− 5·80	0·76	2·24	− 1·54
Vryburg	H. Collens	1·33	1·44	− 0·11	6·46	17·00	−10·54	1·52	3·17	− 1·65
Worcester	The Gaoler	0·10	0·54	− 0·44	9·86	12·26	− 2·40	3·44	6·36	− 2·92
Wynberg (Convent)	The Mother Superior	0·49	1·77	− 1·28	34·18	45·72	−11·54	15·18	24·96	− 9·78
Basutoland—										
Maseteng	F. Hodgson	6·05	2·74	+ 3·31	18·60	27·01	− 8·41	9·70	7·65	+ 2·05
South-West Africa—										
Tsumeb	Ing. Schetter	2·04	1·87	+ 0·17	11·61	19·79	− 8·18	5·22	3·01	+ 2·21
Waterberg	D. Hahn	0·72	1·45	− 0·73	9·22	16·90	− 7·68	1·97	1·94	+ 0·03
Omaruru	The Postmaster	0·09	0·52	− 0·43	7·23	10·14	− 2·91	0·97	0·88	− 0·09
Usakos	Rev. Diehl	0·04	0·16	− 0·12	0·90	4·57	− 3·67	0·42	0·33	+ 0·09
Daweberbrook	I. Matthiessen	0·44	0·73	− 0·26	8·97	11·27	− 2·30	0·61	1·19	− 0·58
Gobabis	Rev. Irbe	0·44	1·19	− 0·75	4·59	13·65	− 9·06	0·60	1·85	− 0·25
Gr. Witvley	B. Rueckert	0·37	0·97	− 0·60	3·97	12·85	− 8·88	0·37	1·63	− 0·26
Windhoek	Observatory	1·77	0·81	+ 0·36	7·32	12·30	− 4·98	1·92	1·37	+ 0·55
Maltahoehe	R. Just	—	0·30	− 0·30	1·94	5·71	− 3·77	0·45	0·51	− 0·06
Voigtsgrund	A. Voigts	0·00	0·37	− 0·37	2·97	5·33	− 2·36	1·02	0·75	+ 0·27
Gibeon	Rev. Spellmeyer	0·02	0·51	− 0·49	3·18	5·63	− 2·45	0·04	0·85	− 0·21
Bethany	Rev. Peter	0·00	0·18	− 0·18	1·96	3·84	− 1·88	0·02	0·46	− 0·44
Aus	F. Erni	0·00	0·10	− 0·10	4·43	4·18	+ 0·25	1·86	1·14	+ 0·72
Keetmanshoop	Rev. Father Eder	0·00	0·37	− 0·37	0·67	4·10	− 3·45	0·00	0·58	− 0·58

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

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MEAN barometric pressure above normal over the whole of the country; monthly temperature in excess of the average, except over the greater portions of Natal, the east of the Free State, and in Basutoland, portions of the east and south-west of the Cape, the south of the northern Karroo, the west of Namaqualand; precipitation greater than usual, and mostly well distributed in the south of the Transvaal, the north of the Free State, the inland portions of Natal, and a few stations in Bechuanaland, the northern border and the east of the southern Karroo; droughty conditions elsewhere, relieved occasionally by highly localized showers; some destructive hailstorms in the south-eastern Transvaal, Natal, and the east of the Cape Province, and portions of the west-central Karroo; occasional severe thunderstorms, causing several fatalities to man and beast; frequent duststorms in the south of the Cape and in Bechuanaland. Such were the outstanding features of the weather of December, 1922.

Pressure.—The mean atmospheric pressure during December was above normal by slightly more than half a tenth of an inch all over the Union. The equatorial depression although not so strongly developed as usual, was present during the greater part of the month, and even occasionally extended to the south and south-east coasts. High pressure areas were present on twenty days of the month, and lay as follows: Over the west and south-west on the 1st, 2nd, 6th, 10th, 14th, 21st, 24th, to 26th; over the south on the 4th, 11th, 15th, and 20th; over the south-east and west on the 3rd, 5th, 6th, 16th, 22nd, 23rd, and 27th.

Temperature.—The mean temperature during December was 70·7 degrees (or 0·7 degrees above normal), the excess being equally divided between the days with a mean of 82·9 degrees and the nights with 58·5 degrees. An excess in the temperature of the month was common to the Transvaal and Cape Provinces, whilst the other two Provinces showed a mean lower than usual. The larger excess was shown by the Transvaal, where the mean for the month

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was 71·8 degrees, or 1·8 degree higher than usual. This surplus temperature was due to the mean maximum (84·0 degrees) being 2·0 degrees, and the mean minimum (59·5 degrees) being 1·6 degrees above the corresponding averages. In the Cape Province the month's mean (69·6 degrees) was 0·6 degree above normal, the mean day temperature (81·7 degrees) and the mean night temperature (57·6 degrees), being 0·9 degree and 0·4 degree respectively above the corresponding averages. In the Transvaal the mean maximum temperature (84·0 degrees) and the mean minimum (59·5 degrees), were higher than usual by 2·0 degrees and 1·6 degree respectively, causing the mean for the month (71·8 degrees) to be 1·8 degree higher than the normal. In the Orange Free State the mean day temperature (82·5 degrees) was only a tenth of a degree higher, whilst the mean night temperature (54·9 degrees) was half a degree lower than usual, thus producing a mean of 68·7 degrees, or 0·2 degree less than the average. In Natal a different state of affairs occurred, the mean day temperature, 84·4 degrees, being 2·1 degrees lower, and the mean night temperature (61·9 degrees) being 0·7 degree higher than usual, the mean temperature of the month (73·2 degrees) thus falling 0·7 degree below the normal value. Taking the stations separately, it is found that the mean temperature for the month was below the normal in the east of the Free State, the interior, and the southern portion of the coast of Natal, portion of the Transkei, and of the south-east of the Cape, the east of the east-central Karroo, and the south of the northern Karroo, part of the south-west Cape, and the coast of Namaqualand. The deficits were commonly 1 degree or less, but increased to 2–3 degrees in the higher portions of Natal, 3·4 degrees at Grahamstown in the south-east of the Cape, being greatest (4·4 degrees), however, at Harrismith in the north-east of the Free State. Elsewhere the temperature of the month was higher than usual, generally by 1–2 degrees, but by more than 3 degrees at Potchefstroom in the Transvaal, Hlabisa in Zululand, and Queenstown in the north-east of the Cape. The largest excess, however, was 4·3 degrees at Bloemhof in the south-west Transvaal. At Pretoria and Kroonstad the month's temperature was normal. Both days and nights were lower than usual in the more inland and higher portions of Natal, and the north-east of the Orange Free State, a few stations in the south-east of the Cape, and at Port Nolloth. On the other hand, both days and nights were, with a few exceptions, warmer than usual in the Transvaal, Swaziland, Zululand, and the greater portion of the Cape Province and the Free State. In the Transvaal, however, Piet Retief and Pretoria had mean maxima below the average by 0·6 degree and 1·8 degree respectively, whilst the night temperatures were 2·2 degrees and 1·8 degrees respectively above the corresponding normals. Again, at Louis Trichardt, in the north, and Klerksdorp in the south-west of the Transvaal, the days were 3·2 degrees and 0·9 degree warmer, whilst the nights were 0·4 degree and 0·3 degree cooler than usual. At Kroonstad, in the Orange Free State, both days and nights were normal. At Stanger, Pietermaritzburg, Durban, and Estcourt, in Natal, the mean maxima were lower than usual by amounts varying from 0·8 degree at the last-mentioned station to 3·2 degrees at Pietermaritzburg. The mean minima at these stations were lower than the corresponding averages by about 1½ degrees, but at Estcourt the night temperatures were normal. Over the eastern portion of the Cape Province a diversity of conditions obtained, thus at Kokstad, Queenstown, and Stutterheim both the mean maximum and the mean minimum temperatures were above the average, whilst at Grahamstown, Bedford, and Somerset East, both a diametrically opposite state of affairs was experienced, both days and nights being colder than usual. Again, at Aliwal North, Umtata, Port Elizabeth, and Murraysburg (also at Groot Drakenstein in the south-west), the days were warmer and the nights colder, whereas the reverse held at Port St. Johns, Uitenhage, and Sydney's Hope.

the mean maxima being lower and the minima higher than the correspondnig averages. The similar conditions to the last prevailed at Mafeking in Bechuanaland, Mafeteng in Basutoland, and at Ladybrand in the Orange Free State. The greatest excess of the mean maximum over the average was 5·9 degrees at Queenstown, and the least, 0·1 degree, at Kimberley; whilst the largest deficit was 6·7 degrees at Mafeteng, and the smallest at Graaff-Reinet, Mafeking, and Port Nolloth. The shortage in the mean minimum temperature was greatest, 5·2 degrees, at Harrismith, and least, 0·1 degree, at Port Elizabeth, whilst the excess ranged from 4·6 degrees at Hlabisa in Zululand to 0·1 degree at Johannesburg. The mean warmest station during the month was Komatipoort, with 81·6 degrees, and the coolest Port Nolloth with 58·0 degrees, a difference of 23·6 degrees. The highest mean maximum was 96·4 degrees at Kenhardt (Cape), and the lowest mean minimum 46·6 degrees at Harrismith (Orange Free State). The highest temperatures were registered on eighteen days of the month, viz., 4th to 14th, 16th to 18th, 25th, 27th, 28th, and 31st, principally on the 5th, 7th, 8th, 12th, and 13th. The coolest spells were limited to eleven days—1st to 4th, 6th, 9th, 10th, 22nd, 23rd, 26th, and 27th, the lowest temperatures being most widely recorded on the first three days of the month. Temperatures of 100 degrees or over occurred at several stations in Natal, at Kenhardt, and Kimberley in the Cape Province, and at Komatipoort (Transvaal), where the extreme for the month (viz. 109·0 degrees) was recorded on the 13th, the next highest temperature being 107·0 degrees at Weenen (Natal) on the 12th; the maximum ranged as low as 78 degrees at Port Nolloth, on the 27th. The extreme minima varied between 60·2 degrees at Durban on the 3rd and 37·8 degrees at Murraysburg on the same date. There was, therefore, an extreme range of 71·2 degrees over the Union during the month. No frost was reported.

Precipitation during the month was in excess over limited areas in the Transvaal, Natal, Free State, and isolated portions of the Cape and of South-West Africa. In the Transvaal, *plus* quantities were recorded over part of the high veld, from Middelburg westward through Johannesburg and Heidelberg to Klerksdorp, and southward through Bethal and Ermelo to Piet Retief in the eastern middle veld. Surplus amounts were also met with at Nylstroom and Rooiberg in the low veld. Another area of excess precipitation included the north and north-east of the Free State, and a considerable portion of the more elevated parts of Natal. The excesses were commonly between 2–3 inches in the Transvaal, but decreased to less than half an inch in the central portions of the high veld, being only 0·16 inch at Johannesburg, but rising to 3·50 inches at Piet Retief. In the Free State there was a surplus of 0·92 inch at Harrismith, and of 2–6 inches at Kroonstad, whilst in Natal the excess mostly exceeded 1 inch, but varied from 0·34 inch at Weenen to 8·90 inches at Vryheid. In the Cape Province a small excess occurred at Steytlerville in the east central Karroo, and at Kenhardt in the northern Border, whilst at Mafeking in Bechuanaland the surplus rose to 1·07 inch. In South-West Africa the rainfall for the month was above normal by less than 1 inch at Windhoek and Duesternbrook, that is to say, in the neighbourhood of the 22nd and 23rd parallels and the 17th degree of longitude. Elsewhere the total precipitation was below the average, whilst absolute drought continued throughout the month at a number of stations in the south of the Free State, parts of the northern Border of the south-west of the northern Karroo, the west-central Karroo, the greater part of the southern Karroo, of the west coast, the south-west, and even in parts of the Cape Peninsula. An entire absence of rainfall during December occurred at Groot Drakenstein in the south-west of the Cape, on only two previous occasions during the last thirty years, viz., in 1893 and 1902, and only four other

occasions in any other month, viz., January of 1915 and 1918 and February of 1895 and 1909. The rains were mostly light, but frequent, and well distributed throughout the month in the Transvaal, Natal, and the Orange Free State. In the Transvaal the number of raindays over the various divisions varied between 20 inches in the Lydenburg and 6 inches in the Bloemhof divisions. Another feature of the month's precipitation was its patchy nature, some areas experiencing heavy and even excessive rains, whilst over adjoining areas the rainfall was light, and barely sufficient for agricultural operations, as in the Standerton and Ladysmith districts; in other areas showers fell in narrow strips over one part of a town or farm, and nothing over the remainder as at Louis Trichardt. These highly localized falls were largely due to the frequent and occasionally severe thunderstorms which were occasionally accompanied by destructive hailstroms, particularly in Natal. Some lightning fatalities to man and beast were reported as having occurred in the neighbourhood of Kokstad and at Mafeking. Precipitation was light and deficient in quantity along the coast, also in the east, north, and south-west of the Transvaal, the west of the Orange Free State, and large portions of the Cape. Orchards and vineyards in the south-west of the Cape were suffering from the drought. This paucity of rainfall in conjunction with great heat, caused excessive evaporation, prevented the subsoil in many places being sufficiently moistured to enable ploughing operations to be carried on, whilst springs were getting low and drinking water getting scarce, as at Willowmore. Food for cattle was wanting in many instances to such an extent that numbers were dying from starvation, in such areas as Pietersburg (Transvaal), Prieska, Barkly West, Beaufort West, and Kenhardt, whilst in other cases, as at Murraysburg in the Cape Province, cattle had to be sent away for pasture. Some good rains about the 15th, 24th, and 30th, served to relieve these conditions to a certain degree in a number of areas. The twelve months' drought at New Years Kraal (Prieska Division) is stated to have been the worst since 1862. A few heavy falls occurred during the month, e.g. at Summerford (Ixopo) on the 18th and 19th, which caused washaways, damage to crops, etc.; a total of 3·55 inches in two-and-a-half hours on the 22nd at Gemsbokfontein (Middelburg, Transvaal Province), caused dams to overflow and roads to be washed out, whilst a fall of 0·79 inch at Addo (Uitenhage) on the 18th sufficed to fill drinking-water tanks. The rivers were reported as unusually low in the south-west of the Cape Province and elsewhere, although after rain on the 15th the Groot Letaba was reported by the observer at La Cotto (Zoutpansberg Division) to have risen 3 feet, but at the end of the month the height of the river had fallen to only 1½ feet above the normal dry weather flow. From Bedford (Cape Province), it is reported that in consequence of an unusually dry December succeeding the heavy rains at the end of November, the ground had become caked to such an extent that young crops were unable to grow, or the late planted mealies to come up.

Hailstorms.—Hailstorms were reported as causing considerable damage, mainly to fruit, but occasionally to other crops and garden produce, at Carolina, Mallow (Waterberg District), Ladysmith, Newcastle, Rongpoort (District Weenen), Ngomi, and Matjeskloof (District Beaufort West).

Duststorms were unusually prevalent for the time of the year at Bloemhof, Holfontein (Kroonstad District), and Mafeking, where, on the 12th and 14th they lasted for thirty minutes and one-and-a-half hours respectively. A house two miles east of Mafeking was burned down during a thunderstorm, and two Europeans last lost their lives. The total precipitation for the year 1922 was above the normal in the south-east of the Transvaal by 6–9 inches, and by 1 inch

at Rooiberg in the west; by a few hundredths of an inch to 1½ inch in the north of the Free State, and by almost 6 inches at Harrismith. In Natal excesses occurred in the higher portions to the west and between Pietermaritzburg and Durban, the surplus varying from 0·03 inch at Estcourt to 8·95 inches at Vryheid. A surplus rainfall extended into the interior of Kaffraria, portions of the south-east, the east central Karroo, and the south coastal area as far as Swellendam, also in the south-west of the northern Karroo. Over the portions of the Cape Province excess ranged from 0·12 inch at Umtata to 7·73 inches at East London. Elsewhere there was a deficient rainfall, varying over the Cape Province from 0·81 inch at Queenstown to 11·67 inches at Kuruman; the deficit over the interior of the Cape was mostly between 4 and 8 inches, decreasing towards the coast, but continuing as high as 6·43 inches at the Royal Observatory, Capetown. Over Natal there was a shortage of from 0·03 inch at Howick to 8·28 inches at Stanger, and reaching 11·59 inches at Hlabisa in Zululand. In the centre, west, east, and south of the Free State there was a deficiency of 7–9 inches. The Transvaal showed a considerable variation in the minus quantities, these being less than 1 inch in the centre, increasing to 2–4 inches in the south-west, and over 8 inches in the west and extreme south-west; in the eastern middle and low veld they varied between 1 and 5 inches, but were generally considerably more, commonly between 10 and 20 inches in the north, and greatest, 34·27 inches, at Woodbush. A serious drought also affected South-West Africa throughout the year, the only excess being one of 0·22 inch at Aus in the south-west; over the rest of the country the totals were subnormal, generally by 2–4 inches, but by 10–12 inches in the more northerly portions of the interior, that is, from a little south of 22 degrees s. latitude. The accumulated rainfal since the 1st July, 1922, when compared with the normals, shows a considerable improvement in the Transvaal, where most stations had a precipitation in excess of the average, except in the north, the west, and Bloemhof district in the extreme south-west, where a continued deficit prevailed. The surplus amounts were usually between 4 and 6 inches over the centre and east, increasing to over 10 inches in the south-east, and decreasing to between 1 and 2 inches in the south-west. In the Woodbush area a deficit of between 2 and 5 inches occurred, and of over 5 inches at Louis Trichardt further north; in the west the minus quantities were about 1 inch, increasing to over 2 inches at Bloemhof. Large excesses of 4–7 inches occurred over the greater part of Natal, where, however, they varied from 1·16 inch at Weenen to 13·54 inches at Vryheid, along the north coast, and in Zululand; however, the rainfall was below normal by 4·38 inches at Stanger and 1·05 inch at Hlabisa. Surplus amounts were registered in the north and south of the Free State, ranging from 1·40 inch at Bethulie to 9·1 inches at Harrismith, over the rest of that Province shortages prevailed mostly between 1 and 2 inches. In the Cape Province the rainfall was higher than usual over Kaffraria, the south-east, the north-east, the south coast as far as Knysna, and the east of the central and southern Karroo, also in the south-west of the northern Karroo, and in the Namaqualand plateau. The surplus amounts in the east were mostly between 2 and 6 inches, but rose to 9·53 inches at East London, and decreased to about three quarters of an inch at Knysna, and a few hundredths at Graaff-Reinet. Over the rest of the Cape Province the rainfall was less than usual, mostly between 1 and 2 inches in the interior, but increasing to 3–6 inches in the south-west; the deficiency was greatest (9·39 inches), at Ceres. In South-West Africa there was mostly a continued deficiency of a quarter to three quarters of an inch in the south and west, but rising to between 2 and 3 inches in the north and north-east. An increase over normal of 1·46 inch was, however, shown at Windhoek, and of 0·69 inch at Aus.

OBSERVERS' NOTES FOR DECEMBER, 1922.

TRANSVAAL.

Standerton.—In the district some portions were constantly having rain in excess, some farmers being unable to carry on their routine work in the lands. In Standerton we have had useful rains only. During the period 21st to the 30th the country was becoming very dry indeed, and the rains on the 30th December to the 1st January (approximately 2 inches) were most beneficial. Rainfall: 2·92 inches on sixteen days.—W. J. Madge.

Pigeonhole (New Agatha).—Very fine growing weather. Good deal of thunder during the month. Rainfall: 5·45 inches on seventeen days.—Jno. McCallum.

Piet Retief.—Very heavy soaking rains throughout the month. Rainfall: 8·50 inches in twenty-two days.—J. Werner.

Pietersburg.—Drought and heat. Crops a failure. Cattle dying from starvation in several parts of district. Rainfall: 2·39 inches on six days.—W. J. Frankleyne.

Middelburg.—This has been an unusually wet month, with fine intervals, only two days having been recorded as cloudless. In spite of the generally clouded sky the mean temperature is unusually raised, but hot days have been exceptional. Rainfall: 4·69 inches on twenty-one days.—Dr. H. A. Spencer.

Louis Trichardt.—A remarkable feature is that rain this year commenced and still continues to fall in small strips, covering sometimes only 200 yards in width. It has happened that the top part of the town gets a heavy shower, whilst the lower part remains absolutely dry, and vice versa. Rains mostly move from south-west to north-east. The absence of eastern misty rains, so frequent in the past, is conspicuous. Rainfall: 1·58 inch on six days.—I. J. de Bruin.

Pampoenkraal No. 248 (*Wakkerstroom*).—Pampoenkraal belongs to my son-in-law, Major J. S. Hollenbach, D.S.O., etc., and he has devoted the last four years to draining a vlei in which the Gwampisi lost its course in an immense vlei for a distance of three or four miles in length and about a mile in width. He has completed the main drain and several cross drains to carry water to the main drain. He has planted about 100 acres of mealies in the drained part, and these mealies are a sight almost impossible to describe, the mealies standing from 12–16 feet high, the stalks at the base measure 7–8 inches in circumference; each stalk, so far as we can at present judge, will carry from four to seven cobs; the leaves on the stalks are 6–10 inches wide, and of the darkest green. If we get no hail it is impossible to estimate what the yield per acre will be.—Mrs. S. M. Nicolson.

Strathmore (Klerksdorp).—Rains, mostly from thunderstorms. Rainfall: 4·86 inches on thirteen days.—Chas. Scott.

Bloemhof.—Continued drought. Wells drying up. Dust-storms throughout the month. Rainfall: 1·34 inch on ten days.—A. Adamson.

Barberton.—The hot, dry weather and deficient rainfall are beginning to affect the crops; the springs are running low, owing to the enormous evaporation, and rain is badly needed for the cattle. Rainfall: 2·21 inches on nine days.—Walter Grubb.

Carolina.—Generally clouded, good rains, and several severe hailstorms in the district, destroying fruit on many farms. Crops very promising all over district, and grass excellent. Rainfall: 3·97 inches on fifteen days.—G. F. Mijnhardt.

Mosdene (*Naboomspruit*).—The month has been dry and unusually hot. Last month's rainfall was much below the average, and we have not yet had sufficient rainfall this season to wet the subsoil. Young crops are suffering from lack of moisture, and the indications are that returns will be poor. The rainfall since 1st July last was 11·67 inches, as compared with 15·28 inches last year. Mean of maximum temperature for the month was 86·6 degrees, as compared with 83·3 degrees for December last year. Rainfall: 2·80 inches on eight days.—Ernest E. Galpin.

Krugersdorp.—During the early part of the month under review the weather was very dry and excessively warm, and crops were suffering from drought. From the 10th till the end of the month climatic conditions were almost ideal, with alternating showers of rain and periods of sunshine. Rainfall: 5·07 inches on sixteen days.—H. Sharp.

Gemboksfontein (*Middelburg*).—The weather was very warm at times during the month. A heavy rainstorm was experienced on the afternoon of the 22nd, when 3·55 inches were recorded in two and a half hours, causing dams to overflow and washing out roads. Rainfall: 9·68 inches on eighteen days.—M. C. van Coller.

Christiana.—The heat is commencing to be felt, the greater part of the month registering over 90 degrees. Rainfall: 1·19 inch on six days, but soon dried up again owing to intense heat. The veld is beginning to look green.—J. J. Cooke.

Lichtenburg.—Drought broken, veld in good condition. Farmers still busy planting mealies. A few small swarms of flying locusts still about. Rainfall: 4·59 inches on fourteen days.—J. T. Allman.

Figtree Store (*Barberton*).—Country dried up; heat excessive. Rainfall: 2·61 inches on six days.—W. Clifford.

Crocodile Poort (*Barberton*).—Weather very unsettled, windy and cloudy, but no rain till end of month. A slight mist hangs about nearly every morning. Rainfall: 1·19 inch on six days.—W. Reading.

Kamhlobana Ranch (*Barberton*).—Weather during first part of month inclined to be droughty; some days were extremely warm. Rainfall: 3·99 inches on three days.—H. B. Trollip.

Sandfontein (*Bloemhof*).—Terribly dry; this part will soon be uninhabitable by man. Rainfall: 0·95 inch on eight days.—T. McLetchie.

Reston (*Middelburg*).—Crops looking well, stock in good condition. Rainfall: 6·65 inches on fourteen days.—A. G. Purves.

Shenfield (*Potchefstroom*).—Until after the rain of the 24th the ground was too dry to plough, since sufficiently moist to do fair work. Rainfall: 4·60 inches on thirteen days.—A. B. Lucas.

Elandsfontein (*Potchefstroom*).—Although we had 3½ inches of rain, our water supply is low and veld not too good. A good soaking is what the farmer wants. Rainfall: 3·54 inches on ten days.—P. J. Davidz.

Driekaagte (*Rustenburg*).—Very hot; country burnt up; crops dying. Rainfall: 3·17 inches on seven days.—H. Hardwick.

Vogelfontein (*Rustenburg*).—Unless climatic conditions alter during January, future prospects will be bad; drought very severe. Rainfall: 3·57 inches on ten days.—H. M. Fothergill.

Weltevreden (*Standerton*).—Crops and stock looking well. Rainfall: 3·63 inches on eleven days.—D. Lane.

Mallow (*Waterberg*).—There has been much damage done by hail in the district during the month, but we experienced none. Rainfall: 2·33 inches on five days.—F. Biccard.

Bells Bank (*Zoutpansberg*).—Crops looking very well so far and stock doing well. Rainfall: 5·43 inches on six days.—H. C. van Heerden.

Altijdmooi (*Zoutpansberg*).—Steady soaking rains; things very serious before the rains of the 29th; veld and crops all burnt up by drought. Rainfall: 2·13 inches on seven days.—A. Gettliffe.

La Cotte (*Zoutpansberg*).—Intense heat; majority of days cloudless and calm up to 15th. This rain appears to have been fairly general, but was too late to help crops planted in early November (after first rains). The rains recorded since 15th have been thunderstorms, very local in character, as instanced by the 1·02 inch on the 31st. This rain appears to have fallen in an area not larger than about two square miles. Groot Lataba River rose 3 feet after the rain on the 15th, since subsided, and is now only about 1½ feet over normal dry season flow. Prospects for all crops planted within past three weeks good. Rainfall: 4·47 inches on five days.—M. H. Andrews.

Swaziland.

Transvaalia.—Crops look well, but the borer-worm in mealies bad. Rainfall: 2·31 inches on eleven days.—M. Coates.

Matendela.—An excellent growing month; stock and crops doing well; rains well distributed. Rainfall: 2·76 inches on twelve days.—H. Parry.

Mbabane.—Rains principally due to thunderstorms, which were immediately preceded by oppressive heat. Dry thunderstorms towards end of month. Rainfall: 7·05 inches on twenty-one days.—W. J. D. Crawford.

Orange Free State.

Kroonstad.—Continuance of rain, and cloudy during most days. Lightning very severe during the storms. Rainfall: 6·34 inches on fourteen days.—S. R. Northfield.

Holfontein (*Kroonstad*).—Some very severe dust-storms were experienced during the month, mealie crops being badly destroyed, the north wind having done most of the damage. Stock in general are still in fair condition.—L. C. McInery.

Sterkstrom (*Boshof*).—Veld still very bare; practically no grass; sheep are getting enough fodder and are in good condition, but cattle are suffering. Rainfall for year 1922: only 5·66 inches. Rainfall for December: 0·23 inches on two days.—J. B. Moolman.

Belladale (*Frankfort*).—A very favourable month as regards weather, although not a very wet one. The rainfall was well distributed, so that the soil did not have time to dry out between showers. Stock are looking well, and the veld is in splendid condition. Amongst sheep, tapeworms have been very troublesome. The mealie crop, as a whole, is looking well, but the borer is now making an appearance. Oats crop is above the average; teff is coming on nicely. Rainfall: 4·53 inches on nine days.—C. McCalman.

Stanleyvale (*Harrismith*).—A very nice month. Lands are moist. Veld is fair, and few cattle sick. Oats, millet, and teff doing well. Worms in mealies. Rainfall: 4·49 inches on sixteen days.—G. C. Atkins.

Alma (*Ladybrand*).—Most excellent growing month, with just sufficient rains and no hail. Rainfall: 4·13 inches on eight days.—W. D. Stockdale.

Kalkfontein (*Philippolis*).—Other parts of district have had fair rains during December. Dry west wind daily. Rainfall: 0·30 inch on one day.—D. W. Schoeman.

Prospect (*Vrede*).—The weather on the whole has been very favourable for crops, and the veld is excellent. Stalk-borer is, however, appearing in some of the older mealies. Live stock generally are healthy and look well. Rainfall: 4·22 inches on fourteen days.—T. Pitcairn.

Paardekraal (*Winburg*).—Dry up to middle of month. Mealies looking well. All stock excellent; no diseases or deaths. Rainfall: 3·70 inches on thirteen days.—S. G. Lowe.

NATAL.

Ladysmith.—A hot month, with numerous storms in and around town. Storms mostly very local, some parts being almost flooded, whilst other parts of the district have had little or no rain. Hailstorms during the month did a fair amount of damage to fruit crops, but other crops were affected very little. Rainfall: 5·72 inches on twenty-one days.—D. A. R. Leathern.

Durban (*Point*).—Weather generally cloudy and hazy; threatening with slight showers; unusually hot and sultry. Rainfall: 1·43 inch on fifteen days.—A. P. White.

Dundee.—Good growing weather, but latter half of month very dry; relieved by steady rain as the new year came in. Rainfall: 4·17 inches on five days.—West Thorrold.

Ngomi.—On the 8th a heavy hailstorm passed to the north-east of the Reserve; several farmers reported loss of small stock through the severity of the storm. The crops on the farm Mountain View, which joins the Reserve, and is owned by the Salvation Army, were beaten to the ground, and looked a very sad sight after the storm had passed. Rainfall: 8·36 inches on sixteen days.—J. Tustin.

Hillary.—The driest December since I have been recording (1907). Previous record, 2·60 inches in 1919. Screen maximum on 28th (102·8 degrees) also highest. Previous record for December, 96·1 degrees on 21st December, 1911. The average shade maximum has exceeded 80 degrees for the first time since recording. The sunshine is also a record. Rainfall: 1·34 inch on nineteen days.—H. H. Thorpe.

Newcastle (*The Academy*).—The weather this month was exceedingly changeable. The mornings were usually dull, but the sky cleared towards noon. High winds occurred after sunset, and the rain fell generally during the night. Rainfall: 7·59 inches on fourteen days.—The Mother Superior.

Newcastle (*Gaol*).—The month opened with a few dry and hot days for the first week; the second week opened with violent thunderstorms. Very little hail, no damage in town; two miles out of town, on the town lands, several

hailstorms were witnessed, and a lot of damage was done to fruit and gardens and also crops, such as mealies and potatoes. Rainfall: 8·40 inches on fifteen days.—The Gaoler.

Howick.—Considerable damage done by hail. Rainfall: 4·35 inches on sixteen days.—The Gaoler.

Mid-Illovo.—Rainfall: 3·51 inches on nineteen days; mainly in afternoons with thunder, and at night. Maximum temperature, 96 degrees on the 28th; minimum temperature, 52 degrees on the 3rd. Thunderstorm and gale, 7 a.m. on the 8th and 11.30 p.m. on the 31st. Crops looking well. Total rainfall for 1922: 34·10 inches.—Lt.-Colonel J. W. V. Montgomery, C.M.G., D.S.O.

Rongpoort (*Weenen*).—Very fine month from a farmer's point of view, except for hailstorm on the 7th, which damaged fruit and crops considerably. Total rainfall for year: 30·01 inches. Rainfall for December: 5·81 inches on *fourteen days.—J. H. Bartholomew.*

Summerford (*Ixopo*).—Disastrous rains to crops on the 18th and 19th; washaways, etc. Rainfall: 4·91 inches on sixteen days.—D. Campbell.

CAPE.

Belvedere (*Knysna*).—The rainfall for the month of December (1·09 inch on seven days) has been unusually small, and much less than that for the last five years, in consequence of which the neighbourhood of Knysna is suffering much for want of water.—F. Thornbury.

Somerset East.—A very dry December following on an excessively wet November. Moisture frequently drifted up against the prevailing south-easterly winds, but there was little precipitation—0·90 inch on five days, of which 0·81 inch fell in two hours on the 18th.—C. Harris.

Murraysburg.—Drought continues and becoming very serious, especially in portion of the district. Farmers are obliged to seek pasturage for their stock elsewhere, and several have already trucked their stock for the north and east. South-west and south-east winds still prevailing, and no summer heat yet recorded. Rainfall: 0·39 inch on two days.—W. H. Rose Innes.

Mafeking (*Convent*).—The second week was exceptionally hot, and to the heat was added dust, which is unusual for December. Two particularly bad dust-storms on the 12th and 14th came up from the south-west, and lasted 30 minutes and 1½ hours respectively. They were followed by light rain. A terrific thunderstorm passed over the town on the afternoon of the 16th. A house was burned about two miles east of the town, and two of the inmates (Europeans) lost their lives. Another bad thunderstorm occurred on the 28th, *but no damage was done. Almost an inch of rain fell in half an hour on the* 28th. Rainfall: 4·47 inches on thirteen days.—The Mother Superior.

Kokstad.—Temperature above average. Rainfall short. Much damage by hail on neighbouring farms this month; also several lightning fatalities, human and stock. Rainfall: 2·93 inches on ten days.—H. D. Coyte.

Kenhardt.—Strong southerly winds almost every night. Rainfall (0·43 inch on two days) too insignificant to relieve drought. Cattle and sheep continue dying in alarming numbers.—R. Seydell.

Bedford.—Heavy rains at end of last month, followed by an abnormally dry December, is stated to have had bad effect on agriculture, as the ground became too caked at the surface to permit your crops to grow or late mealies to come up. Rainfall: 0·59 inch on seven days.—T. C. Hall.

Groot Drakenstein.—A rainless month, the fourth in succession with a deficit. Veld very dry and rivers low; orchards and vineyards suffering. Temperature about normal and no extremes. Strong south-easterly winds entirely absent.—Lionel Baker.

Aliwal North.—December has been hot and dry, only occasional thunder-showers, amounting to 1·40 inch on seven days; a good soaking rain badly needed.—Alex. Alcock.

Ceres.—Rainfall: 1·32 inch on one day, and well below the average. Weather generally seasonable.—A. Heathie.

Danger Point.—Cold winds. Heavy seas running from south day after day. Rainfall: 0·42 inch on seven days.—H. H. Hews.

Addo (Uitenhage).—Very welcome rain on 18th (0·79 inch), filled all drinking water tanks. Vile winds, mostly accompanied by dust-storms, blow almost every afternoon. Sometimes these start in morning.—Major J. Kreft.

Willowmore.—The veld is becoming dry, and drinking water in town is getting scarce. Rainfall: 0·56 inch on three days. Rainfall for year: 10·79 inches.—Mrs. B. M. Hemens.

Sydney-on-Vaal (Barkly West).—Drought continued; light rains have not improved condition of veld as far as grass is concerned. Bushes and trees have thrown out fresh foliage. Rain has fallen in purely local showers all through district, and the records can be taken as a fair average for the district as we have been unduly favoured. Rainfall: 1·42 inch on six days.—J. G. Richards.

Grassridge (Cradock).—The veld is now in excellent condition. Mealies are being sown, and in majority of cases second cut of lucerne has been reaped. Rainfall: 2·07 inches on two days.—S. Whitwham.

Abtonia (Kuruman).—Very hot and dry; green grass very scarce, but local showers have brought up the grass in some places. Stock suffering from the drought. Rain badly needed. Rainfall: 0·75 inch on five days.—A. T. Sitwell.

Elsenburg (Stellenbosch).—No rainfall during the month, combined with prevalent south-east winds, has had a very harmful effect on unirrigated summer crops.—D. C. Crawford.

Capetown.—Sudden changes of temperature.—A. Russel Fraser.

Graaff-Reinet.—A fine, dry month, with little wind. Rainfall: 0·65 inch on three days.—S. E. D. Treadwell.

Vruchtbaar (Wellington).—Very dry; fruit trees and vines suffering; crops will be badly affected. Rainfall: 0·10 inch on one day.—P. J. Cillie.

Matjeskloof (Beaufort West).—18th, heavy thunderstorm, severe lightning, and hail. Hail did much damage to fruit and vegetables; fortunately, storm was of short duration. Veld here not too dry, but in near vicinity farmers losing heavily in stock on account of drought. Rainfall: 0·70 inch on one day.—V. de Villiers.

Vogelfontein (Barkly West).—Cattle dying from lack of nourishment. Small stock in fair condition. Rainfall: 0·13 inch on three days.—Frank May.

New Year's Kraal (Prieska).—Stock almost all dead. Twelve months' drought. The most severe drought since 1862. Rainfall; 0·12 inch on two days.—S. P. Louw.

BASUTOLAND.

Mafeteng.—Very hot days, with cool nights. Thunderstorms prevalent, with some hail, but not much damage done. Veld crops not looking too well. Very strong north and north-east winds during the month, with severe dust-storms at intervals. Very cold night on the 28th, ground temperature fell to 36 degrees. Rainfall: 1·67 inch on twelve days.—F. Hodgson.

Maseru.—23rd, heavy hail fell in a narrow strip, and severely damaged fruit garden and wheat lands. The mealie crops are very good, the best for years. The wheat crops on the mountains are good, but those on the flats are very bad. Rainfall: 2·55 inches on nine days.—J. G. Green.

BECHUANALAND.

Serowe.—Very hot spell between 7th and 17th. Rainfall: 1·01 inch on five days.—H. C. P. Baker.

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 broders, 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.

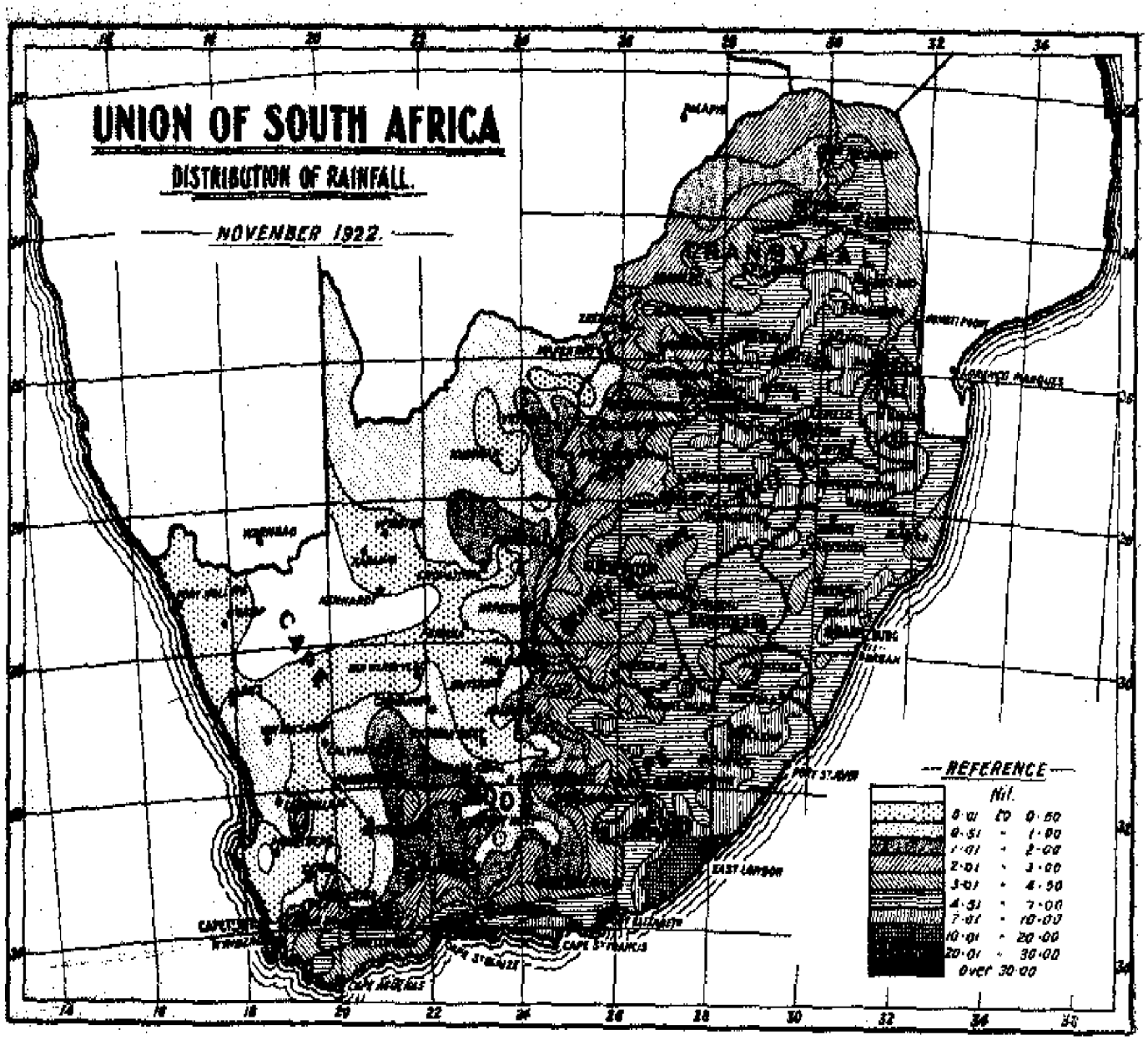
The prevalent wind-directions during this month are south over the south-west of the Cape Province, north-east at East London, east-north-east at Kimberley, and north-north-west at Johannesburg. Compared with the previous month there is a large increase of southerly winds over the Cape Peninsula, together 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

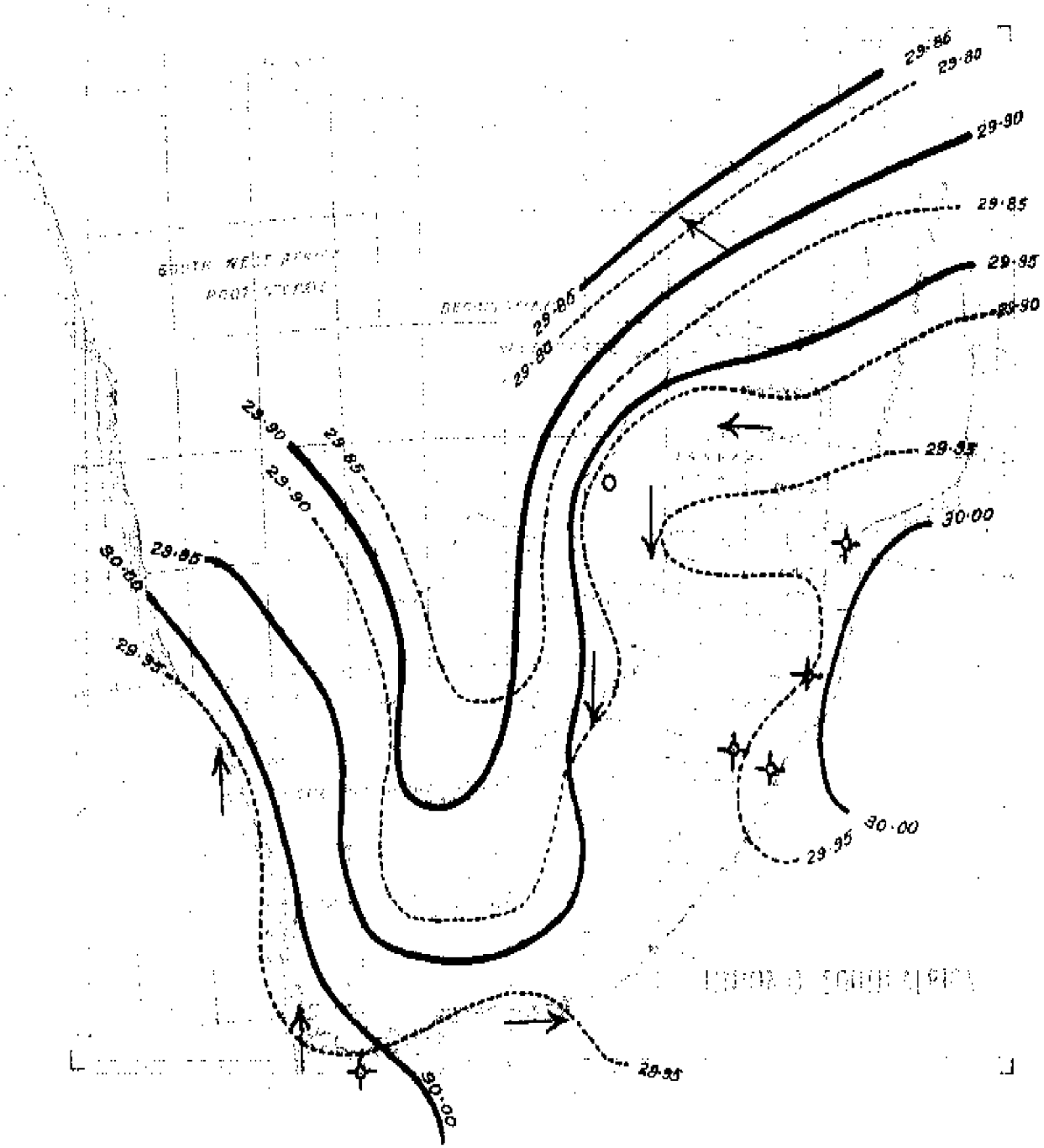
almost equal increase of those from north-east. Kimberley shows an increase in frequency of winds lying between north-east and south, also of those from west and west-north-west, more particularly of those from south-east; but a diminution in all others, especially those from south-south-west. At Johannesburg 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,

Pretoria. *Chief Meteorologist.*


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
NOVEMBER 1922.
REFERENCE
Nil.
0·01 to 0·50
0·51 " 1·00
1·01 " 2·00
2·01 " 3·00
3·01 " 4·50
4·51 " 7·00
7·01 " 10·00
10·01 " 20·00
20·01 " 30·00
Over 30·00
EAST LONDON
CAPE ST FRANCIS
PORT ST JOHN
LORENCO MARQUES



December, 1922. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for December.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), DECEMBER, 1922.

Station.	Observer.	Month—Dec., 1922.		Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes.			
		Mean Max.	Mean Min.				Highest.	Date.	Lowest.	Date.
Transvaal—		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Barberton	Walter Grubb	86·1	63·6	74·8	72·1	+ 2·7	97·0	8th	56·0	4th.
Belfast	The Forester	75·1	51·3	63·2	61·2	+ 2·0	85·0	8th	41·0	6th.
Bloemhof	A. Adamson	92·9	62·8	77·8	73·5	+ 4·3	97·0	7th, 8th, 9th, and 10th	52·0	1st.
Brmelo	The Forester	77·6	53·8	65·7	65·4	+ 0·3	85·0	13th	46·0	22nd.
Johannesburg (Observatory)	The Staff	77·4	54·9	66·2	64·8	+ 1·4	86·0	6th	50·0	1st.
Klerksdorp (Strathmore)	Chas. Scott	87·5	59·8	73·6	73·4	+ 0·2	97·0	7th	48·0	3rd.
Komatipoort	B. J. Fothergill	93·6	69·6	81·6	80·6	+ 1·0	109·0	13th	58·0	1st.
Louis Trichardt	I. J. de Bruin	85·4	61·2	73·3	71·9	+ 1·4	97·0	13th and 14th	56·0	6th and 10th.
Middelburg	Dr. H. A. Spencer	82·5	57·0	69·8	67·4	+ 2·4	90·0	8th and 13th	50·0	2nd.
Nylstroom	G. Bakker	85·7	60·9	73·3	72·0	+ 1·3	95·0	11th	52·5	3rd.
Pietersburg	W. J. Franklyne	83·7	61·0	72·4	70·2	+ 2·2	94·5	13th	54·0	4th and 6th.
Piet Retief	J. Werner	78·2	58·1	68·2	67·4	+ 0·8	86·5	8th	51·5	3rd.
Pigeonhole (New Agatha)	Jno. McCallum	76·9	59·5	68·2	—	—	88·0	13th	55·0	3rd and 4th.
Pilgrims Rest	E. M. Skea	80·4	58·3	69·4	67·3	+ 2·1	92·0	7th and 12th	51·0	3rd.
Potchefstroom (Exp. Farm)	The Manager	88·2	59·0	73·6	70·1	+ 3·5	95·4	9th	43·7	1st.
Pretoria (Meteorological Office)	The Staff	82·1	60·1	71·1	71·1	± 0·0	91·5	8th	49·0	2nd.
Standerton	The Town Clerk	82·5	56·0	69·2	66·2	+ 3·0	91·3	7th	44·8	2nd.
Zeerust	H. Dietrich	88·5	63·5	76·0	74·7	+ 1·3	96·8	7th	51·2	1st.
Swaziland—										
Mbabane	Swaziland Police	77·7	58·7	68·2	66·4	+ 1·8	88·0	17th	53·0	1st.
Orange Free State—										
Bethulie	J. J. Wardhaugh	88·5	57·5	73·0	72·9	+ 0·1	95·0	12th	46·0	3rd.
Bloemfontein	G. A. Schepers	87·3	59·5	73·4	71·9	+ 1·5	95·9	12th	48·6	2nd.
Harrismith	The Forester	75·4	46·6	61·0	65·4	− 4·4	84·0	7th	38·0	3rd.
Kroonstad	S. R. Northfield	84·9	58·2	71·6	71·6	± 0·0	93·3	7th	42·8	2nd.
Ladybrand	The Forester	81·0	54·4	67·7	68·2	− 0·5	90·0	7th	45·0	1st and 3rd.
Lindley	J. Collister-Ostes	83·7	56·0	69·8	67·6	+ 2·2	92·8	7th	42·0	2nd.
Natal—										
Dundee	West Thorrold	82·6	57·1	69·8	72·0	− 2·2	92·0	12th	50·0	1st and 2nd.
Durban (Point)	The Port Captain	80·9	67·8	74·4	74·8	− 0·4	88·0	31st	60·2	3rd.
Estcourt	The Town Clerk	82·8	57·9	70·4	71·8	− 1·4	96·0	13th	50·0	2nd and 26th.
Hlabisa	E. E. Lightening	82·8	66·6	74·7	71·6	+ 3·1	96·0	9th	59·0	4th.
Ladysmith	D. A. B. Leathern	88·6	59·9	74·2	77·4	− 3·2	100·0	13th	53·0	1st and 2nd.
Maritzburg (Mental Hospital)	The Staff	80·9	61·0	71·0	71·8	− 1·0	95·2	10th	54·0	3rd.
Stanger	C. C. Foss	84·6	65·9	75·2	75·0	+ 0·2	103·0	28th	58·6	3rd.
Weenen	The Gaoler	92·3	59·3	75·8	76·5	− 0·7	107·0	12th	50·0	2nd.

AIR TEMPERATURES, DECEMBER, 1922—(*continued*).

Station.	Observer.	Month—Dec., 1922. Mean Max.	Month—Dec., 1922. Mean Min.	Mean Monthly Temperature.	Normal Monthly Temperature.	Difference from Normal.	Extremes. Highest.	Extremes. Date.	Extremes. Lowest.	Extremes. Date.
		°F.	°F.	°F.	°F.	°F.	°F.		°F.	
Cape—										
Alfred North	Alex. Alcock	85·7	54·2	70·0	68·3	+ 1·7	93·0	12th	43·5	1st.
Bedford	T. C. Hall	82·1	53·7	67·9	68·3	− 0·4	97·0	5th	45·0	3rd and 27th.
Capetown (Royal Observatory)	The Staff	78·5	59·3	68·9	67·3	+ 1·6	93·8	27th	46·8	9th.
Calitzdorp	A. P. Malherbe	88·5	56·2	72·4	73·5	− 1·1	95·0	5th and 6th	40·0	2nd.
Clanwilliam	P. E. Scholtz	89·4	55·9	72·6	73·2	− 0·6	102·0	27th	45·0	3rd.
East London	The Port Captain	78·6	63·2	70·9	68·5	+ 2·4	84·0	18th	56·0	1st.
Graaff-Reinet	S. E. D. Treadwell	87·0	59·4	73·2	71·8	+ 1·4	98·0	5th	47·8	3rd.
Grahamstown	The Vet. Res. Officer	76·2	52·2	64·2	67·6	− 3·4	94·6	5th	41·2	9th.
Groot Drakenstein	Lionel Baker	84·2	55·0	70·0	70·4	− 0·4	97·2	27th	44·6	10th.
Kenhardt	R. Seydell	96·4	64·1	80·2	78·4	+ 1·8	104·0	6th	48·0	1st and 2nd.
Kimberley	Jno. Acton	92·0	62·2	77·1	75·7	+ 1·4	100·0	16th	52·0	1st.
Kingwilliamstown	L. Clayton	86·9	58·9	69·9	69·8	+ 0·1	97·0	5th	53·0	1st, 2nd, 23rd and 27th.
Kokstad	H. D. Coyte	79·5	52·2	66·4	63·2	+ 3·2	93·0	12th	45·7	1st.
Maseru (Convent)	The Mother Superior	89·9	63·1	76·5	74·7	+ 1·8	98·8	8th	47·8	1st.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	74·5	61·6	68·0	67·5	+ 0·5	80·0	17th	54·0	2nd.
Murraysburg	W. H. Rose Innes	85·5	50·0	67·8	69·4	− 1·6	94·0	17th	37·8	3rd.
O'okiep	J. Burrows	87·1	58·4	72·8	71·4	+ 1·4	97·2	4th and 6th	42·0	1st.
Port Elizabeth	The Lightkeeper	74·5	61·5	68·0	67·7	+ 0·3	82·0	18th	52·0	3rd.
Port Nolloth	The Lightkeeper	65·5	50·4	58·0	59·0	− 1·0	78·0	27th	40·0	10th.
Port St. Johns (Cape Hermes)	The Lightkeeper	77·8	65·8	71·8	71·4	+ 0·4	84·0	25th	60·0	2nd and 3rd.
Queenstown	H. Holley	86·9	56·6	71·8	68·4	+ 3·4	97·0	12th	47·0	27th.
Sutherland East	C. Harris	81·9	54·4	68·2	69·1	− 0·9	94·8	5th	42·0	3rd.
Swellendam	F. C. Bousfield	79·1	55·7	67·4	65·9	+ 1·5	92·3	5th	47·0	—
Tarkastad	Rev. S. Rippon	75·9	55·7	65·8	65·2	+ 0·6	97·5	5th	45·5	2nd.
Uitenhage	H. Ingra	80·8	58·3	69·6	70·2	− 0·6	95·7	5th	46·0	3rd.
Umtata	Miss N. Dix Peck	80·3	57·6	69·0	69·1	− 0·1	97·2	28th	40·0	27th.
Vryburg	—	—	—	—	75·3	—	—	—	—	—
Wynberg (Convent)	The Mother Superior	77·9	59·4	68·6	66·3	+ 2·3	87·8	27th	51·5	10th.
Basutoland—										
Maseru	F. Hodgson	81·2	54·5	67·8	69·6	− 1·8	87·0	11th and 12th	45·0	3rd and 27th.

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		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	2·21	4·56	− 2·35	27·94	33·74	− 5·80	13·60	12·80	+ 0·86
Bethel	H. F. M. Joubert	5·86	5·52	+ 0·34	36·74	30·39	+ 6·35	20·74	15·52	+ 5·22
Belfast	The Forester	5·27	5·94	− 0·67	40·93	32·00	+ 8·93	21·53	14·85	+ 6·68
Bloemhof	A. Adamson	1·34	2·03	− 0·69	10·21	18·82	− 8·61	4·04	6·32	− 2·28
Claremont	S.A. Police	1·35	3·24	− 1·89	11·71	18·13	− 6·42	6·53	7·16	− 0·63
Ermelo	The Forester	7·90	4·99	+ 2·91	38·00	29·21	+ 8·79	24·83	14·41	+10·42
Hanepertsburg	S.A. Police	4·29	5·25	− 0·96	27·02	40·36	−13·34	13·99	13·67	+ 0·32
Heidelberg	W. A. ter Horst	4·83	4·14	+ 0·69	27·71	27·73	− 0·02	15·92	12·91	+ 3·01
Johannesburg (Observatory)	The Staff	4·98	4·82	+ 0·16	27·77	30·73	− 2·96	15·27	14·38	+ 0·89
Klerksdorp (Strathmore)	C. Scott	4·86	3·06	+ 1·80	17·86	21·89	− 4·03	9·54	8·12	+ 1·42
Kroonstadpoort	B. J. Fothergill	0·44	3·80	− 3·36	25·68	26·27	− 1·19	12·15	9·28	+ 2·87
Louis Trichardt	I. J. de Bruin	1·58	6·00	− 4·42	13·68	32·36	−18·68	7·67	13·06	− 5·39
Middelburg	Dr. H. A. Spencer	7·06	4·69	+ 2·37	37·41	28·77	+ 8·64	21·91	13·65	+ 8·26
Nylstroom	G. Bakker	6·05	3·88	+ 2·17	23·27	23·99	− 0·72	14·60	10·02	+ 4·58
Pietersburg	W. J. Frankleyne	2·39	4·25	− 1·86	17·34	21·69	− 4·35	10·22	9·52	+ 0·70
Piet Retief	J. Werner	8·50	5·00	+ 3·50	37·72	30·62	+ 7·10	26·33	15·21	+11·12
Pilgrims Rest	E. M. Skea	4·87	5·86	− 0·99	35·15	40·48	− 5·33	17·23	14·05	+ 3·18
Pigeonhole (New Agatha)	J. McCallum	5·45	7·66	− 2·21	30·22	47·66	−17·44	16·88	18·81	− 1·93
Potchefstroom (Exp. Farm)	The Manager	2·33	4·26	− 1·93	21·89	23·69	− 1·80	12·68	10·70	+ 1·98
Pretoria (Meteorological Office)	The Staff	4·01	4·18	− 0·17	29·53	29·68	− 0·15	19·11	12·62	+ 6·49
Roodberg	M. Baumann	5·75	3·15	+ 2·60	24·90	23·89	+ 1·01	14·53	9·95	+ 4·58
Rustenburg	H. J. Streatfield	3·32	4·28	− 0·96	20·34	25·86	−5·52	9·89	10·95	− 1·06
Standerton	The Town Clerk	2·92	4·63	− 1·71	—	30·26	—	19·11	14·83	+ 4·28
Wakkerstroom	F. J. Grant	3·75	4·70	− 0·95	36·02	32·13	+ 3·89	22·47	15·05	+ 7·42
Woodbush	The Forester	7·93	11·26	− 3·33	37·70	71·97	−34·27	20·36	25·09	− 4·73
Zoerust	H. Dietrich	2·74	3·24	− 0·50	15·72	24·05	− 8·33	7·89	9·08	− 1·19
Swaziland—										
Mbabane	Swaziland Police	7·05	7·51	− 0·46	47·94	50·18	− 2·24	29·32	21·42	+ 7·90
Orange Free State—										
Bethulie	J. J. Wardhaugh	1·15	2·40	− 1·25	11·37	18·46	− 7·09	7·90	6·50	+ 1·40
Bloemfontein	G. A. Schepers	1·14	2·73	− 1·59	11·47	19·22	− 7·75	5·57	7·63	− 2·06
Boshof	P. H. van Rooyen	1·56	2·02	− 0·46	10·32	19·45	− 9·13	5·44	7·36	− 1·92
Harrismith	The Forester	5·14	4·22	+ 0·92	34·00	28·19	+ 5·81	22·14	13·13	+ 9·01
Kroonstad	S. R. Northfield	6·34	3·72	+ 2·62	23·63	22·05	+ 1·58	16·08	11·37	+ 4·71
Ladybrand	The Forester	3·01	3·34	− 0·33	20·18	27·34	− 7·16	11·14	11·98	− 0·84
Lindley	J. Collister-Oates	3·60	3·61	− 0·01	24·43	24·34	+ 0·09	14·68	10·48	+ 4·20
Natal—										
Dundee	West Thorold	4·17	4·61	− 0·44	36·02	31·27	+ 4·75	20·34	13·32	+ 7·02
Durban (Point)	The Port Captain	1·43	4·93	− 3·50	49·13	41·76	+ 7·37	25·94	19·47	+ 6·47

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		Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Natal—(continued).										
Estcourt	The Town Clerk	6·61	4·77	+ 1·84	28·09	28·06	+ 0·03	16·33	11·80	+ 4·53
Kliplea	The Gaoler	4·10	6·17	− 2·07	31·64	43·23	−11·59	19·79	20·84	− 1·05
Howick	The Gaoler	4·35	4·63	− 0·28	32·01	32·04	− 0·03	17·76	14·31	+ 3·45
Impetyne	The Forester	—	7·28	—	—	76·92	—	—	36·88	—
Ladysmith	D. A. R. Leathern	5·72	4·41	+ 1·31	34·22	27·31	+ 6·91	18·68	11·24	+ 7·44
Maritzburg (Mental Hospital)	The Staff	6·24	5·04	+ 1·20	34·80	33·80	+ 1·00	22·86	15·14	+ 7·72
Stanger	Cecil C. Foss	1·75	6·25	− 4·52	34·03	42·31	− 8·28	17·83	22·21	− 4·38
Vryheid	The Gaoler	14·94	6·14	+ 8·90	45·84	36·89	+ 8·95	30·53	16·99	+13·54
Weenen	The Gaoler	4·32	3·98	+ 0·34	25·97	26·37	− 0·40	12·74	11·58	+ 1·16
Cape—										
Aliwal North	A. Alcock	1·40	2·62	− 1·22	16·21	21·14	− 4·93	10·98	8·02	+ 2·96
Beaufort West	The Gaoler	0·75	0·88	− 0·13	7·53	9·46	− 1·93	3·48	3·53	− 0·05
Bedford	T. C. Hall	0·59	2·92	− 2·33	30·86	27·97	+ 2·89	14·79	12·24	+ 2·55
Bellstown	The Gaoler	0·14	0·94	− 0·80	2·57	11·35	− 8·78	1·11	3·37	− 2·26
Calvinia	The Gaoler	0·00	0·22	− 0·22	8·46	7·74	+ 0·72	4·51	3·45	+ 1·06
Capetown (Royal Observatory)	The Staff	0·16	0·86	− 0·70	19·11	25·54	− 6·43	9·00	12·89	− 3·89
Ceres	A. Heatlie	0·32	1·41	− 1·09	35·66	41·29	− 5·63	19·38	22·77	− 9·39
Carnarvon	A. P. Malherbe	0·08	0·48	0·40	1·26	8·02	− 6·76	0·98	2·25	− 1·27
Clanwilliam	P. E. Scholtz	0·00	0·18	− 0·18	8·07	8·59	− 0·52	3·09	4·36	− 1·27
East London	A. Downie	0·73	3·34	− 2·61	41·11	33·38	+ 7·73	26·12	16·59	+ 9·53
French Hoek (*Drielontein*)	The Forester	1·12	1·87	− 0·75	55·30	72·77	−17·47	25·14	33·41	− 8·27
Fraserburg	The Gaoler	0·00	0·37	− 0·37	—	6·64	—	—	2·06	—
Grahamstown	Vet. Res. Officer	1·33	2·57	− 1·24	24·72	28·79	− 4·07	20·64	14·12	+ 6·52
Gaths	The Gaoler	—	0·12	—	—	5·20	—	—	2·75	—
Graaff-Reinet	S. E. D. Treadwell	0·65	1·35	− 0·70	10·63	13·92	− 3·29	5·95	5·88	+ 0·07
Groot Drakenstein	Lionel Baker	0·00	0·98	− 0·98	34·31	35·61	− 1·30	12·67	18·70	− 6·03
Grootfontein	The Gaoler	0·56	1·31	− 0·75	3·50	13·08	− 9·58	2·08	3·57	− 1·49
Hanover	The Gaoler	0·00	1·07	− 1·07	6·03	13·22	− 7·19	3·84	4·14	− 0·30
Hopetown	The Gaoler	0·10	1·12	− 1·02	4·56	12·78	− 8·22	2·40	3·93	− 1·53
Kalkfonteen	R. Seydell	0·43	0·41	+ 0·02	1·43	5·64	− 4·21	0·68	1·51	− 0·83
Kimberley	J. Acton	1·51	2·03	− 0·57	7·91	16·26	− 8·35	4·90	5·73	− 0·83
Knysna	The Gaoler	0·50	2·39	− 1·89	33·95	28·79	+ 5·16	16·25	13·49	+ 0·76
Kokstad	H. D. Coyte	2·93	4·14	− 1·21	29·17	27·14	+ 2·03	13·68	11·76	+ 1·92
Kingwilliamstown	L. Clayton	0·64	2·73	− 2·09	27·28	25·26	+ 2·02	17·48	11·75	+ 5·73
Kuruman (Altonia)	A. T. Sitwell	0·75	2·26	− 1·51	4·76	16·43	−11·67	1·26	5·11	− 3·85
Mafeking (Convent)	The Mother Superior	4·47	3·40	+ 1·07	14·03	21·51	− 7·48	8·24	8·32	− 0·08
Mossel Bay (Cape St. Blaise)	The Lightkeeper	0·37	1·34	− 0·97	14·15	17·33	− 3·18	6·57	8·58	− 2·01
Mutrasburg	W. H. Ross Innes	0·39	0·91	− 0·52	4·19	11·04	− 6·85	1·83	3·70	− 1·87
Oudtshoorn	J. Burrows	0·00	0·17	− 0·17	4·97	7·11	− 2·14	3·66	3·34	+ 0·32
Philipstown	The Gaoler	0·15	1·52	− 1·37	4·71	18·94	− 9·23	2·06	4·70	− 2·64

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		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cape—(continued).										
Piquetberg	The Gaoler	0·12	0·70	− 0·58	18·45	20·74	− 2·29	7·02	11·40	− 4·38
Port Elizabeth	The Lightkeeper	1·19	1·68	− 0·49	21·43	22·23	− 0·75	12·65	12·37	+ 0·28
Port St. Johns (Cape Hermes)	The Lightkeeper	2·13	5·85	− 3·72	41·75	48·69	− 6·94	23·97	24·29	− 0·32
Port Nolloth	The Lightkeeper	0·00	0·03	− 0·03	2·39	2·21	+ 0·18	1·49	1·11	+ 0·38
Prieska	The Gaoler	0·11	0·78	− 0·67	2·41	9·72	− 7·31	1·47	2·49	− 1·02
Queenstown	H. Holley	2·69	2·85	− 0·16	20·60	21·41	− 0·81	12·29	8·61	+ 3·68
Steytlerville	The Gaoler	1·24	0·84	+ 0·40	10·95	9·26	+ 1·09	4·90	3·86	+ 1·04
Sutherland	The Gaoler	0·00	0·42	− 0·42	6·43	9·22	− 2·79	2·58	3·86	− 1·28
Swellendam	The Gaoler	0·85	3·06	− 2·21	32·81	32·64	+ 0·17	13·25	16·21	− 2·96
Sydney's Hope	Rev. S. Rippon	0·56	2·01	− 1·45	28·29	22·78	+ 5·51	13·48	11·06	+ 2·42
Somerset East	C. Harris	0·90	2·84	− 1·94	29·10	23·82	+ 5·28	15·36	10·83	+ 4·53
Stutterheim	F. C. Bousfield	3·45	3·68	− 0·23	34·67	29·67	+ 5·00	20·13	13·18	+ 6·95
Uitenhage	H. Inggs	1·16	1·64	− 0·48	23·70	17·46	+ 6·24	14·00	9·05	+ 4·95
Umtata	Miss N. Dix Peck	1·16	2·98	− 1·82	25·86	25·74	+ 0·12	14·28	11·08	+ 3·20
Uniondale	The Gaoler	0·03	0·76	− 0·73	12·86	13·58	− 0·72	5·09	6·71	− 1·62
Upington	The Gaoler	0·45	0·63	− 0·18	1·87	7·03	− 5·16	0·85	2·00	− 1·15
Victoria West	The Gaoler	0·40	0·89	− 0·49	3·85	10·14	− 6·29	1·10	3·13	− 2·03
Vryburg	H. Collens	—	2·63	—	—	19·69	—	—	5·86	—
Worcester	The Gaoler	0·00	0·41	− 0·41	9·86	12·67	− 2·81	3·44	6·77	− 3·33
Wynberg (Convent)	The Mother Superior	0·08	1·40	− 1·32	34·26	47·12	−12·86	15·26	26·36	−11·10
Basutoland—										
Maseteng	F. Hodgson	1·67	4·68	− 3·01	20·27	31·69	−11·42	11·37	12·33	− 0·96
South-West Africa—										
Tsumeb	Ing. Schetter	0·56	4·47	− 3·91	12·17	24·26	−12·09	5·78	7·48	− 1·70
Waterberg	D. Hahn	0·43	3·14	− 2·71	9·65	20·04	−10·39	2·40	5·08	− 2·68
Omaruru	The Postmaster	0·51	1·37	− 0·86	7·74	11·51	− 3·77	1·48	2·25	− 0·77
Usakos	Rev. Diehl	0·16	0·60	− 0·44	1·06	5·17	− 4·11	0·58	0·93	− 0·35
Duesterabrook	L. Matthiessen	1·44	1·22	+ 0·22	10·41	12·49	− 2·08	2·05	2·41	− 0·36
Gobabis	Rev. Irbe	0·63	2·11	− 1·48	5·22	15·76	−10·54	1·23	3·96	− 2·73
Gr. Witvley	B. Rueckert	1·85	1·80	− 0·04	5·82	14·74	− 9·92	2·22	3·52	− 1·30
Windhoek	Observatory	2·67	1·76	+ 0·91	9·99	14·06	− 4·07	4·59	3·13	+ 1·46
Maltahoehe	E. Just	0·28	0·46	− 0·18	2·22	6·17	− 3·95	0·73	0·97	− 0·24
Voigtsgrund	A. Voigts	0·03	0·65	− 0·62	3·00	5·98	− 2·98	1·05	1·40	− 0·35
Gibeon	Rev. Spellmeyer	0·00	0·34	− 0·34	3·18	5·97	− 2·79	0·64	1·19	− 0·55
Bethany	Rev. Peter	0·00	0·34	− 0·34	1·96	4·18	− 2·22	0·02	0·80	− 0·78
Ais	F. Ernst	0·08	0·11	− 0·03	4·51	4·29	+ 0·22	1·94	1·25	+ 0·69
Betrachabis	Rev. Father Eder	0·21	0·46	− 0·25	0·88	4·56	− 3·68	0·21	1·04	− 0·83