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DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. IV. JANUARY, 1923. No. 1.

MEAN pressure lower than usual in the east, but slightly above normal in the west and south; temperature about half a degree less than usual; warm spells in the beginning and between the third and fourth weeks, with cool weather in the second and third weeks and at the end of the month; good, steady, soaking rains, with a marked absence of severe thunderstorms or intense falls; an excess of precipitation in the eastern, but a deficiency in the western half of the Union; an unusually high number of rain-days; comparatively few destructive hailstorms; frequent floods in the rivers in the north and east of the Transvaal, Swaziland, and in Natal; these were the principal weather conditions during the month of January, 1923, causing a considerable improvement in agricultural prospects.

Pressure.—Mean barometric pressure for the month, as may be seen from the accompanying map, was about five-hundredths of an inch lower in the east, particularly over the Transvaal and Natal, but slightly higher than the normal over the west and south-west. The equatorial tongue of low pressure was strongly developed throughout the month. A series of low pressure areas affected the coast on fourteen days, viz., 1st to 2nd, 6th to 7th, 9th, 16th to 17th, 22nd to 23rd, and 30th to 31st. High pressure areas appeared on the coast on 3rd to 5th, 7th to 8th, 10th to 12th, 13th to 15th, 19th to 21st, 24th to 27th, 28th, 29th, and on the 31st.

Temperature.—The mean temperature over the Union during January was 70·9 degrees, or 0·4 degree lower than usual, the deficiency being brought about by the mean day temperature (81·3 degrees) being 1·8 degree below normal, whereas the mean night temperature (60·4 degrees) was 1·0 degree above the average. These conditions, viz., low mean maxima and high mean minima, were common to all the Provinces. The largest deficit in mean temperature for the month was 1·1 degree in Natal, where the temperature of the month was only 73·7 degrees, as against the normal of 74·8 degrees. The mean maximum in that Province (82·8 degrees) was 4·3 degrees below the average, whilst the mean minimum (64·7 degrees) was 2·1 degrees higher than

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National Oceanic and Atmospheric Administration

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usual. In the Free State, the mean of the month (69·5 degrees) was half a degree less than the average, due to the mean day temperature (81·3 degrees) being 1·2 degree less, and the mean night temperature (57·7 degrees) being only 0·3 degree more than the corresponding normals. Over the Cape Province the mean for the month (70·6 degrees) was 0·4 degree lower than usual, the mean maximum (81·6 degrees) being 1·0 degree below, and the mean minimum (59·7 degrees) being 0·4 degree above the corresponding averages. In the Transvaal the departure of the mean temperature of the month (70·3 degrees) from the normal, although negative, was very small, being only one-tenth of a degree; the mean day temperature (80·2 degrees) was subnormal to the extent of 1·8 degree whilst the night temperature was supranormal by the slightly smaller amount of 1·6 degree. A consideration of the individual stations shows that the relation of the month's mean temperature was extremely irregular, areas of excess temperature adjoining areas of minus quantities. Thus, in the Transvaal, Belfast, Middelburg, Standerton, Potchefstroom, Bloemhof, and Piet Retief, and Mbabane in Swaziland, were warmer than usual by amounts varying from a few tenths to 2½ degrees at Potchefstroom; whereas other stations between these, such as Ermelo, Johannesburg, Klerksdorp, etc., were cooler than usual by 0·2 degree at Johannesburg to 2·1 degrees at Klerksdorp. Again, the stations in the centre and west, as well as in Bechuanaland, were subnormal generally by 1–2 degrees, whereas Pietersburg, in the north, was slightly above normal. In the east the mean temperature at Komatipoort was normal, but subnormal by 0·4 degree at Pilgrims Rest. In Natal, the month was cooler than usual by 1–3½ degrees, Estcourt, however, exceptional, inasmuch as it showed a surplus of half a degree. In the Free State there was a generally deficient temperature of less than a degree, except at Lindley, where a small excess of 0·3 degree occurred. In the Cape Province, excesses of less than 1 degree were recorded in parts of the Transkei, northern Border, and south-west, increasing to between 1 and 2 degrees in the north-east, and exceeding 2 degrees at O'okiep (Namaqualand), Kenhardt (northern Border), and Wynberg, in the Cape Peninsula. At the remaining stations in the Cape Province the mean temperature was below the average, commonly by 1–2 degrees, but occasionally by only a few tenths. The day temperatures at Transvaal stations were mostly below normal by amounts ranging from 0·2 degree at Bloemhof to 5·7 degrees at Pretoria. Deficits were also general over the Free State and Natal, ranging in the former Province from 0·6 degree at Bethulie to 3·0 degrees at Harrismith, and in the latter between 2·0 degrees at Weenen to 8·8 degrees at Ladysmith. In the Cape Province cool days were also prevalent, the shortages being frequently between 1 and 3 degrees, but ranging from 0·6 degree at Port Elizabeth to 6·3 degrees at Mafeking. The mean maxima were, however, higher than usual at a number of stations in the north-east, south-east, south-west, also on the Namaqualand plateau and part of the northern border, the surplus ranging from 0·8 degree at East London to 2·8 degrees at Wynberg, in the Cape Peninsula. In the Transvaal, an excess in day temperatures also occurred at Barberton (0·5 degree) and Potchefstroom (1·0 degree), whilst the mean maximum at Mbabane in Swaziland was normal. The night temperatures were generally above the average in the Transvaal, usually by about 2 degrees, but varying between 0·3 degree at Johannesburg Observatory to 4·2 degrees at Piet Retief. Two exceptional stations were Belfast and Klerksdorp, where deficits in the neighbourhood of 1 degree were recorded. In the Free State the stations showed considerable diversity in the departures from normal, which varied between *plus* 1·4 degree at Lindley to *minus* 1·1 at Ladybrand. In Natal the only station showing a subnormal night temperature was Dundee, where the departure amounted to 1·3 degree. Elsewhere the mean minima were supranormal, usually by amounts of slightly

less than 2 degrees, but ranging from 0·4 degrees at Weenen to 5·9 degrees at Estcourt. In the Cape Province, the nights were warmer than usual over the greater portion of the east, the northern border, Bechuanaland, Namaqualand, and portions of the south-west, the excess ranging from 3·4 degrees at Port St. Johns to 0·1 degree at O'okiep. Elsewhere—that is to say, over parts of the east, along the south coast, over the northern Karroo, in the west coastal area, and portions of the south-west—the mean minima were subnormal, usually by amounts varying between a few tenths and 1 degree, but rising to 3·2 degrees at Murraysburg. In Basutoland the mean maximum at Mafeteng was 7·5 degrees lower than usual, whilst the mean minimum was 2·9 degrees above the normal. The mean warmest station during the month was Kenhardt with 80·8 degrees, on this occasion exceeding Komatipoort by 0·3 degree. The coolest station was Belfast in the Transvaal high veld with a mean of 61·8. There was, therefore, a difference of 19·0 degrees between the warmest and coolest portions of the Union. The highest mean day temperature was 95·8 degrees at Kenhardt and the lowest mean night temperature 51·5 degrees at Belfast. The highest temperatures of the month were recorded on sixteen days, viz., 1st to 3rd, 5th to 10th, 19th to 24th, and on the 29th, principally over the Transvaal during the first few days, and over the Cape, the Free State, and Natal between the end of the third and the middle of the fourth weeks. Temperatures of 100 degrees and over were practically confined to the Cape Province, where they were reported over a number of stations in the south-east and north-east, the south and west coasts, parts of the Karroo and the northern border. The only station outside the Cape Province similarly affected was Komatipoort in the east of the Transvaal, where 109 degrees was registered on the 2nd. Although the highest temperature recorded in the accompanying list of selected stations was 117·5 degrees at Uitenhage on the 22nd, this was slightly exceeded on the same date at Dunbrody, where 118 degrees was registered; from the latter it is reported that cattle, ostriches, fowls, and bees died and the mealie crop was destroyed as the result of the hot northerly wind. The extreme minima, mostly below 60 degrees were noted on twenty days of the month, viz., 1st to 4th, 6th to 9th, 11th to 16th, 21st to 23rd, 25th to 26th, and 29th to 31st, but most widely on the last day of the month. The lowest temperature reported was 41·9 degrees at Murraysburg on the 12th. There was, therefore, an extreme range of 76·1 degrees during the month over the Union. As an example of the fluctuations during the month it may be stated that at Pretoria the mean daily temperature was mostly above the mean from the 1st to the 10th, after which it fell rapidly till the 12th; it continued low till the 15th, afterwards rising slowly till the 20th; it continued high with slight oscillations till the 30th, and was falling fairly rapidly on the 31st.

Precipitation.—The total rainfall for the month of January was above normal over practically the whole of the Transvaal, Free State, and Natal, Kaffraria, the north-east and south-east of the Cape Province, Bechuanaland, the eastern portion of the northern border, portions of the south and south-west of the interior plateau, and of the south-west of the Cape. A somewhat curious, exceptional area of deficient rainfall affected parts of the Transvaal, Free State, and Natal, extending from Ermelo in the Transvaal southwards through Wakkerstroom, Vryheid, Dundee to Weenen in Natal, and in a westerly direction to Lindley in the north of the Free State. The rains during the month were of the steady, soaking type (set-in rains), persisting over some areas, particularly in the Transvaal for ten or more days at a time. There was also a marked absence of the usual summer thunderstorms with their accompanying intense falls in short periods. In consequence of these rains, not only were the totals far in excess of the normal, but new records for January were set up at a number

of stations, in some cases exceeding the heavy falls of January, 1909. As indicating the degree of excess above the average there may be noted, Komatipoort, where the total for January, 1923, was 16·06 inches as against a normal of 5 inches, that is 221 per cent. more than usual; Louis Trichardt with 17·11 inches or 169 per cent. above as compared with the average of 6·37 inches; Standerton with 12·14 inches or 182 per cent. above the normal of 4·31 inches; Mbabane (Swaziland), with 23·93 inches, was 13·56 inches or 131 per cent. in excess of the normal; in the Free State, Boshof, with an average of 3·05 inches, had a total of 8·16 inches or an excess of 168 per cent.; in Natal, Stanger, with a total for the month of 12·19 inches, was 6·94 inches or 132 per cent. above normal; whilst in the Cape Province excesses of 100 per cent. or over were mainly confined to the more easterly portions, e.g. Aliwal North, with 6·30 inches, was 3·41 inches or 118 per cent. more than the average; Kingwilliamstown, with 5·10 inches, was 2·56 inches or 101 per cent. in excess; Port St. Johns, with 11·80 inches, was 6·88 inches or 140 per cent.; and Stutterheim, with 10·68 inches, was 6·76 inches or 172 per cent. above the average.

Rainfall during January over South-West Africa was apparently mostly below the normal, except in these detached areas, in the east of Windhoek, where Gobabis and Groot Witvley had surplus amounts of 1·72 inches, 3·26 inches, or 44 and 104 per cent. respectively in excess; a second area was in the extreme south-east at Heirachabis, where the excess (0·59 inches), although small in itself, was 369 per cent. above the average. The third area lay about midway between the other two, to the west of the railway line between Maltahoehe and Gibeon, where excesses of 0·29, 2·73, and 0·23 inches or 20, 32, and 17 per cent. were recorded at Maltahoehe, Voigtsgrund, and Gibeon respectively. Absolute drought prevailed at Aus in the south-west, but in the more northerly portions the deficits were small (4–10 per cent.); elsewhere, the shortages were generally between 40–60 per cent., but rising to over 90 per cent. at Duesternbrook. The cumulative amounts since the 1st July, 1922, were mostly below the average by between 2 and 3 inches in the extreme north, decreasing to 1–1½ inch further south, and decreasing still further to less than a third of an inch at Windhoek. Deficits of similar amount are encountered at Gibeon and Heirachabis, but at Bethany to the west of Keetmanshoop the minus quantity reached 1·19 inches. Excesses, as compared with the normals, were recorded at Groot Witvley (1·96 inch), Maltahoehe (0·05 inch), Voigtsgrund (2·38 inches), and Aus (0·44 inch), which lie practically in a line extending from north-north-east to south-south-west between Groot Witvley and Aus.

Not only new maximum totals for the month, but also the number of rain-days was in a number of cases greater than had occurred during any previous January, e.g. at Middelburg (Transvaal). Among the exceptional totals for the month, mention may be made of the Embembe Gold Mine (Swaziland), where a total for the month was 33·02 inches; this amount was, however, exceeded by a total of 34·68 inches at Kamhlabane Ranch in the Barberton Division, and by the total of 37·45 inches at Tsakoma in the Zoutpansberg. These amounts were all considerably in excess of the 28·45 inches at Woodbush and Broederstroom (33·01 inches), whose records are usually the largest of the Transvaal stations during the summer months. Daily totals of 2–5 inches were common, but these amounts were exceeded in a number of instances, thus, 6·45 inches were recorded on the 25th at Embembe Gold Mine (Swaziland); 7·61 inches on the same date at Komatipoort in about twelve hours—the Komati River rising 12 feet above normal the next day; 9· inches at Tsakoma on the 29th, and 9·22 inches at Kamhlabane Ranch (Barberton Division) on the 26th (? 25th). Although intense falls in short periods were rare, a fall of 2·16 inches in half an hour at Lomati (Barberton Division) is

worthy of notice. Some fairly heavy falls spread over several hours were reported however, e.g. 1·99 inch in three hours on the 18th and 3·17 inches in four hours, both accompanied by thunderstorms, at Fleur-de-Lys No. 496 in the Lydenburg District of the Transvaal; 4·49 inches in two and a quarter hours at Clifton Farm, Ermelo, on the 28th, and about 5 inches in two and a half hours at Umyenyana (Division of Barberton) on the 17th. As a result of the heavy rains most of the rivers in the north and east of the Transvaal, in Swaziland, Bechuanaland, and the east of the Cape were in flood during the month, in some cases higher than for many years. Among these mention may be made of the following:—At Mahalapye (Bechuanaland) it is stated that the river was often full when little rain had fallen at the station, indicating heavy rains higher up the stream; at Pietersburg the Zand River came down in flood as the result of a "cloud-burst" on the 14th, whilst on the 18th both the Sterk Spruit and the Zand River were in spate from a similar cause, whilst at Zand River (209), Division Waterberg, the river was in flood most of the month, so that it was impossible to cross; at Lomati (Barberton) the river rose about 25 feet on the night of the 25th, and carried away all native crops along its banks; three natives were drowned in the Middle Letaba River (Altijdmooi No. 444); all the rivers in the district round Natalia (Swaziland) came down in flood during the 28th and 29th, the rivers in the neighbourhood of Pampoenkraal (Wakkerstroom Division) were constantly in flood and the roads in a dreadful state; in consequence of heavy rains at Ladysmith (Natal) between the 25th and 28th, the Klip River rose 10–12 feet on the 27th and 28th, causing slight damage to crops as evidenced by the large number of pumpkins, etc., that came down the river; at Estcourt (Natal) the Bushman's River was constantly in flood; at New Hanover (Natal) the river rose higher on the 17th than had ever been seen by the oldest inhabitant; at Hlabisa (Zululand) the Umfolozi River came down, covering the railway bridge to a depth of 6 feet and stopping all traffic; from Standerton it is stated that the Vaal River was constantly in flood, on the 10th being 32 feet and on the 28th 42 feet above the normal level; although the river usually rises gradually it rose about 30 feet within an hour on the 28th, flooding the town and causing families to leave their homes at 4 a.m. to seek refuge elsewhere; many stores and one mill were damaged through water rising into the warehouses, but no accidents occurred. From Protest (Standerton) it is reported that the Leeuwspruit Bridge on the road to Standerton was clean swept away. From Hendrikspan (Bethal District) it is stated that the railway line between Maizefield and Morgenzon was washed away, and the water reached a height never attained before. At Leeuwkuil (Heidelberg Division) the Vaal was in great flood on the 26th. At Sydney-on-Vaal the river was running high throughout the month. On the 31st, the Orange River was in flood at Upington and trains were held up owing to heavy rains up-country. From Queenstown comes the statement: "Continued steady rains; dams and rivers full." Thunderstorms were comparatively rare and of no great severity, and mostly local, and hailstorms were by no means numerous. On the 1st, hail, just over 1 inch in diameter, fell at Johanna Hoeve (Waterberg District), causing damage to the extent of about £100 to beans and other vegetables, guavas being but slightly affected, whilst oranges were untouched. On the same date hail caused much damage to crops on portion of the farm Nooitgedacht (Witwatersrand). On the 2nd, the mealies were damaged by a hailstorm at Vaalbank No. 66 (Bethal District); on the 7th, much damage was caused to gardens at Kokstad (Cape); on the 14th, vegetables and fruit were considerably damaged, and on the same date, hail, the size of pigeons' eggs, fell over portion of Scorpion's Drift (Carnarvon District), stripping vegetables, lucerne, and trees of their leaves. Considerable damage was wrought in various portions

of Natal, particularly towards the middle of the month, e.g. Howick, Impendhle, as well as in the Wakkerstroom District of the Transvaal. Although a fair amount of damage was wrought directly and indirectly, particularly to young crops, by these heavy rains, the benefit derived in an improved state of the veld, and consequently a better condition of stock, rapid growth of earlier-planted crops, the filling of dams, etc., far exceeded any havoc wrought in other directions. Whilst these favourable conditions prevailed over the greater part of the Transvaal, Free State, Natal, and the east of the Cape, the reverse held over the greater part of the northern Karroo, the central and southern Karroos, and parts of the west coastal area of the south-west and Cape Peninsula, and the west of the south coast, and parts of the west and south of the Free State, the amount of rain falling being short of the average, leading to further losses in stock, etc. The cumulative rainfall for the seven months is below the normal amount in the west of the northern border, the greater part of the northern Karroo, parts of the west-central and southern Karroo, the south of the west coastal area, and west of the south coast, also in the south-west and Cape Peninsula; also in the extreme south-west of the Transvaal, the east of the Free State, and a few stations in the inland portion of Natal. The deficits were greatest in the south-west Cape, varying between 3 and 10 inches, whereas over the rest of the areas mentioned the shortages were mostly between two-thirds and one and a quarter inch. Over the rest of the country precipitation was above the normal, frequently by large amounts of 4–10 inches or even more. Such amounts were common over the north, east, and centre, and south-east of the Transvaal, Swaziland, the north-east of the Free State, and adjoining portions of Natal, also the south of Natal, the north-east, south-east, the east of the south coastal area of the Cape and Kaffraria. In the west, south, and centre of the Free State, the north-easterly parts of Natal, Zululand, the northern border, and parts of the Karroos, the excess decreased mostly to quantities varying between ½ inch and 3 inches. Amongst the largest excesses may be mentioned Mbabane (Swaziland), 19·37 inches; Piet Retief, 14·26 inches; Komatipoort, 13·30 inches; Nylstroom, 12·84 inches; Middelburg, 12·11 inches, in the Transvaal; Vryheid, in Natal, 13·55 inches; East London, 17·84 inches, and Stutterheim, 17·60 inches, in the Cape Province.

One of the most severe southerly gales on record blew over the south-west from the 26th to the 28th, causing very heavy losses in fruit, individual farmers being reported to have lost from 150 tons downwards, a considerable portion of what was left being unusable.

OBSERVERS' NOTES FOR JANUARY, 1923.

TRANSVAAL.

Middelburg.—The chief characteristic of this month's weather has been the exceptionally heavy rainfall, and though the amount has not constituted a record, the number of rainy days—viz., twenty-three out of thirty-one—is a record for January for the last twenty years. The exceptional January rainfalls have been as follows: 1907, 9·85 inches; 1909, 9·76 inches. With so much rain the hottest month of the year has been temperate, the maximum recorded temperature being but 88 degrees on a few occasions, and the mean minimum temperature raised. Low barometric readings have obtained, some very low readings being noted between the times for taking these readings, notably on the evening of the 29th, when the barometer fell below 25 inches. Rain has come chiefly from the south-east and the north-north-east and north-north-west. Rainfall: 9·59 inches on twenty-three days.—Dr. H. A. Spencer.

Barberton.—A dry spell at the beginning of the month was followed by a succession of soaking rains. As a result, the cotton crops throughout the district are looking exceptionally well. No floods of any consequence have been reported. Rainfall: 12·63 inches on sixteen days.—Walter Grubb.

Bloemhof.—Drought partly relieved by rains at latter part of month. Rainfall: 4·51 inches on fourteen days.—A. Adamson.

Piet Retief.—Heaviest January rainfall since my term of meteorological observer in Piet Retief (1916). Farmers are anticipating an exceptionally good maize crop this season. Rainfall: 10·22 inches on eighteen days.—J. Werner.

Standerton.—The rainfall has been exceptionally heavy—a record for January. During the month the river was constantly in flood. On the 10th the river rose 32 feet from the normal level, and on the 28th 42 feet. The river usually rises gradually, but on the 28th it rose about 30 feet within an hour. The town was flooded and numbers of families had to leave their homes at 4 a.m. to seek refuge. Many stores and one mill have suffered losses through water rising into their warehouses. Fortunately, no accidents took place. Rainfall: 12·14 inches on sixteen days.—W. J. Madge.

Groeneboom No. 444 (Rustenburg).—This month marks itself by a very heavy and satisfactory precipitation, which was much needed. In general the crops are healthy and advancing rapidly, but in comparison with the advancement of the season they are backward. Veld and cattle are looking fine. During the last day of January a curious haze was noticed on the hills surrounding the station. It lasted all day: the day was warm and clear. Though noticed many times, this day the haze was particularly heavy, and could not have been occasioned by moisture. Rainfall: 7·89 inches on fifteen days.—F. von Nouhuys.

White River (Barberton).—After a very dry December, the middle and latter end of January were very wet. Exceptionally heavy rain fell on the night of the 25th, 4·52 inches being recorded in twenty-four hours. Rainfall: 14·38 inches on seventeen days.—G. S. Ostler.

Gemboksfontein (Middelburg).—Exceptionally heavy rains experienced during the month, and several heavy storms were very local. Rainfall: 7·90 inches on seventeen days.—G. M. van Coller.

Mosdene (Naboomspruit).—Fine soaking rains have had a wonderful effect on the crops, which are now in first-class condition and promise heavy returns. Rainfall: 6·73 inches on thirteen days.—Ernest E. Galpin.

Piet Retief.—This has been a very wet month, 12·19 inches falling on nineteen days. The heavy rains have prevented the farmers from clearing their crops properly; in some places the land has washed badly.—Government Experimental Station.

Krugersdorp.—January, taking the month as a whole, was a very good one from an agricultural point of view. From the 10th to 16th (inclusive) one of the best and most gentle rainfalls of recent years was experienced. Temperatures were slightly under normal, due probably to the amount of dull weather. A decided fall of temperature took place on the last day of the month. Rainfall: 8·08 inches on fifteen days.—H. Sharp.

Lichtenburg.—Splendid steady and soaking rains; veld looking fine; cattle in good condition; heavy rain south of district on 26th and 27th. Early variety of mealies planted until middle of month. Rainfall: 5·19 inches on hirteen days.—J. T. Allman.

Pomona Estates (*Pretoria*).—A month of favourable rains: 7·81 inches on seventeen days.—H. H. John.

Pietersburg.—Steady soaking rains in town and immediate vicinity. Cloud-bursts and torrential rains in district. Cloud-burst on 14th brought Zand River down in flood; another on the 18th flooded Sterkspruit and Zand River. Reports from remote parts show rainfall to have been general and heavy. Rainfall: 6·49 inches on twelve days.

Pampoenkraal (*Wakkerstroom*).—January, 1923, proved a very wet month. The rivers were constantly in flood, and the roads are in a dreadful condition. Crops look splendid where the hail has not been too severe. Low-lying lands are not likely to produce the promising returns looked for unless a spell of dry weather sets in. Rainfall: 8·10 inches on sixteen days.—Mrs. S. M. Nicolson.

Umgenyana (*Barberton*).—17th January: about 5 inches in two and a half hours. Rainfall: 20·38 inches on nineteen days.—A. Hopper.

Lomati (*Barberton*).—25th: River rose about 25 feet during night; all native crops along banks washed away. (10th: 2·16 inches in half an hour). Rainfall: 16·20 inches on nine days.—W. Wright.

Vaalbank No. 66 (*Bethal*).—2nd: Hailstorm damaged mealies. Rainfall: 8·38 inches on fifteen days.—Isaac Spitz.

Clifton Farm (*Ermelo*).—28th January: 4·49 inches in two and a quarter hours. Rainfall: 10·82 inches on twenty-two days.—W. Thompson.

Leeuwkuil (*Heidelberg*).—26th: Vaal River in great flood. Rainfall: 10·33 inches on twelve days.—S. Carter.

Fleur-de-Lys No. 496 (*Lydenburg*).—18th: 1·99 inch in three hours. 25th: 3·17 inches in four hours. Rainfall: 14·08 inches in nineteen days.—P. W. Willis.

Reston (*Middelburg*).—A very wet month; some damage to low-lying crops. Stock in good condition. Rainfall: 11·97 inches on nineteen days.—G. G. Purves.

Hilltop No. 422 (*Pretoria*).—Mealie crop badly damaged, owing to abnormal rains; water lying everywhere, causing plants to die. Rainfall: 12·17 inches on nineteen days.—W. B. Rush.

Protest (*Standerton*).—In spite of the heavy rain during January, and the crops several times being under water, a good return is expected from mealies and maize now standing over 4 feet, but it is feared the small crops will never come to maturity. On the road to Standerton the Leeuwspruit bridge was clean swept away. The Vaal River at Standerton was running 39 feet high. Fall on this farm less than on surrounding district. Rainfall: 8·39 inches on seventeen days.—G. H. Groote.

Zand River No. 209 (*Waterberg*).—Zand River in flood most of the month; impossible to cross. Rainfall: 14·57 inches on fourteen days.—J. B. Armstrong.

Settlers (*Waterberg*).—No damage; crops "A1." Rainfall: 10·42 inches on fifteen days.—M. S. P. Williams.

Johanna Hoeve (*Waterberg*).—1st: Hailstorm from south to north fell from 4.3 p.m. to 4.15 p.m., stones just over 1 inch diameter. Damage estimated at over £100 to beans and other vegetables; oranges escaped; little harm to guavas. Rainfall: 11.30 inches on sixteen days.—T. Romein.

Nooitgedacht (*Witwatersrand*).—19th: Hail on one portion of farm; crops very much damaged. Rainfall: 10·36 inches on thirteen days.—H. C. Hind.

Kleinbegin (*Zoutpansberg*).—Grazing excellent; crops promising. Rainfall: 6·35 inches on nineteen days.—A. Bicheno.

Doornkloof (*Zoutpansberg*).—Much damage to roads by washouts. Top worms had started in mealies, but rains have caused their disappearance. Rainfall: 12·64 inches on seventeen days.—S. M. Ralston.

Altydmooi No. 444 (*Zoutpansberg*).—Crops turning yellow, owing to heavy rains. Three natives drowned in the river (Middle Letaba). Rainfall: 15·73 inches on twenty days.—A. L. Gettliffe.

Onverwacht (*Zoutpansberg*).—The country is saturated, and the crop yield should be enormous for those who plough quickly. The little mealies, being in the wet ground, will not succeed well. Rainfall: 17·89 inches on twenty days.—B. Wessmann.

Hendrikspan (*Bethal*).—Railway line between Maizefield and Morgenzon washed away, and water reached a height never attained before. This is a record fall for any month during past ten years. Rainfall: 10·25 inches on eleven days.—Theo. Jooste.

Swaziland.

Natalia.—At the beginning of the month intense heat accompanied by dry north winds did considerable damage to the veld and crops; of the latter, mealies suffered more severely than the kaffir corn. A considerable portion of the mealies was destroyed completely. The veld has now completely recovered, and crops which are not in a cobbing stage have recovered. Cotton generally suffered little damage. All the rivers in this district came down in spate during the 28th and 29th.—E. J. Merryweather.

McCreedy Tins. Ltd.—Constant rains towards latter part of month have not done the young mealies any good, though the earlier plants look A1. Rainfall: 8·47 inches on nineteen days.—J. L. Reilly.

Orange Free State.

Kroonstad.—Though maximum temperature was not very high, the heat has been very intense during the month. Rainfall: 4·32 inches on eleven days.—S. R. Northfield.

Holfontein (*Kroonstad*).—Hot winds were experienced during the month; the rains on the 26th (1·35 inch) and 27th (0·63 inch) came just in time to save the mealie crop. Gallsickness was severe in the district during the month; several cases of anthrax were also reported. Rainfall: 5·17 inches on eight days.—L. C. McInerney.

Shannon (*Bloemfontein*).—Rainfall for month: 7·08 inches on twelve days. On the 26th 4·05 inches fell, when it rained steadily from 8·45 a.m. on the 26th to 8.30 a.m. on the 27th.—J. G. Hatchard, F.R.A.S., M.I.Mech.E.

Stanleyvale (*Harrismith*).—A very nice month; stock and crops doing well. Rainfall: 6·72 inches on eight days.—G. C. Atkins.

Heilbron.—Crops are in excellent condition, and the season up to the present promises to be a fine one. Live stock are in good condition, and diseases are nil. Grazing is plentiful and of good quality. Rainfall: 6·01 inches on twelve days.—P. A. du P. Naude.

Alma (*Ladybrand*).—Most excellent light rains; no water ran off the ground. Rainfall: 4·22 inches no twelve days.—H. W. Stockdale.

Kalkfontein (*Philippolis*).—Parts of district had good rains, but north-western part is very dry. Rainfall: 0·72 inch on six days.—D. W. Schoeman.

Woudsicht (*Vrede*).—On account of the very hot days, with sufficient moisture on the ground, the crops have been doing exceptionally well. Rainfall: 5·89 inches on thirteen days.—J. N. Köhler.

Paardekraal (*Winburg*).—Rainfall for month: 2·56 inches on eleven days. Total fall most disappointing; rainfall on 24th most welcome; mealies suffered considerably. All cattle and sheep doing well, and in excellent condition; no deaths.—G. S. Lowe.

NATAL.

Impendhle.—Heat very oppressive during the month. Fruit crops good, but one hailstorm about the middle of the month did much damage. All crops looking well. Rainfall: 6·65 inches on sixteen days.—T. H. Biddulph.

Maritzburg (*Mental Hospital*).—Severe thunderstorm on 17th: 1·02 inch fell in one hour. Crops looking well. Rainfall: 7·67 inches on twenty days. —The Staff.

Ladysmith.—Good rains during the month: 7·80 inches on eleven days. Heavy rains fell throughout the district during the four days 25th to 28th, and the Klip River rose from 10 to 12 feet on the 27th and 28th. Crops in the district sustained slight damage through small streams flooding, and a large number of pumpkins, etc., came down the Klip River.—D. A. R. Leathern.

Dundee.—A good deal of hot, clammy weather during the month. Nice rains for growing crops, which appear to have done well during the month. Rainfall: 5·24 inches on ten days.—West Thorrold.

Hlabisa.—Heavy rains fell during the month; more than needed for growing crops. Owing to heavy rains up-country, the Umfolozi River came down in flood, covering the railway bridge with 6 feet of water and stopping all traffic. Rainfall: 9·97 inches on eighteen days.—E. E. Lightening.

Stanger.—Ground in many places saturated with water; no severe thunderstorms. Rainfall: 12·19 inches on sixteen days.—Cecil C. Foss.

Estcourt.—Weather normal for January, except heat for first ten days. Storm on 11th (2·12 inches) did considerable surface damage by way of waste. Bushmans River has been consistently flooded. Rainfall: 7·97 inches on fourteen days.—The Town Clerk.

New Hanover.—During the storm on the 17th (2·01 inches) the river rose higher than the oldest inhabitants have ever seen it. Rainfall: 14·80 inches on seventeen days.—Mrs. E. M. Herbert.

Howick.—Considerable damage done to crops by hail and wind. Rainfall: 6·17 inches on eighteen days.—T. H. Maby.

Mid-Illovo.—Misty and damp. Excellent growing weather, consequently crops looking exceptionally well. Rainfall: 8·86 inches on twenty-one days, well above the average for this month.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Nottingham Road.—Some very hot days, which scorched off acres of rye-grass and teff. Fruit ripening too quickly; stock of all kind healthy. Rainfall: 2·87 inches on twenty-three days.—Miss E. Smythe.

Middleton (*Umvoti*).—Crops in general excellent, but very weedy. Rainfall: 6·39 inches on twelve days.—O. L. Nel.

Rongpoort (*Weenen*).—An ideal month; nice even rains—nothing too heavy. Crops look well, and grass perfect. Rainfall: 4·68 inches on ten days.—J. H. Bartholomew.

Cape Province.

Groot Drakenstein.—The long-continued drought slightly relieved by showers on 29th and 30th. I have never seen the country so dry in 25 years. Fruit small, and vines losing their leaves. The gale on 26th to 28th was one of the worst on record, and great damage was done to fruit crop, individual farms having lost from 150 tons downwards, and what was left is much of it unusable. Rainfall: 0·17 inch on four days.—Lionel Baker.

Queenstown.—A month of continued steady rains: dams and rivers full; heavier rains recorded in the district. Rainfall: 4·19 inches on eighteen days.—H. Holley.

Clanwilliam.—The wind continued to blow fairly strongly from the south and south-west every afternoon almost without exception. Rainfall: 0·15 inch on one day.—P. E. Scholtz.

Aliwal North.—January was hot and dry up to about the 20th of the month. Heavy hailstorm on the 14th, which did considerable damage to vegetables and fruit. Rainfall: 6·30 inches on eleven days.—Alex. Alcock.

Mafeking (Convent).—The rains from 5th to 15th, added to those which fell during the end of December, have changed the appearance of the veld. The farmers rejoice over the improved state of things. Rainfall: 4·68 inches on nine days.—The Mother Superior.

Somerset East.—The persistent rains which fell after the third week relieved the drought which had prevailed since the end of November. Rainfall: 3·01 inches on sixteen days.—C. Harris.

Bedford.—The main features of the weather this month have been the great range of temperature and the almost continuous rains. From summer heat to winter was experienced more than once, and the usual sharp thunderstorms with downpours of rain were not in evidence, but instead, drizzling rains took their place until the end of the month, when for several days continuous rains were our lot. The total rainfall, 5·24 inches on twenty days, is nearly 2 inches above the mean (3·37 inches) for thirty-nine years, and has only been exceeded twice during that period. The abnormal weather this season has developed all the diseases fruit is liable to, and as spraying is not general, there will be a poor crop in town.—T. C. Hall.

Kokstad.—Much damage to gardens by hail on 7th. Rainfall: 7·98 inches on fourteen days.—H. D. Coyte.

Kenhardt.—Strong wind part of the night most of the month. Rainfall: 0·15 inches on one day.—R. Seydell.

Murraysburg.—Drought continues in greater part of district, although beneficial rains have fallen in parts, more espeically in the Sneeuwberg Mountains Range. A few very warm days were experienced during the month, but on the whole it has not been our usual summer weather. Some of our farmers are suffering big losses, due to the drought. Rainfall: 0·45 inches on five days.—W. H. Rose-Innes.

Elsenburg.—The rain towards the end of the month was very badly needed, especially for green feed for stock. It came too late for most other crops. On account of the prevalent south-east winds, the evaporation for the month was high. Rainfall: 0·85 inches on five days.—D. C. Crawford.

Darling (Malmesbury).—Strong south-easters, as last month, have been the prevailing feature. The nice shower at the end of the month was very acceptable for gardens and vineyards, which were very much behind. The

green harvest turned out very much worse in the threshing than it promised by the look of it, and on the whole seems to have been below the average. Rainfall: 0·53 inches on five days.—P. H. Drake.

Kraaipan (*Mafeking*).—Very severe drought has been experienced for months past, and loss in live stock has been very severe. Pasturage is now good, but rain has been late for crops. Rainfall: 6·21 inches on ten days.—P. J. Hart.

Rietfontein (*Aliwal North*).—Very hot month, culminating in an unprecedented steady three days' rain, with no thunder or lightning. Rainfall: 6·42 inches on eleven days.—A. G. Smith.

Kamanassie Dam (*Oudtshoorn*).—The 22nd was the hottest day recorded during the construction of the work: 105 degrees at noon and 110 degrees at 3.15 p.m. Rainfall: Nil.—F. T. Patterson.

Emerald Hill Priory (*Port Elizabeth*).—Great damage was done to the following crops in the Priory vegetable garden by the heat wave on the 22nd: Tomatoes were shrivelled, beans dried up, mealies burnt, loquat leaves scorched, and plants not thoroughly established were utterly destroyed. Rainfall: 4·79 inches on eleven days.—The Mother Superior.

Liwandi-Addo (*Uitenhage*).—Early portion of month made very unpleasant by wind and dust storms. During the very hot day we had on Monday, the 22nd, much damage was done to vegetable gardens (beans and ripe tomato crops). About 1,000 pullets died in valley from heat stroke. At 8 p.m. the temperature was still 98 degrees. Unseasonable cold nights latter part of month are responsible for many colds, especially among children.—Major J. Kreft.

Willowmore.—Temperature unusually changeable for January. Rainfall very disappointing, as weather seemed to promise much more. Parts of district had nice rains, other parts still needing it badly; no thunderstorms. Rainfall: 0·33 inches on four days.—Mrs. B. M. Hemens.

Danger Point.—Strong southerly sea prevailing through the month; frequent heavy showers at sea during last fortnight. Rainfall: 2·11 inches on eleven days.—H. H. Dews.

Riversdale.—The drought was very severe again. The rain showers at the end of the month came just in time to save some late mealies and beans, but in many cases it was too late already. Rainfall: 0·87 inches on six days.—Rev. Carl Prozesky.

Sydney-on-Vaal.—Rains on 26th (1·38 inch) were the first to really benefit the country in this district. Grass is now growing, and given further rains in February, winter veld is assured. River has been running high throughout the month. Rainfall: 3·11 inches on nine days.—J. G. Richards.

Graaff-Reinet.—A warm, dry month, with a cool spell after the great heat on the 22nd. Rainfall: 0·91 inch on five days.—S. E. Treadwell.

Upington.—Rain badly needed. 31st: Orange River in flood; trains held up owing to heavy rains up-country. Rainfall: 0·32 inches on one day.—E. H. Jones.

Abtonia (*Kuruman*).—Good soaking rains; veld good; stock doing well. Locusts in district, but so far well under control. Rainfall: 5·16 inches on nine days.—A. T. Sitwell.

Ceres.—Weather generally cooler than usual and fair amount of wind. Rainfall: 1·90 inch on three days.—A. Heatlie.

Uitenhage.—22nd: Maximum temperature, 117·5 degrees, a record heat for this station; much damage to vegetation, poultry, and small birds. Rainfall: 3·06 inches on ten days.—H. Inggs.

Dunbrody (Uitenhage).—22nd: Maximum temperature, 118 degrees; hot wind; mealie crop destroyed; some cattle, ostriches, fowls, and bees died. Rainfall: 0·81 inch on six days.—Rev. I. Lallemand.

Rondavel (Richmond).—A few good showers fell in the district, but things are still in a miserable state. The few drizzles I had this month have done nothing to the veld. Rainfall: 0·92 inch on five days.—P. J. Kock.

Scorpiondrift (Carnarvon).—14th: Severe hailstorm; stones the size of pigeon eggs; garden (vegetables), lucerne, and trees leafless. Storm was confined to only half of the farm; surrounding farms had nothing; veld growing nicely. Rainfall: 2·21 inches on two days.—J. D. Bester, J.P.

Bechuanaland.

Mahlapye.—Unusual rains; river often full when we had little rain; very little thunder; veld very good after rains, but locusts rampant everywhere. Rainfall: 11·30 inches on fifteen days.—Miss M. Giles.

Dikgatlong Ranch.—The drought broke on the 9th without any immediate indications excepting a few clouds towards the north the previous evening. No rush of water at all, scarcely beyond a drizzle; scarcely any thunder, and that distant. Voetgangers in all directions. Veld recovering fast. Rainfall: 10·27 inches on fourteen days.—Paul Jousse.

Palapye Road.—Rainfall: 9·46 inches on seventeen days, as compared with 0·05 inch for January, 1922. Country looking beautiful and green; cattle looking well and getting fat rapidly; prospects good for good grain crop.—Thos. W. Shaw.

Basutoland.

Mafeteng.—Very hot spell 1st, 9th, and from 18th to 23rd; very cold night on 31st, ground temperature falling to 36 degrees. Glorious rains fell throughout the month; thunderstorms frequent. Soft, soaking rains fell almost continuously from 24th to 28th. Veld looking splendid and stock in first-class condition. A partial mealie crop probable, but wheat crop almost a failure in this district. Rainfall: 5·71 inches on twelve 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 inches; 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.

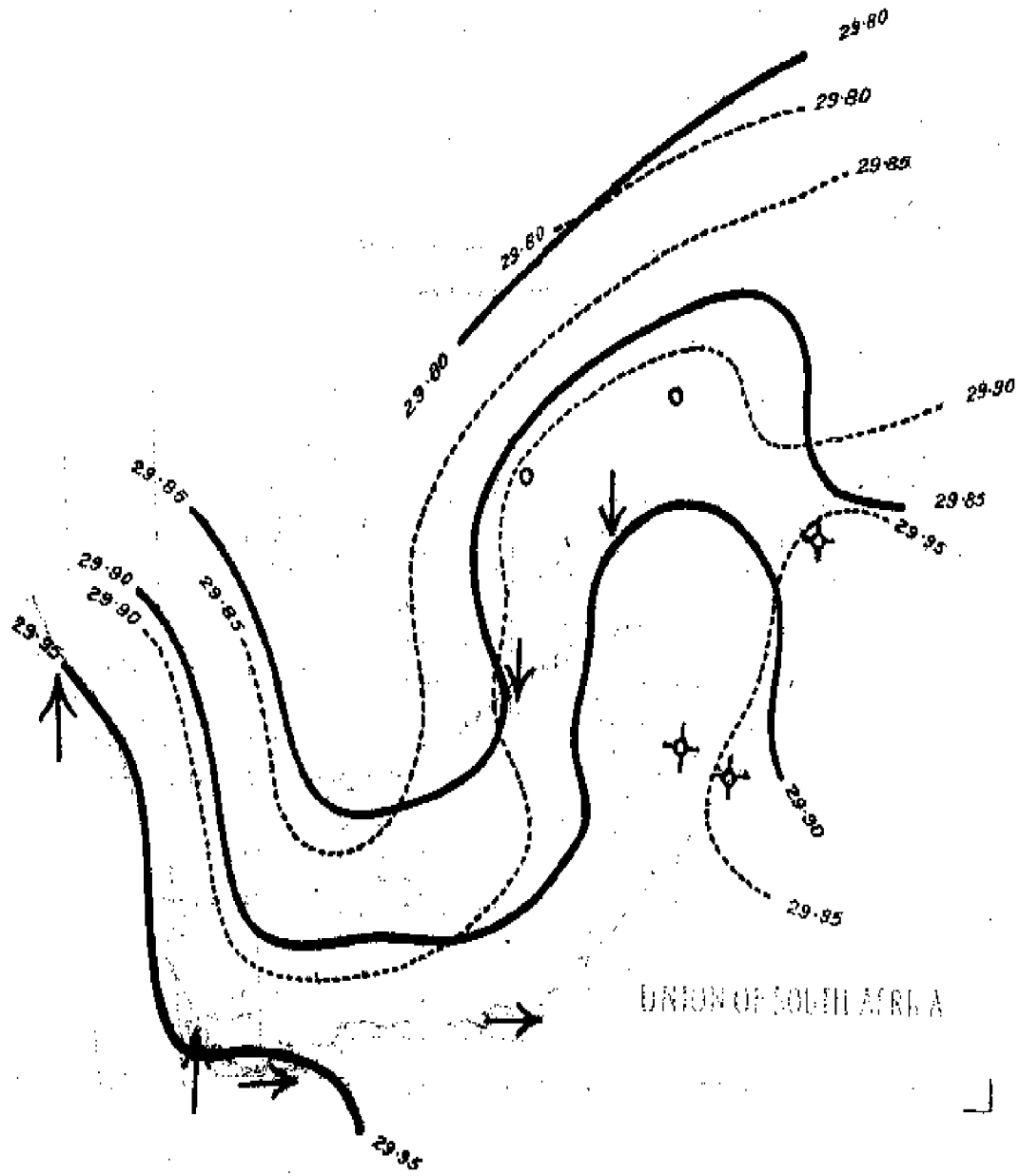
Throughout the Union the mean daily temperature is falling. It may be expected to reach about 73 degrees over the northern border of the Cape and the south Karroo; 72 degrees in Natal; 70 degrees over the east-central Karroo; 69 degrees along the west coast and in the south-west of the Cape; 68 degrees 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 these 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.

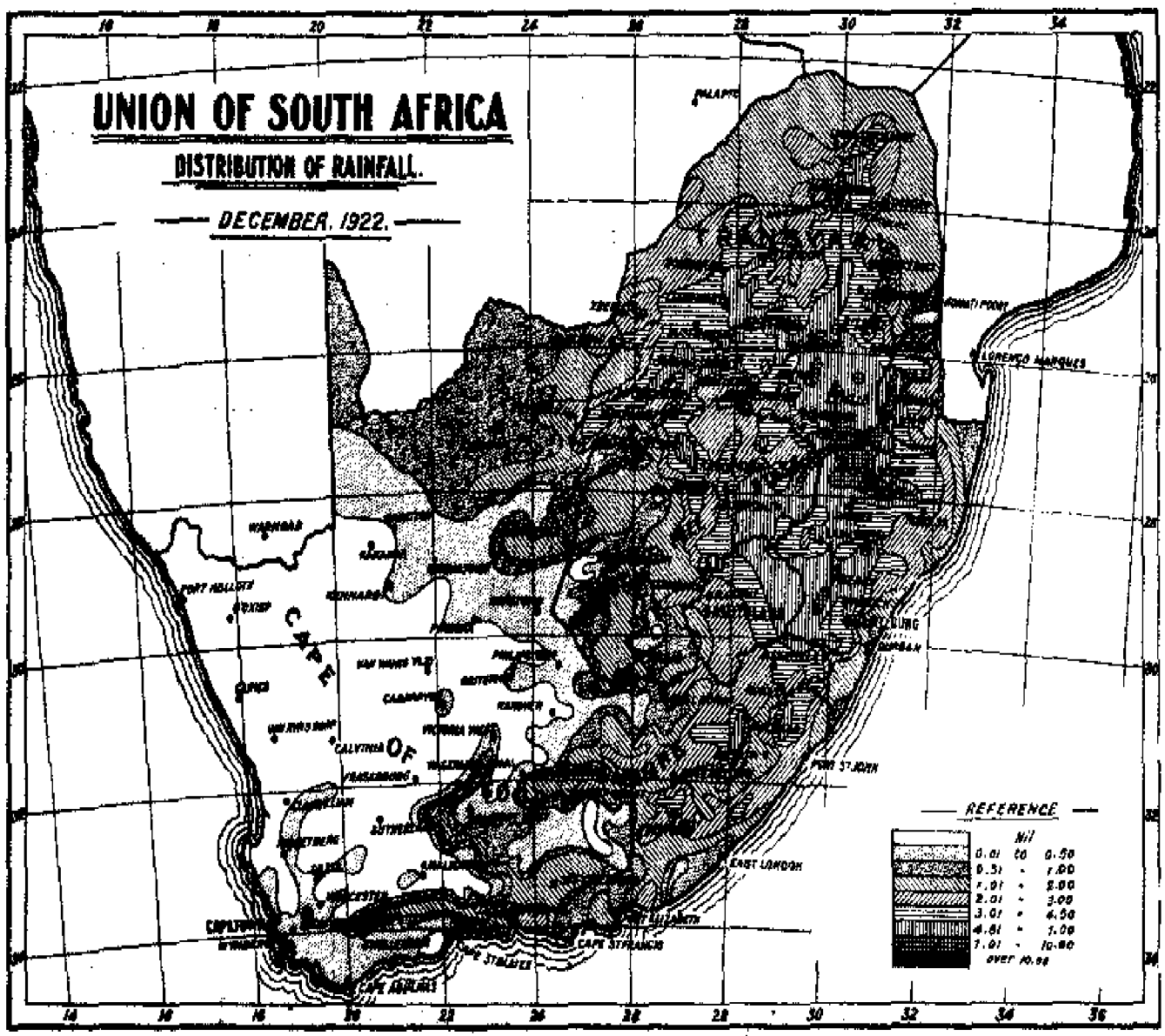
Coincident with the diminution in strength of winds over the Cape Peninsula, there is a tendency to the formation of low-lying fogs over the south-west, but within the summer-rainfall zone the quantity of cloud should be noticeably diminishing, and over the Transvaal and the Cape northern border the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

C. STEWART,
Chief Meterologist.

Pretoria.



January, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for January.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
DECEMBER, 1922.
CAPE OF
LORENCO MARQUES
PORT ST JOHN
EAST LONDON
CAPE ST FRANCIS
CAPE ST BLAIRE
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
over 10.00

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), JANUARY, 1923.

Station.	Observer.	Month—Jan., 1923. Mean Max.	Month—Jan., 1923. 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	82·9	65·3	74·1	73·2	+ 0·9	98·0	2nd	69·0	29th.
Belfast	The Forester	72·0	51·5	61·8	63·0	− 1·2	80·0	7th, 23rd, and 24th	47·0	2nd, 9th, 21st, 22nd, and 23rd.
Bloemhof	A. Adamson	87·9	63·6	75·8	74·5	+ 1·3	90·0	1st	54·0	31st.
Ermelo	The Forester	75·4	55·9	65·4	66·2	− 0·8	87·0	2nd	47·5	31st.
Johannesburg (Observatory)	The Staff	74·5	56·0	65·2	65·4	− 0·2	85·3	20th	49·2	31st.
Klerksdorp (Strathmore)	Chas. Scott	83·1	60·6	71·8	73·9	− 2·1	95·0	3rd	48·0	31st.
Komatipoort	S. J. Fothergill	90·2	70·8	80·5	80·5	± 0·0	100·0	2nd	66·0	15th and 23rd.
Louis Trichardt	L. J. de Bruin	78·8	—	—	—	—	92·0	3rd	—	—
Middelburg	Dr. H. A. Spencer	79·8	58·0	68·9	68·2	+ 0·7	88·0	3rd, 7th, and 24th.	52·0	31st.
Nylstroom	G. Bakker	80·4	62·5	71·4	72·3	− 0·9	89·5	1st and 3rd.	58·0	6th.
Pietersburg	W. J. Frankleyne	79·5	62·0	70·8	70·7	+ 0·1	88·8	10th	58·0	4th, 6th, 15th, and 23rd.
Piet Retief	J. Werner	76·5	60·2	68·4	66·9	+ 1·5	87·1	2nd	51·9	18th.
Pigeonhole (New Agatha)	Jno. McCallum	73·2	61·2	67·2	—	—	85·0	2nd	53·0	13th.
Pilgrims Rest	E. M. Shea	75·9	59·2	67·6	68·0	− 0·4	86·0	1st	54·5	22nd.
Potchefstroom (Exp. Farm)	The Manager	84·6	60·9	72·8	70·2	+ 2·6	94·4	3rd	51·0	31st.
Pretoria (Meteorological Office)	The Staff	78·1	61·6	69·8	71·8	− 2·0	87·5	20th	56·7	15th.
Standerton	W. J. Madge	78·8	57·4	68·1	67·8	+ 0·3	87·6	21st	50·5	31st.
Zeerust	H. Dietrich	83·1	62·4	72·8	74·4	− 1·6	97·0	3rd	54·9	31st.
Swaziland—										
Mbabane	Swaziland Police	76·3	60·2	68·2	67·4	+ 0·8	92·0	2nd	55·5	15th and 16th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	86·6	59·2	72·9	73·3	− 0·4	95·2	8th	47·5	31st.
Bloemfontein	G. A. Schepers	83·3	60·8	72·0	72·5	− 0·5	93·1	1st	47·5	31st.
Harrismith	The Forester	73·6	54·2	63·9	64·8	− 0·9	84·0	23rd	46·0	31st.
Kroonstad	S. R. Northfield	83·0	59·6	71·3	72·0	− 0·7	90·3	3rd and 20th	49·0	31st.
Ladybrand	The Forester	80·6	55·2	67·9	68·8	− 0·9	90·0	23rd	46·0	31st.
Lindley	J. Collister-Oates	80·6	57·1	68·8	68·5	+ 0·3	89·0	20th and 23rd	47·6	31st.
Natal—										
Dundee	West Thorrold	79·8	58·8	69·3	72·2	− 2·9	91·0	7th, 8th, and 24th	53·0	2nd, 12th, and 18th.
Durban (Point)	The Port Captain	81·1	69·2	75·2	76·6	− 1·4	88·6	19th	63·8	12th.
Estcourt	The Town Clerk	80·7	63·8	72·2	71·7	+ 0·5	92·0	2nd and 24th	53·0	31st
Hlabisa	E. E. Lightening	83·3	—	—	74·4	—	93·0	10th	—	—
Ladysmith	D. A. R. Leathern	83·9	62·8	73·4	77·0	− 3·6	96·0	6th and 23rd	57·0	12th and 14th.
Maritzburg (Mental Hospital)	The Staff	80·3	63·1	71·7	73·3	− 1·6	94·0	24th	56·0	13th.
Stanger	C. C. Foss	82·8	68·1	75·4	76·6	− 1·2	98·0	24th	63·0	12th.
Weenen	The Gaoler	90·8	62·0	76·2	77·0	− 0·8	103·0	2nd, 6th, and 24th.	57·0	1st and 12th.

AIR TEMPERATURES, JANUARY, 1923—(*continued*).

Station.	Observer.	Month—Jan., 1923.		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—										
Aliwal North	Alex. Alcock	84·6	58·0	71·3	69·6	+ 1·7	93·5	22nd	44·5	31st.
Bedford	T. C. Hall	80·2	57·1	68·6	69·6	− 1·0	105·0	22nd	49·0	21st.
Capetown (Royal Observatory)	The Staff	79·7	59·9	69·8	69·3	+ 0·5	91·2	29th	53·9	11th.
Carnarvon	A. P. Malherbe	88·7	57·3	73·0	73·5	− 0·5	99·0	5th	46·0	30th.
Clanwilliam	P. E. Scholtz	89·5	57·4	73·4	75·6	− 2·2	110·0	5th	50·0	31st.
East London	The Port Captain	75·8	63·7	69·8	70·0	− 0·2	85·0	9th	58·0	21st.
Graaff-Reinet	S. H. D. Treadwell	86·4	60·0	73·2	73·5	− 0·3	104·8	22nd	50·2	12th.
Grahamstown	The Vet. Res. Officer	77·6	56·0	66·8	68·5	− 1·7	106·4	22nd	47·6	21st.
Great Drakensteiff	Lionel Baker	83·5	57·5	70·5	70·2	+ 0·3	98·6	21st	40·4	1st.
Kimberley	R. Seydell	95·8	65·9	80·8	78·4	+ 2·4	106·0	21st	52·0	31st.
Kimberley	Jno. Acton	89·1	63·9	76·5	75·8	+ 0·7	99·0	21st	54·0	31st.
King Williamstown	L. Clayton	79·0	61·0	70·0	72·4	− 2·4	107·5	22nd	54·0	21st.
Kokstad	H. D. Coyte	77·4	55·7	66·6	66·4	+ 0·2	91·4	22nd	49·7	31st.
Mahking (Convent)	The Mother Superior	83·9	62·0	73·0	75·6	− 2·6	96·2	3rd	55·0	29th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	75·1	63·1	69·1	69·8	− 0·7	81·0	8th	58·0	25th and 31st.
Matatiele	W. H. Rose-Innes	84·8	54·1	69·4	71·5	− 2·1	97·8	5th	41·9	12th.
Oudtshoorn	J. Burrows	86·0	57·0	71·5	70·2	+ 1·3	100·4	21st	46·2	25th.
Port Elizabeth	The Lightkeeper	74·8	63·5	69·2	69·9	− 0·7	100·0	22nd	54·0	31st.
Port Nolloth	The Lightkeeper	66·3	52·1	59·2	59·9	− 0·7	71·0	30th	47·0	1st, 8th, and 21st.
Port St. Johns (Cape Hermes)	The Lightkeeper	76·5	66·5	71·5	71·2	+ 0·3	84·0	23rd	59·0	31st.
Queenstown	H. Holley	82·9	59·2	71·0	69·4	+ 1·6	104·0	5th	33·0	14th, 26th, and 31st.
Somerset East	C. Harris	80·0	57·3	68·6	70·9	− 2·3	102·0	22nd	48·2	29th.
Stutterheim	F. C. Bousfield	75·3	57·8	66·6	67·7	− 1·1	103·2	22nd	50·3	31st.
Sydney's Hope	Rev. S. Rippon	75·6	57·9	66·8	67·6	− 0·8	108·0	22nd	51·0	31st.
Steinhage	H. Ingus	81·2	60·8	71·0	72·0	− 1·0	117·5	22nd	52·0	5th.
Umtata	Miss N. Dix Peck	78·8	60·1	69·4	69·9	− 0·5	99·9	22nd	53·0	31st.
Vryburg	—	—	—	—	76·1	—	—	—	—	—
Wynberg (Convent)	The Mother Superior	78·9	59·8	69·4	67·2	+ 2·2	92·5	22nd	52·5	3rd.
Basutoland—										
Maseteng	F. Hodgson	79·1	56·5	67·8	70·1	− 2·3	88·0	19th and 23rd	44·0	31st.

RAINFALL, JANUARY, 1923.

Station.	Observer.	Month. January, 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—							
Barberton	W. Grubb	12·63	6·51	+ 6·12	26·29	20·53	+ 5·70
Bethal	H. F. M. Joubert	10·53	5·33	+ 5·20	31·51	20·94	+10·57
Belfast	The Forester	9·64	6·15	+ 3·49	31·17	22·08	+ 9·00
Bloemhof	A. Adamson	4·51	3·41	+ 1·10	8·55	9·95	− 1·40
Claremont	S.A. Police	8·04	4·60	+ 2·44	14·57	12·53	+ 2·04
Ermelo	The Forester	4·96	6·12	− 1·16	32·71	23·24	+ 9·47
Hazmertsburg	S.A. Police	13·79	9·52	+ 4·27	27·78	23·67	+ 4·11
Heidelberg	W. A. ter Horst	8·03	4·70	+ 3·33	23·95	18·73	+ 5·22
Johannesburg (Observatory)	The Staff	7·45	5·57	+ 1·88	22·72	19·95	+ 2·77
Klerksdorp (Strathmore)	C. Scott	4·51	4·06	+ 0·45	14·05	13·86	+ 0·19
Komatipoort	B. J. Fothergill	16·06	5·00	+11·06	28·21	14·91	+13·30
Louis Trichardt	I. J. de Bruin	17·11	6·37	+10·74	24·78	18·28	+ 6·50
Middelburg	Dr. H. A. Spencer	9·59	5·25	+ 4·34	31·50	19·39	+12·11
Nylstroom	G. Bakker	14·20	5·20	+ 9·00	28·80	15·96	+12·84
Pietersburg	W. J. Frankleyne	6·49	4·28	+ 2·21	16·71	14·18	+ 2·53
Piet Retief	J. Werner	10·22	5·83	+ 4·39	36·55	22·29	+14·26
Pilgrims Rest	E. M. Skea	12·97	8·37	+ 4·60	30·20	22·71	+ 7·49
Pigeonhole (New Agatha)	J. McCallum	20·97	9·07	+11·90	37·85	27·88	+ 9·97
Potchefstroom (Exp. Farm)	The Manager	4·68	4·15	+ 0·53	17·36	15·15	+ 2·21
Pretoria (Meteorological Office)	The Staff	10·20	5·86	+ 4·34	29·31	19·33	+ 9·98
Rooiberg	M. Baumann	8·91	5·99	+ 2·92	23·44	16·65	+ 6·79
Rustenburg	H. J. Streatfield	8·86	5·03	+ 3·83	18·75	16·98	+ 1·77
Standerton	W. J. Madge	12·14	4·31	+ 7·83	31·25	20·59	+10·66
Wakkerstroom	F. J. Grant	2·70	6·10	− 3·40	25·17	21·50	+ 3·67
Woodbush	The Forester	28·45	16·77	+11·68	48·81	42·85	+ 5·96
Zeerust	H. Dietrich	7·19	4·45	+ 2·74	15·10	14·18	+ 0·92
Swaziland—							
Mbabane	Swaziland Police	23·93	10·37	+13·56	58·25	38·88	+19·37
Orange Free State—							
Bethulie	J. J. Wardbaugh	4·02	2·64	+ 1·38	11·92	8·83	+ 3·09
Bloemfontein	G. A. Schepers	7·02	3·76	+ 3·26	12·59	11·55	+ 1·04
Boshof	P. H. van Rooyen	8·16	3·05	+ 5·11	13·70	10·41	+ 3·29
Harrismith	The Forester	6·40	5·04	+ 1·36	28·54	19·02	+ 9·52
Kroonstad	S. R. Northfield	4·32	4·21	+ 0·11	20·40	14·15	+ 6·25
Ladybrand	The Forester	4·80	4·78	+ 0·02	15·94	16·77	− 0·83
Lindley	J. Collister-Oates	3·18	4·26	− 1·08	17·86	14·92	+ 2·94
Natal—							
Dundee	West Thorrold	5·24	6·04	− 0·80	25·58	20·47	+ 5·11
Durban (Point)	The Port Captain	5·97	4·36	+ 1·61	31·91	25·08	+ 6·83

RAINFALL, JANUARY, 1923—(*continued*).

Station.	Observer.	Month, January, 1923.	Normal.	Difference from Normal.	Fr... 1st July, 1922.	Normal.	... from Normal.
Natal—(continued).		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Netcourt	The Town Clerk	7·97	5·59	+ 2·38	24·80	17·93	+ 6·37
Hlabisa	The Gaoler	9·97	7·25	+ 2·72	29·76	28·17	+ 1·59
Howick	The Gaoler	6·17	5·24	+ 0·93	23·93	20·27	+ 3·66
Impetyne	The Forester	—	5·82	—	—	42·70	—
Ladysmith	D. A. R. Leathern	7·80	4·65	+ 3·15	26·48	16·90	+ 9·58
Maritzburg (Mental Hospital)	The Staff	7·67	5·98	+ 1·69	30·53	23·24	+ 7·29
Stanger	Cecil C. Foss	12·19	5·25	+ 6·94	30·02	27·75	+ 2·27
Vryheid	The Gaoler	6·68	6·89	− 0·21	37·21	23·66	+13·55
Weenen	The Gaoler	4·82	5·52	− 0·70	17·56	17·62	− 0·06
Cape—							
Aliwal North	A. Alcock	6·30	2·89	+ 3·41	17·28	7·76	+ 9·52
Beaufort West	The Gaoler	0·50	1·09	− 0·59	3·98	3·50	+ 0·48
Bedford	T. C. Hall	5·24	3·37	+ 1·87	20·03	11·01	+ 9·02
Britstown	The Gaoler	1·01	1·14	− 0·13	2·12	3·24	− 1·12
Calvinia	The Gaoler	0·16	0·37	− 0·21	4·67	3·49	+ 1·18
Capetown (Royal Observatory)	The Staff	0·53	0·68	0·15	9·53	12·89	− 3·36
Ceres	A. Heatlie	1·90	1·02	+ 0·88	15·28	22·79	− 7·51
Carnarvon	A. P. Malherbe	0·27	1·02	− 0·75	1·25	2·24	− 0·99
Clanwilliam	P. E. Scholtz	0·15	0·22	− 0·07	3·24	4·33	− 1·09
East London	A. Downie	7·97	3·19	+ 4·78	34·09	16·25	+17·84
French Hoek (Driefontein)	The Forester	1·27	2·45	− 1·18	26·41	35·86	− 9·45
Fraserburg	The Gaoler	1·16	0·73	+ 0·43	—	2·00	—
Grahamstown	Vet. Res. Officer	3·88	2·53	+ 1·35	24·52	13·80	+10·72
Garies	The Gaoler	0·00	0·14	− 0·14	3·39	2·51	+ 0·88
Graaff-Reinet	S. E. D. Treadwell	0·91	1·37	− 0·46	6·86	5·67	+ 1·19
Groot Drakenstein	Lionel Baker	0·71	1·10	− 0·39	13·38	18·58	− 5·20
Griquatown	The Gaoler	2·72	1·76	+ 0·96	4·80	3·69	+ 1·11
Hanover	The Gaoler	1·08	1·65	− 0·57	4·92	4·07	+ 0·85
Hopetown	The Gaoler	1·88	1·89	− 0·01	4·28	3·76	+ 0·52
Kenhardt	R. Seydell	0·15	0·57	− 0·42	0·83	1·53	− 0·70
Kimberley	J. Acton	3·16	2·33	+ 0·83	8·06	5·73	+ 2·33
Knysna	The Gaoler	3·54	2·10	+ 1·44	19·79	14·91	+ 4·88
Kokstad	H. D. Coyte	7·98	4·52	+ 3·46	21·66	11·65	+10·01
Kingwilliamstown	L. Clayton	5·10	2·54	+ 2·56	22·58	11·66	+10·92
Kuruman (Abtonis)	A. T. Sitwell	5·16	3·29	+ 1·87	6·42	4·93	+ 1·49
Mafeking (Convent)	The Mother Superior	4·68	4·23	+ 0·45	12·92	9·26	+ 3·66
Mossel Bay (Cape St. Blaize)	The Lightkeeper	1·69	1·18	+ 0·51	8·26	8·49	− 0·23
Murraysburg	W. H. Rose-Innes	0·45	1·11	− 0·66	2·28	3·57	− 1·29
O'okiep	J. Burrows	0·00	0·21	− 0·21	3·66	3·30	+ 0·36
Philipstown	The Gaoler	—	1·69	—	—	4·16	—

RAINFALL, JANUARY, 1923—(*continued*).

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		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Cape—(continued).							
Piquetberg	The Gaoler	0·88	0·55	+ 0·33	7·90	11·43	− 3·53
Port Elizabeth	The Lightkeeper	2·34	1·20	+ 1·14	14·99	12·12	+ 2·87
Port St. Johns (Cape Hermes)	The Lightkeeper	11·80	4·92	+ 6·88	35·77	24·97	+10·80
Port Nolloth	The Lightkeeper	0·05	0·07	− 0·02	1·54	1·08	+ 0·46
Prieska	The Gaoler	1·73	1·23	+ 0·50	3·20	2·42	+ 0·78
Queenstown	H. Holley	4·19	3·38	+ 0·81	16·48	8·84	+ 7·64
Steytlerville	The Gaoler	0·67	0·82	− 0·15	5·57	3·72	+ 1·85
Sutherland	The Gaoler	0·22	0·50	− 0·28	2·80	3·97	− 1·17
Swellendam	The Gaoler	1·70	2·41	− 0·71	14·95	15·60	− 0·65
Sydney's Hope	Rev. S. Rippon	2·31	2·06	+ 0·25	15·79	10·92	+ 4·87
Somerset East	C. Harris	3·01	2·79	+ 0·22	18·37	11·21	+ 7·16
Stutterheim	F. C. Bousfield	10·68	3·92	+ 6·76	30·81	13·21	+17·60
Uitenhage	H. Inggs	3·06	1·11	+ 1·95	17·06	8·44	+ 8·62
Umtata	Miss N. Dix Peck	7·07	3·56	+ 3·51	21·35	10·98	+10·37
Haloudale	The Gaoler	0·61	0·68	− 0·07	5·70	6·38	− 0·68
Upington	The Gaoler	0·32	0·83	− 0·51	1·17	1·85	− 0·68
Victoria West	The Gaoler	1·72	1·05	+ 0·67	2·82	3·18	− 0·36
Vryburg	H. Collens	—	4·15	—	—	5·90	—
Worcester	The Gaoler	0·25	0·25	± 0·00	3·69	6·66	− 2·97
Wynberg (Convent)	The Mother Superior	0·52	1·37	0·85	15·78	25·84	−10·06
Basutoland—							
Maleteng	F. Hodgson	5·71	5·48	+ 0·23	17·08	12·33	+ 4·75
South-West Africa—							
Tsumeb	Ing. Schetter	5·47	6·06	− 0·59	11·25	13·54	− 2·29
Waterberg	D. Hahn	4·79	4·98	− 0·19	7·19	10·06	− 2·87
Omaruru	The Postmaster	1·24	3·20	− 1·96	2·72	5·45	− 2·73
Usakos	Rev. Diehl	0·08	1·16	− 1·08	0·66	2·09	− 1·43
Duesternbrook	J. Matthiessen	1·44	2·41	− 0·97	3·49	4·82	− 1·33
Gobabis	Rev. Irbe	5·66	3·94	+ 1·72	6·89	7·90	− 1·01
Gr. Witvley	B. Rueckert	6·40	3·14	+ 3·26	8·62	6·66	+ 1·96
Windhoek	Observatory	1·18	2·96	− 1·78	5·77	6·09	− 0·32
Maltahoehe	E. Just	1·75	1·46	+ 0·29	2·48	2·43	+ 0·05
Voigtsgrund	A. Voigts	3·58	0·85	+ 2·73	4·63	2·25	+ 2·38
Gibeon	Rev. Spellmeyer	1·60	1·37	+ 0·23	2·24	2·56	− 0·32
Bethany	Rev. Peter	0·38	0·79	− 0·41	0·40	1·59	− 1·19
Aus	F. Erni	0·00	0·25	− 0·25	1·94	1·50	+ 0·44
Heirachabis	Rev. Father Eder	0·75	0·16	+ 0·59	0·96	1·20	− 0·24

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. IV. **FEBRUARY, 1923** **No. 2**

MEAN pressure about normal over the north, east, and centre, but above the average in the south-west Cape; mean temperature normal over the Union as a whole, but showing small excesses over the Transvaal and Cape Province, and deficits of one to one and a half degrees over the Orange Free State and Natal; cool days, particularly in Natal and the Free State, with nights warmer than usual, more especially in the Transvaal; an excess of rainfall over the north, north-east, east, and south-west of the Transvaal and Swaziland, parts of Natal, the north, east, centre, and west of the Free State, in Basutoland, also in the northern border, Bechuanaland, centre and south of the northern Karroo, parts of the central Karroo, and of the east of the Cape, and in Kaffraria; a shortage of precipitation elsewhere, with absolute drought in Namaqualand, the west coast, and south-west of the Cape; some very heavy falls in the twenty-four hours, and in short periods; an absence of thunderstorms of any great intensity, also destructive hailstorms, except in the neighbourhood of Kokstad and Kokstad; rivers in flood, notably in the Barberton, Zoutpansberg, and Rustenburg Divisions in the Transvaal, at Ladysmith in Natal, and Smithfield, Vrede and Bloemfontein Districts in the Free State, also in the adjoining territories of South-West Africa, Rhodesia, and Portuguese East Africa; these were the leading features of the weather of February, 1923.

Pressure.—The mean pressure for February was about normal over Rhodesia, the Transvaal, the Free State, and the east, but was about 0·05 inch above the average in the south-west of the Cape. The most noticeable feature during the month was the persistence of the equatorial low pressure area, which frequently lay well to westward, on most occasions reaching the coast. High pressure areas, with isobars of 30·10 inches or over were present, over the south-east on the 2nd and 15th, over the south and east on 21st to 24th, over the west on the 20th, and along the west, south, and south-east coasts on the 24th.

Temperature.—The mean day temperature over the Union during February was 81·1 degrees, or 0·9 degree lower than usual, whilst the mean night temperature (60·3 degrees) was 0·8 degree above the average; as these differences

practically neutralize each other, the resulting mean monthly temperature was the same as usual (70·7 degrees), but with a reduction of 1·7 degree in the mean monthly range. In all the four Provinces the mean maxima were lower and the mean minima were higher than usual, although by widely differing amount. Thus in Natal, the mean maximum temperature during February (83·4 degrees) was 4·0 degrees lower than usual, and in the Free State the corresponding mean day temperature (78·7 degrees) was 2·1 degrees below normal; compared with these, deficits in the mean maximum over the Cape Province (81·6 degrees) and over the Transvaal (80·3 degrees) were small, being only 0·3 degree and 0·2 degree less than usual. On the other hand, the largest surplus in the mean minimum or night temperature was 1·2 degree in the Transvaal above the normal (58·5 degrees); in Natal the corresponding temperature (63·5 degrees) was 0·6 degree above the average, or only half the excess obtaining in the Transvaal; in the Cape Province the excess in the mean minimum for February (60·5 degrees) was 0·7 degree; whilst the Orange Free State, with 57·7 degrees, was only 0·1 degree in excess. The net result of these differences was that the mean monthly temperature over the Transvaal (70·0 degrees) was 0·5 degree, and over the Cape Province, with 71·1 degrees, was 0·2 degree above the corresponding averages, whereas the means for the month over the Free State (68·2 degrees) and over Natal (73·5 degrees) were 1·0 degree and 1·6 degree respectively below the corresponding normal values. Considering the stations separately, it is seen that the temperature of the month was higher than usual in the Transvaal to the east and south of a line drawn from Potchefstroom in the south-west to Pietersburg in the north, and thence south-east to Komati Poort, on the Portuguese border. The only exceptional stations in this area were Belfast, where there was a deficit of 0·7 degree, and Ermelo, where the month's temperature was normal. The excesses were mostly less than one degree, but varied between 1 and 2 degrees in the more southerly portion, reaching 2·2 degrees at Johannesburg, whilst Barberton in the east was 2·6 degrees warmer than usual. At Bloemhof the temperature of the month was 2 degrees, and at Mbabane (Swaziland) 1·2 degree above normal. In the extreme north and west the mean for the month was lower than usual by amounts ranging from 2·0 degrees at Louis Trichardt to 0·5 degree at Zeerust. Sub-normal temperatures for the month were also experienced over the Orange Free State, Basutoland, Natal, Bechuanaland, the east of the northern border, the east of Kaffraria, part of the south-east and central Karroo, south and west coastal areas, and part of the south-west of the Cape. An excess in mean temperature occurred over the west of the northern border, the northern Karroo, parts of the east central Karroo, and of the south-east, the north-east, and south of Kaffraria, the Cape Peninsula, and the interior of Namaqualand. The deficits in the Free State varied between 0·1 degree at Bethulie and 2·4 degrees at Harrismith, in Natal between 0·5 degree at Durban and 3·7 degrees at Ladysmith, but were mostly slightly over one degree. Over the Cape Province the deficits were about half a degree or less in the northern border, the Transkei, south coast, and the south-west; in the south-east and the coast of Namaqualand they increased generally to between 1 and 1½ degrees, reaching a maximum of 2·8 degrees at Grahamstown and 2·2 degrees at Clanwilliam. The excesses in the Cape Province were mostly slightly less than a degree in the east and over the Cape Peninsula, but rose about 2 degrees over the northern Karroo, the east central Karroo, and the Namaqualand plateau; the maximum excess was 4·9 degrees at Carnarvon. Although generally speaking the days were cooler and the nights warmer than usual by slightly less than a degree, the relationship to the normal presented great diversity at the individual stations. Thus in the Transvaal, at Louis Trichardt, in the north, Klerksdorp in the south-west, and Belfast in the east of the high veld, both

mean maxima and mean minima were below the average. On the other hand, at Barberton, Mbabane, and Piet Retief in the east, and in the Witwatersrand, Potchefstroom, Middelburg, and Standerton Districts in the south, both days and nights were warmer than usual, whilst elsewhere the days were cooler and the nights warmer than the average. Similarly, both maxima and minima were sub-normal in the east, north-east, and north of the Free State, in Basutoland, at several stations in Natal, portions of the south-east, south, and west coastal areas of the Cape Province. Diametrically opposite conditions prevailed in Namaqualand, over the west of the northern border, the central portion of the northern Karroo, and at a few stations in the south-east of the Cape; both maxima and minima for the month being higher than usual. The days were warmer and the nights cooler over the Cape Peninsula, the south-west Cape, and the south of the northern Karroo, whereas the reverse (i.e. lower maxima and higher minima than usual) held over the remainder, and that the greater portion of the Union. The mean warmest station was Kenhardt, with a temperature of 80·4 degrees, Komati Poort coming next with 80.0 degrees; whilst the mean coolest station was Port Nolloth, with 58·8 degrees, a difference of 21·6 degrees. The highest mean maximum was 93·9 degrees at Kenhardt, the next highest being 89·9 degrees at Clanwilliam; in the other Provinces, the corresponding values of the day temperatures were 89·4 degrees at Weenen in Natal and Komati Poort in the Transvaal, and 82·9 degrees at Bethulie in the Free State. The lowest mean minimum for the month was 51·4 degrees at Belfast, the second in order being Port Nolloth, with 51·5 degrees; in the Free State the corresponding temperature was 52·6 degrees at Harrismith, and in Natal, 57·9 degrees at Dundee. The highest temperatures were registered on nineteen days of the month, viz., 1st to 7th, 9th to 11th, 15th, 16th, 18th to 20th, 22nd, 23rd, 25th, and 28th; these extremes were most numerously recorded during the first seven days and most widely from the 4th to the 7th. The lowest temperatures were recorded on seventeen days of the month, viz., 1st to 7th, 13th, 15th to 22nd, and 25th. Temperatures of 100 degrees and over were confined to Weenen (Natal), and to O'okiep, Clanwilliam, Groot Drakenstein, Somerset East, and Graaff-Reinet and Kenhardt in the Cape Province, the extreme of 106·0 degrees being registered at the last mentioned station on the 4th; the lowest minimum at any station was 40·0 degrees at Pilgrims Rest on the same date, when also the second lowest value of 41·0 degrees occurred at Belfast. There was, therefore, an extreme range of 66·0 degrees during the month.

Precipitation of February presented all degrees of variation, from continuous excessive and occasionally record falls, to absolute drought. An excess of rainfall was experienced over the eastern borders of the Transvaal and in Swaziland northwards to Louis Trichardt, also in the south-west. These heavy rains in the east appear to have been confined to portions of the middle and low veld, particularly the former; whilst in the south-west they affected the middle and high veld as far east as Johannesburg. The surplus amounts were large: 12–14 inches at Pilgrims Rest, Woodbush, and Pigeonhole, decreasing to 6 inches at Louis Trichardt and Mbabane; in the south-west the excesses were mostly about 2 inches. A belt of sub-normal rainfall extended in a north-west to south-east direction, being bounded on the west by Rooiberg, Claremont, Pretoria, Heidelberg, Standerton, Wakkerstroom, and on the east by a line through Nylstroom, Belfast, Barberton, and Piet Retief. The only exceptional station in this area was Middelburg, on the high veld, where there was a small excess of 0·14 inch. The area of deficient rainfall extended into Natal, including also the north-east of the Free State, where Harrismith was 0·12 inch lower than the normal. In the Transvaal the deficits were less

than 1 inch in the east, but increased to 2–4 inches at Pretoria, Heidelberg, and Nylstroom; deficits of slightly over an inch occurred at Pietersburg in the north and Bloemhof in the south-west. In Natal the shortages were mostly between 1 and 2 inches, but varied from 0·05 inch at Stanger to 4·08 inches at Hlabisi in Zululand. Excesses of between 1 and 2 inches were met with at Dundee and Durban. In the Free State the month's rainfall was above normal in the north, east, and west by quantities varying between 0·39 inch at Kroonstad and 5·10 inches at Boshof. In the north-east and extreme south, however, small shortages occurred. In the Cape Province precipitation was in excess in Bechuanaland, the northern border, the greater portion of the northern Karroo, the central Karroo, parts of the south-east and north-east and Kaffraria, also in Basutoland and South-West Africa. The surplus amounts were mostly between 1¼ inch and 2½ inches over the northern Karroo, the east of the Cape Province, and the Transkei, but decreased to less than half an inch between Kimberley and Prieska, and to less than half an inch in the south-west of the northern Karroo and the central Karroo, and part of the south-east. The excesses rose to over 3 inches, however, at East London and Kokstad, and to almost 8 inches at Mafeteng in Basutoland. The rest of the Cape Province—that is to say, the west of the northern Karroo, the west coast, south-west, Cape Peninsula, southern Karroo, south coast, and portions of the south-east and north-east—had a sub-normal rainfall, absolute drought prevailing along the west coastal area and portions of the south-west. In South-West Africa the surplus amounts varied between 12·53 inches at Voigtsgrund, with a normal of 2·06 inches, to 0·11 inch at Bethany. Here the largest excesses seem to be along a line lying practically north and south from Tsumeb, E.S.E. of the Etoscha Pan, to Gibeon. In the north the excess was between 5 and 6 inches at Tsumeb and Waterberg, decreasing to slightly over 4 inches at Duesternbrook, whilst further south, at Windhuk, the plus amount approached 9 inches. The largest surplus of 12·53 inches was recorded at Voigtsgrund (normal rainfall, 2·06 inches), about forty miles W.N.W. of Gibeon, at which place there was an excess of 3·01 inches. To the west of this band the rainfall was generally between 1 and 2 inches above normal, but was less than an inch in excess to the south, decreasing to absolute drought at Aus. At Gobabis, about 120 miles east of Windhuk, a total of 8·40 inches, as compared with a normal of 4·83 inches, was recorded; but at Groot Witvley, about thirty miles to the west of Gobabis, the excess of 1·74 inch was only 48 per cent. above normal. Hierachabis, in the south-east, showed a total for the month of 1·55 inch, or 96 per cent. over normal. Over the Transvaal, the first week was dry practically everywhere, but dull, cloudy, and rainy weather persisted from the 8th to the 28th over the greater part of the Province. Rain was almost continuous in some parts, with very little sunshine, the number of rain days being greatest in the Lydenburg, Barberton, and Zoutpansberg Divisions, also in Swaziland, Bloemhof, Lichtenburg, Heidelberg, and Wolmaransstad. Piet Retief and Standerton Districts came next, whilst precipitation was least frequent in the Wakkerstroom, Bethal, and Middelburg Districts. In the Free State rains were widespread and occurred at frequent intervals from the 9th, whilst in Natal the most general rains occurred during the last three weeks of the month. In the Cape Province, frequent light showers fell over the northern Karroo and Bechuanaland from the 8th onwards, whilst rains were fairly continuous over the northern Border, the north-east, south-east, and Kaffraria. Slight thunder showers occurred over the central Karroo, and light rains over the south coast and southern Karroo, with small quantities over the Cape Peninsula and the Caledon Districts. No rain fell over the west coast, the greater part of the south-west, and part of the west central Karroo. Although thunderstorms were infrequent, a number of heavy falls in twenty-four hours were registered during the month.

particularly between the 11th and 13th, when many rivers in the Transvaal, Natal, and Free State came down in flood. Thus the flood at Ladysmith (Natal) on the morning of the 12th was apparently caused by heavy rains near its source. Among these falls may be mentioned a fall of 8·85 inches at Wyford, in the Klip River Division of Natal, during a heavy thunderstorm starting at 8.30 p.m. on the 11th; Moorside, in the same division, where 6·18 inches were recorded on the same date; Gourton, in the Division of Weenen, 5·29 inches on the 11th; Holmlea, in the Klip River Division, where, out of a total of 3·70 inches for this date, 2·85 inches are stated to have fallen in one and a half hours; and Edendale (Klip River Division), when a fall of 3·20 inches occurred between 9 p.m. on the 11th and 2 a.m. on the 12th, and from which station it is reported that the Sand Spruit rose higher than ever known, causing considerable damage to lands and fencing on the river banks. At Ndumu (Ingwavuma Division) 3·03 inches were recorded on the 12th (? 13th), and at Maputa, in the same district, 7·24 inches fell on the 13th; whilst in the Port Shepstone Division, Port Shepstone registered 5·15 inches, and Bushy Vales 3·79 inches, on the same date (13th). At Maputa (Ingwavuma Division), 7·24 inches occurred also on that date. At Wyford, a second heavy fall of 5 inches occurred on the 24th. At Pampoenkraal in the Wakkerstroom Division of the Transvaal, a cloudburst (date not given) on the hills to the west brought the Gwampisi down in flood, the height of the flood being greater than ever known before. It is further stated that immense cavities in the hills bore witness to the damage produced by the rush of water. At Krugersdorp, a fall of 6·05 inches occurred on the 21st. On the same date, a fall of 4·68 inches at Nooitgedacht (Witwatersrand) caused considerable damage to growing crops. At Hilltop (Pretoria District) much smaller falls of 1·14 inch and 2·58 inches on the 26th and 27th respectively did considerable damage to lands, cutting furrows two feet deep and washing seed away. At Welgedacht (Pretoria), 7·74 inches fell in 4¼ hours. At Louisville (Barberton) a fall of 5·60 inches on the 20th caused considerable damage to lands. In the Free State, particularly the south and centre, quantities of 3–5 inches in twenty-four hours were fairly common, and principally also on the 13th. Among these heavy falls may be noted: 1·82 inch at Tweespruit (Thaba 'Nchu District), on a tributary of the Caldeon, on the 11th, when 1½ inch fell within an hour; 3·57 inches at Winburg, in the catchment of the Vet River—this amount fell in five and a half hours, 2·35 inches falling in seventy minutes; at Klipnek (Fauresmith District) 3·49 inches, consisting of very heavy rain and hail, fell on the 12th at Newlands, 3·11 inches on the 13th—of this amount, 2½ inches fell in three-quarters of an hour; at Reddersburg (Bloemfontein District), 4·0 inches, at Helpmekaar (Smithfield District) 5·0 inches, at Laspoort (Smithfield District) 7·22 inches, all on the 13th, in the catchment of the Riet River. At Zastron (Rouxville District), in the Caledon River catchment, 3·65 inches fell on the 13th. At Dewetsdorp and Bultburg, both in the district of Bloemfontein and in the Modder River catchment, 3·71 inches and 3·99 inches were recorded respectively; whilst at Dwogfontein, in the same district, but in the Kaffir River area, 5·33 inches fell also on the 13th, causing a considerable amount of damage and breaking two dams. On the 26th, a total of 2·68 inches occurred, of which amount 2·5 inches fell in an hour. These heavy rains of the 13th extended into Basutoland, where Mafeteng recorded 4·13 inches on that date, out of a total of 12·43 inches for the month. The three largest totals for the month were Broederstroom (Zoutpansberg), 46·51 inches on twenty-three days, which, with 33·01 inches during January, make a total of 79·52 inches for the two months; Woodbush showed 28·85 inches on twenty-three days for February, which, with 30·02 inches during the preceding month, gives a total of 58·87 inches. Kamblabane Road, in the Barberton District, received

20·42 inches during last month, which, with the previous month's total of 34·68 inches, makes 55·10 inches for the first two months of the year; Tsakoma, in the Zoutpansberg Division, with a total of 37·45 inches for January, received an addition of only 16·90 inches in February, making in all 54·35 inches for these two months. As a result of the heavy rains, many rivers and spruits were in flood, occasionally overflowing their banks, and causing a considerable amount of damage to lands, houses, dams, fences, etc. At the beginning of February the Vaal River was in flood from the rains of the previous month, and the water at the barrage was reported as 17 feet above the level of the concrete "apron." The maximum height of this flood is stated to have been 9½ feet below the highest point of the 1907 flood. At Kamblabane, in the Barberton District, all rivers were in flood practically all through the month, the Komati River occasionally overflowing its banks; several natives were drowned. Similar conditions affected the rivers in Swaziland. At La Cotte (Zoutpansberg Division), the Groot Letaba from 13th to 19th was approximately 30 feet above the normal dry season flow—the highest level seen for years past. At Matjespruit (Wolmaransstad Division), the spruit was in flood from the 12th to the 15th, and on the 27th, at Pampoenkraal (Wakkerstroom), the Ingwemfusi (a tributary of the Groot Usutu River) rose higher than could be recollected to have occurred before. The Sterkfontein Spruit at Krugersdorp was rendered impassable for several hours by the heavy rain of the 21st, and on the same date the Schoonspruit at Klerksdorp came down level with the railway bridge, overflowing its banks above and below the town. The Rhenosterspruit (sixteen miles west) was also in spate.

In Natal the Sand Spruit was higher on the 11th and 12th than it had ever been known to be before; whilst at Ladysmith the Klip River overflowed its banks on the 12th, rising 27 feet (approximately) to the same level as in 1886, the highest known level (*vide* Notes). On the same date (12th), heavy rains occurred in Bloemfontein, breaking down some of the masonry work of the canal of the Bloem Spruit; whilst the rainfall at Kuruman on that day is stated to have been heavier than ever before experienced. On the 13th, the heavy rains in the south of the Free State brought the Riet River down in full flood, higher than in March, 1920, washing away dams, and causing considerable damage to lands, fencing, and property. Parts of the Modder and Kaffir River basins were also affected, the new dam on the latter being filled to overflowing. Some tributaries of the Caledon River were also in flood, washing down sheep in some cases, whilst the heavy rains extended into Basutoland. Washaways on the railway line occurred at Reitz in the north, at Riet River north of Edenburg, between Border and Taungs on the Kimberley–Vryburg line, and between Upington and Prieska; whilst the Riet River bridge was under water for the first time in forty years, and the railway bridge at Upington was impassable. Some rivers and spruits in the north, as at Roadside (Vrede District), were overflowing, whilst from Kokstad it was reported that rivers were full and posts delayed. A cloudburst is reported to have occurred on the farm Albert Louw Vley (Kenhardt Division), causing two dams to burst, and drowning a thousand head of small stock. Similar flood conditions prevailed in South-West Africa, where, according to newspaper reports, most of the rivers were in flood, particularly the Fish and Swakop Rivers. In consequence of the Fish River overflowing its banks on the 17th, a number of houses at Mariental collapsed, whilst similar destruction was wrought at Gibeon, further south. Railway traffic was suspended for weeks, owing to a number of washaways north and south of Windhuk, as well as on the Luderitzbucht branch, and the telegraph lines were, according to newspaper reports, submerged for about half a mile. Some damage also occurred at Kub, and in the Aurub and other districts. Similar heavy rains occurred about a week later, again washing

away the portions of the railway line that had been repaired between Rehoboth and Mariental. Farm houses, gardens, and pumps were washed away, and at Tsumis drinking water was being sold by the railway authorities at 5s. 3d. per 100 gallons. Pans in the sand dunes, which had been dry for the last thirty years, had 5–6 feet of water in the Witvlei area. The rivers at Okahandya and Rehoboth were in full flood. Floods were reported again towards the end of the month, running far out of their usual courses. Heavy rains and flood were also reported in Rhodesia and Portuguese East Africa. The Zambesi was in flood, and threatened to rival the unprecedented rise in March, 1918, when hundreds of natives were drowned, and Nyassaland traffic to and from Chindio was stopped for several months. Fortunately, the water failed to reach the previous level, so that the only damage was the partial flooding of the line along the north bank. The only loss of life in South-West Africa seems to have been the drowning of three natives. Thunderstorms were of comparative infrequency. Occasional hailstorms were reported from the Free State, Natal, and the Transkei, the only destructive storm being that at Middleton (Umvoti Division), in Natal, on the 28th, which caused slight damage to crops and much heavier losses to several farmers in the neighbourhood of Kokstad.

The accumulated rainfall since the 1st July, 1922, is above normal over the Transvaal, except in the extreme south-west, where Bloemhof shows a deficit of 2·42 inches. The excesses are largest in the north and east, being commonly 5–10 inches, but rising in places to 20 inches or over. The most noteworthy excesses were 10·32 inches at Bethal, 12·91 inches at Louis Trichardt, 13·34 inches at Piet Retief, 14·84 inches at Komati Poort, 19·66 inches at Pilgrims Rest, 20·40 inches at Woodbush, and 23·17 inches at Pigeonhole. In the west and south the surplus amounts were mostly less than 5 inches, ranging from 1·88 inches at Klerksdorp to 4·08 inches at Potchefstroom. In the Free State, the excess during these eight months varied from 2·58 inches at Bethulie in the south to 9·40 inches at Harrismith in the north-east. A small deficit of 0·14 inches was, however, shown at Ladysmith in the east. An excess of over 12 inches occurred at Mafeteng in Basutoland, and Vryheid in Natal, in which Province, however, the surplus amounts were mostly between 2 inches and 5 inches, increasing to 6·26 inches at Dundee and 8·71 inches at Durban (Point). Shortages of more than 2 inches, on the other hand, were registered at Weenen (Natal) and Hlabisa (Zululand). In the Cape Province the cumulative amounts were mostly above the average, the largest excesses (6·21 inches) occurring in the east and Kaffraria. The most noteworthy surplus amounts were 10·46 inches at Kingwilliamstown, 10·66 inches at Grahamstown, 11·51 inches at Umtata, 11·81 inches at Port St. Johns, 13·80 inches at Kokstad, and 21·01 inches at East London. Over the greater part of the northern and central Karroo, the northern border, and Bechuanaland, and along the south coast, from Knysna eastwards, the excesses were mostly between 1 inch and 3 inches, but exceeded 3 inches at Knysna and Kuruman, and reached 4·87 inches at Mafeking. Over the more southerly and westerly parts of the Karroo and Namaqualand the surplus was generally less than an inch. South of the parallel of 32 degrees and west of 22 degrees E. longitude, as well as in small portions in the centre of the northern Karroo and in the southern Karroo, precipitation for these eight months was sub-normal by amounts ranging between 0·96 inches at Sutherland and 10·35 inches at Wynburg. In South-West Africa precipitation was in excess mostly by 2–4 inches, but by 8½ inches at Windhuk, and almost 15 inches at Voigtsgrund. Deficits, however, occurred at Omaruru in the north and Bethany and Aus in the south-west. Supra-normal aggregates for the two months, January and February, showed very much the same distribution as for the eight months, the totals in a number of cases

showing even a larger excess than for the longer period, particularly in parts of the north, east, and west of the Transvaal; in portions of the south and south-east of that Province, however, the totals for the two months were less than the average by quantities varying between 0·56 inch at Heidelberg and 4·48 inches at Wakkerstroom. In the Free State excesses were general, usually of about an inch, but rising to 8 inches at Bloemfontein and 10 inches at Boshof. Mafeteng in Basutoland also showed a surplus of 8 inches. In Natal, sub-normal amounts were more frequent than during the eight months; these were mostly between 1 inch and 3 inches, whilst a deficit of 1·36 inches occurred at Hlabisa in Zululand. The excesses in this Province were mostly small, although reaching 6·89 inches at Stanger. In the Cape Province the area of sub-normal rainfall affected the whole of the west coast, also the central Karroo, in addition to the south and south-west. The deficits were mostly small, ranging from a few tenths to slightly over 1½ inches. The excesses over the northern, central, and southern parts of the Cape Province were commonly between 1 inch and 2 inches, but increased eastwards to 7·25 inches at Kokstad and 7·95 inches at East London. In South-West Africa shortages for these two months were confined to the same areas as for the eight months, whilst the excess amounts were generally between 3 inches and 6 inches, but rose to 15·26 inches at Voigtsgrund, about thirty miles W.N.W. of Gibeon.

OBSERVERS' NOTES FOR FEBRUARY, 1923.

TRANSVAAL.

Barberton.—A dry spell at the beginning of the month was succeeded by showery weather. All the creeks are running, and the crop prospects are very favourable. Rainfall: 4·00 inches on eleven days.—Walter Grubb.

Groeneboom No. 444 (Rustenburg).—This month, as the foregoing, marked itself by much precipitation and little sunshine. Cattle and veld in excellent condition. Young crops are retarded and held back by excessive moisture and cool weather, and by uncontrollable growth of weeds. On many soils cultivation has been impossible, especially on black soils. Advanced crops looking fine. Owing to the impossibility of cultivation, it is feared that bollworm and other cotton insects will do much damage to this crop. Rainfall: 6·62 inches on twelve days.—F. N. van Nouhuys.

Christiana.—The rainfall during the month was very welcome and well distributed. The veld is looking beautiful, and animals are getting fat. Horse-sickness is prevalent. Rainfall: 4·87 inches on eleven days.—J. J. Cooke.

White River.—A lot of drizzle and misty rain during the second half of month; heavy thunderstorms on the nights of 11th, 12th, 19th, and 25th. Rainfall: 11·99 inches on sixteen days.—H. P. Pooley.

Bloemhof.—Drought greatly relieved. Rainfall: 2·69 inches on ten days.—A. Adamson.

Sabie.—Heaviest rainfall (13·45 inches on twenty days) recorded in February since February, 1907, when 19·68 inches fell.—W. Lea.

Gemboksfontein (Middelburg).—Cloudy weather was experienced at the beginning of the month. More rain was required towards the middle of the month, as everything was drying up. Welcome rain—1·40 inches—fell on the 25th. Rainfall: 2·28 inches on ten days.—G. M. van Coller.

Middelburg.—The month appeared to be unusually dry until the last week, when more than two-thirds of the total rain for the month fell. The evenings have begun to be cool, and leaves to show the sere and yellow of autumn. Rainfall: 4·28 inches on twelve days.—Dr. H. A. Spencer.

Piet Retief.—Throughout the month, very heavy dew. Nothing special to report; weather very changeable. Rainfall: 3·67 inches on ten days.—J. Werner.

Rustenburg.—Splendid rains have fallen throughout the district during the month, and good crops are expected everywhere. The cotton, maize, and kaffir corn crops are splendid. An abundance of grass, and cattle in good condition. Diseases in stock are quiet; at places the three-day sickness has appeared amongst cattle, but very few have died. Horse-sickness, however, is bad, and quite a number have already died. The rivers and springs are all running strong; roads and drifts are in a bad state of repair. No locusts have been reported of late, and district is free. Rainfall: 6·07 inches on ten days.—A. Streatfield.

Pampoenkraal (Wakkerstroom).—February, 1923, was a seasonable month. Warm days and nights caused immense growth and development in maize lands which were considered too backward to ripen before frost comes. A cloudburst on the hills west of Pampoenkraal brought the Ingwimpisi (tributary of Groot Usutu River) down in flood so high no one remembers to have seen in previous years. The hills bear witness to the amount of flood water, as immense cavities show plainly to the naked eye the damage caused by the rush of water. Rainfall: 4·04 inches on seven days.—Mrs. S. M. Nicolson.

Mosdene (Naboomspruit).—An exceedingly dry month, only 0·93 inches on six days being recorded, of which 0·65 inch fell on the 26th, against an average of 2·21 inches for the month over six years during which records of rainfall have been kept. From the 18th of January to the 25th February 0·61 inch fell. Notwithstanding this very dry period in the middle of the growing season, the early planted mealies and monkey nuts have done well, but late plantings have suffered a good deal, particularly so in the case of monkey nuts, the late planted crops of which are likely to be very poor.—Ernest E. Galpin.

Krugersdorp.—The first week of the month was very dry; fine growing weather was experienced during the remainder of the month. A very heavy downpour—6·05 inches—was experienced on the 21st; as the fall appeared to be more or less of a local nature, no serious damage has been reported. Rainfall: 9·57 inches on eleven days.—H. Sharp.

Pietersburg.—Soft rains, but not quite sufficient; crops and veld splendid. Rainfall: 2·32 inches on eight days.—W. J. Franklyne.

Pomona Estates (Pretoria).—Weather generally mild and dry: a good month for all crops. Rainfall: 2·60 inches on eight days.—H. H. John.

Lomati (Barberton).—Rain has done considerable damage to European and native crops, particularly mealies; in several parts whole lands were washed away. Rainfall: 17·54 inches on nine days.—W. Wright.

White Hills (Barberton).—20th: Hail; slight damage. Rainfall: 6·77 inches on eleven days.—L. Lounds.

Louieville (Barberton).—20th February: 5·60 inches; considerable damage to lands. Rainfall: 10·85 inches on fifteen days.—E. Roselt.

Figtree Store (Barberton).—Komati flooded all the month, sometimes over its banks. Natives lost most of early crops through December drought. Late crops are scanty, but so far doing well. Rainfall: 10·27 inches on fifteen days.—Messrs. Clifford and Gardner.

Malelane (Barberton).—Small green caterpillar very plentiful, feeding mostly on weeds. Some damage to young mealies. Rainfall: 6·39 inches on fifteen days.—G. A. P. Hobson.

Kamhlabane Road (Barberton).—The mealie crops need some bright sunny days, otherwise they will be ruined. The pumpkin crop is quite a failure, the young fruit rotting on the vine as soon as formed. The army worm has made its appearance, and the grass is being rapidly devoured by them. All the rivers are in flood; several natives have been drowned in attempting to cross. Rainfall: 20·42 inches on twelve days.—H. B. Trollip.

Davel (Bethal).—Mealie crops good; all other crops suffer through exceptional moisture. Rainfall: 6·34 inches on seven days.—H. Wollenburg.

Schoonoord (Lichtenburg).—Mealie crops not suffering any damage yet in this part, standing the excessive rains well. Rainfall: 15·07 inches on fourteen days.—A. Snodgrass.

Elandsfontein (Lydenburg).—Cotton and maize in need of more sun. Rainfall: 7·42 inches on ten days.—G. Bridger.

Waterpan (Middelburg).—Insufficient rain; conditions promising; some parts having rain daily. Rainfall: 1·68 inches on five days.—D. McDougall.

Mimosa Park (Potchefstroom).—Splendid rains from a farmer's point of view. Rainfall: 6·35 inches on nine days.—J. G. Dixon.

Elandsfontein (Potchefstroom).—The prospect for the winter is much better than last year. Rainfall: 5·03 inches on nine days.—P. Davidtz.

Hilltop (Pretoria).—The rains of 26th and 27th February (1·14 inch and 2·58 inches) did considerable damage to lands, cutting out furrows 2 feet deep, and washing seed away. Rainfall: 6·53 inches on six days.—M. Rush.

Welgedacht (Pretoria).—27th February: 7·74 inches fell in 4¾ hours. Rainfall: 9·80 inches on nine days.—J. D. Bosscher.

Weltevreden (Standerton).—Fine weather for stock, but a lot of farmers were caught with the forage crop; lands too wet to carry machines; in many cases sickles had to be used. Rainfall: 4·30 inches on eight days.—D. Lane.

Winkelhaak (Standerton).—Since the 20th February to 11th March no rain has fallen. The veld is so dry, it could easily be set alight. Everybody longing for rain. Rainfall: 4·83 inches on three days.—D. H. Louwrens.

Woburn (Waterberg).—Springbok Flats are going to yield record mealie crops this year. Rainfall: 0·95 inch on two days.—C. W. Brumage.

Nooitgedacht (Witwatersrand).—A most terrific downpour, causing considerable damage to growing crops, on 21st February: 4·68 inches. Rainfall: 8·83 inches on ten days.—H. C. Hinds.

Matjespruit (Wolmaransstad).—12th to 15th and on 27th February Matjespruit in flood (tributary of Vaal). Rainfall: 8·38 inches on thirteen days.—B. Kuikead.

Altydmooi (Zoutpansberg).—We are having far too much rain for the crops. Rainfall: 10·28 inches on fifteen days.—A. L. Gettliffe.

Bell's Bank (Zoutpansberg).—Crops and stock not doing as well as they should, owing to excessive rains. Rainfall: 14·08 inches on fifteen days.—H. van Heerden.

Lacotte (Zoutpansberg).—Between 13th and 19th February, Groot Letaba was at its highest level seen for past years, viz. 30 feet (approximately) above normal dry season flow. Crops and monkey nuts doing well, but would benefit by a dry spell of about two weeks. Rainfall: 5·35 inches on fourteen days.—W. Andrews.

Dusseldorf (Zoutpansberg).—Crops, especially cotton, are recovering from the heavy rains of last month. Rainfall: 8·09 inches on fifteen days.—L. Stevens.

SWAZILAND.

Matendela.—An abundant mealie crop among white farmers this year. A considerable amount of malaria about. Rainfall: 5·37 inches on twelve days. —H. S. Parry.

Mbabane.—Too much rain for crops: rivers flooded: travelling difficult; warm nights. Rainfall: 14·20 inches on fourteen days.—W. J. D. Crawford.

ORANGE FREE STATE.

Holfontein (Kroonstad).—An exceptionally good month; crops are "A 1"; farmers are expecting a record crop. Stock in general are looking very well. Several cases of horse-sickness have been reported in the district. Anthrax and gall sickness seem to have been mastered for the present, as no further deaths have been reported. Rainfall: 4·54 inches on six days.—L. C. McInerney.

Glen (Bloemfontein).—The veld is looking much better, owing to the heavy rains; heavy dews have started. Rainfall: 4·25 inches on ten days.—E. G. L. Smith.

Kroon (Fauresmith).—Excellent rains on the 8th, 9th, 10th, 11th, 13th, and 16th. No damage was done by these rains. There were no hailstorms. Lightning was seen almost every night, mostly in the north and east. Rainfall: 6·57 inches on six days.—C. J. Grobbelaar.

Grootkuil (Winburg).—Nice mild weather and beneficial rains. Rainfall: 4·62 inches on ten days.—W. Cooke.

Blaauwboskop (Bloemfontein).—16th: Exceptionally heavy rain—3·05 inches. River overflowed, and many fences washed away, but no loss of stock. Rainfall: 4·59 inches on six days.—A. J. van Tonder.

Tembani (Fauresmith).—13th: Riet River rose higher than in March, 1920. Rainfall: 5·17 inches on eight days.—M. F. Schickerling.

Jansdeel (Harrismith).—This month started with ideal summer weather. Oats and wheat have all been reaped, being a record crop for this district. Rainfall: 2·11 inches on four days.—J. J. Uijs.

Heilbron.—There is not much to report, except that crops are excellent, as from far and wide good reports come in. Stock are in good condition and grazing plentiful. Stock diseases have been nil so far. There has been a remarkable absence of lightning during the month, and the few storms we have had have been very mild. Rainfall: 3·27 inches on eight days.—P. A. du P. Naude.

Alma (Ladybrand).—Most excellent growing month for maize, which has never promised so well as this year. No storms of any kind. Rainfall: 5·25 inches on thirteen days.—H. W. Stockdale.

Bloemspruit (Smithfield).—13th–14th: 8·54 inches, 1.30 p.m. to 3 a.m. Dams broken, fences washed away, also sheep. Rainfall: 12·67 inches on five days.—J. Strauss.

Laspoort (Smithfield).—13th: 7·22 inches; terrible floods. Riet River in full flood, and much damage caused to fences, property, and dams. Rainfall: 9·81 inches on ten days.—D. C. Venter.

Rockwood (Thaba 'Nchu).—No very violent storms; all rains soaked in, and dams full. Too much rain to allow of mowing; since rains lucerne lands alive with a green caterpillar. Rainfall: 4·82 inches on thirteen days.—H. Howell.

Woudzicht (Vrede).—This month was very favourable for all crops; only light rains have occurred here, while in other parts heavy downpours took place. Rainfall: 3·82 inches on nine days.—J. N. Kohler.

Roadside (Vrede).—Local showers reported over sub-area. Mealie crops are doing splendidly, and the outlook is rosy; record crop for this area; forage and teff in abundance; veld grasses are good. Cattle, sheep, and horses are in fat condition. Along Hol Spruit horse-sickness, south from Roadside. River and spruit have been overflowing. Rainfall: 2·90 inches on seven days.—W. B. Fry.

Paardekraal (Winburg).—Rain on 8th (0·61 inch), just in time to save mealie crops, which were badly wilted; teff crop looking very fine; no deaths in stock during month. Rainfall: 3·46 inches on thirteen days.—G. S. Lowe.

NATAL.

Impendhle.—The weather can be described as rain, rain, rain. Fruit and vegetable crops have been very good; the mealie return this year should be excellent, i.e. what the storms have not washed out. Rainfall: 9·57 inches on thirteen days.—T. H. Biddulph.

Durban (Point).—Generally fine at beginning and latter part of month; rain during middle of month. Rainfall: 6·57 inches on nine days.—A. R. White.

Newcastle (Convent).—This month was very unsettled: several dull and rainy days; cold snap about the middle of the month. Rainfall: 4·39 inches on nine days.—The Mother Superior.

Newcastle (Gaol).—The month passed with good, steady rains, too much in some places for crops; much damage done by washaways; in some places the crops stood under water for days. Stock, big and small, are looking well. Rainfall: 4·37 inches on nine days. The Gaoler.

Nottingham Road.—Very hot and dry: stock healthy and fat. Rainfall: 5·57 inches on twenty-one days.—Miss E. Smythe.

Dundee.—First part of month very dry; some parts of district report crops suffering from want of rain. Season so far has been very favourable for agriculture, and the district reports generally are good. Rainfall: 5·84 inches on ten days.—West Thorrold.

Ismont (Mid-Illovo).—Rain fell on fourteen days, making a total of 7.74 inches. Heaviest rainfall on the 13th, 3·55 inches, over 3·0 inches of this falling during the night. Maximum temperature, 97 degrees on the 5th; minimum temperature, 50 degrees on the 13th. Mealie crop promising excellent results; veld good.—Lieut.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Cape St. Lucia.—Native crops fairly good. No haze, mist, or dew during the month. Stock are in good condition. Rainfall: 4·42 inches on fourteen days.—J. Murphy.

Ntambanana (Nagana Research Laboratory).—Meagre rainfall of only 1·88 inch on ten days, which fell during the latter half of the month, has almost completely revived the grass, which had withered to a considerable extent. Winds have been somewhat irregular as regards direction, but a persistent light wind to a breeze during the daytime and throughout most nights. European crops of maize and cotton are looking well, as they were mostly put in late. Cases of nagana are occurring throughout the district, but not to any considerable extent. Temperature has been most erratic, varying from almost oppressive weather to quite cool days.—The Vet. Research Officer.

Maritzburg (*Mental Hospital*).—Mealie crops are looking well, and cattle feeding is plentiful. Rainfall: 2·91 inches on ten days.—The Staff.

Hlabisa.—Weather very dry, compared with last month. Rainfall: 1·64 inches on seven days.—E. E. Lightening.

Ladysmith.—It may possibly be of interest to you to have some information in connection with the flood which occurred here yesterday, the 12th February, 1923. The river commenced to rise during the early hours of the morning, i.e. some time between 4 a.m. and 6 a.m. The river came down rapidly, and by 6.30 a.m. had overflowed its banks in certain parts, and was encroaching on the lower portion of the town. The river rose very rapidly, and continued to do so until nearly 10 a.m., when it reached its highest level. The total rise was approximately 27 feet, and the water reached the same level as during the flood in 1886, i.e. the highest known flood level. When the water was at its highest, it was flowing rapidly across a portion of the main street about three-quarters of a mile in extent, and in some parts was as much as 6 to 7 feet in depth, whilst approximately a mile of Lyell Street, which lies considerably lower than the main street, was also under water. Considerable damage was done to the streets, all the binding material being washed out, and only the cobbles left. Houses and the fencing surrounding grounds also sustained considerable damage. Several houses, mostly built of green brick and very old, collapsed entirely, whilst numerous wood and iron structures were washed away. The railway line on the right bank of the Klip River, i.e. on the opposite side from the town itself, was under water for a considerable distance, and sustained considerable damage, all trains being held up until the line could be repaired. The first train to get away from Ladysmith left here at about 11 p.m. on the 12th. The water commenced to subside at about midday, and went down very rapidly, a fall of approximately 12 feet taking place in the course of a few hours. The river during the night went down further, and although there is still a lot of water, it is not thought that there is any likelihood of it flooding again at present. The flood was apparently caused through exceptionally heavy rains in the vicinity of Bester's Station and up towards Brakwaal and Van Reenen. Rainfall: 3·61 inches on thirteen days.—D. A. R. Leathern.

Edendale (*Klip River*).—11th: Sand Spruit higher than ever known, and considerable damage to lands and fencing on river banks. Rain on 11th, 3·20 inches. A little too much rain, but all crops are looking splendid. Very large acreage planted, and record yield expected. Very little horse-sickness or blue-tongue so far. Rainfall: 6·70 inches on twelve days.—T. N. Niland.

Rongpoort (*Weenen*).—Rather dry; not sufficient rain for crops to do as they should; grass excellent. Rainfall: 2·93 inches on eleven days.—J. H. Bartholomew.

Goedgeraden (*Louwsburg*).—Maize, 95 per cent.; kaffir corn, 88 per cent.; cattle and sheep in fairly good condition. Rainfall: 3·17 inches on seven days.—J. C. Klopper.

Summerford (*Ixopo*).—The longest and heaviest continuous rains recorded since October, 1917. Rainfall: 8·83 inches on thirteen days.—D. Campbell.

Moorside (*Klip River*).—11th: 6·18 inches: floods. Rainfall: 12·06 inches on twelve days.—D. K. W. Sparks.

Cape.

Elsenburg (*Stellenbosch*).—Month without rain; fairly constant southerly winds did considerable damage to fruit about the 7th.—D. C. Crawford.

Upington.—Veld green—first time for two years. Rainfall: 3·29 inches on seven days.—E. H. Jones.

Bedford.—Another month of erratic temperature, with rainfall well above the mean. Notwithstanding the good rains both last month and this, most farmers complain that water is low in dams, the run-off having been very small. Rainfall: 3·67 inches on sixteen days.—Thos. C. Hall.

Grootfontein (Middelburg).—Quite wet for February; cool generally; south-east wind very prevalent, with frequent low stratus clouds; notable absence during whole month of true cirrus clouds of any type; fruit crop ripe and plentiful; veld looking fine; stock running on veld fat and in good condition. Rainfall: 2·25 inches on ten days.—E. J. van Meerten.

Kenhardt.—Rains have not been general; drought relieved, but not completely broken. Rainfall: 3·61 inches on five days.—R. Seydell.

Groot Drakenstein.—Another rainless month—the second this summer. Unusually cold weather prevailed, especially as far as the nights were concerned. Temperature only twice rose above 100 degrees.—Lionel Baker.

Danger Point.—Veld getting very dry. Rainfall: 0·27 inches on two days.—H. H. Hews.

Ceres.—Weather generally fine and cooler than the usual February. Rainfall: 0·10 inches on two days.—A. Heatlie.

Darling.—Seasonable weather; no special feature. Rainfall: 0·04 inches on two days.—P. H. Drake.

Clanwilliam.—Hot weather was experienced during the earlier part of the month, and the wind continued to blow fairly strongly almost every afternoon. During the latter part of the month the weather was cooler, and the wind blew less strongly. The country is very dry, and the water supplies have become very weak. The flow of the Olifants River is so weak that the water in the Bulshoek Dam has fallen several feet. Rainfall: Nil.—P. E. Scholtz.

Belvedere (Knysna).—The rainfall for this month is again very small, and, owing to the light nature of the falls, it was quickly dried up and was of no benefit to the ground. The country is very dry and hard, and appears more like autumn. Rainfall: 1·38 inch on nine days.—F. Thornbury.

Riversdale.—The late harvest suffered by the drought badly, and turned out very poorly. The veld and garden look parched and dusty. A good soaking rain is much needed. Rainfall: 0·54 inches on seven days.—Rev. Carl Prozesky.

Liwandi, Addo (Uitenhage).—A total rainfall of 1·02 inch on ten days during this month is totally inadequate for the time of the year. The rainfall of 0·66 inch on 10th to 13th did very little good. We are experiencing an unfortunate drought, and, saddest of all, Lake Mentz is empty, or nearly so. The heat during the month has been very trying; in each week we registered a maximum temperature of over 100 degrees.—Major J. Kreft.

Lovedale (Victoria East).—Much cloud and many damp days, but weather was sultry rather than wet. Rainfall: 1·99 inch on fourteen days.—C. A. Pilson.

Somerset East.—Rain fell on twelve days, and totalled 2·43 inches. Several successive days overcast, and, with persistent but slight drizzle, made things seem much wetter than they really were.—C. Harris.

Graaff-Reinet.—Winds moderate; a few hot days during the month, the maximum temperature reaching 104·0 degrees on the 6th. Fair amount of moisture in the form of drizzling rains and mists. Rainfall: 1·21 inch on nine days.—S. E. D. Treadwell.

Murraysburg.—Beautiful rains during the month, measuring 3·25 inches on six days, but rain still partial; portions of district still dry. Thousands of sheep and goats are trekking through the district back to the north-west from the southern districts.—W. H. Rose Innes.

Kokstad.—Heavy rains much above the average; rivers full, and posts delayed. Several farmers have suffered heavily from hail. Rainfall: 8·03 inches on sixteen days.—H. D. Coyte.

Queenstown.—Prospects for mealie crop good; veld splendid. Rainfall: 5·28 inches on eighteen days.—H. Holley.

Aliwal North.—The first week of February was hot and dry, being 90 degrees and over; since then we have had cloudy weather, with gentle soaking rains. Rainfall: 2·62 inches on fourteen days.—Alex. Alcock.

Rietfontein (Aliwal North).—Practically no thunder or lightning this month, which is exceptional. All rains soft and steady, very beneficial to veld and mealie crops. Rainfall: 2·68 inches on fifteen days.—A. G. Smith.

Altonia (Kuruman).—Excellent rains; veld good; all classes of stock doing well. Locusts still hatching out; voetgangers bad in places, but being dealt with. Rainfall: 5·15 inches on fifteen days.—A. T. Sitwell.

Sydney-on-Vaal (Barkly West).—Although the rainfall in aggregate was light, it was practically all of it spread over long periods, there being no really heavy showers; therefore the veld and all vegetable life is completely restored throughout the district. Temperatures have been wonderfully even, and have assisted growth. Total rainfall: 3·19 inches on ten days recorded—can be considered the minimum for the district.—J. G. Richards.

Carnarvon.—Good rains in the village and parts of the district. Great portions of the district have had practically no rain, and are still in the throes of the drought. Rainfall: 2·77 inches on five days.—A. P. Malherbe.

Kilcullen (Barkly East).—Grass plentiful, and stock in prime conditions. Rainfall: 5·86 inches on eleven days.—O. A. Vorster, J.P.

Achtertang (Colesberg).—Veld very good; stock in excellent condition. Rainfall: 2·86 inches on nine days.—C. Coetzee.

Port Alfred (Bathurst).—Veld in excellent condition; stock fat; crops generally not a success, particularly mealies. Rainfall: 2·57 inches on seven days.—W. H. Pascoe.

Kalkoenkrantz (Sterkstroom).—Stock fat; sheep poor, on account of continuous rains; veld and cereal crops good. Rainfall: 4·52 inches on thirteen days.—J. C. Botha.

BASUTOLAND.

Mafeteng.—Glorious rains fell throughout the month, totalling 12·43 inches on seventeen days. Very heavy rains on the 13th, amounting to 4·13 inches, of which 3·0 inches fell during the night. Probably the heaviest recorded in February at this station since records were established. Country looking beautiful; veld and stock in splendid condition; a good mealie crop assured.—F. Hodgson.

Leribe.—Crops in excellent condition, owing to rains from the 9th of the month to the end. No lightning or thunder during the month. Rainfall: 3·15 inches on ten days.

Maseru.—Sky cloudy almost every day, overcast in the morning and clear in the afternoon; crops looking very good. Rainfall: 5·18 inches on fifteen days.—J. G. Green.

BECHUANALAND.

Palapye Road.—Prospects excellent for a good grain crop; veld splendid, and cattle fattening rapidly. Rainfall: 4·41 inches on ten days.—Thos. W. Shaw.

Dikgatlong Ranch.—The rainfall during February has been very disappointing, but other places in the district have fared much better. Heavy dews have, however, been continuous, and in consequence the veld is excellent, but not so good as in seasons when rainfall has been heavier. Voetgangers have been destroyed as they appeared. Rainfall: 1·54 inches on six days.—P. Jousse.

Mahalapye.—Good month; rains not too heavy, all soaked in; veld looks grand, but poor in patches; seems more rain north-west and west in the desert. Rainfall: 1·69 inches on four days.—Miss M. Giles.

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-west of the Cape, and Basutoland, with 2·5 inches; Kaffraria, the Cape south-western and north-eastern districts, and the Orange Free State with 2·0 inches; the Transvaal, the Cape northern borders and the northern Karroo, with 1·5 inches; and the southern and central and east-central Karroo and the west coast, with 1·0 inch.

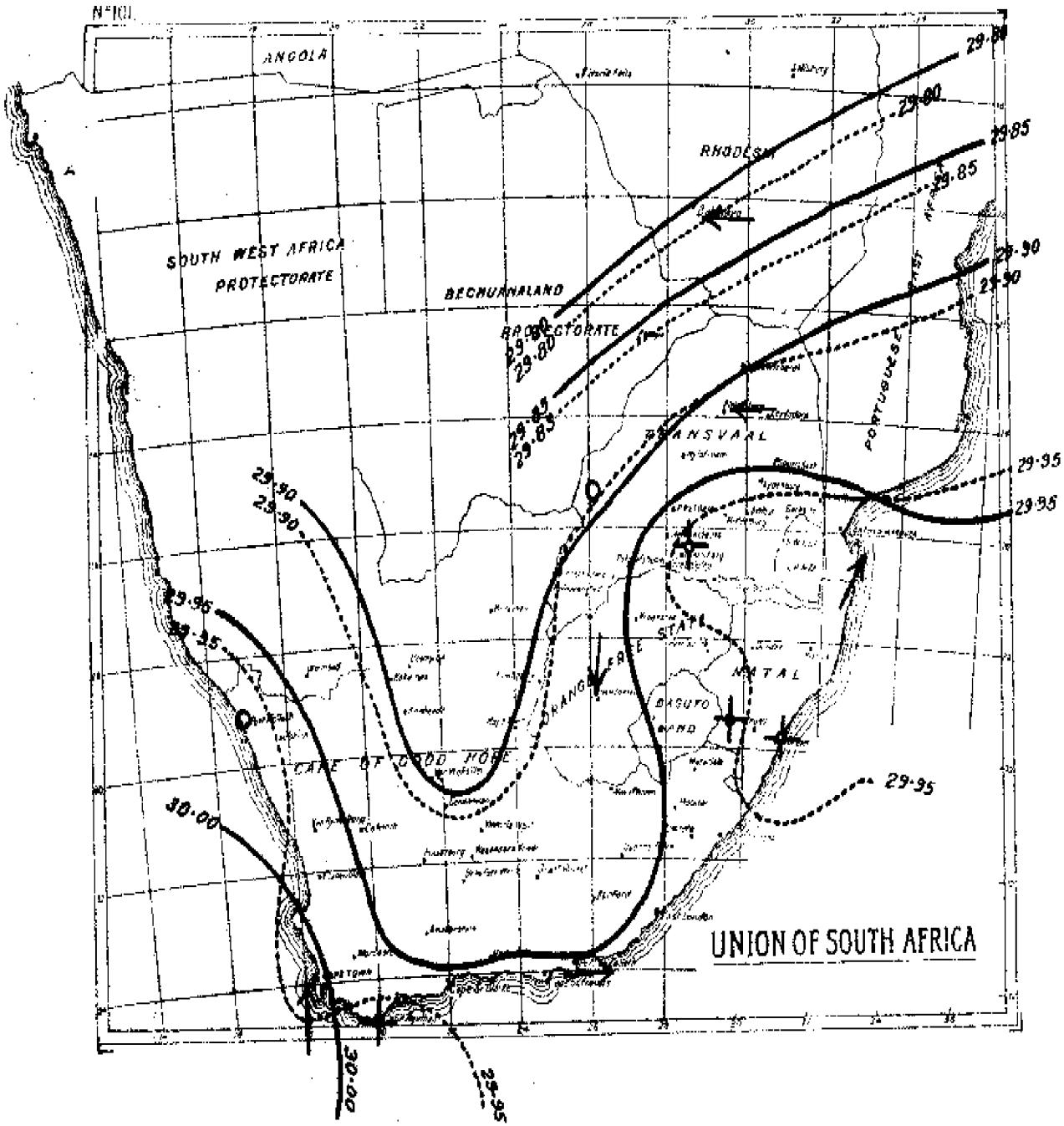
The mean daily air temperature is now about 70 degrees on the Transvaal low veld; 68 degrees in Natal; 65 degrees in the Cape south-eastern districts; 64 degrees along the west coast and over the southern Karroo; 63 degrees over the Cape south-western districts; 62 degrees over the Cape Peninsula; 61 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.

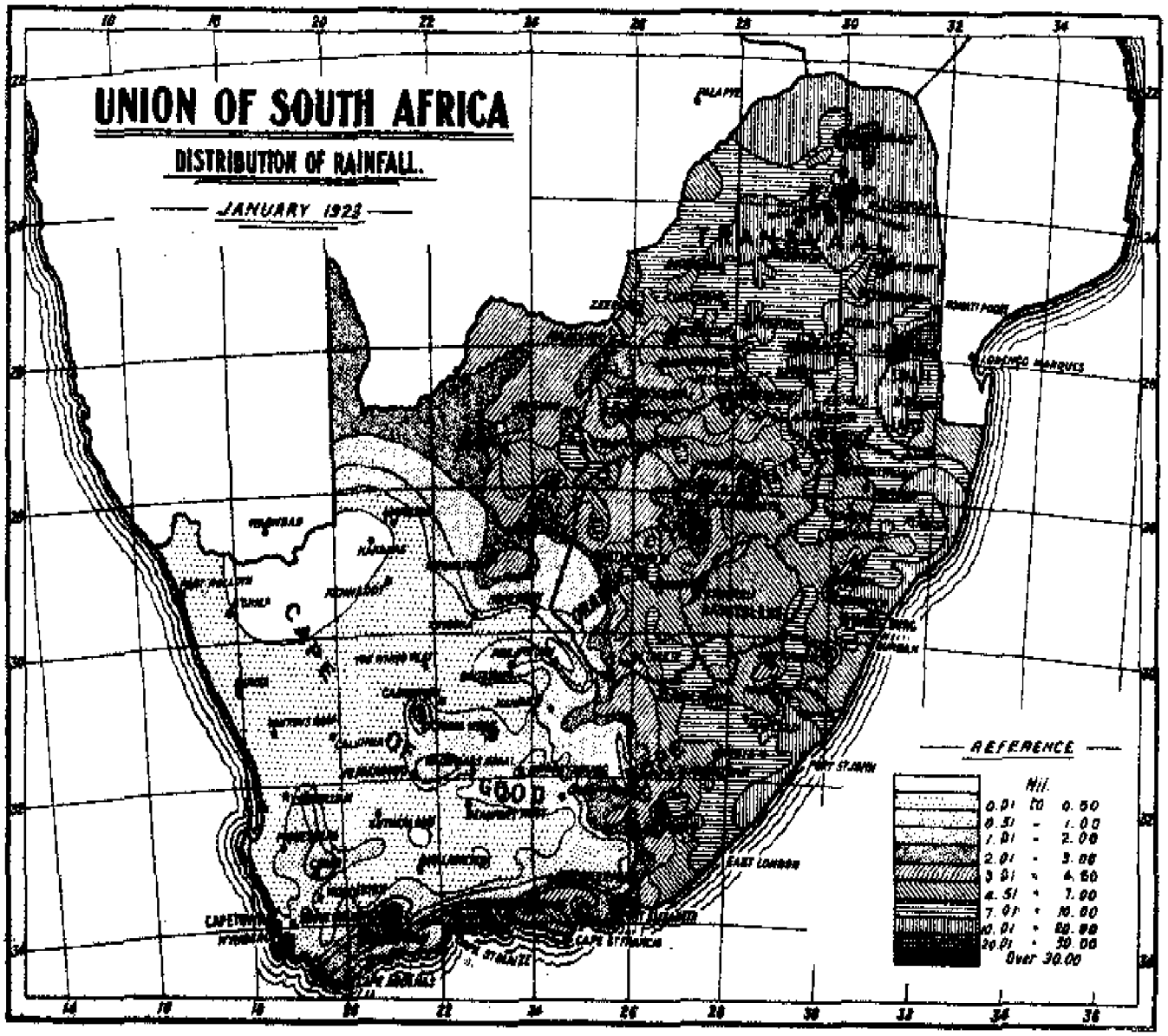
Over the northern border of the Cape Province, north-north-westerly, and over the south-east of the Cape north-easterly and south-westerly winds prevail; over the Transvaal there is a decrease in frequency and force of winds from S.E. round by E. to N.N.W., with an increase in frequency of stronger winds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

C. STEWART,
Chief Meteorologist.

Pretoria.



February, 1923. 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 1928
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
10.01 - 20.00
20.01 - 30.00
Over 30.00
LOURENCO MARQUES
PORT ST JOHN
EAST LONDON
CAPE ST FRANCIS
CAPE TOWN
GOOD

AIR TEMPERATURES, FEBRUARY, 1923—(*continued*).

Station.	Observer.	Month—Feb., 1923. Mean Max.	Month—Feb., 1923. 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	81·6	57·9	69·8	69·2	+ 0·6	93·5	4th	47·0	1st.
Bedford	Thos. C. Hall	80·3	59·8	70·0	70·7	− 0·7	94·0	16th and 23rd	51·0	1st.
Capetown (Royal Observatory)	The Staff	81·3	59·5	70·4	69·7	+ 0·7	99·6	15th	49·5	18th.
Carnarvon	A. P. Malherbe	88·0	60·6	74·3	69·4	+ 4·9	99·0	5th	46·0	2nd.
Clanwilliam	P. E. Scholtz	89·9	57·4	73·6	75·8	− 2·2	103·0	2nd	48·0	21st.
East London	The Port Captain	77·2	64·4	70·8	69·5	+ 1·3	86·0	23rd	56·0	19th and 21st.
Graaff-Reinet	S. R. D. Treadwell	87·4	62·4	74·9	74·0	+ 0·9	104·0	6th	52·0	19th.
Grahamstown	The Vet. Res. Officer.	77·8	58·1	68·0	70·8	− 2·8	94·5	6th	46·4	19th.
Groot Drakenstein	Lionel Baker	85·8	58·1	72·0	72·6	− 0·6	101·6	15th	46·0	18th.
Kenhardt	R. Seydell	93·9	66·9	80·4	78·6	+ 1·8	100·0	4th	52·0	18th.
Kimberley	Jno. Acton	85·2	64·5	74·8	75·2	− 0·4	99·0	4th	58·0	1st.
Kingwilliamstown (The Club)	The Chairman	80·8	62·2	71·5	73·0	− 1·5	98·0	6th	52·0	1st.
Koksstad	H. D. Coyte	77·4	55·0	66·2	66·4	− 0·2	91·3	5th	46·0	1st.
Mafeking (Convent)	The Mother Superior.	83·5	62·0	72·8	72·9	− 0·1	91·0	4th and 5th.	52·8	1st.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	74·1	64·2	69·2	69·6	− 0·4	80·0	6th	60·0	1st, 18th, 19th, 20th, and 21st.
Murraysburg	W. H. Rose-Innes	85·8	56·5	71·2	69·3	+ 1·9	98·3	4th	46·0	1st and 20th.
O'okiep	J. Burrows	88·1	60·6	74·4	72·2	+ 2·2	101·2	6th	46·6	20th.
Port Elizabeth	The Lightkeeper	75·5	63·3	69·4	69·8	− 0·4	96·0	10th	56·0	21st.
Port Nolloth	The Lightkeeper	66·2	51·5	58·8	60·1	− 1·3	70·0	10th, 16th, and 28th	46·0	20th, 21st, 22nd, and 25th.
Port St. Johns (Cape Hermes)	The Lightkeeper	78·4	68·2	73·3	72·4	+ 0·9	86·0	9th	63·0	19th.
Queenstown	H. Holley	81·8	59·1	70·4	69·9	+ 0·5	98·0	5th	51·1	1st.
Somerset East	C. Harris	80·5	59·8	70·2	71·4	− 1·2	100·4	6th	48·8	21st.
Stutterheim	F. C. Bousfield	78·4	59·3	68·8	68·0	+ 0·8	93·9	6th	50·0	1st.
Sydney's Hope	Rev. S. Rippon	76·9	60·2	68·6	70·2	− 1·6	96·0	6th and 16th	51·0	21st.
Uitenhage	H. Inggs	82·1	62·0	72·0	73·4	− 1·4	99·0	10th and 22nd	50·7	21st.
Umtata	Miss N. Dix Peek	81·1	61·5	71·3	70·6	+ 0·7	98·8	3rd	56·5	7th and 22nd.
Vryburg	—	—	—	—	75·2	—	—	—	—	—
Wynburg (Convent)	The Mother Superior.	80·1	59·6	69·8	68·8	+ 1·0	90·8	15th	52·0	18th and 19th.
Basutoland—										
Maseteng	F. Hodgson	76·0	56·4	66·2	70·8	− 4·6	88·0	4th	49·0	1st.

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), FEBRUARY, 1923.

Station.	Observer.	Month—Feb., 1923. 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	83·4	66·5	75·0	72·4	+ 2·6	94·0	20th	58·0	16th.
Belfast	The Forester	72·0	51·4	61·7	62·4	− 0·7	78·0	19th and 20th	41·0	4th.
Bloemhof	A. Adamson	84·3	63·7	74·0	72·0	+ 2·0	93·7	7th	58·0	1st.
Krugsdo	The Forester	76·3	54·3	65·3	65·3	± 0·0	83·0	11th	47·0	17th.
Johannesburg (Observatory)	The Staff	77·0	56·3	66·6	64·4	+ 2·2	86·2	4th	49·8	17th.
Klerksdorp (Strathmore)	Chas. Scott	82·7	60·0	71·4	72·7	− 1·3	91·0	4th and 7th	50·0	1st.
Komatipoort	B. J. Futhergill	89·4	70·5	80·0	79·4	+ 0·6	97·0	19th	64·0	1st.
Louis Trichardt	I. J. de Bruin	77·4	58·4	67·9	69·9	− 2·0	89·0	9th	50·0	7th.
Middelburg	Dr. H. A. Spencer	81·3	56·9	69·1	68·1	+ 1·0	89·0	25th	50·0	5th and 17th.
Nylstroom	G. Bakker	82·4	60·7	71·6	71·3	+ 0·3	86·5	18th	53·0	5th.
Pietersburg	W. J. Franklyne	79·8	60·8	70·3	69·6	+ 0·7	88·0	20th	54·0	17th.
Piet Retief	J. Werner	77·1	58·8	68·0	67·1	+ 0·9	84·1	11th	54·3	16th.
Pigeonhole (New Agatha)	Jno. McCallum	72·1	60·5	66·3	—	—	81·1	1st	56·0	3rd, 5th, and 22nd.
Pilgrims Rest	W. M. Skea	75·5	58·7	67·1	67·0	+ 0·1	84·0	19th	40·0	4th.
Potchefstroom (Exp. Farm)	The Manager	84·1	58·1	71·1	69·8	+ 1·3	92·3	4th	47·3	13th.
Pretoria (Meteorological Office)	The Staff	80·7	61·3	71·0	70·8	+ 0·2	86·9	20th	54·6	1st.
Standerton	W. J. Madge	79·9	56·6	68·2	66·4	+ 1·8	87·3	—	48·0	—
Zeerust	H. Dietrich	82·2	62·6	72·4	72·9	− 0·5	89·4	4th	54·2	1st.
Swaziland—										
Mbabane	Swaziland Police	76·6	59·4	68·0	66·8	+ 1·2	86·0	20th	51·0	5th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	82·9	60·6	71·8	71·9	− 0·1	93·8	7th	52·1	1st.
Bloemfontein	G. A. Schepers	78·8	60·2	69·5	71·2	− 1·7	88·5	4th	51·6	1st.
Harrismith	The Forester	71·9	52·6	62·2	64·6	− 2·4	81·0	7th	43·0	17th.
Kroonstad	S. R. Northfield	81·1	59·6	70·4	71·4	− 1·0	91·0	4th and 5th	51·3	6th.
Ladybrand	The Forester	78·1	56·0	67·0	68·0	− 1·0	89·0	5th and 6th	49·0	1st.
Lindley	J. Collister-Oates	79·5	57·2	68·4	68·4	± 0·0	88·8	4th	51·0	17th.
Natal—										
Dundee	West Thorrold	80·4	57·9	69·2	71·3	− 2·0	88·0	3rd and 7th	52·0	5th and 16th.
Durban (Point)	The Port Captain	82·4	69·8	76·1	76·6	− 0·5	88·4	9th	64·8	2nd and 22nd.
Estcourt	The Town Clerk	80·9	59·6	70·2	71·0	− 0·8	90·0	5th, 7th, and 10th	51·0	15th.
Hlabisa	E. B. Lightening	85·0	—	—	73·4	—	94·0	5th	—	—
Ladysmith	D. A. R. Leathern	83·0	62·8	72·6	76·3	− 3·7	93·0	5th	55·0	16th.
Maritzburg (Mental Hospital)	The Staff	81·5	62·4	72·0	73·4	− 1·4	95·2	7th	56·5	17th.
Stanger	Cecil C. Foss	83·9	68·1	76·0	77·2	− 1·2	95·0	5th	65·1	1st.
Weenen	The Gaoler	89·4	60·6	75·0	76·0	− 1·0	102·0	10th	50·0	15th.

RAINFALL, FEBRUARY, 1923.

Station.	Observer.	Month. Feb., 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	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	4·00	4·41	− 0·41	16·63	10·92	+ 5·71	30·29	24·94	+ 5·35
Bethal	H. F. M. Joubert	3·62	3·87	− 0·25	14·15	9·20	+ 4·95	35·13	24·81	+10·32
Belfast	The Forester	3·39	3·54	− 0·15	13·03	9·69	+ 3·34	34·56	25·62	+ 8·94
Bloemhof	A. Adamson	2·69	3·71	− 1·02	7·20	7·12	+ 0·08	11·24	13·66	− 2·42
Claremont	S.A. Police	0·90	2·10	− 1·20	8·94	6·70	+ 2·24	15·47	14·63	+ 0·84
Ermelo	The Forester	1·78	3·15	− 1·37	6·74	9·27	− 2·53	34·49	26·39	+ 8·10
Hanneritsburg	—	—	—	—	—	—	—	—	—	—
Heidelberg	W. A. ter Horst	0·92	4·81	− 3·89	8·95	9·51	− 0·56	24·87	23·54	+ 1·33
Johannesburg (Observatory)	The Staff	5·60	4·97	+ 0·63	13·65	10·54	+ 2·51	28·32	24·92	+ 3·40
Klerksdorp (Strathmore)	C. Scott	5·63	3·94	+ 1·69	10·14	8·00	+ 2·14	19·68	17·80	+ 1·88
Komatipoort	B. J. Fethergill	7·20	5·66	+ 1·54	23·26	10·66	+12·60	35·41	20·57	+14·84
Louis Trichardt	I. J. de Bruin	12·28	5·87	+ 6·41	29·39	12·24	+17·15	37·06	24·15	+12·91
Middelburg	Dr. H. A. Spencer	4·28	4·14	+ 0·14	13·87	9·39	+ 4·48	35·78	23·53	+12·25
Nylstroom	G. Bakker	0·79	3·83	− 3·04	14·99	9·03	+ 5·96	29·59	19·79	+ 9·80
Pietersburg	W. J. Franklyne	2·32	3·35	− 1·03	8·81	7·63	+ 1·18	19·03	17·53	+ 1·50
Piet Retief	J. Werner	3·67	4·39	− 0·72	13·89	10·22	+ 3·67	40·22	26·68	+13·54
Pilgrims Rest	B. M. Skes	20·01	7·84	+12·17	32·98	16·21	+16·77	50·21	30·55	+19·66
Pigeonhole (New Agatha)	J. McCallum	22·56	9·36	+13·20	43·53	18·43	+25·10	60·41	37·24	+23·17
Potchefstroom (Exp. Farm)	The Manager	5·73	3·86	+ 1·87	10·41	8·01	+ 2·40	23·09	19·01	+ 4·08
Pretoria (Meteorological Office)	The Staff	2·60	4·80	− 2·20	12·80	10·66	+ 2·14	31·11	24·13	+ 6·98
Rustenburg	M. Baumann	3·35	3·57	− 0·22	12·26	9·56	+ 2·70	26·79	20·22	+ 6·57
Rustenburg	A. Streatfield	6·07	4·23	+ 1·84	14·93	9·26	+ 5·67	24·82	21·21	+ 3·61
Standerton	W. J. Madge	4·05	5·17	− 1·12	16·19	9·48	+ 6·71	35·30	25·76	+ 9·54
Wakkerstroom	F. T. Grant	3·77	4·85	− 1·08	6·47	10·05	− 4·48	28·94	26·35	+ 2·59
Woodbush	The Forester	27·25	12·81	+14·44	55·70	29·58	+26·12	76·06	55·66	+20·40
Zeerust	H. Dietrich	6·71	4·31	+ 2·40	13·90	8·76	+ 5·14	21·81	18·49	+ 3·32
Swaziland—										
Mbabane	Swaziland Police	14·20	8·22	+ 5·98	38·13	18·59	+19·54	67·45	42·10	+25·35
Orange Free State—										
Bethulie	J. J. Wardhaugh	2·71	3·22	− 0·51	6·73	5·86	+ 0·87	14·63	12·05	+ 2·58
Bloemfontein	G. A. Schepers	8·00	3·31	+ 4·69	15·02	7·07	+ 7·95	20·59	14·86	+ 5·73
Boshof	J. Miller	7·87	2·77	+ 5·10	16·03	5·82	+10·21	21·57	13·18	+ 8·39
Harrismith	The Forester	4·34	4·46	− 0·12	10·74	9·50	+ 1·24	32·88	23·48	+ 9·40
Kroonstad	S. B. Northfield	3·95	3·56	+ 0·39	8·27	7·77	+ 0·50	24·35	17·71	+ 6·64
Ladybrand	The Forester	4·76	4·07	+ 0·69	9·56	8·85	+ 0·71	20·70	20·84	− 0·14
Lindley	J. Collister-Oates	6·46	3·57	+ 2·89	9·64	7·83	+ 1·81	24·32	18·49	+ 5·83
Natal—										
Dundee	West Thorrold	5·84	4·69	+ 1·15	11·08	10·73	+ 0·35	31·42	25·16	+ 6·26
Durban (Point)	The Port Captain	6·57	4·69	+ 1·88	12·54	9·05	+ 3·49	38·48	29·77	+ 8·71

RAINFALL, FEBRUARY, 1923—(*continued*).

Station.	Observer.	Month. Feb., 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Natal—(continued).		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Estcourt	The Town Clerk	2·59	4·83	− 2·24	10·56	10·42	+ 0·14	26·89	22·76	+ 4·13
Hlatikulu	The Gaoler	1·64	5·72	− 4·08	11·61	12·97	− 1·36	31·40	33·89	− 2·49
Howick	The Gaoler	4·88	5·49	− 0·61	11·05	10·73	+ 0·32	28·81	25·76	+ 3·05
Impetyne	The Forester	—	8·41	—	—	14·23	—	—	—	—
Ladysmith	D. A. R. Leathern	3·61	5·23	− 1·62	11·41	9·88	+ 1·53	30·09	22·13	+ 7·96
Maritzburg (Mental Hospital)	The Staff	2·91	5·54	− 2·63	10·58	11·52	− 0·94	33·44	28·78	+ 4·66
Stanger	Cecil C. Foss	4·40	4·45	− 0·05	16·59	9·70	+ 6·89	34·42	32·20	+ 2·22
Vryheid	The Gaoler	3·25	4·65	− 1·40	9·93	11·54	− 1·61	40·46	28·31	+ 12·15
Weenen	The Gaoler	2·09	4·31	− 2·22	6·91	9·83	− 2·92	19·65	21·93	− 2·28
Cape—										
Alfred North	A. Alcock	2·62	3·40	− 0·78	8·92	6·29	+ 2·63	19·90	11·16	+ 8·74
Beaufort West	The Gaoler	1·65	1·22	+ 0·43	2·45	2·31	+ 0·14	5·63	4·72	+ 0·91
Bedford	T. C. Hall	3·67	3·50	+ 0·17	8·91	6·87	+ 2·04	23·70	14·51	+ 9·19
Bellstown	The Gaoler	1·16	1·93	− 0·77	2·17	3·07	0·90	3·28	5·17	− 1·89
Calvinia	The Gaoler	0·13	0·42	− 0·29	0·29	0·79	− 0·50	4·80	3·91	+ 0·89
Capetown (Royal Observatory)	The Staff	0·17	0·59	− 0·42	0·70	1·27	0·57	9·70	13·48	− 3·78
Ceres	A. Heatlie	0·10	0·55	− 0·45	2·00	1·57	+ 0·43	15·88	23·34	− 7·46
Carnarvon	A. H. Malherbe	2·77	1·26	+ 1·51	3·04	2·28	+ 0·76	4·02	3·50	+ 0·52
Clanwilliam	P. E. Scholtz	0·00	0·23	− 0·23	0·15	0·45	− 0·30	3·24	4·50	− 1·82
East London	A. Downie	6·45	3·28	+ 3·17	14·42	6·47	+ 7·95	40·54	19·53	+ 21·01
French Hoek (Drietontein)	The Forester	0·32	0·80	− 0·48	1·59	3·25	− 1·66	26·73	36·66	− 9·93
Fraserburg	The Gaoler	0·60	0·94	− 0·34	1·76	1·67	+ 0·09	—	2·94	—
Grahamstown	Vet. Res. Officer	2·73	2·79	− 0·06	6·01	5·32	+ 1·29	27·25	16·50	+ 10·60
Gariep	The Gaoler	0·00	0·13	− 0·13	0·00	0·27	− 0·27	3·39	2·64	+ 0·75
Graaff-Reinet	S. E. D. Treadwell	1·21	1·82	− 0·61	2·12	3·19	− 1·07	8·07	7·49	+ 0·58
Groot Drakenstein	Lionel Baker	0·00	0·61	− 0·61	0·71	1·71	− 1·00	13·38	19·19	− 5·81
Griquatown	The Gaoler	2·66	2·21	+ 0·45	5·38	3·97	+ 1·41	7·46	5·90	+ 1·56
Hanover	The Gaoler	4·13	2·10	+ 2·03	5·21	3·75	+ 1·46	9·05	6·17	+ 2·88
Hopetown	The Gaoler	3·84	1·87	+ 1·97	5·72	3·76	+ 1·96	8·12	5·63	+ 2·49
Keimoes	B. Seydell	3·61	1·21	+ 2·40	3·76	1·78	+ 1·98	4·44	2·74	+ 1·70
Kimberley	J. Acton	3·22	2·64	+ 0·58	6·38	4·97	+ 1·41	11·28	8·37	+ 2·91
Kuysna	The Gaoler	0·79	2·12	− 1·33	4·33	4·22	+ 0·11	20·53	17·03	+ 3·55
Kokstad	H. D. Coyte	8·03	4·24	+ 3·79	16·01	8·76	+ 7·25	29·69	15·89	+ 13·80
Kingwilliamstown (Club)	The Chairman	2·83	3·29	− 0·46	7·93	5·83	+ 2·10	25·41	14·95	+ 10·46
Kuruman (Abtonia)	A. T. Sitwell	5·15	3·20	+ 1·95	10·31	6·49	+ 3·82	11·57	8·13	+ 3·44
Mafeking (Convent)	The Mother Superior	4·90	3·69	+ 1·21	9·58	7·92	+ 1·66	17·82	12·95	+ 4·87
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·48	1·46	− 0·98	2·17	2·64	− 0·47	8·74	9·95	− 1·21
Murraysburg	W. H. Rose-Innes	3·25	1·61	+ 1·64	8·70	2·72	+ 0·98	5·53	5·18	+ 0·35
O'okiep	J. Burrows	0·00	0·33	− 0·33	0·00	0·54	− 0·54	3·66	3·63	+ 0·03
Phillipstown	The Gaoler	—	2·19	—	—	3·88	—	—	6·35	—

RAINFALL, FEBRUARY, 1923—(*continued*).

Station.	Observer.	Month. Feb., 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Cape—(continued).		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Piquetberg	The Gaoler	0·00	0·48	− 0·48	0·88	1·03	− 0·15	7·90	11·91	− 4·01
Port Elizabeth	The Lightkeeper	0·59	1·34	− 0·75	2·93	2·54	+ 0·39	15·58	13·46	+ 2·12
Port St. Johns	The Lightkeeper	4·82	3·81	+ 1·01	16·62	10·73	+ 5·89	40·59	28·78	+11·81
Port Nolloth	The Lightkeeper	0·04	0·05	− 0·01	0·09	0·12	− 0·03	1·58	1·13	+ 0·45
Prieska	The Gaoler	2·53	1·57	+ 0·96	4·26	2·80	+ 1·46	5·73	3·99	+ 1·74
Queenstown	H. Holley	5·28	4·04	+ 1·24	9·47	7·42	+ 2·05	21·76	12·88	+ 8·88
Steytlerville	The Gaoler	1·40	1·24	+ 0·16	2·07	2·06	+ 0·01	6·97	4·96	+ 2·01
Sutherland	The Gaoler	0·88	0·67	+ 0·21	1·10	1·17	− 0·07	3·69	4·64	− 0·96
Swellendam	The Gaoler	0·88	2·76	− 1·88	2·58	5·17	− 2·59	15·83	18·36	− 2·53
Sydney's Hope	Rev. F. Rippon	1·70	2·01	− 0·31	4·01	4·07	− 0·06	17·49	12·93	+ 4·56
Somerset East	C. Harris	2·43	3·26	− 0·83	5·44	6·05	− 0·61	20·80	14·47	+ 6·33
Stutterheim	F. C. Bousfield	8·46	4·34	+ 4·12	19·14	8·26	+10·88	39·27	17·55	+21·72
Ultenhage	H. Inggs	0·98	1·60	− 0·62	4·04	2·71	+ 1·33	18·04	10·04	+ 8·00
Umtata	Miss N. Dix-Peck	4·88	3·62	+ 1·24	11·93	7·18	+ 4·75	26·11	14·60	+11·51
Uniondale	The Gaoler	0·47	0·95	− 0·48	1·08	1·63	− 0·55	6·17	7·33	− 1·16
Upington	E. H. Jones	3·29	1·04	+ 2·25	3·61	1·87	+ 1·74	4·46	2·89	+ 1·57
Victoria West	The Gaoler	2·44	1·90	+ 0·54	4·16	2·95	+ 1·21	5·26	5·08	+ 0·18
Vryburg	H. Collens	—	3·61	—	—	7·76	—	—	9·51	—
Worcester	The Gaoler	9·00	0·35	− 0·35	0·25	0·60	− 0·35	3·69	7·01	− 3·32
Wynberg (Convent)	Mother Superior	0·16	0·45	− 0·29	0·68	1·82	− 1·14	15·94	26·29	−10·35
Basutoland—										
Mafeteng	F. Hodgson	12·43	4·61	+ 7·82	18·14	10·09	+ 8·05	29·51	16·94	+12·57
South-West Africa—										
Tsumeb	Ing. Schetter	11·98	6·00	+ 5·98	17·45	12·06	+ 5·39	23·23	19·54	+ 3·69
Waterberg	D. Hahn	9·65	4·57	+ 5·08	14·44	9·55	+ 4·89	16·84	14·63	+ 2·21
Omaruru	The Postmaster	4·78	3·03	+ 1·75	8·02	8·23	− 0·21	7·50	4·48	− 0·98
Usakos	Rev. Diehl	2·73	1·23	+ 1·50	2·81	2·39	+ 0·42	3·39	3·32	+ 0·07
Düsternbrook	I. Matthiessen	7·63	3·49	+ 4·14	9·07	5·90	+ 3·17	11·12	8·31	+ 2·81
Gobabis	Rev. Irbe	8·40	3·57	+ 4·83	14·06	7·51	+ 6·55	15·29	11·47	+ 3·82
Gr. Witvley	B. Rueckert	5·35	3·61	+ 1·74	11·75	6·85	+ 4·90	13·97	10·27	+ 3·70
Windhoek	Observatory	11·92	3·08	+ 8·84	13·10	6·04	+ 7·06	17·69	9·17	+ 8·52
Maltahoehe	E. Just	4·12	1·25	+ 2·87	5·87	2·71	+ 3·16	6·60	3·68	+ 2·92
Voigtsgrund	A. Voigts	14·59	2·06	+12·53	18·17	2·91	+15·26	19·22	4·31	+14·91
Olbeon	Rev. Spellmeyer	4·63	1·62	+ 3·01	6·23	2·99	+ 3·24	6·87	4·18	+ 1·69
Bethany	Rev. Peter	1·07	0·96	+ 0·11	1·45	1·75	− 0·30	1·47	2·55	− 1·08
Aus	F. Ernl	0·00	0·53	− 0·53	0·00	0·78	− 0·78	1·94	2·03	− 0·09
Heirachabis	Rev. Father Eder	1·55	0·79	+ 0·76	2·30	0·95	+ 1·35	2·51	1·99	+ 0·52

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. IV. MARCH, 1923. No. 3.

EXCEPTIONALLY dry, warm weather; mean pressure practically normal; mean temperature slightly more than one degree above the average, both days and nights being warmer than usual; a few excessively high temperatures, and occasional frosts in low-lying areas; rainfall occurring mostly in local showers, causing a total precipitation less than usual except over a few restricted areas in the north, west, and south of the Transvaal, Zululand, Kaffraria, south-east Cape, Namaqualand, the northern border, the west coast, and South-west Africa; a total absence of precipitation in portion of the Bethal, Middelburg, Standerton, and Wakkerstroom divisions of the Transvaal, also in parts of the Kroonstad, Lindley, Harrismith, and Bloemfontein divisions of the Free State, and part of the west coast; a comparative absence of thunderstorms, and a renewal of floods in South-West Africa; a few destructive hailstorms; such were the leading features of the weather of March, 1923.

Pressure.—Mean pressure during March deviated but little from normal, the equatorial low pressure area, although present during the greater part of the month, was not so strongly developed as during February, whilst there was also a falling off in intensity during the latter half of the month. "Lows" passed along the coast, from south to south-east, on 3rd to 5th, 7th to 8th, 10th to 11th, 22nd to 23rd, 27th to 28th, from west to south on 12th to 14th, and 17th to 18th, and lay over the south on 25th. High pressure areas appeared over the west coast from 14th to 17th, 23rd to 26th, and 29th to 31st, and lay over the south coast on the 9th.

Temperatures.—The mean temperature for all stations during March was 69·5 degrees, or 1·1 degree higher than usual, the mean day temperature (81·1 degrees) being 1·3 degree and the mean night temperature (57·9 degrees) 0·8 degree higher than the corresponding normals. All the Provinces were similarly affected, although not to the same extent. Thus, the mean for the month in the Free State was 66·6 degrees, or 1·5 degree above the average, the mean day temperature (79·5 degrees) being 2·4 degrees and the mean night temperature (53·6 degrees) only 0·6 degree higher than the corresponding averages. In the Transvaal, the excess of 1·5 degree in the mean temperatures

for this month (68·8 degrees) was almost equally divided between the mean maximum (80·4 degrees) and the mean minimum (57·1 degrees), which were 1·6 degree and 1·4 degree respectively higher than usual. In Natal the excess of 0·6 degree in this month's mean (73·2 degrees) was almost entirely due to the nights (with 62·3 degrees) being 1·0 degree, whilst the days (with 84·1 degrees) were only 0·1 degree higher than the respective averages. In the Cape Province, the mean for the month (69·7 degrees) was 0·8 degree higher than the average; two-thirds of this excess was due to the mean day temperature (81·1 degrees) being 1·0 degree higher, whilst the mean night temperature (58·3 degrees) was only 0·5 degree higher than the corresponding normals. At the individual stations, the mean temperature was mostly above the average, mostly by amounts between 1·0 degree and 2·0 degrees. The excess, however, rose in the Transvaal to 3·2 degrees at Johannesburg, 4·0 degrees at Potchefstroom, 4·1 degrees at Bloemhof; in the Free State, to 2·6 degrees at Bethulie; and in the Cape Province to 2·2 degrees at Wynberg, 2·7 degrees at Graaff-Reinet, and 3·2 degrees at O'okiep. At Belfast and Klerksdorp, in the Transvaal, the temperature was normal, and at Zeerust only 0·2 degree higher than usual. In Natal the excess of mean temperature was mostly half a degree or less, and in the south of Bechuanaland and part of the south-east Cape about the same. Sub-normal temperatures occurred at Louis Trichardt in the north of the Transvaal, at Harrismith in the Free State, at Dundee in Natal, portions of the south-east, the west coast, at Kenhardt on the northern border, and at Mafeteng in Basutoland. The largest deficit was 2·8 degrees at Grahamstown, the next largest being 2·2 degrees at Clanwilliam. In the majority of cases, both days and nights were warmer than usual. The excesses in the mean maxima were mostly between 1·0 degree and 3·0 degrees, but increased to between 3·0 degrees and 4·0 degrees at Bloemhof in the south-west Transvaal, at Ladybrand in the east and Bethulie in the south of the Free State, and East London and Carnarvon in the Cape Province. Still larger excesses of 4·5 degrees were registered at Weenen (Natal), Groot Drakenstein in the south-west of the Cape Province, and Potchefstroom and Johannesburg in the south of the Transvaal. In the extreme north, east, and at Klerksdorp in the south-west of the Transvaal, the south of Bechuanaland, portions of Natal and of the south-east, the south and west coastal areas of the Cape Province, the surplus in the day temperatures decreased to less than one degree On the other hand, the days were cooler than usual at Pretoria and Zeerust in the Transvaal, Mafeking (Bechuanaland), Ladysmith, Maritzburg, and Durban in Natal, a few stations in the south-east and east central Karroo of the Cape, and Port St. Johns in the Transkei. These deficits varied between 0·3 degree at Zeerust (T.P.) to 3·0 degrees at Grahamstown (C.P.). Both days and nights were cooler than the average at Clanwilliam in the west coastal area, Grahamstown in the south-east of the Cape, Kenhardt (northern border), Mafeteng in Basutoland, and Harrismith in the north-east of the O.F.S. The excesses in the night or minimum temperatures were about equally divided between amounts of less than one degree and quantities of one to half a degree or over; these surplus amounts ranged from 0·1 degree at Vryburg and Carvnaron to 4·9 degrees at O'okiep. In addition to those stations where both the mean maxima and mean minima were lower than the average, there were instances in which only the night temperatures were sub-normal, such as Belfast, Louis Trichardt, and Klerksdorp in the Transvaal; Dundee and Weenen in Natal; Groot Drakenstein, Murraysburg, Stutterheim, Port Elizabeth, and Port Nolloth in the Cape Province. These deficits varied between 0·1 degree at Klerksdorp (T.P.) and 2·9 degrees at Groot Drakenstein (C.P.).

The mean warmest station was Komatipoort, with a mean temperature for the month of 78·0 degrees, and the coolest, Port Nolloth, with a temperature

of 59·2 degrees, showing a difference of 18·8 degrees. The highest mean maximum was 91·8 degrees at Weenen (Natal), and the lowest mean minimum 47·0 degrees at Belfast, Transvaal. The highest temperatures during the month were recorded on eighteen days, viz., 5th to 10th, 12th to 15th, 17th to 18th, 20th to 22nd, and 27th, most widely on the 7th and 8th. The lowest temperatures occurred on fourteen days, viz., 1st, 3rd, 7th, 14th to 20th, and 28th to 31st, most generally on the last three days. The highest temperature recorded at any one station in the list appended was 105·0 degrees at Uitenhage on the 27th; this temperature was exceeded at Dunbrody, where 106·8 degrees, and at Liwandi (Addo), in the Uitenhage Division of the Cape, where 108·0 degrees were recorded on the same date. Temperatures of 100·0 degrees or over were confined to Kenhardt (100·0 degrees), Clanwilliam (100·4 degrees), Groot Drakenstein (103·6 degrees), and Jansenville (103·0 degrees) recorded these high temperatures, and Natal, where Weenen registered 101·0 degrees on the 14th. The lowest temperature recorded was 36·0 degrees at Belfast on the 19th. There was, therefore, an extreme range of 69·0 degrees over the selected stations, or 72·0 degrees including Liwandi. Frosts in vlei ground were reported in the Middelburg Division of the Transvaal.

Precipitation during March was generally below normal, an excess being confined to limited areas in the Transvaal, Zululand, and the Cape Province, and apparently the greater part of South-West Africa. In the Transvaal the areas of excess rainfall were found in the neighbourhood of Louis Trichardt, Woodbush, and Pigeonhole, in the Zoutpansberg Plateau, the last having a surplus of 2·44 inches; also at Claremont in the west and Heidelberg in the south, the excesses in these cases being less than one inch. In Zululand, Hlabisa had a total precipitation 0·27 inches more than the average. In the east of the Cape Province, Kokstad, Umtata, and Port St. Johns in the Transkei, Bedford in the south-east, and Steytlerville in the Central Karroo, O'okiep in Namaqualand, Upington and Kenhardt in the northern border were above normal. Kenhardt, with plus 1·0 inch, and Umtata, with plus 2·62 inches, were the only stations where the excesses rose to 1 inch or more. Port Nolloth and Piquetberg in the west were only 0·01 inch above the average, whilst Port Elizabeth and Kingwilliamstown had each a normal rainfall. The shortages were greatest (3–4 inches) in the higher portions of Natal, e.g. at Vryheid and Ladysmith, and in the north-east of the Free State at Harrismith, and decreased thence in all directions, although not uniformly. Thus in Swaziland, the north-east, east, and part of the south-west Transvaal, the north, west, and centre of the Free State, in Basutoland, the greater part of Natal, at Kuruman in the northern border, and at Swellendam in the south coast section of the Cape Province, the deficits decreased to between 2 and 3 inches; over the rest of the Transvaal, Free State, Natal, Bechuanaland, the northern border, the north-east and portions of the northern and central Karroo, the deficits were mostly between 1 and 2 inches; whilst in the more westerly and southerly parts of the northern Karroo, the greater portion of the central Karroo, and the west and south-west, the shortages were generally less than an inch. In parts of the Bethal, Middelburg, Standerton, and Wakkerstroom Districts of the Transvaal, however, the shortages amounted to absolute drought during the month. In South-West Africa the only station reporting a sub-normal rainfall were Gobabis, about 120 miles to the east of Windhoek, and Heirachabis, in the extreme south-east of the territory. At all the other stations a surplus occurred, varying from 0·04 inch at Aus, to the east of Luderitzbucht, and 8·73 inches at Omaruru, about 110 miles north-west of Windhoek. The largest excesses of 4 inches and upwards seem to have occurred at practically the same stations as during February, viz., along a

north and south line from Bethany to Windhoek, thence north-west to Omaruru, and thence north-north-east to Tsumeb. In consequence of heavy rains about the 10th and 11th, there were renewed floods and washaways on the railway lines, over practically the same portions as during February in South-West Africa, as well as between Upington and Prieska. There was a recurrence of floods about a week later, owing to practically continuous rains between the 15th and 18th over the area between Windhoek and Keetmanshoop. The Drie River at Heibe, north of Mariental, and the Fish River were in full flood; ballast was washed away; repairs to bridges could not be effected, and telephonic communication was interrupted, whilst the roads were practically impassable. The Swakop River came down on the 18th, and the tributary Khan River on the 19th, the volume of water being greater than ever seen before by the oldest European or native residents. The greatest amount of damage appeared to have been caused at Haigkamkab and Goanikontes, at and below the junction of these two rivers, farm houses being inundated, farms destroyed, motors and motor houses washed away, wells buried in sand, etc. Similar conditions prevailed as during February, according to newspaper reports, in Rhodesia, Nyassaland, and Portuguese East Africa; the Zambesi was again in flood, and traffic interrupted on the Beira–Mashonaland and Trans-Zambesia systems, owing to washaways; the Pungwe Flats were under water, thousands of natives driven from their kraals; crops of maize, sugar, tobacco, cotton, etc., destroyed; whilst pneumonia and influenza broke out, chiefly amongst natives, along the Zambesi. The Incomati River overflowed its banks, flooding the low-lying country between Xinavane and Chai-Chai. Thunderstorms were comparatively infrequent during the month, whilst hailstorms occurred on the 15th at Weilaagte (Pretoria District) and Oakdene (Witwatersrand), causing some damage to crops at the former station; at Kokstad there were some severe storms, especially on the 20th, when large hail caused much damage to glass and gardens; on the 28th severe thunderstorms occurred at Maritzburg and Cedara (Natal), maize and other crops being damaged, although not entirely destroyed, by hail at the latter place. Following on the excessive rains of last month, horse-sickness and blue-tongue amongst sheep were rife in the northern and western Transvaal and the Free State, also horse-sickness at Kakamas (Upington) and blue-tongue in the Barkly East and Kingwilliamstown Divisions of the Cape. The state of crops and veld is reflected in the notes appended.

The accumulated rainfall since the 1st July of last year was above normal over the greater part of the Union, the exceptional areas being principally the south-west of the Cape Province, including the Cape Peninsula, the western portion of the south coastal area, and of the central Karroo, the southern Karroo, the south, south-west, and eastern parts of the northern Karroo, the east of the Orange Free State, the centre of Natal, Zululand, and the neighbourhood of Pietersburg in the north and Wakkerstroom in the south-east of the Transvaal. The deficits in the Transvaal were small, a few tenths of an inch, but were between 1 and 2 inches over the greater part of the Cape Province and the Free State, but increased towards the south-west to 4–6 inches, culminating in a shortage of 11·39 inches at Wynberg in the Peninsula. In Natal, there was a falling off of between 2 and 5 inches. The surplus amounts in the Transvaal were commonly between 1 and 2 inches in the west and south-west, rising to 5–9 inches over the centre and south-east, and being greatest (12–26 inches) in the east and north-east and Swaziland. In the Free State the excesses were mostly between 3 and 6 inches, although Bethulie in the south had only 1·32 inch more than usual; in Natal the plus amounts varied between 1 and 5 inches, but reached 8·65 inches at Vryheid. In the Cape Province the excesses increased from less than an inch in the west and centre to over 3 inches at

Mafeking, to 7–14 inches in the east, where East London showed a surplus of almost 20 inches and Stutterheim an excess of 22–24 inches. The gross totals of precipitation since the beginning of the current year were somewhat similar in distribution, the areas of deficient rainfall being more extensive, affecting practically the whole of the inland parts of Natal, the north, east, and south of the Free State; whilst in the Cape Province there was an extension eastwards over practically the whole of the central Karroo, along the south coast beyond Knysna, and in parts of the south-east. The deficits varied generally between a few tenths and one inch over the Cape Province and the south and east of the Free State. The shortages exceeded 2 inches in a few places in the central Karroo and the south-west of the Cape, as well as the north and east of the Free State. In Natal the shortages varied between 0·80 inch at Howick and 5·62 inches at Weenen. In the Transvaal the shortages were small (less than an inch) in the north and part of the high veld, but increased to 2 inches at Bloemhof and 5–7 inches in the Ermelo and Wakkerstroom Districts. Generally speaking, the surplus amounts increased from west to east. In the Cape Province the excesses ranged from 0·07 inch at O'okiep to 7·78 inches at Kokstad, in Natal, where a supra-normal rainfall was confined to the coastal stations; they varied between 0·75 inch at Durban and 6·15 inches at Stanger; in the Free State, between 0·21 inch at Lindley and 7·23 inches at Boshof; and in the Transvaal, from 0·14 inch at Heidelberg to 27·54 inches at Pigeonhole, in the Zoutpansberg Division. In South-West Africa, the accumulated rainfall for the nine months was below normal by 0·05 inch at Aus in the south-west, but elsewhere was in excess by amounts between 0·13 inch at Heirachabis in the south-east and 20·10 inches at Voigtsgrund, west-south-west of Mariental. For the three months the aggregate amounts were also less than usual, by 0·74 inch at Aus, but elsewhere a surplus was recorded ranging from 0·96 inch at Heirachabis to 20·45 inch at Voigtsgrund: generally, however, by between 4 and 8 inches.

OBSERVERS' NOTES FOR MARCH, 1923.

Transvaal.

Wakkerstroom.—Blue-tongue and horse-sickness rife in district. Rainfall: 0·86 inch on four days.—F. J. Grant.

Lichtenburg.—Cattle in good condition; farmers cutting and stocking their grass and manna. The country in the neighbourhood is beautiful after the excellent rains. Locust hatching seems to be prevalent, but officers seem to have control over the swarms. Rainfall: 4·70 inches on five days.—E. Newton.

Krugersdorp.—Weather conditions during March have been fine and agreeable. The rainfall has been considerably under the average, but following on the excess of January and February, the deficiency has not been missed to any appreciable extent. Rainfall: 2·45 inches on eleven days.—H. Sharp.

Christiana.—Nothing unusual to report; very dry, warm month. Rainfall: 0·53 inch on two days.—J. J. Cooke.

Gemboksfontein (Middelburg).—The month has been very dry, and the veld is rapidly turning. Farmers have reported frosts in vlei ground. Rainfall: 0·53 inch on four days.—G. M. van Coller.

Sabie (Lydenburg).—Large numbers of horses and mules died from horse-sickness during the month. Rainfall: 3·09 inches on fourteen days.—W. Lea.

Mosdene (Naboomspruit).—The driest March known during the five years that records have been made, the total rainfall being 1·28 inch on four days,

against an average for the month of 3·73 inches. The next driest March was last year, when 2·10 inches were registered. Notwithstanding the last two very dry months, the mealie crop is particularly good, but late sown monkey nuts are a total failure. There is an abundance of good grass, and live stock are in excellent condition.—Ernest E. Galpin.

Piet Retief.—The weather has been exceptionally fine during the month. Bright days, heavy dews, and heavy deposits from mists have been a leading feature for the month. Rainfall: 2·29 inches on eight days.—J. Werner.

Pietersburg.—Very dry; crops suffering, but veld quite good. Rainfall: 0·69 inches on seven days.—W. J. Frankleyne.

Barberton.—The rainfall for this month is considerably below the normal, the weather keeping dry and pleasant throughout the month. Following the wet weather of the previous two months, malaria fever has been very much in evidence in the low-lying parts of the district. Rainfall: 1·16 inch on four days.—Walter Grubb.

Bloemhof.—Intense, oppressive heat on several days; nights somewhat chilly towards latter part of the month. Dense locust swarm passed over the town on the 29th. Rainfall: 0·48 inch on two days.—A. Adamson.

Middelburg.—The weather has been hot by day and cool by night, the latter specially marked towards the end of month. It has been unusually dry during the month, rain only falling on four days, showers of a quarter and an eighth of an inch on two days, and drops only on two other days. Total for month: 0·45 inch. With an average of 3·46 inches during the last twenty years, this month's rainfall of less than half an inch marks the minimum rainfall for March during that time. Winter is coming on apace, after a curtailed autumn.—Dr. H. A. Spencer.

Pampoenkraal (*Wakkerstroom*).—March has been a dry month, with very hot days and very cold nights, verging on frost, which is not looked for yet, and would cause much damage to the vlei lands here, which ripen very slowly. Horse-sickness is bad in the district, but no cases so far have broken out here. The sheep are beginning to trek to the low veld, and cattle will be sent away next month. The summer has been exceptionally productive in all lines of agriculture, and so far no locusts have been seen. Rainfall: 0·71 inch on seven days.—Mrs. S. M. Nicolson.

Nylstroom.—Seeing that the rainfall, since the heavy rains of January, is still far below normal the mealie crop will receive a severe set-back, whilst on many farms there will not be sufficient water for the winter crops. Rainfall: 0·69 inch on five days.—G. Bakker.

Kamhlabane Road (*Barberton*).—The mealie crops in this neighbourhood are rather poor this season, owing to the heavy rain which fell in January and February. Rainfall: 7·19 inches on three days.—H. B. Trollip.

Schoonoord (*Lichtenburg*).—Crops looking well, but late; district full of flying locusts, doing great damage to young mealies and Kaffir corn. Rainfall: 3·87 inches on seven days.—A. Snodgrass.

Delarey (*Lichtenburg*).—Horse-sickness very severe in the whole district. Swarms of locusts entering from west, infesting district. Rainfall: 1·28 inches on two days.—M. Michaelis.

Kaffirs Kraal No. 80 (*Marico*).—It is stated that many horses have died in the district of horse-sickness. Flying locusts are abnormal, generally travelling east. Rainfall: 0·74 inches on four days.—A. E. Scheuble.

Mimosa Park (*Potchefstroom*).—Each year since I came to the Transvaal, the crops have failed because of the abnormally dry weather in January and February. This year the crops were planted very late, because of drought, and therefore the critical month for cob formation and maturing is March, and once again there is a drought, and therefore in this district the mealie crop will be a failure, i.e. east of Potchefstroom up to Fochville. Rainfall: 1·15 inch on four days.—J. Dixon.

Mimosa (*Lichtenburg*).—It is again very dry, and locusts are causing much damage again in the district. Rainfall: Nil.—P. Prinsloo.

Weilaagte (*Pretoria*).—15th: Heavy rain and hail; some damage to crops (3·50 inches). Rainfall: 3·65 inches on two days.—M. Levinson.

Waaikraal No. 206 (*Rustenburg*).—Much horse-sickness; very few mosquitoes; no malaria fever. Rainfall: 2·34 inches on five days.—W. Behrens.

Weltevreden (*Standerton*).—Fine weather and no frost this month; mealies and crops are withered up, owing to the drought. The grass is very wintry looking. Cattle in fair condition. Rainfall: Nil.—D. Lane.

Dandaloo (*Waterberg*).—Drought this month has caused all late planted maize crops much damage—say, 40 per cent. less than last year; but early mealies will yield well. Horse-sickness is rife. The veld is in very good condition, and cattle are healthy. Rainfall: 1·67 inch on five days.—E. E. Biccard.

Brakfontein (*Waterberg*).—Horse-sickness is very bad. Rainfall: 1·80 inch on eight days.—W. Howard.

Oakdene (*Witwatersrand*).—15th February: 2·6 inches and hail—a most violent storm. Rainfall: 3·84 inches on seven days.—W. McCallum.

Swaziland.

Transvaalia.—Fever is very bad; mealies good; jassids very bad in the cotton. Rainfall: 1·62 inch on four days.—J. Coates.

Mbabane.—Cool month; country drier; crops unhealthy, grub infested. Indications of an early winter. Rainfall: 4·18 inches on nineteen days.—W. J. D. Crawford.

Orange Free State.

Grootkuil Estate (*Theunissen*).—Horse-sickness very severe on this farm; ten horses died during the month; blue-tongue prevalent amongst the sheep; three days stiff-sickness amongst cattle, but no losses.—V. B. Richards.

Kroonstad.—The outstanding features of the month were the cool nights and the heat from midday to sundown. Rainfall: 0·69 inch on three days.—S. R. Northfield.

Doornplaats (*Bloemfontein*).—Horse-sickness very severe; sheep dying of blue-tongue; flying locusts destroying veld. Rainfall: 0·09 inch on one day.—C. G. Oertel.

Vaalbank (*Edenburg*).—Blue-tongue and horse-sickness rife; locusts in large swarms. Rainfall: 0·94 inch on two days.—W. Callendar-Easby.

Janedeel (*Harrismith*).—Hot and dry weather. Crops are mostly past the first stage. Mealies and kaffir-corn should give a record crop. Hardly any winter feed has been planted, as the ground is too dry to be ploughed. Rainfall: 0·10 inch on one day.

Fairfield (*Hoopstad*).—Many cases of blue-tongue and horse-sickness, and many deaths. Rainfall: 1·08 inch on three days.—Mrs. E. M. Ayton.

Roodepoort (*Hoopstad*).—Horse-sickness and blue-tongue in sheep very prevalent, and big swarms of locusts doing much damage in mealie lands. Rainfall: 0·55 inch on two days.—P. E. Mooij.

Boshofshoop (*Jacobsdal*).—Horse-sickness and anthrax in this neighbourhood. Rainfall: 0·91 inch on five days.—G. Webster.

Leeuwspruit (*Kroonstad*).—Dry; blue-tongue and horse-sickness bad; crops still promising. Rainfall: 0·49 inch on two days.—P. Botha.

Roadside (*Vrede*).—Mealie crops fairly good, but a lot of the young crops are drying up for want of rain; forage and teff crops good; a lot of blue-tongue amongst sheep, and horse-sickness is prevalent. A lot of sickness amongst cattle. Rainfall: 0·91 inch on four days.—W. B. Fry.

Wbudzicht (*Vrede*).—This month has been exceptionally dry; the only good rain was very local; young mealies and teff crops have suffered; several cases of blue-tongue and horse-sickness. Rainfall: 1·12 inch on four days.—J. N. Kohler.

Dunottar (*Vredefort*).—The longest drought at this time of the year since keeping rainfall register (for thirteen years). Rainfall: 0·80 inch on three days.—W. L. Turpin.

NATAL.

Newcastle (*Convent*).—The weather was quite moderate on the whole during this month, gradually becoming colder in the early mornings and in the evenings. Rainfall: 0·4 inch on three days.—The Mother Superior.

Cedara.—Severe thunderstorms, accompanied by hail, on 28th. Rainfall: 2·25 inches. Maize and other crops damaged, but not a total loss. Rainfall: 5·10 inches on nineteen days.—School of Agriculture.

Hillary.—The mean maximum temperature (81·5 degrees) is a record for March since 1908, also mean minimum (67·6 degrees) and grass minimum (64·9 degrees). Rainfall: 2·66 inches on fifteen days.—H. A. Thorpe.

Nottingham Road.—Warm days, but cold nights towards the end of the month; stock of all kinds healthy; no horse-sickness; harvesting forwarded. Rainfall: 3·60 inches on fifteen days.—Miss E. Smythe.

Newcastle (*Gaol*).—With a few showers and slight drizzle, the month has kept dry, and good rains would be welcome. The winter can now be felt: mornings and evenings are cool. Rainfall: 0·43 inch on three days.—The Gaoler.

Ismont (*Mid-Illovo*).—Total rainfall for month: 5·07 inches on fourteen days, including 1·92 inch on the night of the 12th. Maximum temperature, 95·0 degrees on 7th; minimum temperature, 54·0 degrees on the 31st. Good growing weather; crops and veld good.—Lieut.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Dundee.—A pleasant month, but very dry. Mealie crops in the district suffering from want of rain. Rainfall: 1·07 inch on three days.—West Thorrold.

Maritzburg (*Mental Hospital*).—This month has been, on the whole, oppressively hot; severe thunderstorms on evening of 28th. Rainfall: 3·48 inches on twelve days.—The Staff.

Ladysmith.—A very dry month, only 0·78 inch of rain having fallen on four days. Rains badly needed in most parts of the district, as practically no rain has fallen since the exceptionally heavy storms which caused the flooding of the Klip River, as reported in February.—D. A. R. Leathern.

Rongpoort (Weenen).—Exceptionally dry month continued with excessive heat; mealie crop practically ruined, and grass would burn in places. Rainfall: 1·01 inch on seven days.—J. H. Bartholomew.

CAPE.

Bedford.—Though the rainfall is much above the average, yet it has been chiefly so-called veld rains, and many farmers are complaining that their dams have very little water for the winter. Rainfall: 4·20 inches on sixteen days. —Thos. C. Hall.

Groot Drakenstein.—Rainfall for month, 0·45 inch on four days, below the average. This is the seventh month in succession showing a deficit, which now amounts to 6·86 inches, actual rainfall during that period being 4·42 inches. Temperature slightly above the average, the days being warmer than usual, but nights considerably cooler. The mean daily range, 30·2 degrees, is the highest recorded here for any month. The fall of temperature during the eclipse of the sun was from 103·6 degrees just before to 96·0 degrees at height of eclipse.—Lionel Baker.

Ceres.—Weather generally fine, with heavy dews. Rainfall: 0·19 inch on four days.—A. Heatlie.

Upington.—Officer-in-Charge, S.A. Police, whilst inspecting outstations Uitdraai and Rietfontein in the Kalahari, some 250 miles north from Upington, during the early part of the month, reports: "Grass 4 feet high; river in flood." Horse-sickness rife in this district. Rainfall: 2·29 inches on six days. —E. H. Jones.

Kakamas.—Horse-sickness very bad.—M. J. T. Oosthuizen.

Liwandi (Addo, Uitenhage).—The weather during March was even more trying than that of February. All dams and underground tanks were beginning to show signs of giving in when the drought broke on the 28th, with a rainfall of 1·35 inch. The day previous to the rain, the 27th, was one of almost unbearable heat, the maximum reaching 108·0 degrees. That evening there was considerable lightning to the north-west, and on the following morning came the welcome rain. Rainfall: 1·87 inch on seven days.—Major J. Kreft.

Belvedere (Knysna).—27th, 4 p.m.: Much distant thunder to north and north-west, storm passing eastward; 9.30 p.m.: sharp thunderstorm passing overhead, working eastward; heavy showers and good, soaking rain; 1·03 inch during the night. Rainfall: 2·03 inches on eleven days.—F. Thornbury.

Jansenville.—Very little wind during month. Rainfall: 1·28 inch on six days.—E. H. Egan.

Kraaipan (Mafeking).—The month has been practically a dry one, and the veld feeding has fallen off considerably. Locusts have made their appearance in the near neighbourhood, and considerable damage to crops has been done. Rainfall: 0·73 inch on four days.—P. J. Hart.

Rietfontein (Aliwal North).—Still month; very little wind. Rainfall: 2·86 inches on eight days—below average.—A. G. Smith.

Queenstown.—A month of heavy dews nights and mornings, timely showers, and bright sunny weather; little wind; mealie crops above the average in the districts, and looking well. Rainfall: 2·25 inches on ten days.—H. Holley.

Kokstad.—Warmer days and cooler nights than in February, but mean monthly temperature slightly above the average; severe storms, especially on evening of 20th, with large hail and much damage to glass and gardens. Rainfall: 4·06 inches on nine days.—H. D. Coyte.

Aliwal North.—March was hot and dry during the first part of the month, after which light rains amounting to 1·55 inch on ten days. March, 1922: 0·47 inch.—Alex. Alcock.

Murraysburg.—Fair rains fell during the month, but still very partial; dry portion still dry. Unless rain continues during April and May, prospects generally for farmers will be none too good. Rainfall: 1·56 inch on five days. —W. H. Rose-Innes.

Kenhardt.—The western part of district still suffering from drought. Rainfall: 2·20 inches on five days.—Rud. Seydell.

Graaff-Reinet.—A fair amount of deposit from mist and dew; light winds, generally from south. Duststorm at 8.30 p.m. on the 4th. Rainfall: 1·73 inch on seven days.—S. E. D. Treadwell.

Moira (Addo, Uitenhage).—The recent rain has considerably relieved the local situation, but the Sundays River has not been in flood since last November, consequently Lake Mentz is still dry. Rainfall: 1·62 inch on six days.—J. H. Champion.

Woodlands (Kingwilliamstown).—This season has been about the worst on record for blue-tongue in sheep, several farmers' losses running into hundreds. Cattle in good, healthy condition; crops a complete failure, on account of excessive rainfall. Rainfall: 3·53 inches on ten days.—P. Landrey.

Kilcullen (Barkly East).—Stock, large and small, in prime condition, but blue-tongue sickness is playing havoc amongst rams, especially stud rams. Rainfall: 4·60 inches on eight days.—O. A. S. Vorster, J.P.

Basutoland.

Mafeteng.—Very fine month; calm, sunny days; nightly dews; stock and veld looking well. Rainfall: 1·31 inch on five days.—F. Hodgson.

South-West Africa.

Goanikontes.—The Swakop came down very strongly on the 18th of March at 3.30 p.m., and the Kahn River followed suit on the following morning at 5.10 a.m. The oldest Europeans and natives cannot remember ever having seen such monstrous volumes of water. The old pumping station erected in 1898 on very high ground has been carried away, and the old police station in Haigkambak, which existed many years, is entirely under water.

Mr. Toss's farm in Haigkamkab, also Mr. W. Broik's magnificent farm, have been flooded, nine-tenths carried away, wells destroyed, motor and motor-house simply disappeared. My own place was set entirely under water; wells and pumping shaft filled with sand. I personally had a narrow escape, and had to take refuge in a tree with great difficulty, and in the dark, when the water entered my house; it was only in the morning that the natives succeeded in rescuing me. The little "weather house," which I had planted deep in the ground, also vanished. I could find it only two days after, two kilometres lower down. Curiously, the thermometers were not damaged, whilst the records were destroyed. My loss amounts to about £100.

Kramer and Schultz's farm is entirely ruined. The flood, two metres high, rushed into the house, very nearly drowning the manager and a lady. Two motors and motor house have disappeared.

The whole farm of Mr. Karlbaum has been flooded, residence and motor-house carried away. A similar fate had the farms of Mr. Funk and Mr. F. A. Birckenmeier; the dwelling-house, though built on very high ground up the

mountain, has been invaded by the torrent, motor and motor house carried away, and the wells, etc., buried in sand. Also Mr. Fiedler's farm experienced the same cruel treatment.

Goanikontes, one of the most beautiful places of the Protectorate, in the twinkling of an eye has been rendered a waste. The inhabitants of a formerly happy and prosperous district are plunged into desperation, and ask, Will the Government come forward and alleviate the distress?

MAY WEATHER CHARACTERISTICS.

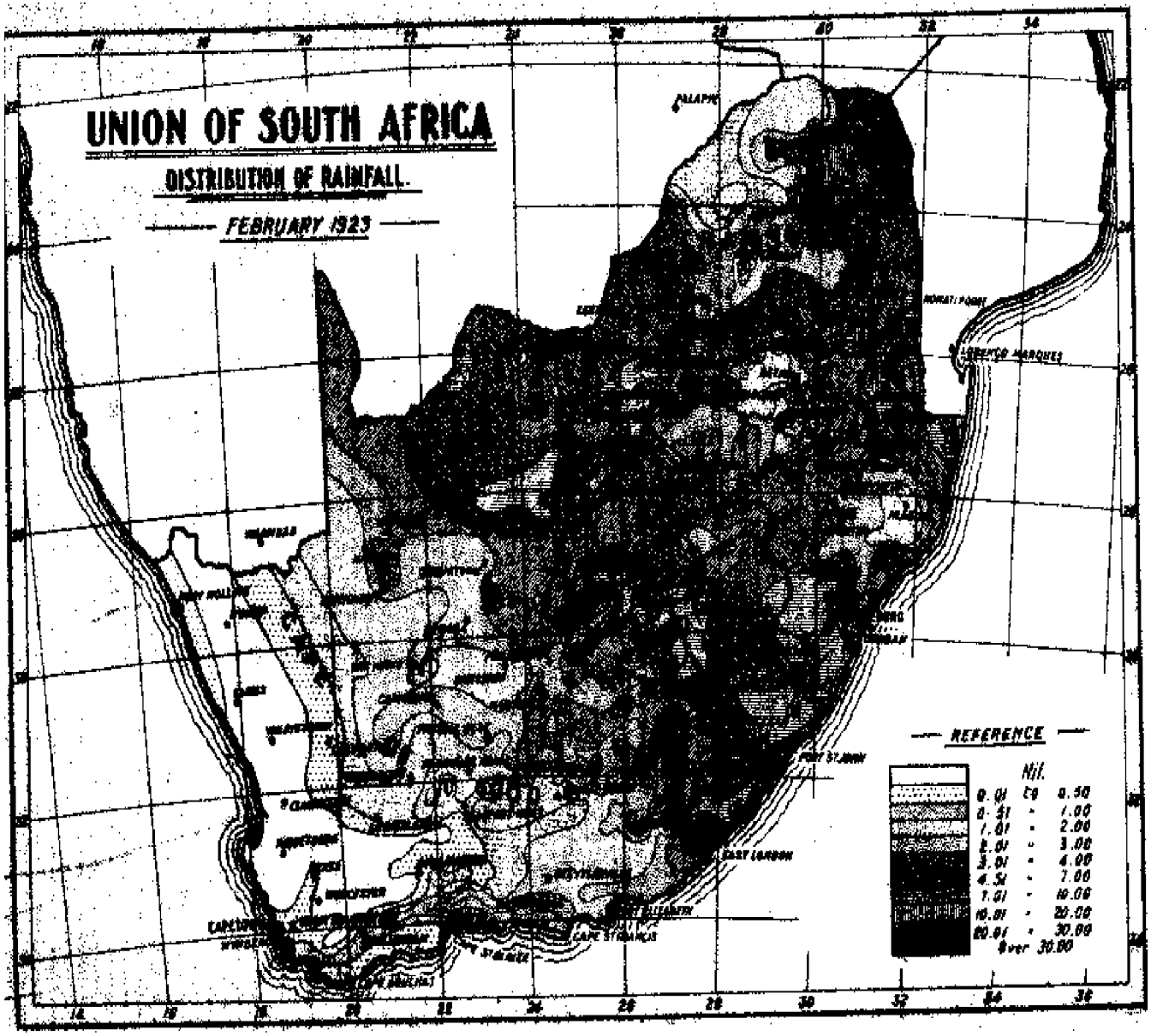
Over the Cape Peninsula precipitation is now increasing rapidly, the average over this area being about 5 inches. Rainfall is now at its maximum: about 1·5 inch along the west coast, whilst along the south there is a slight increase over the preceding month. In all parts of the Union the rainfall seldom 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.

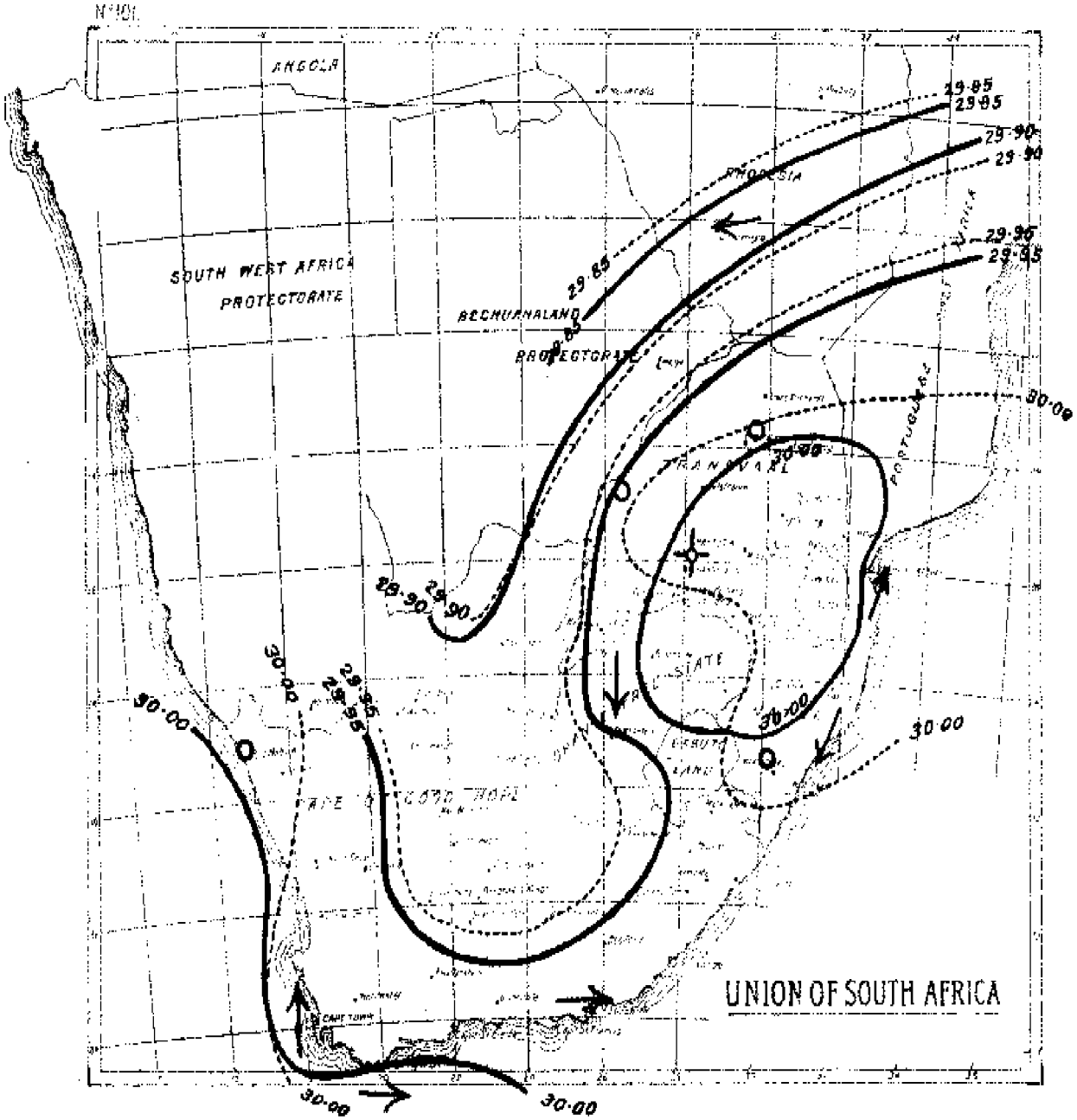
The mean daily temperatures are still decreasing rapidly, particularly over the Karroo, the Orange Free State, and Basutoland. Over the high veld and the Karroo radiation frosts occur, and killing frosts may be expected. The highest mean temperatures now occur over Natal, where the average is 61 degrees; 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 S. and S.W. winds, but an increase of northerly and all winds having westerly components, particularly of those from N.W., although those from W.S.W. have a slight excess over the other directions. Over the Cape Pensniula, north-westerly and south-westerly winds are about equally frequent, while over the northern border there is a marked increase of winds from S. and E.N.E., together with a decrease of all winds from N. round by W. to W.S.W,, as well as of S.E. winds. The winds from S. are slightly in excess of those from E.N.E.; these constitute the principal directions during the month. On the high veld, on the other hand, the only directions showing an increased frequency are those between N. and W.N.W., and from S., all others showing a diminution in frequency; N.N.W. is the prevalent direction.

C. STEWART,
Chief Meteorologist.

Pretoria.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
FEBRUARY 1923
REFERENCE
Nil.
0.01 to 0.50
0.51 - 1.00
1.01 - 2.00
2.01 - 3.00
3.01 - 4.00
4.01 - 7.00
7.01 - 10.00
10.01 - 20.00
20.01 - 30.00
Over 30.00
LOURENCO MARQUES
EAST LONDON
CAPE ST FRANCIS



March, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for March.

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AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), MARCH, 1923.

Station.	Observer.	Month—Mar., 1923. 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	82·3	62·2	72·2	70·6	+ 1·6	90·0	21st	53·0	31st.
Belfast	The Forester	72·5	47·0	59·8	59·8	± 0·0	79·0	14th	36·0	19th.
Bloemhof	A. Adamson	86·1	59·7	72·9	68·8	+ 4·1	93·0	8th	48·0	29th.
Bronkhorstspruit	The Forester	76·2	51·0	63·6	62·2	+ 1·4	84·3	14th	36·5	18th.
Johannesburg (Observatory)	The Staff	76·0	55·0	65·5	62·3	+ 3·2	81·2	8th and 15th.	49·0	31st.
Klerksdorp (Strathmore)	Chas. Scott	82·2	56·8	69·5	69·5	± 0·0	88·0	15th	48·0	29th.
Komatipoort	B. J. Futhergill	88·5	67·5	78·0	77·0	+ 1·0	97·0	21st	59·0	1st.
Louis Trichardt	L. J. de Bruin	78·1	59·1	68·6	68·8	− 0·2	87·0	21st	49·0	3rd.
Middelburg	Dr. H. A. Spencer	80·6	52·5	66·6	65·6	+ 1·0	87·0	8th	42·0	18th and 20th.
Nylstroom	G. Bakker	81·5	57·6	69·6	68·4	+ 1·2	88·0	15th	48·0	18th.
Pietersburg	W. J. Franklyne	80·0	57·8	68·9	67·0	+ 1·9	84·5	8th	51·5	19th.
Piet Retief	J. Werner	76·8	56·6	66·7	65·2	+ 1·5	87·0	14th	46·3	30th.
Pigeonhole (New Agatha)	Jno. McCallum	72·5	59·3	65·9	—	—	79·0	21st and 22nd	54·0	31st.
Pilgrims Rest	E. M. Skea	74·8	55·2	65·0	65·3	− 0·3	85·0	19th	44·0	17th.
Potchefstroom (Exp. Farm)	The Manager	84·4	57·3	70·8	66·8	+ 4·0	90·5	8th	50·5	29th and 30th.
Pretoria (Meteorological Office)	The Staff	79·1	58·6	68·8	67·8	+ 1·0	85·5	15th	49·7	18th.
Standerton	W. J. Madge	81·5	52·8	67·2	63·0	+ 4·2	87·0	8th	40·0	17th.
Zeerust	H. Dietrich	81·4	57·9	69·6	69·4	+ 0·2	89·9	15th	47·2	30th.
Swaziland—										
Mbabane	Swaziland Police	75·3	56·3	65·8	64·6	+ 1·2	84·0	14th	49·0	30th and 31st.
Orange Free State—										
Bethulie	J. J. Wardhaugh	83·6	55·2	69·4	66·8	+ 2·6	90·8	8th	41·0	29th.
Bloemfontein	G. A. Schepers	81·0	56·3	68·6	66·7	+ 1·9	86·8	8th	42·6	30th.
Harrismith	The Forester	72·0	49·3	60·6	61·0	− 0·4	79·0	20th	37·0	31st.
Kroonstad	S. B. Northfield	82·0	55·1	68·6	67·0	+ 1·6	86·5	12th	44·0	29th.
Ladybrand	The Forester	78·8	52·4	65·6	63·6	+ 2·0	84·0	9th, 13th, and 15th	44·0	30th.
Lindley	J. Collister-Oates	79·5	53·4	66·4	65·3	+ 1·1	84·8	8th and 9th	44·0	29th.
Natal—										
Dundee	West Thorrold	80·4	55·6	68·0	68·7	− 0·7	89·9	14th	46·0	18th.
Durban (Point)	The Port Captain	83·3	69·5	76·4	76·0	+ 0·4	88·8	7th	62·0	31st.
Estcourt	The Town Clerk	81·2	58·0	69·6	69·4	+ 0·2	89·0	8th, 14th, and 20th	50·0	31st.
Hlabisa	E. E. Lightening	84·9	—	—	70·0	—	92·0	14th	—	—
Ladysmith	D. A. R. Leathern	83·5	60·7	72·1	71·6	+ 0·5	92·0	8th	51·0	31st.
Maritzburg (Mental Hospital)	The Staff	81·3	61·9	71·6	71·4	+ 0·2	92·0	14th	53·5	31st.
Stanger	Cecil C. Foss	84·3	68·1	76·2	74·4	+ 1·8	95·0	7th	63·0	30th.
Weenen	The Gaoler	91·8	57·8	74·8	73·2	+ 1·6	101·0	14th	47·0	31st.

AIR TEMPER ATURES, MARCH, 1923—(*continued*).

Station.	Observer.	Month—Mar., 1923. Mean Max.	Month—Mar., 1923. 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	81·1	53·5	67·3	66·1	+ 1·2	90·5	8th	40·5	30th.
Bedford	Thos. C. Hall	80·1	57·0	68·6	66·8	+ 1·8	96·0	7th	45·0	30th.
Capetown (Royal Observatory)	The Staff	79·9	59·5	69·7	68·0	+ 1·7	96·3	12th	46·8	14th.
Carnarvon	A. P. Malherbe	85·0	56·1	70·6	68·9	+ 1·7	92·0	3rd, 6th, 7th, and 10th	46·0	29th.
Clanwilliam	P. C. Scholtz	88·5	54·7	71·6	73·8	− 2·2	100·4	17th	43·8	30th.
East London	The Port Captain	77·8	63·5	70·6	68·7	+ 1·9	85·0	7th	58·0	15th, 16th, 29th and 31st.
Graaff-Reinet	S. E. D. Treadwell	85·8	59·2	72·5	69·8	+ 2·7	99·8	7th	44·5	16th.
Grahamstown	The Vet. Res. Officer.	78·3	55·7	67·0	69·8	− 2·8	96·4	27th	45·0	30th.
Groot Drakenstein	Lionel Baker	85·4	55·2	70·3	69·4	+ 0·9	103·6	17th	46·3	31st.
Kenhardt	R. Seydell	88·4	60·5	74·4	74·8	− 0·4	100·0	9th	47·0	29th.
Kimberley	Jno. Acton	86·5	60·8	73·6	72·0	+ 1·6	96·0	8th	44·0	29th.
Kingwilliamstown (The Club)	The Chairman	81·5	60·4	71·0	72·0	− 1·0	99·0	27th	52·0	16th and 29th.
Kokstad	H. D. Coyte	77·2	52·7	65·0	63·6	+ 1·4	88·0	7th	44·6	31st.
Mafeking (Convent)	The Mother Superior.	83·1	58·3	70·7	70·9	− 0·2	88·0	15th	52·0	31st.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	75·2	64·3	69·8	68·6	+ 1·2	79·0	4th	59·0	28th and 29th.
Murraysburg	W. H. Rose-Innes	83·3	51·4	67·4	66·4	+ 1·0	92·0	9th	40·4	29th.
O'okiep	J. Burrows	85·3	61·1	73·2	70·0	+ 3·2	95·0	3rd	51·2	1st.
Port Elizabeth	The Lightkeeper	76·1	61·5	68·8	69·0	− 0·2	84·0	18th	53·0	31st.
Port Nolloth	The Lightkeeper	66·6	51·8	59·2	59·4	− 0·2	79·0	17th	46·0	29th and 30th.
Port St. Johns (Cape Hermes)	The Lightkeeper	78·9	68·2	73·6	71·6	+ 2·0	86·0	4th	60·0	29th.
Queenstown	H. Holley	81·9	57·3	69·6	68·1	+ 1·5	94·0	7th	39·0	29th.
Somerset East	C. Harris	81·5	57·9	69·7	69·5	+ 0·2	96·0	7th	48·4	29th.
Stutterheim	F. C. Bousfield	77·4	56·3	66·8	67·0	− 0·2	—	—	—	—
Sydney's Hope	Rev. S. Rippon	78·6	58·8	68·7	68·2	+ 0·5	99·0	27th	49·2	29th.
Uitenhage	H. Inggs	83·4	59·4	71·4	70·0	+ 1·4	105·0	27th	49·3	30th.
Umtata	Miss N. Otx Peek	81·5	60·6	71·0	69·6	+ 1·4	96·5	7th	48·7	29th.
Vryburg (Armoedsvlakte)	The Vet. Res. Officer.	84·7	57·7	71·2	70·8	+ 0·4	91·0	15th	43·7	30th.
Wynberg (Convent)	The Mother Superior.	79·9	58·9	69·4	67·2	+ 2·2	91·8	12th	52·5	7th.
Basutoland—										
Mafeteng	F. Hodgson	75·5	58·0	64·2	65·7	− 1·5	83·0	8th and 9th	43·0	30th.

RAINFALL, MARCH, 1923.

Station.	Observer.	Month. Mar., 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	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	1·16	3·81	− 2·65	17·79	14·73	+ 3·06	31·45	28·75	+ 2·70
Bethel	E. F. Joubert	0·30	2·92	− 2·62	14·45	12·12	+ 2·33	35·43	27·73	+ 7·70
Belfast	The Forester	0·55	4·41	− 3·86	13·58	14·10	− 0·52	35·11	30·03	+ 5·08
Bloemhof	A. Adamson	0·48	2·93	− 2·45	7·68	10·05	− 2·37	11·72	16·57	+ 4·85
Claremont	S.A. Police	3·13	2·57	+ 0·56	12·07	9·27	+ 2·80	18·60	17·20	+ 1·40
Ermelo	The Forester	0·29	3·20	− 2·91	7·03	12·47	− 5·44	34·78	29·59	+ 5·19
Haenertsburg	S.A. Police	8·25	5·16	+ 2·91	35·15	20·77	+14·38	49·14	34·92	+14·22
Heidelberg	W. A. ter Horst	3·79	3·09	+ 0·70	12·74	12·60	+ 0·14	28·66	26·63	+ 2·03
Johannesburg (Observatory)	The Staff	2·04	3·76	− 1·72	15·09	14·30	+ 0·79	30·36	28·68	+ 1·68
Klerksdorp (Strathmore)	C. Scott	1·32	3·04	− 1·72	11·46	11·04	+ 0·42	21·00	20·84	+ 0·16
Komatipoort	B. J. Fothergill	4·30	4·41	− 0·11	27·56	15·07	+12·49	39·71	24·98	+14·73
Louis Trichardt	I. J. de Bruin	3·25	3·14	+ 0·11	32·64	15·38	+17·26	40·31	27·29	+13·02
Middelburg	Dr. H. A. Spencer	0·45	3·46	− 3·01	14·32	12·85	+ 1·47	36·23	26·99	+ 9·24
Nylstroom	G. Bakker	0·69	3·35	− 2·66	15·68	12·38	+ 3·30	30·28	23·14	+ 7·14
Pietersburg	W. J. Franklyne	0·69	2·41	− 1·72	9·50	10·04	− 0·54	19·72	19·94	− 0·22
Piet Retief	J. Werner	2·29	3·02	0·73	16·18	13·24	+ 2·94	42·51	29·70	+12·81
Pilgrims Rest	E. M. Skea	4·44	5·81	− 1·37	37·42	22·02	+15·40	54·65	36·36	+18·29
Pigeonhole (New Agatha)	J. McCallum	8·92	6·48	+ 2·44	52·45	24·91	+27·54	69·33	43·72	+25·61
Potchefstroom (Exp. Farm)	The Manager	0·44	2·37	− 1·93	10·85	10·38	+ 0·47	23·53	21·38	+ 2·15
Pretoria (Meteorological Office)	The Staff	3·38	3·43	− 0·05	16·18	14·09	+ 2·09	34·49	27·56	+ 6·93
Roodberg	M. Baumann	1·66	3·05	− 1·39	13·92	12·01	+ 1·91	28·45	23·27	+ 5·18
Rustenburg	A. Streatfield	2·03	3·70	− 1·67	16·90	12·96	+ 4·00	26·85	24·91	+ 1·94
Standerton	M. J. Madge	0·74	3·43	− 2·69	16·93	12·91	+ 4·02	36·04	29·19	+ 6·85
Wakkerstroom	F. Grant	0·86	3·61	− 2·75	7·33	14·56	− 7·23	29·80	29·96	− 0·16
Woodbush	The Forester	11·08	10·19	+ 0·89	66·78	39·77	+27·01	87·14	65·85	+21·29
Zeerust	H. Dietrich	1·40	3·27	− 1·87	15·30	12·03	+ 3·27	23·21	21·76	+ 1·45
Swaziland—										
Mbabane	Swaziland Police	4·18	6·64	− 2·46	42·31	25·23	+17·08	71·63	48·74	+22·89
Orange Free State—										
Bethulie	J. J. Wardhaugh	1·65	2·91	− 1·26	8·38	8·77	− 0·39	16·28	14·96	+ 1·32
Bloemfontein	G. A. Schepers	1·01	3·57	− 2·56	16·03	10·64	+ 5·39	21·60	18·43	+ 3·17
Boshof	The Postmaster	0·95	3·83	− 2·88	16·98	9·65	+ 7·33	22·62	17·01	+ 5·51
Harrismith	The Forester	0·13	3·60	− 3·47	10·87	13·10	− 2·23	33·01	27·08	+ 5·93
Kroonstad	S. R. Northfield	0·69	3·53	− 2·84	8·96	11·30	− 2·34	25·04	21·24	+ 3·80
Ladybrand	The Forester	1·67	3·33	− 1·66	11·23	12·18	− 0·95	22·37	24·17	− 1·80
Lindley	J. Collister-Oates	1·27	2·87	− 1·60	10·91	10·70	+ 0·21	25·59	21·36	+ 4·23
Natal—										
Dundee	West Thorrold	1·07	3·91	− 2·84	12·15	14·64	− 2·49	32·49	29·07	+ 3·42
Durban (Point)	The Port Captain	2·38	5·12	− 2·74	14·92	14·17	+ 0·75	40·86	34·89	+ 5·97

RAINFALL, MARCH, 1923—(*continued*).

Station.	Observer.	Month. March, 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Natal—(continued).		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Estcourt	The Town Clerk	1·59	3·92	− 2·33	12·15	14·34	− 2·19	28·48	26·68	+ 1·80
Hlabisa	E. E. Lightening	4·88	4·61	+ 0·27	16·49	17·58	− 1·09	36·28	38·50	− 2·22
Howick	The Gaoler	3·14	4·26	− 1·12	14·19	14·99	− 0·80	31·95	30·02	+ 1·93
Impetyne	The Forester	—	10·63	—	—	30·86	—	—	67·74	—
Ladysmith	D. A. R. Leathern	0·78	4·09	− 3·31	12·19	13·97	− 1·78	30·87	26·22	+ 4·65
Maritzburg (Mental Hospital)	The Staff	3·48	4·95	− 1·47	14·06	16·47	− 2·41	36·92	33·73	+ 3·19
Stanger	Cecil C. Foss	4·05	4·79	− 0·74	20·64	14·49	+ 6·15	38·47	36·99	+ 1·48
Vryheid	The Gaoler	0·21	3·71	− 3·50	10·14	15·25	− 5·11	40·67	32·02	+ 8·65
Weenen	The Gaoler	0·29	2·99	− 2·70	7·20	12·82	− 5·62	19·94	24·92	− 4·98
Cape—										
Alfred North	A. Alcock	1·55	3·14	− 1·59	10·47	9·43	+ 1·04	21·45	14·30	+ 7·15
Beaufort West	The Gaoler	0·88	1·83	− 0·95	3·03	4·14	− 1·11	6·51	6·55	− 0·04
Bedford	T. C. Hall	4·20	3·82	+ 0·38	13·11	10·69	+ 2·42	27·90	18·33	+ 9·57
Bellville	The Gaoler	2·25	2·89	− 0·14	4·42	5·46	− 1·04	5·53	7·56	− 2·03
Calitzdorp	The Gaoler	0·62	0·80	− 0·18	0·91	1·59	− 0·68	5·42	4·71	+ 0·71
Capetown (Royal Observatory)	The Staff	0·70	0·95	− 0·25	1·40	2·22	− 0·82	10·40	14·43	− 4·03
Ceres	A. Heatlie	0·19	1·06	− 0·87	2·19	2·63	− 0·44	15·57	24·40	− 8·83
Clanbrerton	A. H. Malherbe	1·27	1·54	− 0·27	4·31	3·82	+ 0·49	5·29	5·04	+ 0·25
Clanwilliam	P. E. Scholtz	0·00	0·26	− 0·26	0·15	0·71	− 0·56	3·24	4·82	− 1·58
East London	A. Downie	2·55	3·61	− 1·06	16·97	10·08	+ 6·89	43·09	23·14	+19·95
French Hoek (Drielontein)	The Forester	0·77	2·03	− 1·26	2·36	5·28	− 2·92	27·50	38·69	−11·19
Fraserburg	The Gaoler	0·60	1·18	− 0·58	2·36	2·85	− 0·49	3·17	4·12	− 0·95
Grahamstown	Vet. Res. Officer	1·43	3·18	− 1·75	8·04	8·50	− 0·46	28·68	19·77	+ 8·91
Harbh	The Gaoler	0·00	0·15	− 0·15	0·00	0·42	− 0·42	3·39	2·79	+ 0·60
Graaff-Reinet	S. E. D. Treadwell	1·73	2·18	− 0·45	3·85	5·37	− 1·52	9·80	9·66	+ 0·14
Groot Drakenstein	Lionel Baker	0·45	1·19	− 0·74	1·16	2·90	− 1·74	13·83	20·38	− 6·55
Gunstown	The Gaoler	—	2·58	—	—	6·55	—	—	8·48	—
Hanover	The Gaoler	—	2·54	—	—	6·29	—	—	8·71	—
Hopetown	The Gaoler	1·28	2·73	− 1·45	7·00	6·49	+ 0·51	9·40	8·36	+ 1·04
Kakamas	R. Seydell	2·20	1·20	+ 1·00	5·96	2·98	+ 2·98	6·64	3·94	+ 2·70
Kimberley	J. Aston	1·46	3·01	− 1·55	7·84	7·98	− 0·14	12·74	11·38	+ 1·36
Kuruman	The Gaoler	1·82	2·54	− 0·72	6·15	6·76	− 0·61	22·40	19·57	+ 2·83
Kalstad	H. D. Coyte	4·06	3·53	+ 0·53	20·07	12·29	+ 7·78	33·75	19·42	+14·33
Kingwilliamstown	L. Clayton	3·10	3·10	± 0·00	11·03	8·93	+ 2·10	28·51	18·05	+10·46
Kuruman (Abtonia)	A. T. Sitwell	0·60	3·41	− 2·81	10·91	9·90	+ 1·01	12·17	11·54	+ 0·63
Malelking (Convent)	The Mother Superior	1·70	3·28	− 1·58	11·28	11·20	+ 0·08	19·52	16·23	+ 3·29
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·92	1·47	− 0·55	3·09	4·11	− 1·02	9·66	11·42	− 1·76
Murraysburg	W. H. Rose-Innes	1·56	2·09	− 0·53	5·26	4·81	+ 0·45	7·09	7·27	− 0·18
Oudtshoorn	J. Burrows	1·04	0·43	+ 0·61	1·04	0·97	+ 0·07	4·70	4·06	+ 0·64
Philipstown	The Gaoler	1·93	2·74	− 0·81	—	6·62	—	—	9·09	—

RAINFALL, MARCH, 1923—(*continued*).

Station.	Observer.	Month. Mar., 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Cape—(continued).		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Piquetberg	The Gaoler	0·57	0·56	+ 0·01	1·45	1·59	− 0·14	8·47	12·47	− 4·00
Port Elizabeth	The Lightkeeper	1·75	1·75	+ 0·00	4·68	4·29	+ 0·39	17·33	15·21	+ 2·12
Port St. Johns	The Lightkeeper	6·28	5·59	+ 0·69	22·90	16·32	+ 6·58	46·87	34·37	+12·50
Port Nolloth	The Lightkeeper	0·17	0·16	+ 0·01	0·26	0·28	− 0·02	1·75	1·29	+ 0·46
Prieska	The Gaoler	1·29	2·20	− 0·91	5·55	5·00	+ 0·55	7·02	6·19	+ 0·83
Queenstown	H. Holley	2·25	3·43	− 1·18	11·72	10·85	+ 0·87	24·01	16·31	+ 7·70
Steytlerville	The Gaoler	2·52	1·63	+ 0·89	4·59	3·69	+ 0·90	9·49	6·59	+ 2·90
Sutherland	The Gaoler	0·00	0·94	− 0·94	1·10	2·11	− 1·01	3·68	5·58	− 1·90
Swellendam	The Gaoler	0·40	3·06	− 2·66	2·98	8·23	− 5·25	16·23	21·42	− 5·19
Sydney's Hope	Rev. S. Rippon	1·11	2·33	− 1·22	5·12	6·40	− 1·28	18·60	15·26	+ 3·34
Somerset East	C. Harris	2·14	3·64	− 1·50	7·58	9·69	− 2·11	16·61	18·11	− 1·50
Stutterheim	F. C. Bousfield	4·78	4·06	+ 0·72	23·92	12·32	+11·60	44·05	21·61	+22·44
Uitenhage	H. Inggs	1·09	2·08	− 0·99	5·13	4·79	+ 0·34	19·13	12·12	+ 7·01
Umtata	Miss N. Dix-Peek	5·95	3·33	+ 2·62	17·88	10·51	+ 7·37	32·06	17·93	+14·13
Uniondale	The Gaoler	0·97	1·47	− 0·50	2·05	3·10	− 1·05	7·14	8·80	− 1·66
Uitenhage	The Gaoler	2·29	1·92	+ 0·37	5·00	3·79	+ 2·11	6·75	4·81	+ 1·94
Victoria West	The Gaoler	0·81	2·10	− 1·29	4·97	5·05	− 0·08	6·07	7·18	− 1·11
Vryburg	—	—	3·30	--	—	11·00	—	--	12·81	--
Worcester	The Gaoler	0·03	0·54	− 0·51	0·28	1·14	0·86	3·72	7·55	− 3·83
Wynberg (Convent)	Mother Superior	0·26	1·30	− 1·04	0·94	3·12	− 2·18	16·20	27·59	−11·39
Basutoland—										
Mafeteng	F. Hodgson	1·31	4·26	− 2·95	19·45	14·35	+ 5·10	30·82	21·20	+ 9·62
South-West Africa—										
Tsumeb	Ing. Schetler	7·44	3·04	+ 4·40	24·89	15·10	+ 9·79	30·67	22·58	+ 8·09
Waterberg	D. Hahn	6·15	3·26	+ 2·89	20·59	12·81	+ 7·78	22·99	17·89	+ 5·10
Omaruru	The Postmaster	10·57	1·84	+ 8·73	16·59	8·07	+ 8·52	18·07	10·32	+ 7·75
Usakos	Rev. Diehl	3·57	1·08	+ 2·49	6·38	3·47	+ 2·91	6·96	4·40	+ 2·56
Duesternbrook	I. Matthiessen	9·74	2·83	+ 6·91	18·81	8·73	+ 10·08	20·86	11·14	+ 9·72
Gobabis	Rev. Irbe	2·17	2·89	− 0·72	16·23	10·40	− 5·83	17·46	14·36	+ 3·10
Gr. Witvley	B. Rueckert	3·58	2·85	+ 0·73	15·33	9·60	+ 5·73	17·55	13·12	+ 4·43
Windhoek	Observatory	8·53	3·08	+ 5·45	21·63	9·12	+12·51	26·22	12·25	+13·97
Maltahoehe	E. Just	3·33	1·56	+ 1·77	9·10	4·27	+ 4·83	9·93	5·24	+ 4·69
Voigtsgrund	A. Voigts	5·99	0·80	+ 5·19	24·16	3·71	+20·45	25·21	5·11	+20·10
Gibeon	Rev. Spellmeyer	3·14	1·31	+ 1·83	9·37	4·30	+ 5·07	10·01	5·49	+ 4·52
Bethany	Rev. Peter	5·63	0·91	+ 4·72	7·08	2·66	+ 4·42	7·10	3·46	+ 3·64
Aus	F. Ernt	0·82	0·78	+ 0·04	0·82	1·56	− 0·74	2·76	2·81	− 0·05
Keiracharis	Rev. Father Eder	0·87	1·26	− 0·39	3·17	2·21	+ 0·96	3·38	3·25	+ 0·13

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. IV. APRIL, 1923. No. 4.

MEAN pressure lower than usual in the east and south, practically normal elsewhere; temperature about one degree lower than the average, both days and nights being cooler than usual except in the Transvaal, where the temperature for the month was normal; some high temperatures at the beginning of the month with killing frosts from 21st to 23rd, and at the end of the month; an excess of rainfall over limited areas in the north, east, west, and centre of the Transvaal and generally over the south-west there; also in the north, west, centre, and east of the Free State, Basutoland, parts of the northern border, the south of the northern Karroo, the central and southern Karroo, the south coast, and south-west, including the Peninsula in the Cape Province; a sub-normal precipitation elsewhere; a few destructive hailstorms in the Cape Province on the 8th and 12th, with light falls of snow on the 21st at some stations in the south and east of the northern Karroo, the central Karroo, and the north-east; such were the more prominent features of the month of April, 1923.

Pressure. Mean pressure, as may be seen from the map, was practically normal over the west coast, the centre of the Cape, the west of the Transvaal and Rhodesia, slightly below normal along the south coast, and about one-twentieth of an inch less than usual over Natal and the east of the Transvaal. The equatorial low pressure was most prominent during the first half of the month, and high pressure areas with isobars of over 30·10 inches were present; over the east from 1st to 5th and on the 11th; from west to south, south-east and east on the 4th, 14th to 15th, 16th to 18th, 21st to 25th, 26th to 28th and 30th. Low pressure areas passed along the coast from south-west to south, on 3rd, 6th to 7th, and 18th, from south to south-east and east from 12th to 13th, 20th to 21st, 26th, 28th, and 30th.

Temperature.—The mean temperature over the Union during April was 50·0 degrees, or 0·8 degree lower than usual. This deficit was equally divided between the days and nights, both the mean maximum (75·1 degrees) and the mean minimum (60·0 degrees) being 0·8 degree less than the corresponding normals. A mean temperature for the month lower than usual was common

to three of the four Provinces; taken as units, thus the Free State with a mean of 57·5 degrees was 1·3 degree, Natal with 66·9 degrees was 1·2 degree, and the Cape Province with 62·6 degrees was 1·1 degree less than the corresponding averages. On the other hand, the Transvaal with a temperature of 62·2 degrees was normal, the mean maximum (75·5 degrees) being 0·2 degree lower, and the mean minimum (48·9 degrees) being an equal amount higher than the usual values. In the case of the Orange Free State, the mean day temperature (71·5 degrees) was only 0·4 degree, but the mean night temperature (43·5 degrees) was 2·0 degrees lower than the corresponding averages. In Natal the deficit in the month's temperature was almost equally divided between the day (79·0 degrees) and the night temperature (54·8 degrees), which was 1·3 degree and 1·1 degree respectively lower than usual. A similar state prevailed over the Cape Province, where the days with 74·3 degrees and the nights with 50·8 degrees were respectively 1·2 degree and 1·0 degree less than normal. Regarding the stations separately, the temperature of the month was above normal in the east, south-east, south, extreme north of the Transvaal, at Kroonstad in the north of the Free State, at Hlabisa in Zululand, a few stations in Kaffraria and the south-east Cape, at Mossel Bay, and in the Cape Peninsula. The excess amounts were usually between 0·5 degree and 1·0 degree, but exceeded one degree in the east and south-east of the Transvaal and at Stutterheim in the Cape Province. Elsewhere temperature was sub-normal, the deficits in the Transvaal varying from 0·1 degree at Bloemhof to 2·9 degrees at Klerksdorp, both in the south-west; at Middelburg, however, the mean for the month was the same as the average. In the Free State, the deficits were larger on the whole, ranging from 1·1 degree at Bethulie in the south to 2·5 degrees at Ladybrand in the east. In Natal the shortages showed a greater range, being 0·7 degree at Stanger and reaching 3·0 degrees at Dundee. In the Cape Province deficits of 2 to 3 degrees were fairly common, particularly over the innermost plateau and in the west but varied from 0·1 degree at Graaff-Reinet to 3·7 degrees at Murraysburg; Uitenhage with minus 3·5 degrees being not far short of this amount and Clanwilliam 3·1 degrees lower than usual. The day and night temperatures varied considerably in their relations to the normals. Thus both mean maximum and the mean minimum were higher than the corresponding normals at Komatipoort, Barberton, Ermelo, and Piet Retief in the east and south-east, Johannesburg in the south, and Potchefstroom in the south-west of the Transvaal; also at Kroonstad in the Free State, and at Mossel Bay and the stations in the Peninsula in the Cape Province. Again the mean maximum was above and the mean minimum below the average at Louis Trichardt in the north, Nylstroom in the west centre, and Middelburg in the High Veld of the Transvaal; Mbabane in Swaziland; at Bethulie in the Orange Free State; at Dundee and Weenen in Natal; and Umtata, Stutterheim, and East London in the east of the Cape Province. The nights were warmer and the days colder at Pietersburg, Pretoria, Standerton, and Bloemhof in the Transvaal; at Durban and Stanger in Natal; Hlabisa in Zululand; at Port St. John's, Graaff-Reinet, Carnarvon, and Groot Drakenstein in the Cape Province. At the remaining stations both days and nights were colder than the average. The departures from normal in the case of the day temperatures, varied in the plus direction between 0·1 degree at Potchefstroom and 3·9 degrees at Louis Trichardt; and in the minus direction from 0·6 degree at Belfast to 4·0 degrees at Klerksdorp; whilst in the case of the night temperature, between plus 0·4 degree at Barberton and plus 3·4 degrees at Pretoria; and between minus 0·1 degree at Louis Trichardt and 3·7 degrees at Belfast. In the Orange Free State the departures of the day temperatures ranged on the plus side from 0·3 degree at Bethulie to 0·9 degree at Kroonstad; and on the minus side from 0·9 degree at Lindley to 1·7 degree at Harrismith, the variations being

METEOROLOGICAL OFFICE: MONTHLY WEATHER REPORT.

ERRATA.

JANUARY, 1923: RAINFALL.

STATION.	
Transvaal:—	
Pretoria (Meteorological Office) ...	Rainfall from 1st July, 1922, should read 28·51 inches.

FEBRUARY, 1923: RAINFALL.

STATION.	
Natal:—	
Estcourt	Rainfall for February, 1923, should read 2·74 inches.
Maritzburg (Mental Hospital) ...	Rainfall for February, 1923, should read 4·91 inches.
Cape:—	
Port St. Johns	Normal from 1st January should read 8·73 inches.
South-West Africa:—	
Omaruru	Normal from 1st July should read 8·48 inches.

MARCH, 1923: RAINFALL.

STATION.	
Natal:—	
Estcourt	Rainfall from 1st January, 1923, should read 12·30 inches.
Maritzburg (Mental Hospital) ...	Rainfall from 1st January, 1923, should read 16·06 inches.
Cape:—	
Port St. Johns	Normal from 1st January should read 14·32 inches.
Somerset East	Rainfall from 1st July, 1922, should read 22·94 inches.

The "Difference" columns should be altered accordingly.

much smaller than in the Transvaal. In Natal (including Zululand) the departures from normal of the day temperatures were small in the positive direction, being 0·1 degree at Dundee and 1·0 degree at Weenen, but much larger in the negative direction, ranging from 0·2 degree at Hlabisa to 3·9 degree at Maritzburg; whilst in the case of the night temperatures, the departures were much larger, varying in the plus direction between 0·5 degree at Durban and plus 3·8 degrees at Hlabisa, and in the negative direction between minus 1·0 degree at Maritzburg and 6·1 degrees at Dundee. Over the Cape Province the departures from normal of the day temperatures were mostly less than one degree on the positive side, but ranging from 0·2 degree at the Royal Observatory, Capetown, to 5·1 degrees at Stutterheim, and in the negative direction from 0·1 degree at Kimberley to 5·6 degrees at Uitenhage. The night temperatures over the Cape Province ranged in the one direction between plus 0·1 degree at Groot Drakenstein and 3·1 degree at Port St. John's, and in the other direction from minus 0·7 degree at Port Elizabeth to 5·2 degrees at Murraysburg.

The mean warmest station during the month was Komatipoort with 74·1 degrees, the next being Hlabisa (Zululand) with 71·3 degrees, and the coolest was Belfast with 53·7 degrees; there was therefore a difference of 20·4 degrees between the stations with the highest and lowest mean temperature during the month. The highest mean maximum was 87·2 degrees at Komatipoort, which was 2·9 degrees higher than the mean day temperature at Weenen (Natal). The lowest mean minimum was 39·3 at Belfast, which was 1·9 degree lower than the corresponding value for Murraysburg (C.P.). The highest temperatures during the month were registered on nineteen days, principally on 2nd, 3rd, and 4th, over the Cape Province, Natal, and parts of the Free State; about a week later, on 10th and 11th, over parts of the Free State and Transvaal, as well as towards the end of the month over the last-mentioned Province. The coldest spell was common to practically the whole country between the 22nd and 24th, although isolated stations recorded extremes on 15th, 20th, 21st, and 25th. Temperatures of 100·0 degrees or over were confined to Groot Drakenstein (101·7 degrees) in the south-west Cape and Clanwilliam (101·2 degrees) in the west coastal area, both on the 2nd. During the cold spell at the beginning of the fourth week of the month, frosts were common over a large portion of the country, including parts of the east and south of the High Veld and of the south-west of the Transvaal, the Orange Free State, Bechuanaland, the northern border, northern Karroo, and parts of the Transkei in the Cape Province. In many instances these frosts proved destructive to the later and younger crops. The lowest temperature recorded in the thermometer screen at a height of four feet above ground was 25·0 degrees on the 24th at Belfast (T.P.). There was, therefore, an extreme range of 76·7 degrees during the month over the Union.

Precipitation.—The total rainfall during April was above normal at a few stations in the east, north, west, and south centre of the Transvaal, and more generally in the south-west; also in the north, west, and central portions of the Free State, Basutoland, parts of the northern border and Bechuanaland, at Port Nolloth, and over a triangular area, south of a line extending from Port Elizabeth, through Graaff-Reinet to Victoria West, thence to Piquetberg. The excesses in the Transvaal were mostly less than half an inch, but varied from a few hundredths to 1·65 inches at Komatipoort. In the Free State, the surplus amounts ranged from 0·32 inch at Bloemfontein to 1·04 inch at Boshof. In the triangular area in the Cape Province, the excesses were between 1 and 2 inches along the coast, but decreased to under 1 inch at most of the stations further inland; the surplus amounts varied between 0·09 inch at Graaff-Reinet and 1·88 inch at Groot Drakenstein in the south-west. In the more

northerly parts there were excesses between two-tenths and half an inch, but of only 0·03 inch at Port Nolloth. Over the rest of the country the rainfall was below normal with absolute drought at a number of stations in the Transvaal, particularly over the Zoutpansberg Division. Whilst the deficits in the Transvaal varied between 4 and 100 per cent., they were mostly between 25 and 50 per cent. of the normals for this month, which are mostly between 1 and 2 inches, although rising to 3 inches or over in a few places. In the Orange Free State, the shortages in the north-east and south were between 13 and 26 per cent. of the averages, which lie between 1 and 2 inches. In Natal, where the month's normals are between 1½ and 3½ inches, the totals for this month were generally sub-normal, varying between minus 16 per cent. at Maritzburg and 98 per cent. at Weenen. In the Cape Province the shortages ranged from 7 per cent. at Upington to 87 per cent. at Port St. John's. Snow was reported as falling on the 21st at a few stations in the Graaff-Reinet, Middelburg, Murraysburg, Cradock, Tarkastad, Steynsburg, and Aliwal North Divisions of the Cape Province; being noted as heavy at Donkerhoek (Cradock Division). Hail fell at Rondekop (Division Laingsburg in the C.P.) on the 8th, many stones being as large as fowl's eggs, but causing damage mainly to vines. Again on the 12th large hail fell at Fort White (Kingwilliamstown Division), causing damage to cereals, and on the afternoon of the same day at Kingwilliamstown, where stones of the size of pigeons' eggs caused considerable damage, killing a number of small stock and smashing over 400 window panes at the Convent Farm. The rains fell mostly in light local showers and in a number of instances were too light to benefit the winter crops. Maize and grass were drying off, whilst green fodder for cattle is reported to be likely to prove scarce in a number of areas, owing to continued drought during March and April, the ravages of locusts, damage by frost, etc. Malaria was still prevalent in parts of Swaziland and the Waterberg and Barberton Districts of the Transvaal. Horse-sickness and blue-tongue were still prevalent in a number of districts in all the Provinces, but principally, apparently, in the Transvaal and Free State. Caterpillars were general in the veld around Murraysburg. The cotton crop in Swaziland was badly infected with jassid, whilst a few cases of mild typhoid were reported from Grootfontein, Division of Middelburg (C.P.).

The gross totals for the ten months from 1st July, 1922, were mostly above normal, the exceptional areas being the Cape Peninsula, the south-west, part of the south and west coastal areas, the southern Karroo, parts of the central Karroo, the south-west and central parts of the northern Karroo, parts of Natal and Zululand, and the extreme south-west and part of the Pietersburg and Wakkerstroom areas of the Transvaal, and the east of the Free State. The excess in the Transvaal varied between 26·02 inches at Pigeonhole and 0·48 inch at Klerksdorp; in the Free State between 3·49 inches at Bloemfontein and 6·55 inches at Boshof; in Natal from 0·75 inch at Estcourt to 7·21 inches at Vryheid; and in the Cape between 21·42 inches at Stutterheim and 0·08 inch at Carnarvon. The deficits in the Transvaal lay between 0·86 inch at Pietersburg and 4·49 inches at Bloemhof; in the Orange Free State, Ladybrand shows a shortage of about an inch and half; in Natal (including Zululand), the sub-normal amounts ranged from 0·06 inch at Stanger to 6·62 inches at Weenen; and in the Cape from 0·17 inch at Victoria West to 10 inches at Driefontein (French Hoek). The accumulated amounts for the first four months of the year were less generally above the average than for the ten months; thus there were sub-normal amounts in parts of the north, east, south, south-east, and south-west of the Transvaal; the greater part of the Free State, with the exception of the west and centre; practically the whole of Natal and Zululand; parts of the south-east, southern, central, and northern Karroo the greater part of the west coast, part of the south-west, the Cape Peninsula

and the west of the south coastal area. As during the ten months, the excesses were greatest in the east and north-east, and least in the south-west of the Transvaal, varying from about 28 inches at Pigeonhole to 0·62 inch at Potchefstroom; in the Free State, Boshof showed an excess of over 8 inches; in Natal there was a surplus of 4·61 inches at Stanger; whilst in the Cape Province the excess amounts ranged from 0·02 inch at Beaufort West to 10·58 inches at Stutterheim, being generally much less than for the totals since the 1st July of the preceding year. The shortages in the Transvaal were mostly between 1 and 2 inches, but varied from 0·16 inch at Heidelberg to 8 inches at Wakkerstroom; in the Free State they ranged from 0·04 inch at Lindley to 2·62 inches at Harrismith; in Natal, between 0·64 inch at Durban and 7·26 inches at Weenen; and in the Cape Province they were mostly less than 2 inches, but varied from a few hundredths to over 4 inches at Swellendam. In South-West Africa the totals during April were considerably above normal, ranging from 13 per cent. at Maltahoehe to 545 per cent. at Gibeon, most stations having between two and three times the usual amounts, and the only exceptional stations were Tsumeb in the north, where the precipitation was practically normal, and Heirachabis in the extreme south-east, which showed a deficit of 40 per cent. The aggregate falls during the ten months from 1st July, 1922, were above normal commonly by 4 to 8 inches, but ranging from 1·45 inches at Aus in the south-west to 20·34 inches at Voigtsgrund, about 145 miles to the north-north-west. In a number of instances the totals for this period were more than double the average amounts, the excesses ranging, however, between 23 per cent. at Gobabis in the east of Windhoek and 358 per cent. at Voigtsgrund. The accumulated amounts since the 1st January of the current year are all above normal, the actual excesses varying from 0·77 inch or 29 per cent. at Heirachabis to 20·69 inches or 483 per cent. at Voigtsgrund, but being most commonly about double the average amounts.

OBSERVERS' NOTES FOR APRIL 1923.

TRANSVAAL.

Pigeonhole (Zoutpansberg).—Owing to the prevalence of mealie moth and worms and the rains of January and and February, the crop is about 60 per cent. below normal. Rainfall: 2·72 inches on eleven days.—J. McCallum.

Ermelo.—A very dry month. The maize crop is suffering in consequence. Rainfall: 0·68 inch on two days.—E. F. Vardy.

Lichtenburg.—Veld is in good condition, and prospects seem fairly good. Farmers are cutting and burying their mealies for winter food, the frost having caught them. Rainfall: 1·85 inch on six days.—E. Newton.

Piet Retief (Government Experimental Station).—23rd: Frost killed velvet beans, tomatoes, etc. Rainfall: 0·20 inch on nine days.—The Manager.

Rietfontein No. 286 (Pretoria).—Veld and grazing are going off rapidly. The frost of the 23rd killed all tender growth. Rainfall: 0·65 inch on four days.—H. H. John.

White River.—A good deal of dull and cloudy weather. One heavy storm on the 13th. Very cold on morning of 23rd. Rainfall: 2·22 inches on six days.—H. P. Pooley

Gemboksfontein (Middelburg).—The month was a fairly dry one, only 0·97 inch on four days. A few cold days were experienced during the latter part of the month. The first frost registered in the screen occurred on the 22nd.—G. M. van Coller.

Pretoria (*West End Municipal Plantation*).—Few sharp frosts towards end of month, but nothing has been taken with it. Rainfall: 0·86 inch on four days.—W. H. Foster.

Mosdene (*Naboomspruit*).—A bright, calm month with a cold snap on 23rd following a light rain and south-west wind. There was no frost at this station, but frost was reported from several other parts of the Springbok Flats, a month earlier than usual. Rainfall: 0·68 inch on four days, against an average for the month over the previous five years of 0·37 inch. Total rainfall since 1st July last: 21·31 inches.—Ernest E. Galpin.

Krugersdorp.—Although cloudy skies and morning mists have been considerably in evidence during the greater part of the month, the rainfall has been under the average. Following nearly half an inch of rain on the 20th and 21st, a cold snap was experienced, two degrees of frost being registered in the screen on the morning of the 22nd. Rainfall: 0·81 inch on five days.—H. Sharp.

Jakhalsfontein (*Pietersburg*).—A warm fine month until the 22nd, when apparently winter set in with a cold snap. Rainfall: 0·63 inch on three days.—Rev. James C. Palmer.

Pietersburg.—Warm and dry. Dust storms and cold winds for two days without a break. Rainfall: 0·40 inch on four days.—W. J. Franklyne.

Piet Retief.—Weather conditions throughout the month have been perfect. Rainfall: 1·32 inches on six days.—J. Werner.

Middelburg.—The usual autumn weather has prevailed during the month, warm to hot days with cool to cold nights, during five of which frost was registered; four degrees on the ground during one night. Some misty weather in early mornings occurred at intervals, but never so dense as to shut out the ground from the air. Winds blowing up the dust and lasting from 10 a.m. to about 4 p.m. occurred on a few occasions. Grass is bleaching and leaves taking on autumnal tints before falling. Rainfall: 1·28 inch on eight days.—Dr. H. A. Spencer.

Barberton.—Warm, dry weather in the daytime, with cool nights, have been the rule, with the exception of a few days in the middle of the month. Rainfall: 1·70 inch on six days.—Walter Grubb.

Groeneboom (*Rustenburg*).—Crops are ripening splendidly; cotton picking has been started. No locusts have appeared on this station yet, but are expected soon as a few swarms have been seen passing in the east. Veld and cattle in excellent condition. Rainfall: 0·69 inch on two days.—F. N. van Nouhuys.

Pampoenkraal (*Wakkerstroom*).—This has been an exceptionally dry month and vegetation has gone off rapidly. The frost of the 22nd and 23rd killed all the late maize and, we hope, the horse-sickness too. Tick fever has broken out a few miles from here and we are under quarantine for a month. Rainfall: 0·24 inch on three days.—Mrs. S. M. Nicolson.

Eleazar (*Potchefstroom*).—Horse-sickness was very severe the whole month. Rainfall: 1·76 inch on seven days.—W. J. Jooste.

Waaikraal (*Rustenburg*).—13th: Large swarms of devastating locusts here. Rainfall: 1·30 inch on three days.—W. Behrens.

Kruispad (*Waterberg*).—Malaria fever all over this part of the country. Lots of people have died of it. Horse-sickness is raging very badly. Rainfall: 0·16 inch on one day.—P. A. Eloff.

Kopje Alleen (*Waterberg*).—An immense swarm of locusts passed over this farm, taking one and a half hours to pass, and going in a south-east direction. Rainfall: 0·27 inch on five days.—Mrs. A. Jenkinson.

Doornkloof (*Zoutpansberg*).—30th:. Large swarm of locusts to south. Stock in excellent condition. Mealie crop being reaped and a good yield expected. Rainfall: 0·47 inch on three days.—S. M. Ralston.

Klipfontein (*Wolmaransstad*).—The frost of the 21st and 22nd did a lot of damage to the crops. Rainfall: 1·25 inch on two days. S. H. van Heerden.

Louieville (*Barberton*).—Malaria fever has been very bad during the month. Rainfall: 0·74 inch on four days.—E. Roselt.

Davel (*Bethal*).—Some slight cases of horse-sickness and blue-tongue among the sheep. The maize crop is fairly good. Rainfall: 0·96 inch on three days.—H. A. Wollenberg.

Blaauwwildebeestput (*Lichtenburg*).—The frost of the 21st, 22nd, and 30th killed all the young maize crop. Rainfall: 2·36 inches on five days.—C. Hull.

Delarey (*Lichtenburg*).—1st: Large swarms of locusts destroying crops. The crops in Lichtenburg were too young to withstand the frost, so that the district will yield little grain this year. The first frost occurred on the 22nd April. Rainfall: 2·12 inches on six days.—M. Michaelis.

Malmanioog (*Marico*).—Large swarm of locusts on the farm. Rainfall: 1·99 inch on six days.—C. W. Levey.

Riverside (*Middelburg*).—27th: Swarms of locusts, about one and a quarter mile long, passed within four miles of this place, flying in a northerly direction. Rainfall: 2·34 inches on three days.—M. Scher.

Mahemsvlakte (*Lichtenburg*).—The crops this year will be very poor owing to the locusts and early frosts. Rainfall: 1.89 inch on three days.—S. S. C. J. van Rensburg.

Swaziland.

Mbabane.—Horse-sickness; last outbreak on 21st so far as known. Country dry. Grass-burning set in. Native population now living on their standing crops. Rainfall: 1·10 inches on eight days.—W. J. D. Crawford.

Transvalia.—Maize crop is good; cotton badly infected with jassid. Fever still bad. Rainfall: 1·16 inch on five days.—I. H. Coates.

Orange Free State.

Rugby (*Bethlehem*).—A bad month for stock owing to the constant cold west winds which have withered the grass and pulled the cattle down in condition. The light rains which fell during the month were too late to benefit the late-sown mealies, and not heavy enough to do winter-feed crops any good. The second hatching of top grub did some damage in the late mealies, but not to any great extent. Horse-sickness and blue-tongue have been prevalent throughout the month, even after the frost fell (22nd). The latter epidemic, though affecting a large proportion of the flocks was not of a severe type, and losses from blue-tongue have not been heavy. Rainfall: 1·76 inch on five days.—A. C. Glynn-Baker.

Belladale (*Frankfort*).—Splendid rains, and although too late for the mealie crop will do a world of good to veld. Rainfall: 2·39 inches on four days.—D. McCallum.

Jansdeel (*Harrismith*).—Little rain. The veld is showing its winter colour. Very little winter feed in green stuff has been planted. Rainfall: 0·43 inch on one day.—J. J. Uijs.

Karreepan (*Hoopstad*).—23rd: Heavy frost killed all young mealies and kaffir-corn crops. Rainfall: 1·63 inch on four days.—J. Kelly.

Alma (*Ladybrand*).—Most excellent month for sowing winter crops, mild and damp. Rainfall: 2·96 inches on six days.—H. W. Stockdale.

Bonafide (*Thaba 'Nchu*).—The rain was of a very soft and steady nature and was of great benefit to green feeding. Rainfall: 1·88 inch on four days.—R. Morgan.

Woudzicht (*Vrede*).—The month was very dry up to the 12th, when the rain improved everything. Several cases of blue-tongue amongst sheep and a few cases of horse-sickness. Rainfall: 2·87 inches on five days.—J. N. Köhler.

Paardekraal (*Winburg*).—A good month. Grass still green at end of month. Mealies all through. Teff crop light and short in stalk. No locusts yet. Rye and oats shooting nicely. Sheep, excellent; cattle, medium. Rainfall: 2·16 inches on seven days.—G. S. Lowe.

Grootkuil (*Winburg*).—Blue-tongue and horse-sickness are very prevalent. A medium-size swarm of locusts arrived on the 24th, had not departed by the 30th. They are copulating. Rainfall: 1·72 inch on six days.—W. Cooke.

Holfontein (*Kroonstad*).—Some farmers in the district have lost nearly all their horses of horse-sickness. Rainfall: 2·41 inches on three days.—L. C. McInerney.

NATAL.

Dundee.—The continued drought of March and April has very much decreased the mealie crop in this district. Everything points to a long, dry winter. Rainfall: 0·39 inch on two days.—West Thorrold.

Hlabisa.—Grass for stock is drying up owing to the small rainfall in April. Rainfall: 0·95 inch on four days.—D. E. Lightening.

Ladysmith.—The country is looking very dry. Rainfall: 0·07 inch on three days.—D. A. R. Leathern.

Pietermaritzburg (*Mental Hospital*).—An ideal month; food for stock is plentiful. Rainfall: 1·73 inch on eight days.—The Staff.

Mid-Illovo.—Maize crop is drying off. Veld still good. Rainfall: 2·46 inches on seven days.—Lieut.-Col. J. W. Montgomery, C.M.G., D.S.O.

Ntabanana (*Nagana Research Laboratory*).—The rainfall for the month was not sufficient to revive the grass which is in a semi-dried-up condition. Cotton reaping has started, and reports of the crop are good. Maize has almost entirely been harvested and only an average crop is reported. Rainfall: 0·74 inch on three days.—The Staff.

Nottingham Road.—Stock of all kind is healthy. Good harvesting weather, but too dry for the green crops. Rainfall: 0·99 inch on ten days.—Miss E. J. Smythe.

Newcastle.—Frost has done a lot of damage to young crops and gardens. Rainfall: 0·24 inch on four days.—J. E. Torlage.

Estcourt.—The only outstanding feature of weather conditions is the abnormal dearth of rain. The present is generally stated to be one of the driest autumns for years past. Rainfall: 0·43 inch on five days.—W. H. Pitcher.

Newcastle (Convent).—This month was fine on the whole. There were several cold snaps and some very windy days. Towards the latter part of the month the mornings and evenings became considerably colder.—The Mother Superior.

Impendhle.—A few slight frosts during the month; an unusual fall of snow on the 21st on the hills surrounding the village. Rainfall: 1·27 inch on six days.—H. Biddulph.

Rongpoort (Weenen).—Very dry; crops permanently damaged by drought; mealies a failure. Rainfall: 0·64 inch on four days.—J. H. Bartholomew.

Kwambonambi (Lower Umfolozi).—Very bad drought. Worst for this time of year for nine years. Rainfall: 0·89 inch on three days.—W. Springorum.

CAPE.

Kingwilliamstown.—Heavy hailstorms from south-west at 3.55 p.m. on 12th; hailstones about the size of pigeon eggs, a considerable amount of damage done; a number of small stock killed and over 400 window panes broken at Convent Farm. Rainfall: 1·78 inch on nine days.—W. A. Kindness.

Murraysburg.—Winter has set in. The thermometer being on to freezing point for a number of days during the month, snow fell on the night of the 21st. The prospects generally for the winter are not what they should be. Catterpillars in the veld have been very general, and now swarms of locusts have invaded the district. Rainfall: 1·50 inch on six days.—W. H. Rose-Innes.

Groodfontein (School of Agriculture, Middelburg). All crops harvested. Lands being prepared for winter crops. Locusts appeared in swarms on the 23rd, but slowly going. Health generally good, with few cases of mild typhoid. Rainfall: 1·17 inch on seven days.—E. J. van Meerten.

Kraaipan (Mafeking). Locusts are still in evidence, the veld and crops have suffered in consequence. Winter feeding in some neighbouring parts will be very scarce. Rainfall: 2·36 inches on five days.—P. J. Hart.

Sydney-on-Vaal (Barkly West).—Locusts appear to be scattered throughout the district in thin groups. No dense swarm seen. Horse-sickness very prevalent. Rainfall: 1·33 inch on five days.—J. G. Richards.

Kakamas (Keuhardt). Horse-sickness still prevalent. Locusts very troublesome. On the whole the month has been cool. Rainfall 0·58 inch on two days.—M. Oosthuizen.

Riversdale.—The most welcome rain just in good time. Ploughing in full swing. Oatlands begin to shine green here and there. Rainfall: 3·65 inches on eleven days.—Rev. Carl Prozesky.

Maclear.—There has been very sudden changes in the weather with cold nights and frost on one occasion.—Dr. W. MacKenzie.

Queenstown.—Mild autumnal weather except for a short spell of frosty nights on the 22nd and 23rd (first of the season). First snowfall on Hangklip Mountains on 21st and 22nd. Rainfall: 0·75 inch on eight days.—J. F. C. Rein.

Ceres.—Weather generally very cloudy with little wind. Rainfall: 3·96 inches on thirteen days.—A. Heatlie.

Grassridge (Cradock).—The month has been one of greatly varying temperatures, but in the average a steady decline is shown throughout. One degree of frost was recorded on two occasions during the latter part of the month, and during the night of the 21st–22nd snow fell on the highlands south of here. Rainfall: 0·72 inch on seven days.—F. Cooper.

Liwandi (*Addo, Uitenhage*).—With the exception of a few windy periods we had pleasant weather. Irrigation with conserved water from Lake Mentz lasted for five days. Rainfall: 1·14 inch on nine days.—Major J. Kreft.

Darling (*Malmesbury*).—A most seasonable month. The good light rains have enabled ploughing operations to be commenced throughout the neighbourhood under the most favourable conditions. Natural pasture coming on beautifully. Rainfall: 2·18 inches on thirteen days.—P. H. Drake.

Willowmore.—Unusually early frosts, 22nd. Rainfall: 1·34 inch on nine days.—Mrs. B. M. Hemens.

Elsenburg (*Stellenbosch*).—The leading feature of the month is a very fine rainfall well distributed, so that there was no run-off. It has had a good influence on the agricultural operations, and farmers in the area are all busy ploughing. There has been a considerable drop in the temperature from last month, and on the 18th and 19th there was snow on the surrounding mountains. Rainfall: 3·29 inches on eleven days.—D. C. Crawford.

Robben Island.—The general appearance of the island has improved since the rains. The island being very dry and in want of rain, much more is needed to freshen up the springs and boreholes from which the island obtains its water supply. Rainfall: 1·75 inch on thirteen days.—H. E. Stokes.

Reitfontein (*Aliwal North*).—Very little wind. Early frost, 22nd. Locusts at end of month. Mealie crop good. Horse-sickness prevalent early part of month. Rainfall: 1·36 inches on seven days.—A. G. Smith.

Capetown.—The first few days of the month were hot and oppressive, succeeded by a fall of temperature and cloudy days, after which was a week of fine weather with south-easters. Good soaking rains fell on the 19th and continued, with breaks, until the end of the month. Water restrictions have been removed.—A. Russell Fraser.

Bedford.—April was a dry month, the rainfall being less than usual. The nights have been colder than usual at this season. Frosts have been reported from the district. Rainfall: 1·07 inch on thirteen days.—Thos. C. Hall.

Carnarvon.—Heavy frost on 22nd destroying vegetable gardens. All grass destroyed by locusts, who visited the district in their millions, and as rainfall has been insufficient to cause bushes to sprout freely, the outlook for the winter months is dark. Rainfall: 0·71 inch on three days.—A. P. Malherbe.

Kokstad.—Several sharp frosts from 23rd onwards. Rainfall: 0·63 inch on eight days.—H. D. Coyte.

O'okiep.—Swarms of locusts reported to the eastward of this station for greater part of month. Rainfall: 0·31 inch on six days.—J. Burrows.

Groot Drakenstein.—The driest period recorded at this station broke on the 18th, and was followed by exceptionally cold, wet weather till the end of the month. Heavy snow covered the mountain tops on the 21st (including Simonsberg). The earliest date previously recorded was 5th May, 1919; it is often as late as June or July. Hours of sunshine lowest recorded for April, and percentage of cloud the highest. Rainfall: 4·68 inches on eleven days.—Lionel Baker.

Somerset East.—The latter half of month was marked by cold nights and strong westerly winds. Rainfall: 1·37 inch on ten days.—C. Harris.

Graaff-Reinet.—Winds variable and moderate, often changing from north to south during the mornings. A cold snap on the 22nd, the minimum temperature falling to 36·3 degrees, and the mountains in the district being heavily covered with snow. Rainfall: 1·20 inch on eight days.—S. E. D. Treadwell.

Mafeking (*Convent*).—Ideal weather for the first week. Showers from 9th to 21st. The maximum temperature fell from 80·0 degrees on the 20th to 57·0 degrees on the 21st. Slight frost that night (21st–22nd). From the 25th to the end of month the days were bright and warm. Rainfall: 1·19 inch on seven days.—The Mother Superior.

Queenstown.—A month of strong and cool west to northerly winds and dust during the last nine days. Snow on surrounding hills morning of 22nd. Hoar frost morning of 22nd. Rainfall: 0·78 inch on nine days.—H. Holley.

Stutterheim.—23rd April: Hoar frost in valleys, but not in Stutterheim. Rainfall: 1·28 inch on thirteen days.—F. C. Bousfield.

Rondekop (*Laingsburg*).—On the 8th a hailstorm passed over farm; many stones as big as fowl eggs. Damage small, excepting loss in vines. Rainfall: 1·51 on five days.—J. B. Wolfaardt.

Ezelsfontein (*De Aar*).—Since the heavy frosts on the 22nd and 23rd no new cases of blue-tongue or horse-sickness occurred. Rainfall: 1·16 inch on four days.—W. S. Marais.

Fort White (*Kingwilliamstown*).—12th: Storm; large hail fell for five minutes; fair amount of damage to cereal crops. Rainfall: 1·33 inch on five days.—H. W. Blackbeard.

Kilcullen (*Barkly East*).—Stock small and large are in prime condition this year. Rainfall: 1·78 inch on six days.—O. A. S. Vorster, J.P.

Bechuanaland.

Palapye Road.—Grain crops reported excellent. Cattle generally getting into good condition. Rainfall: 0·08 inch on one day.—Thos. W. Shaw.

Mahalapye.—Quite a normal month. Veld still delightfully green, and grass long. Rainfall: 0·45 inch on two days.—Miss M. Giles.

Dikgatlong Ranch.—The weather during the month was normal, and compares with other years, though the many cloudy days raised our hopes for additional rains, hopes which were not realized except for two small showers on the 18th and 21st. Veld is good, and, so far, no flying locusts have been seen. Rainfall: 0·62 inch on two days.—Paul Jousse.

South-West Africa.

Ondonga (*Ovamboland*).—A cloudy month with scattered rains and prevailing east winds. Temperature dropped to 49·9 degrees on the 23rd, the lowest registered since October last. Water in pans rapidly drying up. Stock in fair condition. Natives are busy reaping their crops. Rainfall: 1·37 inch on six days.—H. J. Anderson.

Basutoland.

Mafeteng.—Calm, sunny month. Cold nights. Nice rains 8th and 12th, and from 18th to 21st. Veld and stock in good condition. Ploughing for wheat in full swing. Rainfall: 2·90 inches on six days.—F. Hodgson.

JUNE WEATHER CHARACTERISTICS.

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

The rainfall in the Cape Peninsula is, however, still increasing, approximating 6 inches, whilst over the adjoining south-western districts the monthly maximum

of 3·5 inches is reached. Along the west coast there is a slight decrease, but both there and along the south-coast the variation from the May rainfall is inconsiderable. Thunderstorms are now at their minimum.

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

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

C. STEWART,
Chief Meteorologist.

Pretoria.

SOUTH-WEST AFRICA.

Report of the Meteorological Observer, Mariental, on Floods in Mariental.

Immediately after sunrise on Friday, 16th February, a steady downpour of fine soaking rain commenced at Mariental, continuing the whole day and following night, the precipitation for the twenty-four hours being 55 mm.; the downfall continued until Saturday (17th) abating slightly. Indications of flooding were observed in the Fish River, and in the early forenoon a large volume of water came down the river, gauging 8 metres in depth and filling the whole of its channel.

Mr. Haman Kock, of Kub, 120 km. higher up the river, an old resident in the district, early realized the danger and gave timely warning by telephone. Residents to the west of the railway line immediately commenced precautions against floods, but the most pessimistic hardly anticipated what was to come. The climax was reached at 2 p.m., when the river broke over its banks and

flowed into the plain on which Mariental is situated; the waters rose with great rapidity and to such an extent that the inhabitants living between the river and the railway line had barely time to secure and remove their most necessary effects; thanks to the assistance rendered by Major MacEwen (Maintenance Superintendent, S.A.R.), Mr. Bennett (Station Master), and their European and native staffs, salvage efforts were rewarded by a measure of success.

At 4 p.m. the floods had reached Charney's Hotel, which abuts on the railway property. Despite the pelting rain, salvage operations still continued, although at great personal risk, as one building had collapsed and rents were appearing in the walls of the majority of those still standing; the volunteers were, however, undeterred.

Towards sundown a grey, turbid volume of water, some 15 km. wide, occupied the space which a few hours previously had been a sandy plain.

Destruction and desolation prevailed, the roar of the floods and the thud of collapsing buildings proving anything but consoling to those rendered homeless. All kinds of débris, including iron roofs, animals, trees, and furniture, were being carried past by the once insignificant stream. The setting sun produced an eerie effect, all buildings except the railway station being surrounded by water.

Efforts were now made to accommodate the unfortunate residents who had lost all they possessed, and shelter was found in railway station, post office, and some railway coaches.

At midnight the floods began to show signs of subsiding, and the early rays of breaking day cast their feeble light on a scene of unutterable desolation; what was once the flourishing young village of Mariental now consisted mainly of a few ragged walls.

The following buildings are completely in ruins: The railway pumping station; police station; the business premises of Messrs. Thielman, Borchart, Impelman, and Verheeven; the homestead, garden, windmill, and dipping tank, the property of Mr. Stumpfe; while the buildings the property of Messrs. Charney, Trubig, Wendisch, and A. Fick have suffered very considerable damage. The total loss is estimated at £10,000.

22nd February.—The river is still unfordable, but has receded to its original bed. Great havoc has been wrought to the plantation which was a feature of its banks. This will be readily understood when it is stated that at one period the river was flowing 5 km. wide and 12 metres deep.

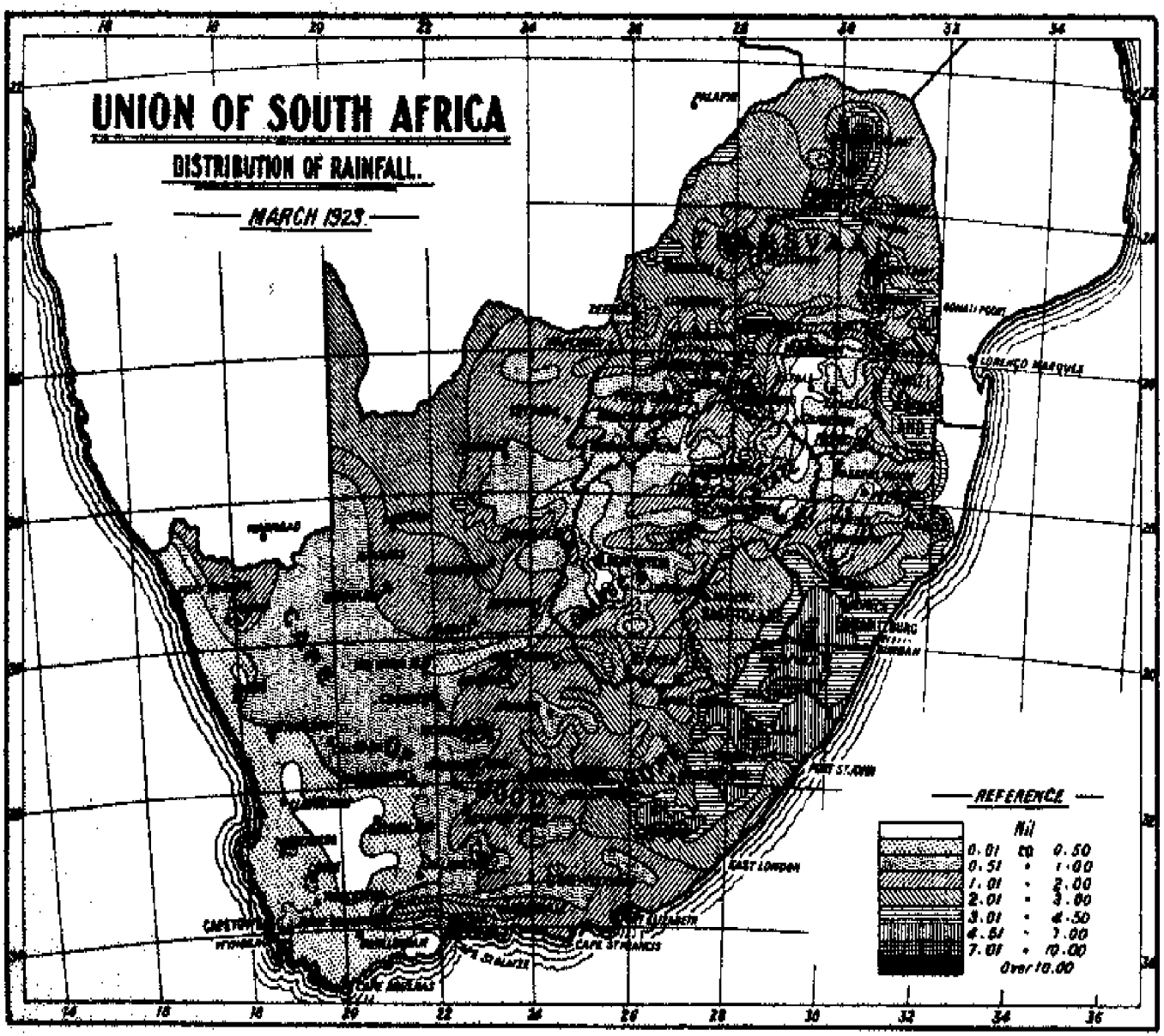
Old natives state that they can only recall one similar occurrence and that as far back as 1893.

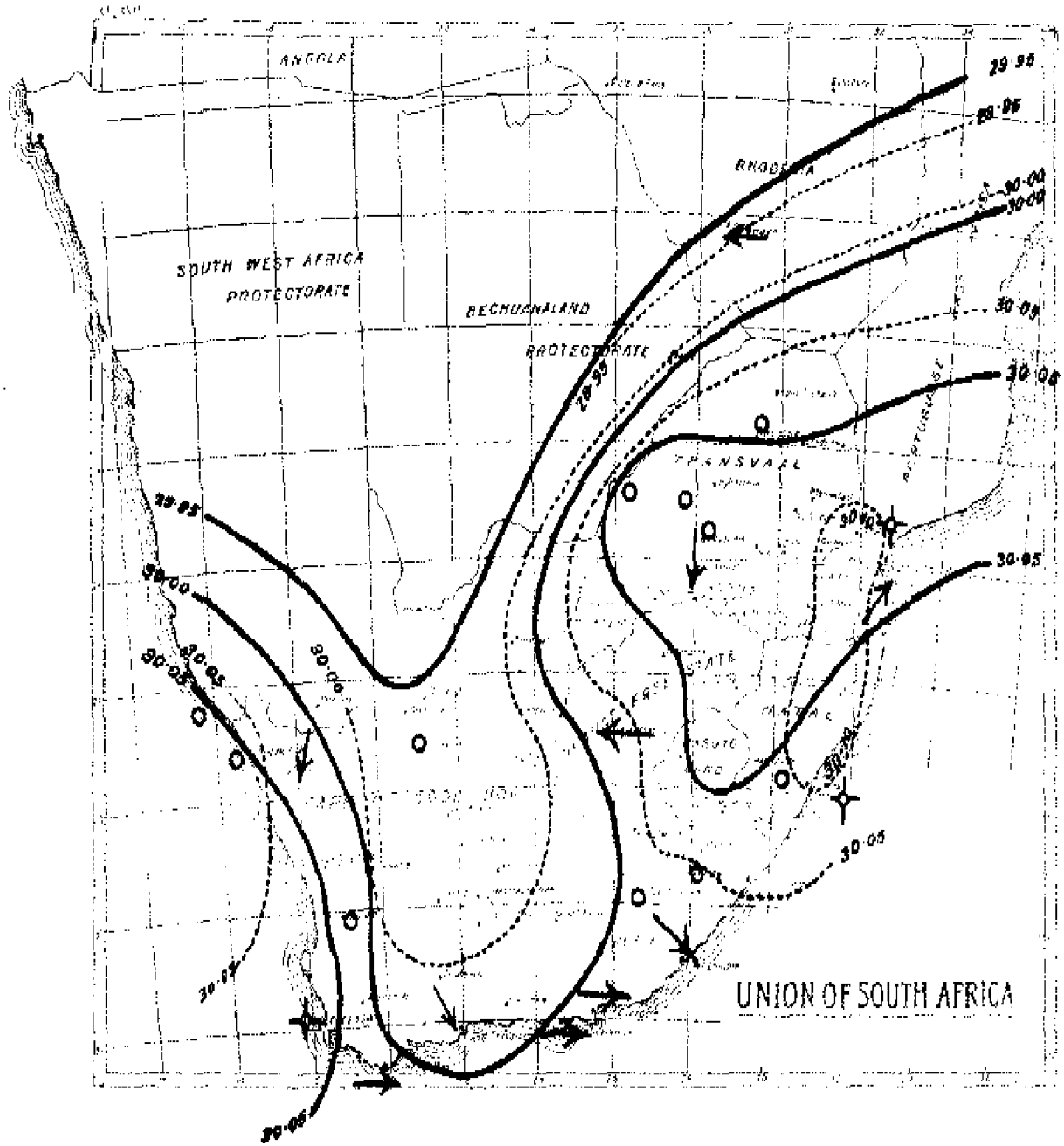
The great accumulation of water is probably due to the flooding of the following tributaries of the Fish River, namely: the Uisip, Nareb, Kamn, Krey, Schlip, and Kalf Rivers, all of which drain a considerable area of the Bastard territory.

The majority of the inhabitants of Mariental, British, Africander, and German, have suffered severe loss, and to a large extent are deprived of their means of livelihood.

It is understood that the Johannesburg *Star* has organized a relief fund, and it is thought that the Administration would be taking a wise and humane step if a grant could be made to assist the destitute.

The inhabitants of Mariental desire to express their deepest gratitude to Major MacEwen, Mr. Bennett, and their assistant volunteers who so ungrudgingly assisted them in their distress.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
MARCH 1923.
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
LORENÇO MARQUES
EAST LONDON
CAPE ST FRANCIS



April, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8,30 a.m.
The dotted lines indicate the normal distribution for April.

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AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), APRIL, 1923.

Station.	Observer.	Month—April, 1923. Mean Max.	Month—April, 1923. 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	80·7	57·1	68·9	67·0	+ 1·9	92·0	27th	45·0	23rd.
Belfast	The Forester	68·1	39·3	53·7	55·9	− 2·2	74·0	9th	25·0	24th.
Bloemhof	A. Adamson	75·9	48·0	61·9	62·0	− 0·1	84·3	11th	35·0	22nd and 23rd.
Ermelo	The Forester	73·0	44·4	58·7	57·3	+ 1·4	79·5	11th	29·0	22nd.
Johannesburg (Observatory)	The Staff	69·4	49·7	59·5	58·8	+ 0·7	75·8	1st and 4th	29·8	22nd.
Klerksdorp (Strathmore)	Chas. Scott	74·5	46·0	60·2	63·1	− 2·9	82·0	10th	30·0	23rd.
Komatipoort	B. J. Fothergill	87·2	61·0	74·1	73·0	+ 1·1	98·0	27th	49·0	23rd.
Louis Trichardt	I. J. de Bruin	78·7	53·5	66·1	64·2	+ 1·9	87·0	22nd and 29th	47·0	25th.
Middelburg	Dr. H. A. Spencer	76·1	44·4	60·2	60·2	± 0·0	84·0	10th	32·0	23rd.
Nylstroom	G. Bakker	78·2	49·1	63·6	64·5	− 0·9	83·5	11th and 14th	38·0	22nd and 23rd.
Pietersburg	W. J. Frankleyne	75·6	50·3	62·9	63·3	− 0·4	81·0	29th	39·0	23rd.
Piet Retief	J. Werner	73·8	49·8	61·8	60·7	+ 1·1	81·8	27th	37·0	23rd.
Pigeonhole (New Agatha)	Jno. McCallum	68·8	55·7	62·2	—	—	80·0	21st	45·0	23rd.
Pilgrim's Rest	E. M. Skea	73·2	49·0	61·1	61·6	− 0·5	82·0	20th and 26th	35·5	22nd.
Potchefstroom (Exp. Farm)	The Manager	76·3	46·3	61·3	60·5	+ 0·8	84·3	1st	30·5	23rd.
Pretoria (Meteorological Office)	The Staff	74·3	51·2	62·7	62·9	− 0·2	79·9	27th	35·3	22nd.
Standerton	W. J. Madge	72·0	43·6	57·8	58·0	− 0·2	76·3	14th	29·0	23rd.
Zeerust	H. Dietrich	76·1	48·1	62·1	63·7	− 1·6	81·9	11th and 27th	34·0	22nd.
Swaziland—										
Mbabane	Swaziland Police	73·7	51·5	62·6	62·5	+ 0·1	84·0	21st	38·0	23rd.
Orange Free State—										
Bethulie	J. J. Wardhaugh	74·0	43·8	58·9	60·0	− 1·1	85·5	4th	30·6	23rd.
Bloemfontein	G. A. Schepers	71·3	44·4	57·8	59·9	− 2·1	80·8	4th	31·4	23rd.
Harrismith	The Forester	67·5	41·5	54·5	56·0	− 1·5	73·0	3rd, 10th, and 11th	26·0	23rd.
Kroonstad	S. R. Northfield	73·9	44·9	59·4	58·9	+ 0·5	82·5	4th	29·5	23rd.
Ladybrand	The Forester	70·1	43·4	56·7	59·2	− 2·5	79·0	3rd and 4th	29·0	23rd.
Lindley	J. Collister-Gates	71·9	42·9	57·4	58·8	− 1·4	80·1	11th	28·0	23rd.
Natal—										
Dundee	West Thorrold	77·6	45·7	61·6	64·6	− 3·0	83·0	27th	32·0	22nd.
Durban (Point)	The Port Captain	78·6	63·8	71·2	72·4	− 1·2	84·8	4th and 8th	55·6	23rd.
Estcourt	The Town Clerk	76·9	48·0	62·5	64·2	− 1·7	85·0	4th	34·0	23rd.
Hlabisa	D. E. Lightening	80·0	62·7	71·3	69·6	+ 1·7	86·0	4th	55·0	23rd.
Ladysmith	D. A. R. Leathern	79·8	52·2	66·0	67·4	− 1·4	86·0	4th	38·0	23rd.
Maritzburg (Mental Hospital)	The Staff	75·9	54·7	65·3	67·8	− 2·5	85·5	4th	43·0	23rd and 24th.
Stanger	Cecil C. Foss	79·2	62·4	70·8	71·5	− 0·7	86·5	4th	55·1	24th.
Weenen	The Gaoler	84·3	48·9	66·6	67·6	− 1·0	90·0	4th, 6th, and 7th	34·0	22nd.

AIR TEMPERATURES, APRIL, 1923—(*continued*).

Station.	Observer.	Month—April, 1923. Mean Max.	Month—April, 1923. 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	72·6	41·5	57·0	59·0	− 2·0	82·0	2nd and 3rd	28·0	23rd.
Bedford	Thos. C. Hall	74·2	49·0	61·6	63·2	− 1·6	91·0	3rd	40·0	22nd and 23rd.
Capetown (Royal Observatory)	The Staff	71·9	55·3	63·6	63·1	+ 0·5	98·2	2nd	45·9	20th.
Carnarvon	A. P. Malherbe	72·3	45·5	58·9	60·2	− 1·3	90·0	3rd	20·0	22nd.
Chatsworth	P. B. Scholtz	78·7	49·4	64·1	67·2	− 3·1	101·2	2nd	38·8	24th.
East London	The Port Captain	74·6	56·5	65·5	66·2	− 0·7	91·0	26th	49·0	22nd.
Graaff-Reinet	S. E. D. Treadwell	75·9	52·1	64·0	64·1	− 0·1	93·0	3rd	36·3	22nd.
Grahamstown	The Vet. Res. Officer	73·8	48·0	60·9	63·9	− 3·0	93·2	3rd	35·6	22nd.
Groot Drakenstein	Lionel Baker	74·0	53·3	63·7	64·0	− 0·3	101·7	2nd	42·2	22nd.
Kenhardt	R. Seydell	78·7	48·4	63·5	66·2	− 2·7	92·0	1st and 4th	34·0	23rd.
Kimberley	Jno. Acton	76·1	49·7	62·9	63·6	− 0·7	88·0	2nd and 3rd	32·0	22nd.
Kingwilliamstown	W. A. Kindness	78·2	51·0	65·0	66·4	− 1·4	97·5	4th	43·0	15th, 23rd, and 24th.
Kokstad	H. D. Coyte	72·1	44·1	58·1	59·4	− 1·3	81·0	3rd	30·0	23rd.
Maleking (Convent)	The Mother Superior	77·2	49·0	63·1	63·5	− 0·4	83·2	10th	31·0	22nd.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	71·5	58·3	64·9	64·4	+ 0·5	88·0	2nd and 3rd	46·0	21st.
Murraysburg	W. H. Rose-Innes	71·8	41·2	56·5	60·2	− 3·7	88·0	3rd	27·6	22nd.
O'okiep	J. Burrows	74·2	53·3	63·7	65·8	− 2·1	89·8	2nd	35·5	22nd.
Port Elizabeth	The Lightkeeper	70·2	57·9	64·0	65·5	− 1·5	76·0	3rd, 6th, and 23rd	47·0	22nd.
Port Nolloth	The Lightkeeper	66·0	48·3	57·1	58·8	− 1·7	80·0	1st	40·0	24th.
Port St. Johns (Cape Hermes)	The Lightkeeper	74·7	62·4	68·6	68·4	+ 0·2	82·0	12th	54·0	22nd.
Queenstown	H. Holley	74·6	47·5	61·0	61·9	− 0·9	88·0	3rd	31·0	23rd.
Somerset East	C. Harris	74·1	49·6	61·8	63·6	− 1·8	91·9	3rd	30·2	23rd.
Stutterheim	F. C. Boustfield	78·7	49·9	64·3	62·4	+ 1·9	89·7	3rd	39·1	23rd.
Sydney's Hope	Rev. S. Rippon	72·3	53·2	62·8	65·2	− 2·4	95·0	3rd	40·0	22nd.
Uitenhage	H. Inggs	75·8	51·7	63·7	67·2	− 3·5	95·0	2nd	40·5	24th.
Umtata	Miss N. Dix Peek	77·5	50·2	63·8	64·5	− 0·7	88·5	7th	36·7	24th.
Vryburg (Armoedsvlakte)	The Vet. Res. Officer	76·3	47·6	62·0	63·1	− 1·1	84·0	10th	34·0	23rd.
Wynberg (Convent)	The Mother Superior	72·9	54·5	63·7	62·8	+ 0·9	94·5	3rd	44·5	22nd.
Basutoland—										
Maketeng	F. Hodgson	67·4	43·0	55·2	59·6	− 4·4	76·9	3rd	29·0	23rd.

RAINFALL, APRIL, 1923.

Station.	Observer.	Month. April, 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Transvaal—		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Barberton	W. Grubb	1·70	1·89	− 0·19	19·49	16·62	+ 2·87	33·15	30·64	+ 2·51
Bethal	H. F. Joubert	1·33	1·21	+ 0·12	15·78	13·33	+ 2·45	36·76	28·94	+ 7·82
Belfast	The Forester	0·81	1·65	− 0·84	14·39	15·75	1·36	35·92	31·68	+ 4·24
Bloemhof	A. A. Adamson	1·48	1·10	+ 0·38	9·16	11·15	− 1·99	13·20	17·69	− 4·49
Claremont	S.A. Police	0·35	1·07	0·72	12·42	10·34	+ 2·08	19·05	18·27	+ 0·78
Ermelo	The Forester	0·68	1·20	− 0·52	7·71	13·67	− 5·96	35·46	30·79	+ 4·67
Hazeltenburg	S.A. Police	0·00	1·34	− 1·34	35·15	22·11	+ 13·04	49·14	36·26	+ 12·88
Heidelberg	W. ter Horst	0·91	1·21	− 0·30	13·65	13·81	− 0·16	29·57	27·84	+ 1·73
Johannesburg (Observatory)	The Staff	1·56	1·27	+ 0·29	16·65	15·57	+ 1·08	31·92	29·95	+ 1·97
Klerksdorp (Strathmore)	C. Scott	2·04	1·72	+ 0·32	13·50	12·76	+ 0·74	23·04	22·56	+ 0·48
Komatipoort	B. J. Fothergill	3·32	1·67	+ 1·65	30·88	16·74	+ 14·14	43·03	26·65	+ 16·38
Louis Trichardt	I. J. de Bruin	0·15	1·54	− 1·39	32·79	16·92	+ 15·87	40·46	28·83	+ 11·63
Middelburg	Dr. H. A. Spencer	1·28	1·33	0·05	15·60	14·18	+ 1·42	37·51	28·32	+ 9·19
Nylstroom	G. Bakker	0·80	1·15	− 0·29	16·54	13·53	+ 3·01	31·14	24·29	+ 6·85
Pietersburg	W. J. Frankleyne	0·40	1·04	− 0·04	9·90	11·08	− 1·18	20·12	20·98	− 0·86
Piet Retief	J. Werner	1·32	1·55	− 0·23	17·50	14·79	+ 2·71	43·83	31·25	+ 12·58
Pilgrims Rest	E. M. Skea	1·17	2·24	− 1·07	38·59	24·26	+ 14·33	55·82	38·60	+ 17·22
Pigeonhole (New Agatha)	J. McCallum	2·72	2·31	+ 0·41	55·17	27·22	+ 27·95	72·05	46·03	+ 26·02
Potchefstroom (Exp. Farm)	The Manager	1·63	1·48	+ 0·15	12·48	11·86	+ 0·62	25·16	22·86	+ 2·30
Pretoria (Meteorological Office)	The Staff	1·30	1·26	+ 0·04	17·48	15·35	+ 2·13	35·79	28·82	+ 6·97
Roodburg	Max Baumann	1·55	0·87	+ 0·68	15·47	13·48	+ 1·99	30·00	24·14	+ 5·86
Rustenburg	A. Streatfield	0·73	0·88	0·15	17·69	13·84	+ 3·85	27·58	25·79	+ 1·79
Standerton	M. J. Madge	0·54	1·33	− 0·79	17·47	14·24	+ 3·23	36·58	30·52	+ 6·06
Wakkerstroom	F. Grant	0·60	1·37	0·77	7·93	15·93	− 8·00	30·40	31·33	− 0·93
Woodbush	—	—	—	—	—	—	—	—	—	—
Zoutpansberg	H. Dietrich	1·44	1·33	+ 0·11	16·74	13·36	+ 3·38	24·65	23·09	+ 1·56
Swaziland—										
Mbabane	Swaziland Police	1·10	2·65	1·55	43·11	27·88	+ 15·53	72·73	51·39	+ 21·34
Orange Free State—										
Bethulie	J. J. Wardhaugh	1·17	1·34	− 0·17	9·55	10·11	0·56	17·45	16·30	+ 1·15
Bloemfontein	G. A. Schepers	2·14	1·82	+ 0·32	18·17	12·46	+ 5·71	23·74	20·25	+ 3·49
Boshof	The Postmaster	2·51	1·47	+ 1·04	19·49	11·12	+ 8·37	21·93	18·48	+ 6·45
Harrismith	The Forester	1·09	1·48	− 0·39	11·96	14·58	− 2·62	34·10	28·56	+ 5·54
Kroonstad	S. B. Northfield	2·36	1·78	+ 0·58	11·32	13·08	1·76	27·40	23·02	+ 4·38
Ladybrand	The Forester	2·22	1·83	+ 0·39	13·45	14·01	+ 0·56	24·59	26·00	− 1·41
Lindley	J. Collister-Oates	1·40	1·65	− 0·25	12·31	12·35	0·04	26·99	23·01	+ 3·98
Natal—										
Dundee	West Thorneld	0·39	2·06	− 1·67	12·54	16·70	− 4·16	32·88	31·13	+ 1·75
Durban (Point)	The Port Captain	2·19	3·58	− 1·39	17·11	17·75	− 0·64	43·15	38·47	+ 4·68

RAINFALL, APRIL, 1923—(*continued*).

Station.	Observer.	Month. April, 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Natal—(continued).		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Estcourt	The Town Clerk	0·43	1·48	− 1·05	12·73	15·82	− 3·09	29·06	28·16	+ 0·90
Hlabisa	The Gaoler	0·95	3·01	− 2·06	17·44	20·59	− 3·15	37·23	41·51	− 4·28
Howick	The Gaoler	1·35	2·13	− 0·78	15·54	17·12	− 1·58	33·30	32·15	− 1·15
Ladysmith	D. A. B. Leathern	0·07	1·45	− 1·38	12·26	15·42	− 3·16	30·94	27·67	+ 3·27
Maritzburg (Mental Hospital)	The Staff	1·73	2·10	− 0·37	17·79	18·57	− 0·78	40·65	35·83	+ 4·82
Stanger	Cecil C. Foss	1·21	2·75	− 1·54	21·85	17·24	+ 4·61	39·68	39·74	− 0·06
Vryheid	The Gaoler	0·69	2·13	− 1·44	10·83	17·38	− 6·55	41·36	34·15	+ 7·21
Weenen	The Gaoler	0·03	1·67	− 1·64	7·23	14·49	− 7·26	19·97	26·59	− 6·62
Cape—										
Aliwal North	A. Alcock	1·11	1·61	− 0·50	11·58	11·04	+ 0·54	22·56	15·91	+ 6·65
Beaufort West	The Gaoler	2·00	0·87	+ 1·13	5·03	5·01	+ 0·02	8·51	7·42	+ 1·09
Bedford	T. C. Hall	1·07	2·35	− 1·28	14·18	13·04	+ 1·14	28·97	20·68	+ 8·29
Britstown	The Gaoler	0·90	1·62	− 0·72	5·32	7·08	− 1·76	6·43	9·18	− 2·75
Calvinia	The Gaoler	0·83	0·97	− 0·14	1·74	2·56	− 0·82	6·25	5·68	+ 0·57
Capetown (Royal Observatory)	The Staff	2·71	1·99	+ 0·72	4·11	4·21	− 0·10	13·11	16·42	− 3·31
Ceres	A. Heatlie	3·96	2·95	+ 1·01	6·15	5·58	+ 0·57	19·53	27·35	− 7·82
Carnarvon	A. H. Malherbe	0·71	0·88	− 0·17	5·02	4·70	+ 0·32	6·00	5·92	+ 0·08
Clanwilliam	P. E. Scholtz	0·72	0·72	± 0·00	0·87	1·43	− 0·56	3·96	5·54	− 1·58
East London	A. Downie	0·82	2·67	− 1·85	17·79	12·75	+ 5·04	43·91	25·81	+18·10
French Hoek (Driefontein)	The Forester	6·08	5·01	+ 1·07	8·44	10·29	− 1·85	33·58	43·70	− 10·12
Fraserburg	The Gaoler	0·74	0·88	− 0·14	3·10	3·73	− 0·63	3·91	5·00	− 1·09
Grahamstown	Vet. Res. Officer	0·76	2·29	− 1·53	8·80	10·79	− 1·99	29·44	22·06	+ 7·38
Gariep	The Gaoler	0·44	0·49	− 0·05	0·44	0·91	− 0·47	3·83	3·28	+ 0·55
Graaff-Reinet	S. E. D. Treadwell	1·20	1·11	+ 0·09	5·05	6·48	− 1·43	11·00	10·78	+ 0·22
Groot Drakenstein	Lionel Baker	4·68	2·80	+ 1·88	5·84	5·70	+ 0·14	18·51	23·18	− 4·67
Griquatown	The Gaoler	1·26	1·52	− 0·26	—	8·07	—	—	10·00	—
Hanover	The Gaoler	0·99	1·43	− 0·44	—	7·72	—	—	10·14	—
Hopetown	The Gaoler	1·36	1·09	+ 0·27	8·36	7·58	+ 0·78	10·76	9·45	+ 1·31
Kenhardt	R. Seydell	0·50	0·63	− 0·13	6·46	3·61	+ 2·85	7·14	4·57	+ 2·57
Kimberley	J. Acton	1·01	1·41	+ 0·20	9·45	9·39	+ 0·06	14·35	12·79	+ 1·56
Knysna	The Gaoler	3·89	2·22	+ 1·67	10·04	8·98	+ 1·06	26·29	21·79	+ 4·50
Kokstad	H. D. Coyte	0·63	1·61	− 0·98	20·70	13·90	+ 6·80	34·38	21·03	+13·35
Kingwilliamstown	W. A. Kindness	1·78	2·16	− 0·38	12·81	11·09	+ 1·72	30·29	20·21	+10·08
Kuruman (Abtonia)	A. T. Sitwell	1·81	1·31	+ 0·50	12·72	11·21	+ 1·51	13·98	12·85	+ 1·13
Mafeking (Convent)	The Mother Superior	1·19	1·72	− 0·53	12·47	12·92	− 0·45	20·71	17·95	+ 2·76
Mossel Bay (Cape St. Blaize)	The Lightkeeper	3·35	1·74	+ 1·61	6·44	5·85	+ 0·59	13·01	13·16	− 0·15
Murraysburg	W. H. Rose-Innes	1·50	1·06	+ 0·44	6·76	5·87	+ 0·89	8·59	8·33	+ 0·26
O'okiep	J. Burrows	0·31	0·63	− 0·32	1·35	1·60	− 0·25	5·01	4·69	+ 0·32
Philipstown	The Gaoler	0·97	1·26	− 0·29	—	7·88	—	—	10·35	—

RAINFALL, APRIL, 1923—(*continued*).

Station.	Observer.	Month. April, 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Cape—(continued).		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Piquetberg	The Gaoler	1·90	1·60	+ 0·30	3·35	3·19	+ 0·16	10·37	14·07	− 3·70
Port Elizabeth	The Lightkeeper	3·68	1·92	+ 1·76	8·36	6·21	+ 2·15	21·01	17·13	+ 3·88
Port St. Johns	The Lightkeeper	0·50	3·87	− 3·37	23·10	20·19	3·21	47·37	38·24	+ 9·13
Port Nolloth	The Lightkeeper	0·27	0·24	+ 0·03	0·53	0·52	+ 0·01	2·02	1·53	+ 0·49
Prieska	The Gaoler	0·78	1·36	− 0·58	6·33	6·30	+ 0·03	7·80	7·55	+ 0·25
Queenstown	H. Holley	0·78	1·64	− 0·86	12·50	12·49	+ 0·01	24·79	17·95	+ 6·84
Steytlerville	The Gaoler	1·16	0·89	+ 0·27	5·75	4·58	+ 1·17	10·65	7·48	+ 3·17
Sutherland	The Gaoler	1·07	0·98	+ 0·09	2·77	3·09	+ 0·32	5·35	6·56	− 1·21
Swellendam	The Gaoler	3·86	2·79	+ 1·07	6·84	11·02	+ 4·18	20·09	24·21	+ 4·12
Sydney's Hope	Rev. S. Rippon	1·58	2·16	+ 0·58	6·70	8·56	+ 1·86	20·18	17·42	+ 2·76
Somerset East	C. Harris	1·37	2·12	− 0·75	8·95	11·81	+ 2·86	24·31	20·23	+ 4·08
Stutterheim	F. C. Bousfield	1·28	2·30	+ 1·02	25·20	14·62	+ 10·58	45·33	23·91	+21·42
Uitenhage	H. Ingos	2·84	1·65	+ 1·19	7·97	6·44	+ 1·53	21·97	13·77	+ 8·20
Umtata	Miss N. Dix-Peck	0·83	1·81	+ 0·98	18·71	12·32	+ 6·39	32·09	19·74	+13·35
Uniondale	The Gaoler	1·64	1·22	+ 0·42	3·69	4·32	+ 0·63	8·78	10·02	+ 1·24
Upington	The Gaoler	0·79	0·85	+ 0·06	6·69	4·64	+ 2·05	7·54	5·66	+ 1·88
Victoria West	The Gaoler	1·02	0·98	+ 0·04	6·89	6·03	+ 0·86	7·99	8·16	+ 0·17
Vryburg	H. Coltens	—	1·37	--	---	12·43	--	--	14·18	--
Worcester	The Gaoler	0·61	1·09	− 0·48	0·89	2·23	− 1·34	4·33	8·64	+ 4·31
Wynberg (Convent)	Mother Superior	3·15	2·90	+ 0·25	4·09	6·02	1·93	19·35	30·49	−11·14
Basutoland—										
Maseteng	F. Hodgson	2·00	2·75	+ 0·15	22·35	17·10	+ 5·25	33·72	23·95	+ 9·77
South-West Africa—										
Tsumeb	Ing. Schetter	1·32	1·33	− 0·01	26·21	16·43	+ 9·78	31·99	23·91	+ 8·08
Waterberg	D. Hahn	4·34	1·68	+ 2·66	24·93	14·49	10·44	27·33	19·57	+ 7·76
Omaruru	The Postmaster	2·92	1·07	+ 1·85	19·51	9·14	+ 10·37	20·99	11·39	+ 9·60
Usakos	Rev. Diehl	1·85	0·52	+ 1·33	8·23	3·99	+ 4·24	8·81	4·92	+ 3·89
Duesternbrook	I. Matthiessen	3·56	0·93	+ 2·63	22·37	9·66	+ 12·71	24·42	12·07	+12·35
Gobabis	Rev. Irbe	1·53	1·07	+ 0·46	17·76	11·47	+ 6·29	18·09	15·43	+ 3·56
Gr. Witvley	B. Rueckert	2·40	1·06	+ 1·34	17·73	10·66	+ 7·07	19·95	14·18	+ 5·77
Windhoek	Observatory	2·62	1·46	+ 1·16	24·25	10·58	+ 13·67	28·84	13·71	+15·13
Maltahoehe	E. Just	0·94	0·83	+ 0·11	10·04	5·10	+ 4·94	10·87	6·07	+ 4·80
Voigtsgrund	A. Volgts	0·81	0·57	+ 0·24	24·97	4·28	+ 20·69	26·02	5·68	+20·34
Gibeon	Rev. Spellmeyer	2·58	0·40	+ 2·18	11·95	4·70	+ 7·25	12·59	5·89	+ 6·70
Bethany	Rev. Peter	2·25	0·57	+ 1·68	9·33	3·23	+ 6·10	9·35	4·03	+ 5·32
Aus	F. Ernl	1·97	0·47	+ 1·50	2·79	2·03	+ 0·76	4·73	3·28	+ 1·45
Keirachabis	Rev. Father Eder	0·28	0·47	− 0·19	3·45	2·68	+ 0·77	3·66	3·72	− 0·06

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1923

UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. IV. MAY, 1923. No. 5.

MEAN pressure lower than usual; temperature sub-normal by about half-a-degree over the Union as a whole; days and nights slightly warmer than usual over the Transvaal, but cooler in the Cape Province; days cooler and nights warmer than the average in both the Free State and Natal; weather generally mild, but with occasional light frosts, particularly on the 18th and 26th; strong westerly to north-westerly winds generally in Natal; the rainfall derived mostly from local showers in the Transvaal, Free State and Natal was mostly sub-normal; absolute drought prevailed at many stations in all districts of the Transvaal and the north of the Free State; heavy continuous rains over the Cape Peninsula and south-west, producing record totals for the month in some instances; exceptional rains in Gordonia and north of the Cape Province; rainfall thus in excess of the average over the greater part of the Cape Province with the exception of portions of the south of the northern Karroo, the central Karroo, portions of the south, south-east, the Transkei and limited areas in the north and south-west; some snow on mountains in the east of the Free State and at a few stations in the northern border, northern Karroo, and the south-east; these were the outstanding features of the weather of May, 1923.

Pressure.—Although the relative distribution of pressure during May was practically normal, the isobars were generally half-a-tenth of an inch lower than normal over the Union, but practically normal in Rhodesia. Fine weather conditions prevailed during the greater part of the month, but a series of low-pressure areas affected mainly the more southerly parts of the country on fourteen days of the month. On the 3rd a low-pressure area appeared on the west coast and moved in a general westerly direction across country till the 6th, causing the exceptional rains with thunderstorms in Gordonia, the northern border, and local showers in the Transvaal as well as over the south and west. During the passage of this depression an isobar of 29·65 inches lay over the central portions of the south coast area on the 5th. The northern extremity of an inverted V affected the south-west and south on the 7th to 18th. Two disturbances passed over the country between the 10th and 14th, affecting mainly the west and south; the first passing off on the 12th, whilst

on the morning of the 16th a low-pressure area was lying along the east coast with the lowest pressure at Durban. On the 21st a "low" was lying along the south, but had disappeared on the 22nd. On the 23rd the outer isobar of another "low" lay along the south-east and east-coastal areas; on the 24th there was a further fall of about 0·15 inch over the same area, and the "low" had pushed farther inland from south-west to north-east and was passing off the east coast on the morning of the 25th. High pressure persisted throughout the remainder of the month.

Temperature.—The mean temperature during May was 56·8 degrees, or 0·6 degree lower than the average; this deficit is due to the day temperature (69·7 degrees) being 1·3 degree cooler than usual, whilst the night temperature (43·8 degrees) was normal. In the Transvaal, where the mean for the month (56·9 degrees) was 0·2 degree higher than usual, both the days with a mean of 71·7 degrees and the nights with 42·1 degrees were above normal by same amounts, viz., 0·2 degree. In the Orange Free State, where the temperature of the month (51·8 degrees) was also 0·2 degree higher than the average, different conditions prevailed, the mean maximum (65·0 degrees) being 0·9 degree lower and the mean minimum (38·7 degrees) being 1·3 degree higher than the corresponding averages. Although a somewhat similar state of affairs prevailed in Natal, the defect (1·6 degree) in the day temperature was greater than the excess (0·9 degree) in the night temperature, causing the mean for the month (60·7 degrees) to be 0·4 degree lower than usual. The actual mean values for May there were mean maximum 73·9 degrees and mean minimum 47·6 degrees. Over the Cape Province as a whole the temperature of the month (56·8 degrees) was 1·4 degree lower than usual, due principally to the days with 68·5 degrees being 2·5 degrees, whilst the nights with 45·0 degrees were only 0·8 degree lower than the corresponding average amounts. The distribution of the excesses and defects in the mean temperature of this month was somewhat peculiar. Thus, temperatures above normal were confined to the south, south-east and south-west of the Transvaal, the north and east of the Free State, the west of Natal, the south of Bechuanaland, together with small outlying areas in the north of the Transvaal, in Zululand, and the coast of Kaffraria. Elsewhere temperature was sub-normal, except at Stanger and Durban in Natal, Ermelo in the south-east of the Transvaal, and Kimberley in the northern border of the Cape Province, which were normal. The excesses varied between 0·2 degree at Piet Retief in the Transvaal and 4·2 degrees at Hlabisa in Zululand, being frequently, however, between 1 degree and 2 degrees. The deficits were mostly less than a degree in the Transvaal, but amounted to 3·0 degrees at Belfast on the high veld; in the Free State they ranged from 0·6 degree at Bloemfontein to 1·5 degree at Bethulie in the south, and in Natal were almost wholly about a degree. In the south-east of the Cape Province the shortages in the monthly temperature were generally between 2 degrees and 3 degrees, but decreased to less than one degree in the Transkei; in the centre, south and south-west the defects were generally about a degree, but rose to 2·4 degrees at Groot Drakenstein. The largest shortages in the Cape Province, however, were met in the extreme west, where Clanwilliam was 4·2 degrees colder than usual, a quantity exceeded, however, at O'okiep in Namaqualand, where the deficit rose to 5·1 degrees. Mafeteng in Basutoland also showed the unusually large deficit of 4·2 degrees. This distribution of plus and minus quantities in the means for May last was brought about by a variety of conditions. Thus in the Transvaal both day and night temperatures were higher than usual in parts of the north, east, south-east and south-west, and the days only in parts of the high veld. Over the western half the days were usually colder and the nights warmer than the average. In the north of the Free State again, both days and nights were in excess, but over the

north-east and centre the mean maxima were higher and the mean minima above or equal to the corresponding averages, whilst in the extreme south both day and night temperatures were lower than usual. In Natal both days and nights were sub-normal at Dundee and Estcourt, but elsewhere the days only were cooler whilst the nights were warmer than the average. Over the greater part of the Cape Province both the mean maxima and the mean minima were lower than usual, frequently by large amounts, particularly in the west. The exceptional stations were mainly situated in Bechuanaland, the northern border, part of the northern Karroo, of the north-east, south-east, and Kaffraria. At Kimberley both days and nights were warmer than the average; at Stutterheim and East London only the days, whilst at Vryburg, Kenhardt, Carnarvon, Aliwal North, and Port St. Johns only the nights were in excess of the normal. The mean warmest station was Durban with a temperature of 67·8 degrees, whilst the coolest was Belfast with 48·3 degrees, a difference of 19·5 degrees. The highest mean maximum was 83·1 degrees at Komatipoort, and the lowest mean minimum 31·6 degrees at Belfast. The highest temperatures at the individual stations were most widely registered on the 10th when portions of all the Provinces were thus affected, but also occurred on eighteen other days of the month, viz., 1st to 4th, 8th, 10th to 16th, 22nd to 24th, 27th, and 29th to 31st. The lowest temperatures were registered on twelve days, viz., 3rd, 9th, 15th to 21st, 26th, and 27th, most generally on the 18th. The extremes for the month were 97·0 degrees at Komatipoort on the 24th, and 19·0 degrees at Belfast on the 26th, both in the Transvaal, showing an extreme range of 78·0 degrees during the month. The month as a whole was unusually mild, but temperatures below freezing-point were recorded at half the stations in the list appended, the frosts, however, being seldom of any great intensity. Cold westerly winds blew from time to time, causing an alternation of cold and warm spells throughout the month.

Precipitation.—Broadly speaking, the precipitation for the month was below normal in the eastern and above normal in the western half of the Union. Although generally true, small areas affected by a surplus are to be found in the east and a fairly large area affected by a deficit in the west, including the southern portion of the northern Karroo and the central Karroo, also the coast of Namaqualand and part of the south-west. The areas in the Transvaal having small excesses are the neighbourhood of Standerton in the south-east and Potchefstroom in the south-west, whilst the rainfall was normal at Nylstroom. In the Free State, Bloemfontein had a rainfall half-an-inch in excess of normal, and Mafeteng in Basutoland an excess of 1·20 inches. Surplus amounts were also recorded at Mafeking, Kimberley, Hanover, Aliwal North, and Queenstown. Rainfall was sub-normal all over Natal. The deficits in the Transvaal amounted to absolute drought during the month at stations in all districts except those of Waterberg and Zoutpansberg in the north. Nil amounts were also reported from Zululand, portions of Natal, and at isolated stations in the Divisions of Heilbron, Kroonstad, Lindley, and Vrede in the Orange Free State. The excesses in the Cape Province were between 1 inch and 2 inches over portions of the northern border, Gordonia, and the south-west, including the Cape Peninsula, and rose to 6·63 inches at Groot Drakenstein; the total for the month there (11·66 inches) being the largest amount recorded in May during the last thirty years, the next largest for this month being 9·42 inches in 1907. Light local showers fell in the Transvaal from 1st to 5th, also on the 10th to 12th, 14th, 19th, and 29th to 31st. Light rains occurred in the Free State during the first half of the month and isolated showers on the 19th and 20th, but continued dry thereafter to the end of the month. Drought, absolute or partial, prevailed over the greater part of Natal during the month, broken only by occasional very light showers. In the Cape Province rain was fairly

heavy and continuous except for a few days at the beginning and during the last week of the month over the Cape Peninsula and south-west; the month was also exceptionally wet in the west coast area. Precipitation was light and mostly small in quantity over the greater part of the remainder of the country, being confined mainly to the first half of the month in the east and to the first week in the central Karroo, being, however, much heavier than usual over parts of the northern border and Gordonia.

Slight showers of *snow* were reported as occurring at New Year's Kraal (Division Prieska) on the 3rd, Tarsus (Division Cathcart) on the 16th, also at Pylfontein (Steynsburg Division) and Ventnor (Division Tarkastad) on the 17th; also on the mountains in the neighbourhood of Imperani (Division Ficksburg) in the east of the Free State. In South-West Africa the rainfall was sporadic in character, varying from nil at several stations to 2·62 inches at Windhoek. In the north the rainfall was 0·61 inch at Waterberg, decreasing in a north-easterly direction to 0·29 inch at Tsumeb and in a south-westerly direction to nil at Usakos. Similarly from Windhoek (2·62 inches) it decreased in an easterly direction to 0·44 inch at Gobabis and in a west-north-westerly direction to nil at Usakos. Further south precipitation varied from 0·15 inch at Maltahoehe to nil at Gibeon to the east-south-east. In the south Aus had no rainfall, whilst Bethany further east showed 1·30 inch and Heirachabis in the extreme south-east had 1·66 inch. Compared with the normals the rainfall was in excess at most of the stations, particularly at Windhoek, where it was more than eight times the usual amount for this month. Sub-normal quantities were recorded at Tsumeb in the north, Usakos in the west-central section, at Voigtsgrund and Gibeon in the south-central area, and at Aus in the south-west, Usakos, Gibeon, and Aus experiencing absolute drought throughout the month.

The accumulated rainfall since the 1st July of last year is well above the average over the greater part of the Transvaal and in Swaziland. The excess amounts vary between 11 and 24 inches in the north and east, between 5 and 9 inches in the centre and south-east reaching almost 12 inches at Piet Retief, whilst elsewhere they are generally between 1 and 3 inches. The exceptional areas are Bloemhof in the south-west where there is a shortage of 4·66 inches, and Pietersburg in the north where the shortfall is under 1 inch. In Natal excesses of between half-an-inch and 6½ inches are met with, although Weenen, Stanger, and Hlabisa have totals lower than usual by 7·16, 1·65, and 5·83 inches respectively. Plus quantities of 1 to 6 inches are general over the Free State except at Ladybrand, where there is a shortage of slightly over 1½ inches. In the Cape Province the excesses were largest, 5 to 12 inches in the south and east, whilst over the north-west, half of the northern Karroo, in the northern border, and Bechuanaland the surplus amounts lie generally between 1 and 4 inches, decreasing to less than an inch in the west coastal area and Namaqualand. In the south-west, including the Cape Peninsula, over the south-east of the northern Karroo, and the central Karroo, the rainfall for the eleven months is generally 1 to 2 inches less than the average, the deficit increasing however to 5 to 6 inches in parts of the south-west, and reaching 9·43 inches at Wynberg in the Cape Peninsula. In South-West Africa the corresponding amounts are all in excess of the average by amounts varying between 1·27 inch at Aus and 20·22 inches at Voigtsgrund.

The totals for the five months since the beginning of the present year are mostly 1 to 3 inches more than usual in the west, centre and south-east of the Transvaal, but increasing to double figures generally 11 to 15 inches in the east and north-east. The excess for this period is greatest (26·82 inches) at Pigeonhole. Small deficits of half-an-inch to 2 inches are met with in the south-west and south and in the north of the high veld, whilst the shortage reaches 6·64 inches at Ermelo. In the Free State excesses of 6 to 8 inches

have been experienced in the west and centre, whilst shortages of about half-an-inch to 3 inches are shown at stations in the north, east and south. In Natal, Stanger is the only station showing a surplus, the remainder being sub-normal by widely varying amounts of about 2 to 8 inches. The largest excesses (6 to 8 inches) in the Cape Province are shown by stations in Kaffraria and the south-west. Surplus amounts of 2 to 4 inches also occur in the west of the northern border and at East London, and smaller excesses in the north-east, south-east, south parts of the south-west, and the northern Karroo. Elsewhere the five months' rainfall was sub-normal mostly by less than an inch, although deficits of over 3 inches are shown by the records at Grahamstown and Somerset East. In Namaqualand the rainfall of this period is practically normal. In South-West Africa the cumulative amounts since January are all in excess, mostly by amounts of 10 to 26 inches, decreasing however to 2·79 inches at Aus in the south-west of the territory. The Orange River was running strong at Upington, an unusual occurrence for this month. The unusually mild weather and general absence of severe frosts were generally favourable to winter crops and stock in the Transvaal, but the ravages of locusts caused a considerable amount of damage. Blue-tongue was prevalent in the Lydenburg, and horse-sickness in the Piet Retief and Waterberg Districts. In the Free State locusts had eaten the grass in the Kroonstad District and the young wheat, rye and oats in parts of the Districts of Bethlehem and Thaba 'Nchu. The lambing season started well in Bethulie. The unusual dryness and prevalence of cold westerly to north-westerly winds rendered the month dusty and disagreeable over the greater part of Natal, causing the veld to dry up at Mid-Illovo (also in Swaziland), whilst the sugar-cane was reported to be dying at Maidstone (Lower Tugela). In the Cape Province the weather was unusually dull, cloudy or rainy over the northern border, Gordonia, Bechuanaland, and part of the north-east (also in Basutoland), with soaking heavy rains in the south-west, but clear and dry with occasional strong west to north-west winds and occasional severe frosts in the east. Stock were generally in good condition, although beginning to fall off in a few areas, mainly owing to the destruction of winter-feed by locusts.

OBSERVERS' NOTES FOR MAY, 1923.

Transvaal.

Louis Trichardt.—Genial weather. Little frost in low-lying lands. Rainfall: 0·15 inch on two days.—P. A. Otto.

Pietersburg.—Very mild. Remarkable absence of frost. Rainfall: 0·19 inch on two days.—W. J. Frankleyne.

Middelburg.—The month has been a genial and mild one. But little rain fell, as is usual, though a useful shower (0·24 inch) fell on the 4th.—Rainfall: 0·26 inch on two days.—Dr. H. A. Spencer.

Standerton.—Bright mild weather, with wind most afternoons, were chief characteristics of weather during May. Rainfall: 0·63 inch on one day.—W. J. Madge.

Strathmore (Klerksdorp).—Rather mild during month. Rainfall: 0·12 inch on one day.—Chas. Scott.

Carolina.—Dry and windy, with clouds frequently making their appearance and raining over small areas. Local showers, but no proper rains. Rainfall: 0·15 inch on three days.—G. F. Mijnhardt.

Gembokzfontein (Middelburg).—With the exception of an odd day the weather has been cold throughout the month. Rainfall: 0·49 inch on two days.—G. M. van Coller.

Lichtenburg.—Frost more frequent, but very mild. Rather warm during day. Rainfall: 0·19 inch on three days.—E. Newton.

Mosdene (Naboomspruit).—The rainfall of 1·05 inch on three days at the beginning of the month is the heaviest May fall during the past six years and has been very useful for ploughing. For the rest of the month the weather has been almost cloudless. On the 26th we had a light frost, the first of the season, about as expected. An excellent crop of mealies has been reaped, and veld is in good condition for the the winter. Total rainfall since 1st July, 1922: 22·36 inches.—Ernest E. Galpin.

Krugersdorp.—More than an average amount of cloudy weather has been experienced during the month. The rainfall has been under the average, but unusually heavy dews have been of frequent occurrence. Temperatures have been fairly normal. Several visitations of locusts took place, but as few of the pests settled for any length of time the damage done has been slight. Rainfall: 0·08 inch on two days.—H. Sharp.

Zwagershoek No. 1448 (Lydenburg).—1st May, locust swarms passing east did little damage. Blue-tongue prevalent. Sowing of oats and wheat complete. The mealie crops which have now been reaped are poor. Rainfall: 0·17 inch on three days.—John D. Stirling.

Badfontein (Lydenburg).—Winter crops are up and looking well. Five swarms of locusts visited the valley during May and did a certain amount of damage, but the crops are likely to recover if not again eaten off. Veld is very dry. Rainfall: 0·09 inch on two days.—L. Parker.

Confidence (Piet Retief).—Horse-sickness has been very severe during this month. The deaths of horses and mules are estimated at 50 per cent. for this area. Malaria flue epidemic is very bad, but fortunately there have not been many deaths. Rainfall: Nil.—P. Viljoen.

Welverdiend (Potchefstroom).—Eight swarms of locusts have visited this district since 27th April. The damage done to mealie crops was not serious, but teff grass was eaten off. Rainfall: 0·10 inch on one day.—The Station Master.

Woburn (Waterberg).—Swarms of locusts have been passing through the district. Horse-sickness has been very bad this year. Rainfall: 0·45 inch on one day.—C. W. Brumage.

Doornkloof (Zoutpansberg).—Mealie crops well above average. Veld good and cattle fat. Barley under irrigation is doing well. Citrus picking is nearly complete and the yield is excellent. No locusts. Rainfall: 0·15 inch on two days.—S. M. Ralston.

Innerleithen (Zoutpansberg).—The veld is very dry and cattle falling off in condition. Rainfall: 0·10 inch on one day.—F. Halse.

Swaziland.

Mbabane.—Grass country drying up. Rainfall: Nil.—W. J. D. Crawford.

Orange Free State.

Holfontein (Kroonstad).—The position here is very serious indeed—hardly a blade of grass is to be seen anywhere; the locusts have completely stripped the district of every bit. The mealie crop is not quite what the farmers expected. Rainfall: 0·83 inch on three days.—L. C. McInerney.

Imperani (Ficksburg).—Late rains; cold nights; some snow on mountains. Rainfall: 1·02 inch on six days.—S. Wenning.

Rugby (*Bethlehem*).—A bad month for stock, extremes of heat and cold being experienced throughout—piercing cold west winds alternating with days of almost summer heat. Large flights of straggler locusts arrived during the last week of the month, and are kept in the vicinity by the constantly changing winds. All wheat, rye and winter-oat crops have been eaten. The mealie crops, though not fulfilling the promise given in February owing to the dry month of March, are nevertheless good, and there will be an exceptionally heavy harvest. Rainfall: 0·19 inch on two days.—A. C. Glynn-Baker.

Middelfontein (*Bethulie*).—The cold has not yet been too severe for cattle. The lambing season has started and there are prospects of a good lambing season. Rainfall: 0·88 inch on three days.—H. J. Joubert.

Pakpoort (*Bloemfontein*).—Very mild for this time of year. Very little frost. Veld in good condition. Flying locusts prevalent. Rainfall: 1·32 inch on seven days.—L. S. Evans.

L'Esperance (*Ladybrand*).—This month was comparatively mild. Some heavy frosts fell, but most frosts were quite light. Stock quite fit and mealie crop (being harvested) very promising. Rainfall: 0·91 inch on nine days.—C. F. M. Casalis.

Carrigholt (*Thaba 'Nchu*).—Locusts bad, scattered everywhere. Eaten all green rye, etc. Rainfall: 0·70 inch on six days.—A. E. Arnold.

Prospect (*Vrede*).—Stock generally doing well and keep healthy. Veld cattle falling off in condition. Rainfall: 0·18 inch on one day.—T. Pitcairn.

Woudzicht (*Vrede*).—This month was favourable for stock, the grass keeping very well. Some nights heavy frosts, others none at all. Rainfall: 0·44 inch on three days.—J. N. Köhler.

NATAL.

Nottingham Road.—Mild, but very dry. Some unusually high winds. Stock of all kinds healthy. Rainfall: 0·05 inch on three days.—Miss E. Smythe.

Maritzburg (*Mental Hospital*).—May has been very dry, only 0·20 inch on three days. Very fine weather otherwise.—The Staff.

Dundee.—Owing to the unusually very dry autumn the country is exceptionally dry and dusty. As a rule May is considered one of our most pleasant months of the year; westerly and north-westerly winds and dust have however prevailed this month. Rainfall: 0·07 inch on one day.—West Thorrold.

Ladysmith.—A very dry month, with a good deal of wind from the west. Country very dry and a bad winter is anticipated. Rainfall: 0·09 inch on three days.—D. A. R. Leathern.

Durban (*Point*).—Genial weather throughout month. Weather generally hazy in morning, with occasional heavy dews. Rainfall: 0·52 inch on four days.—A. P. White.

Port Shepstone.—Very dry for month of May—only 0·48 inch on six days, as against 5·15 inches in May last year. Generally windy greater part of month.—E. K. Andresen.

Mid-Illovo.—Unsettled weather during first half of month. Rainfall: 0·10 inch on five days. Maximum temperature: 85·0 degrees on 23rd. Minimum temperature: 41·0 degrees on 18th. A little frost occasionally; veld getting brown.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Newcastle.—The weather is keeping dry. Rainfall: Nil.—The Gaoler.

Hillary.—The shade maximum (92·9 degrees on the 23rd) is the highest recorded at this station during May. Rainfall: 0·24 inch on seven days—the lowest since 1907.—H. A. Thorpe.

Castledene (Polela).—No rain during month. Every day dry, cold, frosty and windy at times.—D. Fotheringham.

Edendale (Klip River).—Early part of month very windy, but latter part lovely days and frosty nights. Rainfall: 0·05 inch on one day.—T. N. Niland.

Maidstone (Lower Tugela).—Drought very bad; cane dying. Rainfall: 0·03 inch on one day.—G. E. Beater.

Rongpoort (Weenen).—Exceptionally dry and exceptionally mild, except for cold winds. Frost very slight. Rainfall: Nil.—J. H. Bartholomew.

Westbury (Alfred).—Latter half of month dry and cold. Frequent frosts, which are affecting stock. Rainfall: 0·24 inch on two days.—M. Miles.

CAPE.

Queenstown.—Generally mild nights except on 18th when there were 6 degrees of frost and towards end of month. Occasional high winds. Rainfall: 1·06 inch on four days.—J. F. C. Rein.

Ceres.—Weather generally calm, with very soaking rains. Rainfall 8·05 inches on sixteen days.—A. Heatlie.

Maclear.—Month of very favourable weather. Bright sunny days, with cold nights.—Dr. W. MacKenzie.

Grassridge (Cradock).—The month has again been one of varying temperatures, with a remarkable absence of cloud or strong wind, particularly during the latter part. Rainfall: 0·94 inch on four days.—F. Cooper.

Kakamas.—The rainfall for May (1·81 inch on two days) is unusual. Locusts have caused a good deal of damage to the veld.—M. J. J. Oosthuizen.

Abtonia (Kuruman).—Large swarms of flying locusts have done considerable damage to the veld. Rainfall: 1·33 inch on four days.—A. T. Sitwell.

Capetown.—The month began fine and warm; rain began on the 4th, with a considerable drop in temperature. Heavy rains continued to fall until the 25th, when it cleared and remained so until the 31st; it then became cloudy with indications of a change. This is said to have been an exceptionally wet month for May.—A. Russell Fraser.

Sydney-on-Vaal (Barkly West).—Exceptionally moist atmosphere and a considerable quantity of cloud for this particular month. No serious frosts even in the valley. Locusts and "corn crikes" or "tock tockies" still prevalent. Cattle in excellent condition, but serious losses from horse-sickness and blue-tongue incurred by farmers generally in the district. Rainfall: 0·47 inch on four days.—J. G. Richards.

Kraaipan (Mafeking).—Prevailing wind has been from the north. Very cold southerly winds occasionally. Rainfall: 0·67 inch on five days.—P. J. Hart.

Upington.—Veld dried up. Water running strong in Orange River, most unusual for this time of the year. Rainfall: 1·65 inch on three days.—E. H. Jones.

Rietfontein (Aliwal North).—On the whole a warm month. Good rains. Locusts very bad, all crops eaten off. Rainfall: 2·17 inches on nine days.—A. G. Smith.

Liwandi-Addo (Uitenhage).—Rain fell on ten days during the month amounting to 0·49 inch, and on two mornings there was a deposit from dew amounting to 0·02 inch. Drinking-water tanks are getting low and rain is

needed. Rispers were very bad during first half of month and did some damage. A ground frost on two mornings (15th and 18th) did some damage in spoiling several crops of green peas. Lake Mentz is empty for all practical purposes.—Major J. Kreft.

Sydney's Hope (*Albany*).—Spells of dry, hot weather, with sudden cold changes. Rainfall: 0·92 inch on seven days.—Rev. S. Rippon.

Lovedale.—Pressure on the whole low, except for the last six days, with accompanying wind mainly of the dry and dusty order and always from the west or north-west. A swarm of locusts passed through Lovedale on the 31st, flying from west to east. Rainfall: 0·70 inch on five days.—Charles A. Pilson.

Clanwilliam.—Soft soaking rains. An exceptionally wet month as compared with the same month in previous years. Farmers enabled to do early ploughing. Weather mild throughout the month. Dry, easterly winds during last week of month. Rainfall: 3·12 inches on eight days.—P. E. Scholtz.

Stutterheim.—27th May, locusts invaded this area, three small swarms. Rain badly needed for oat and barley crops. Stock in good condition. Mealie crop being harvested is A1 quality and above the average quantity. Rainfall: 1·01 inch on five days.—F. C. Bousfield.

Mafeking (*The Convent*).—May usually bright and rainless, had many cloudy dull days. Mist, which is almost unknown here, was witnessed on the morning of the 6th. Rainfall: 0·62 inch on eight days.—The Mother Superior.

Aliwal North.—May has been a very mild month; generally cloudy; slight frosts. Rainfall: 1·26 inch on eight days.—Alex. Alcock.

Kenhardt.—Locusts made their appearance in alarming quantities. Rainfall: 1·99 inch on two days.—Rud. Seydell.

Queenstown.—Invasion of locusts 26th to 31st; devoured all green crops in district. Rainfall: 1·00 inch on four days.—H. Holley.

Groot Drakenstein.—The wettest May recorded in thirty years—11·66 inches on eighteen days. Previous wettest 1907 with 9·42 inches. There were six days with over 1 inch, and two with over 2 inches. On the 4th approximately 3 inches fell in twenty-four hours, and on the 23rd over 3 inches fell in about sixteen hours. Temperature low till last week. No snowfall on mountains during the month. Sunshine deficient and cloudiness in excess.—Lionel Baker.

Bedford.—Two or three heavy frosts are unusual in May. Winter prospects have been jeopardized by locust ravages. Rainfall: 1·01 inch on eight days.—Thos. C. Hall.

Somerset East.—Rain badly needed. Locusts reported throughout this and surrounding districts. Rainfall: 0·96 inch on five days.—C. Harris.

Kokstad.—The first half of month was warm and springlike, but after high winds severe frosts occurred. Rainfall: 0·31 inch on five days.—H. D. Coyte.

Roodebloem (*Graaff-Reinet*).—Locusts have destroyed all growing crops of wheat, oats, etc.; they have also done much damage to the veld. Rainfall: 0·15 inch on two days.—E. Murray.

Vinegard (*Albert*).—All winter-feeding destroyed by locusts. Cattle and sheep in fair condition. Rainfall: 1·43 inch on four days.—C. J. Hoar.

Bechuanaland.

Dikgatlong Ranch.—The weather during the month has been normal. Rain threatened on several days, but nothing came of it. Only one flight of locusts passed going east from the west on the 15th. Rainfall: 0·23 inch on one day.—Paul Jousse.

Mahalapye.—Milder month than usual, not any hard frost yet. Flying locusts seen in the desert on the 27th going towards Lake N'ganu, also in other parts of the Reserve. Rainfall: 0·21 inch on two days.—Miss M. Giles.

Palapye Road.—Small birds have been doing great damage to the kaffir-corn and nyoute crops. Water in the vleis drying up fast. Cattle keeping in good condition. Lowest minimum temperature: 32·5 degrees on the 26th. Rainfall: 0·10 inch on one day.—Thos. W. Shaw.

BASUTOLAND.

Mafeteng.—Fine soaking rains fell during the month on nine days totalling 2·74 inches. Ground thoroughly soaked. Calm days with light clouds. Cold nights. Small swarms of locusts about on the 20th, and some damage done to wheat crops.—F. Hodgson.

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,

Pretoria. *Chief Meteorologist.*

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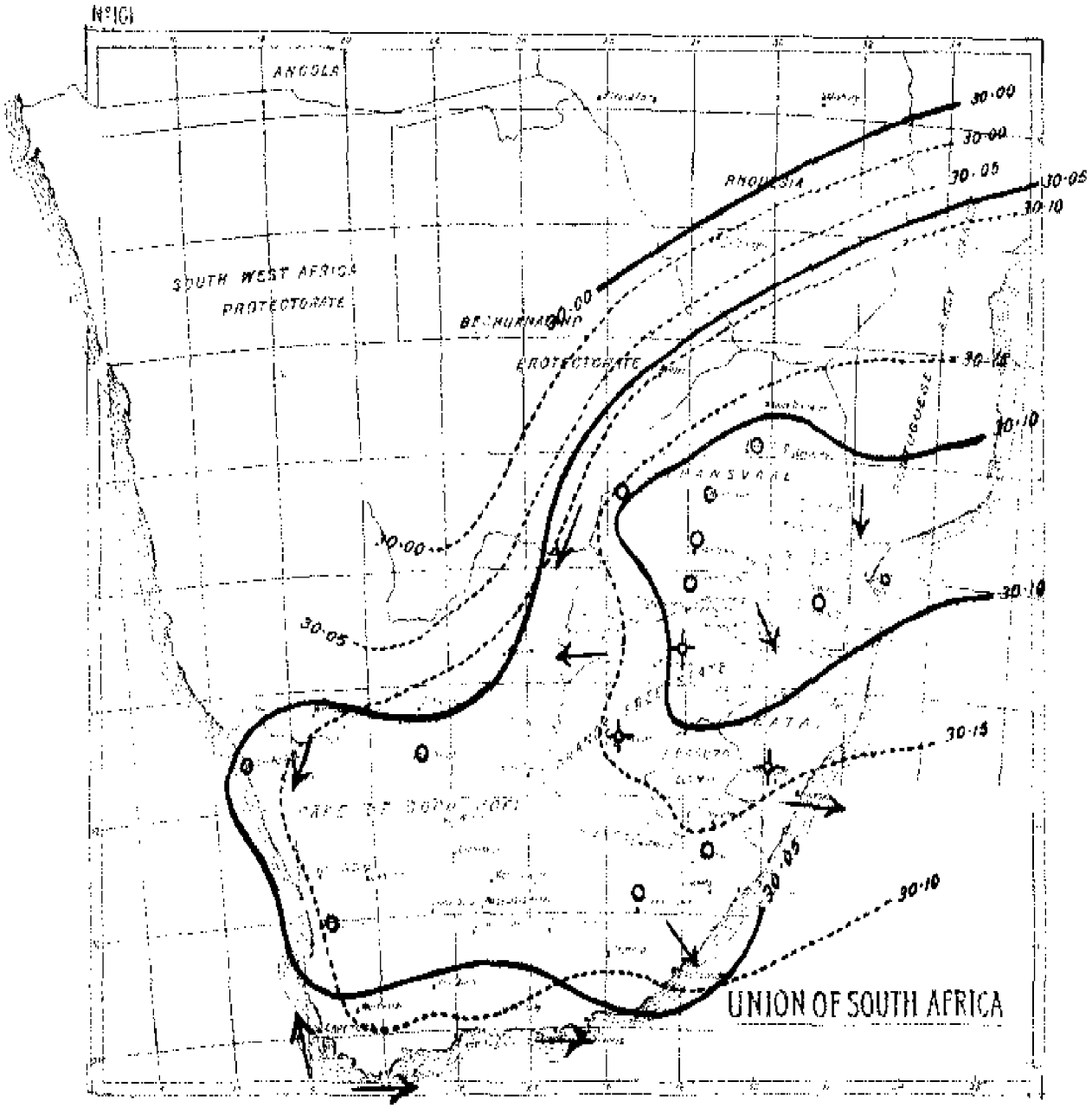
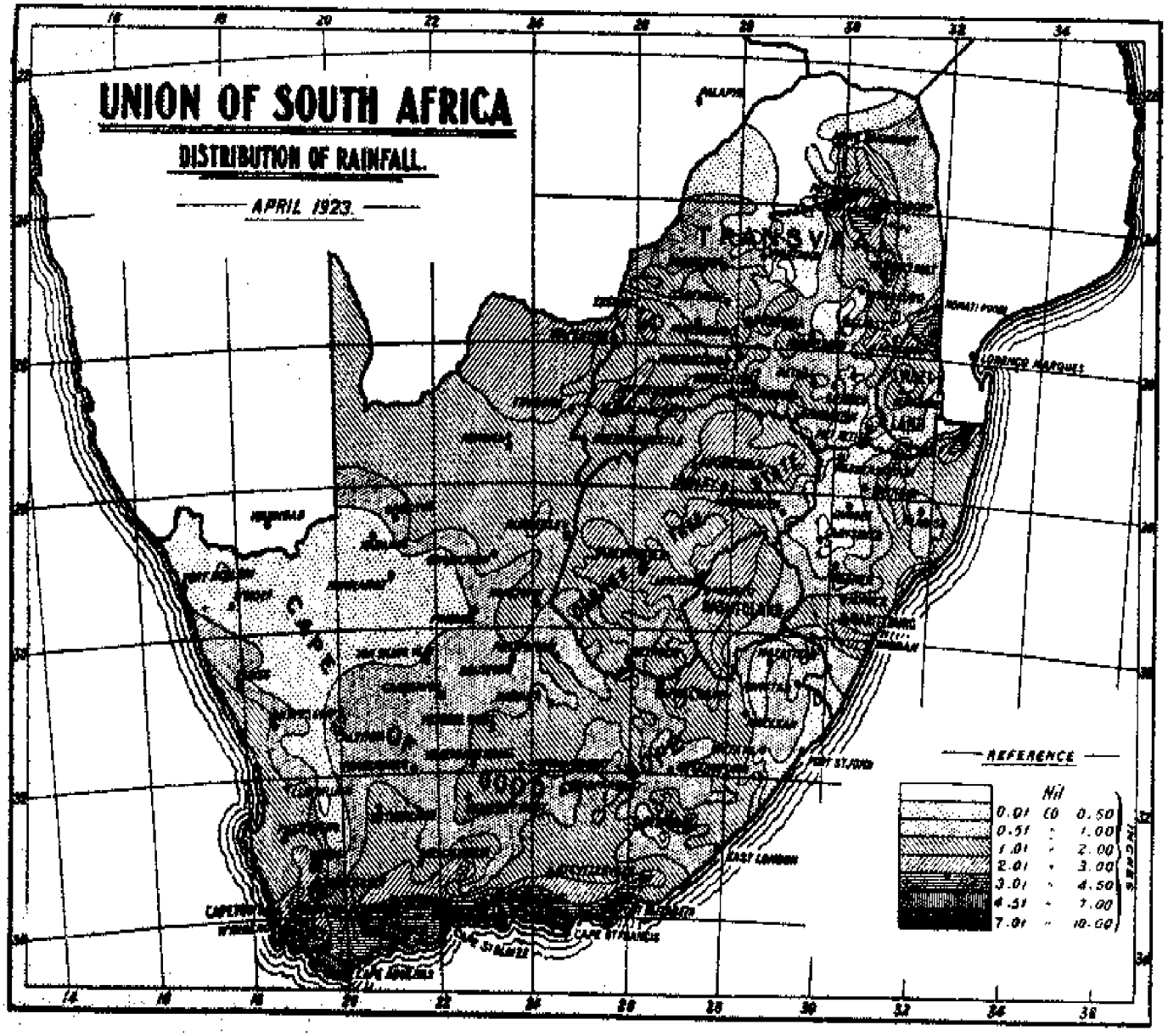


May, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for May.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
APRIL 1923.
TRANSVAAL
LORENCO MARQUES
PORT ST. JOHN
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
INCHES

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), MAY, 1923.

Station.	Observer.	Month—May, 1923. Mean Max.	Month—May, 1923. 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	76·5	52·5	64·5	63·5	+ 1·0	89·0	16th	40·0	18th.
Belfast	The Forester	65·0	31·6	48·3	51·3	− 3·0	75·0	15th	19·0	26th.
Bloemhof	A. Adamson	71·0	42·7	56·8	55·1	+ 1·7	79·0	10th	32·0	27th.
Ermelo	E. F. Vardy	68·0	37·1	52·6	52·6	± 0·0	76·0	13th and 15th	25·5	17th.
Johannesburg (Observatory)	The Staff	64·7	45·4	55·0	54·5	+ 0·5	72·1	15th	31·8	17th.
Klerksdorp (Strathmore)	Chas. Scott	71·2	40·0	55·6	56·4	− 0·8	79·0	15th	28·0	26th and 27th.
Komatipoort	B. J. Fothergill and H. J. Evans	83·1	52·2	67·6	68·1	− 0·5	97·0	24th	42·0	19th.
Louis Trichardt	P. A. Otto	77·4	47·8	62·6	60·1	+ 2·5	87·0	2nd	40·0	21st.
Middelburg	Dr. H. A. Spencer	72·2	36·2	54·2	54·4	− 0·2	80·0	12th and 15th	28·0	20th.
Nylstroom	G. Bakker	74·2	41·5	57·8	58·6	− 0·8	83·0	12th	30·5	26th.
Pietersburg	W. J. Frankleyne	70·6	43·6	57·1	58·1	− 1·0	82·0	15th	35·0	26th.
Piet Retief	J. Wetner	70·9	43·8	57·4	57·2	+ 0·2	80·0	12th	30·7	18th.
Pigeonhole (New Agatha)	Jno. McCallum	66·8	52·5	59·6	—	—	77·0	24th	43·0	18th.
Pilgrims Rest	E. M. Skea	70·9	41·3	56·1	56·4	− 0·3	80·0	11th	32·0	17th and 18th.
Potchefstroom (Exp. Farm)	The Manager	72·0	41·0	56·5	54·3	+ 2·2	77·8	15th	26·0	26th.
Pretoria (Meteorological Office)	The Staff	71·6	43·9	57·7	56·7	+ 1·0	79·9	15th	34·3	27th.
Standerton	W. J. Madge	69·0	32·9	50·9	50·6	+ 0·3	75·5	15th	22·5	18th and 26th.
Zeerust	H. Dietrich	70·9	41·6	56·2	56·5	− 0·3	78·1	1st	30·0	27th.
Swaziland—										
Mbabane	Swaziland Police	69·9	46·1	58·0	59·6	− 1·6	81·0	16th	33·0	18th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	65·7	37·6	51·6	53·1	− 1·5	74·0	10th	28·0	18th.
Bloemfontein	G. A. Schepers	64·6	40·8	52·4	53·0	− 0·6	74·3	10th	29·6	26th.
Harrismith	The Forester	60·4	38·7	49·6	49·1	+ 0·5	67·0	15th and 23rd	27·0	18th.
Kroonstad	S. R. Northfield	68·7	39·0	53·8	52·2	+ 1·6	76·5	12th	25·4	26th.
Ladybrand	The Forester	63·8	39·2	51·5	51·0	+ 0·5	71·0	10th	30·0	17th.
Lindley	J. Collister-Oates	66·9	37·5	52·2	51·4	+ 0·8	73·0	10th, 12th, and 23rd	24·8	26th.
Natal—										
Dundee	West Thorrold	71·8	41·9	56·8	57·9	− 1·1	80·0	12th and 15th	29·0	18th.
Durban (Point)	The Port Captain	75·0	60·6	67·8	67·8	± 0·0	87·4	23rd	53·2	18th.
Estcourt	The Town Clerk	70·9	40·5	55·7	56·8	− 1·1	80·0	10th	30·0	18th.
Ladysmith	D. A. R. Leathern	72·6	44·9	58·8	57·6	+ 1·2	82·0	10th	34·0	18th.
Maritzburg (Mental Hospital)	The Staff	73·6	47·9	60·8	61·9	− 1·1	86·0	14th	36·0	18th.
Stanger	Cecil C. Foss	76·3	57·8	67·0	67·0	± 0·0	93·5	23rd	50·7	18th.
Weenen	The Gaoler	77·0	39·4	58·2	58·6	− 0·4	87·0	13th	30·0	17th.

AIR TEMPERATURES, MAY, 1923—(*continued*).

Station.	Observer.	Month—May, 1923. Mean Max.	Month—May, 1923. 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—										
Alwal North	Alex. Alcock	64·9	36·7	50·8	61·8	− 1·0	72·5	10th	26·5	26th.
Bedford	Thos. C. Hall	68·3	43·2	55·8	58·7	− 2·9	80·0	10th	32·0	18th.
Capetown (Royal Observatory)	The Staff	65·5	50·4	58·0	58·9	− 0·9	81·0	29th	39·6	18th.
Carnarvon	A. P. Malherbe	62·8	38·4	50·6	51·6	− 1·0	75·0	2nd	28·0	18th.
Clanwilliam	P. E. Scholtz	70·1	43·0	56·6	60·8	− 4·2	86·2	29th	35·9	15th.
East London	The Port Captain	71·9	52·7	62·3	62·4	− 0·1	84·0	8th	44·0	18th.
Graaff-Reinet	S. E. D. Treadwell	70·1	44·3	57·2	58·5	− 1·3	79·3	10th	35·4	17th.
Grahamstown	The Vet. Res. Officer.	68·9	41·5	55·2	58·6	− 3·4	81·2	30th	30·0	18th.
Groot Drakenstein	Lionel Baker	66·2	46·5	56·4	58·8	− 2·4	82·6	29th	36·3	15th.
Kenhardt	R. Seydell	70·5	43·5	57·0	58·4	− 1·4	86·0	2nd	33·0	26th.
Kimberley	F. W. J. Schmidt	68·9	44·6	56·7	55·8	+ 0·9	80·0	10th	34·0	9th.
Kingwilliamstown	W. A. Kindness	72·1	46·3	59·2	60·8	− 1·6	85·0	10th	35·0	18th.
Kokstad	H. D. Coyte	67·0	38·8	52·9	53·7	− 0·8	76·0	10th	26·0	18th.
Mafeking (Convent)	The Mother Superior.	72·7	44·1	58·4	58·6	− 0·2	80·0	1st	26·0	26th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	67·0	53·5	60·2	61·2	− 1·0	80·0	27th	46·0	15th.
Murraysburg	W. H. Rose-Innes	64·2	33·2	48·7	50·6	− 1·9	75·5	3rd	23·0	19th.
O'okiep	J. Burrows	65·1	46·7	55·9	61·0	− 5·1	79·0	2nd	37·0	16th.
Port Elizabeth	The Lightkeeper	67·9	52·6	60·2	62·2	− 2·0	83·0	31st	44·0	27th.
Port Nolloth	The Lightkeeper	64·5	46·9	55·7	58·0	− 2·3	88·0	2nd	37·0	20th.
Port St. Johns (Cape Hermes)	The Lightkeeper	72·9	58·8	65·8	64·6	+ 1·2	81·0	13th	52·0	18th.
Queenstown	H. Holley	66·2	40·6	53·4	55·2	− 1·8	75·0	10th and 13th	27·0	18th.
Somerset East	C. Harris	69·1	42·8	56·0	58·0	− 2·0	80·0	10th	32·0	18th.
Stutterheim	F. C. Bousfield	70·3	44·8	57·6	57·6	± 0·0	80·4	10th	31·9	18th.
Sydney's Hope	Rev. S. Ribbon	66·7	47·8	57·2	60·6	− 3·4	79·0	4th	41·0	15th, 18th, and 19th.
Uitenhage	H. Inggs	72·3	43·9	58·1	61·8	− 3·7	85·3	30th	34·5	27th.
Umtata	Miss N. Dix Peek	72·9	43·3	58·1	58·3	− 0·2	85·0	10th	31·2	18th.
Vryburg (Armoedsvlakte)	The Vet. Res. Officer.	70·9	42·0	56·4	53·8	+ 2·6	78·0	22nd	30·0	26th.
Wynberg (Convent)	The Mother Superior.	67·3	49·4	58·4	59·6	− 1·2	80·8	3rd	43·0	15th.
Basutoland—										
Maseteng	F. Hodgson	60·5	49·0	50·2	54·4	− 4·2	67·0	10th	30·0	25th.

RAINFALL, MAY, 1923.

Station.	Observer.	Month. May, 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	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	0·07	0·93	− 0·86	19·56	17·55	+ 2·01	33·22	31·57	+ 1·65
Belfast	The Forester	0·13	0·61	− 0·48	14·52	16·36	− 1·84	36·05	32·29	+ 3·76
Bethal	H. F. Joubert	0·27	0·60	− 0·33	16·05	13·93	+ 2·12	37·03	29·54	+ 7·49
Bloemhof	A. A. Adamson	0·34	0·51	− 0·17	9·50	11·66	− 2·16	13·54	18·20	− 4·66
Claremont	S.A. Police	0·00	0·39	− 0·39	12·42	10·73	+ 1·69	19·05	18·66	+ 0·39
Ermelo	The Forester	0·06	0·74	− 0·68	7·77	14·41	− 6·64	35·52	31·53	+ 3·99
Hanertsburg	S.A. Police	0·00	1·63	− 1·63	35·15	23·74	+ 11·41	49·11	37·89	+11·25
Heidelberg	W. ter Horst	0·16	0·48	− 0·32	13·81	14·29	− 0·48	29·73	28·32	+ 1·41
Johannesburg (Observatory)	The Staff	0·15	0·69	− 0·54	15·80	16·26	+ 0·54	32·07	30·64	+ 1·43
Klerksdorp (Strathmore)	C. Scott	0·12	0·58	− 0·46	13·62	13·34	+ 0·28	23·16	23·14	+ 0·02
Komatipoort	B. J. Fothergill and H. J. Evans	0·00	0·77	− 0·77	30·88	17·51	+13·37	43·09	27·42	+15·61
Louis Trichardt	P. A. Otto	0·15	0·81	− 0·66	32·94	17·73	+15·21	40·61	29·64	+10·97
Middelburg	Dr. H. A. Spencer	0·26	0·57	− 0·31	15·86	14·75	+ 1·11	37·77	28·89	+ 8·88
Nylstroom	G. Bakker	0·39	0·39	= 0·00	16·93	13·92	+ 3·01	31·53	24·68	+ 6·85
Pietersburg	W. J. Frankleyne	0·19	0·26	− 0·07	10·09	11·34	− 1·25	20·31	21·24	− 0·93
Piet Retief	J. Werner	0·00	0·64	− 0·64	17·50	15·43	+ 2·07	43·83	31·89	+11·94
Pigeonhole (New Agatha)	J. McCallum	0·31	1·44	− 1·13	55·48	28·66	+26·82	72·36	47·47	+24·89
Pilgrims Rest	E. M. Skea	0·18	1·17	− 0·99	38·77	25·43	+13·34	56·00	39·77	+16·23
Potchefstroom (Exp. Farm)	The Manager	0·70	0·65	+ 0·05	13·18	12·51	+ 0·67	25·86	23·51	+ 2·35
Pretoria (Meteorological Office)	The Staff	0·01	0·50	− 0·49	17·49	15·85	+ 1·64	35·80	29·32	+ 6·48
Roolberg	N. H. Monro	0·21	0·63	− 0·42	15·68	14·11	+ 1·57	30·21	24·77	+ 5·44
Rustenburg	A. Srteatfield	0·03	0·56	− 0·53	17·72	14·40	+ 3·32	27·61	26·35	+ 1·26
Standerton	W. J. Madge	0·63	0·55	+ 0·08	18·10	14·79	+ 3·31	37·21	31·07	+ 6·14
Wakkerstroom	F. Grant	—	—	—	—	—	—	—	—	—
Woodbush	The Forester	0·51	1·88	− 1·37	—	—	—	—	—	—
Zeerust	H. Dietrich	0·29	0·76	− 0·56	16·94	14·12	+ 2·82	24·85	23·85	+ 1·00
Swaziland—										
Mbabane	Swaziland Police	0·00	1·21	− 1·21	43·41	29·69	+14·32	72·73	52·60	+20·13
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·79	0·80	− 0·01	10·34	10·91	− 0·57	18·24	17·10	+ 1·14
Bloemfontein	G. A. Schepers	1·56	1·06	+ 0·50	19·73	13·52	+ 6·21	25·30	21·31	+ 3·99
Boshof	The Postmaster	0·08	0·74	− 0·06	20·17	11·86	+ 8·31	25·61	19·22	+ 6·39
Harrismith	The Forester	0·44	0·72	− 0·28	12·49	15·30	− 2·90	34·54	29·28	+ 5·26
Kroonstad	S. R. Northfield	0·39	0·95	− 0·56	11·71	14·03	− 2·32	27·79	23·97	+ 3·82
Ladybrand	The Forester	0·79	0·96	− 0·17	14·24	14·97	− 0·73	25·38	26·96	− 1·58
Lindley	J. Collister-Oates	0·59	0·96	− 0·37	12·90	13·31	− 0·41	27·58	23·97	+ 3·61
Natal—										
Dundee	West Thorrold	0·07	0·79	− 0·72	12·61	17·49	− 4·88	32·95	31·92	+ 1·03
Durban (Point)	The Port Captain	0·52	1·86	− 1·34	17·63	19·61	− 1·98	43·67	40·33	+ 3·34

RAINFALL, MAY, 1923—(*continued*).

Station.	Observer.	Month. May, 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
***Natal*—(continued).**										
Estcourt	The Town Clerk	0·07	0·51	− 0·44	12·80	16·33	− 3·53	29·13	28·67	+ 0·46
Hlabisa	The Gaoler	0·00	1·55	− 1·55	17·44	22·14	− 4·70	37·23	43·06	− 5·83
Howick	The Gaoler	0·12	0·74	− 0·62	15·67	17·86	− 2·19	33·43	32·89	+ 0·54
Ladysmith	D. A. R. Leathern	0·09	0·60	− 0·51	12·35	16·02	− 3·67	31·03	28·27	+ 2·76
Maritzburg (Mental Hospital)	The Staff	0·20	1·09	− 0·89	17·99	19·66	− 1·67	40·85	36·92	+ 3·93
Stanger	Cecil C. Foss	0·33	1·92	− 1·59	22·18	19·16	+ 3·02	40·01	41·66	− 1·65
Vryheid	The Gaoler	0·00	0·64	− 0·64	10·83	18·02	− 7·19	41·36	34·79	+ 6·57
Weenen	The Gaoler	0·00	0·54	− 0·54	7·23	15·03	− 7·80	19·07	27·13	− 7·16
***Cape*—**										
Aliwal North	A. Alcock	1·26	1·00	+ 0·26	12·84	12·04	+ 0·80	23·82	16·91	+ 6·91
Beaufort West	The Gaoler	0·25	0·71	− 0·46	5·28	5·72	− 0·44	8·76	8·13	+ 0·63
Bedford	T. C. Hall	1·01	1·55	− 0·54	15·19	14·59	+ 0·60	29·98	22·23	+ 7·75
Britstown	The Gaoler	1·04	0·70	+ 0·34	6·36	7·78	− 1·42	7·47	9·88	− 2·41
Calvinia	The Gaoler	2·85	1·12	+ 1·73	4·50	3·68	+ 0·91	9·10	6·80	+ 2·30
Capetown (Royal Observatory)	The Staff	5·36	3·99	+ 1·37	9·47	8·20	+ 1·27	18·47	20·41	− 1·94
Ceres	A. Heatile	8·05	6·15	+ 1·90	14·20	11·73	+ 2·47	27·58	33·50	− 5·92
Carnarvon	A. P. Malherbe	1·28	0·62	+ 0·66	6·30	5·32	+ 0·98	7·28	6·54	+ 0·74
Clanwilliam	P. E. Scholtz	3·12	1·39	+ 1·73	3·99	2·82	+ 1·17	7·08	6·93	+ 0·15
East London	A. Downie	0·67	2·32	− 1·65	18·46	15·07	+ 3·39	44·58	28·13	+ 16·45
French Hoek (Driefontein)	The Forester	17·08	7·99	+ 9·09	25·52	18·28	+ 7·24	50·66	51·69	− 1·03
Fraserburg	The Gaoler	0·50	0·60	− 0·10	3·60	4·33	− 0·73	4·41	5·60	− 1·19
Grahamstown	Vet. Res. Officer	0·65	2·07	− 1·42	9·45	12·86	− 3·41	30·09	24·13	+ 5·96
Garies	The Gaoler	1·08	0·71	+ 0·37	1·52	1·62	− 0·10	4·01	3·99	+ 0·02
Graaff-Reinet	S. E. D. Treadwell	0·10	1·15	− 1·05	5·15	7·63	− 2·48	31·10	11·93	+ 0·83
Groot Drakenstein	Lionel Baker	11·66	5·03	+ 6·63	17·50	10·73	+ 6·77	39·17	28·21	+ 1·96
Griquatown	The Gaoler	1·05	0·73	+ 0·32	9·60	8·80	+ 0·80	11·68	10·73	+ 0·95
Hanover	The Gaoler	2·22	0·93	+ 1·29	9·62	8·65	+ 0·97	13·46	11·07	+ 2·39
Hopetown	The Gaoler	0·60	0·86	− 0·26	8·96	8·44	+ 0·52	11·36	10·31	+ 1·05
Kenhardt	R. Seydell	1·99	0·37	+ 1·62	8·45	3·98	+ 4·47	9·13	4·94	+ 4·19
Kimberley	F. W. J. Schmidt	1·11	0·65	+ 0·46	10·56	10·04	+ 0·52	15·46	13·44	+ 2·02
Knysna	The Gaoler	2·72	2·54	+ 0·18	12·76	11·52	+ 1·24	29·01	24·33	+ 4·68
Kokstad	H. D. Coyte	0·31	1·02	− 0·71	21·01	14·92	+ 6·09	34·69	22·05	− 12·64
Kingwilliamstown	W. A. Kindness	0·62	1·46	− 0·84	13·43	12·55	+ 0·88	30·91	21·67	+ 9·24
Kuruman (Abtonia)	A. T. Sitwell	1·33	0·51	+ 0·82	14·05	11·72	+ 2·33	15·31	13·36	− 1·95
Mafeking (Convent)	The Mother Superior	0·62	0·38	+ 0·24	13·09	13·30	− 0·21	21·33	18·33	+ 3·00
Mossel Bay (Cape St. Blaize)	The Lightkeeper	1·04	1·60	− 0·56	7·48	7·45	+ 0·03	14·05	14·76	− 0·71
Murraysburg	W. H. Rose-Innes	0·60	1·03	− 0·43	7·36	6·90	+ 0·46	9·19	9·36	− 0·17
O'okiep	J. Burrows	1·29	1·03	+ 0·26	2·64	2·63	+ 0·01	6·30	5·72	+ 0·58
Philipstown	The Gaoler	1·14	0·95	+ 0·19	7·08	8·83	− 1·75	9·14	11·30	− 2·16

RAINFALL, MAY, 1923—(*continued*).

Station.	Observer.	Month. May, 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Cape—(continued).		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Piquetberg	The Gaoler	4·40	3·07	+ 1·33	7·75	6·26	+ 1·49	14·77	17·14	— 2·37
Port Elizabeth	The Lightkeeper	2·12	2·37	— 0·25	10·48	8·58	+ 1·90	23·13	19·50	+ 3·63
Port St. Johns (Cape Hermes)	The Lightkeeper	1·23	2·93	— 1·70	24·63	23·12	+ 1·51	48·60	41·17	+ 7·43
Port Nolloth	The Lightkeeper	0·39	0·42	— 0·03	0·92	0·94	— 0·02	2·41	1·95	+ 0·46
Prieska	The Gaoler	1·93	0·61	+ 1·32	8·26	6·97	+ 1·29	9·73	8·16	+ 1·57
Queenstown	H. Holley	1·00	0·88	+ 0·12	13·50	13·37	+ 0·13	25·79	18·83	+ 6·96
Steytlerville	The Gaoler	0·67	0·64	+ 0·03	6·42	5·22	+ 1·20	11·32	8·12	+ 3·20
Sutherland	The Gaoler	0·81	1·26	— 0·45	3·58	4·35	— 0·77	6·16	7·82	— 1·66
Swellendam	The Gaoler	5·39	3·05	+ 2·34	12·23	14·07	— 1·84	25·48	27·26	— 1·78
Sydney's Hope	Rev. S. Rippon	0·92	1·90	— 0·98	7·62	10·46	— 2·84	21·10	19·32	+ 1·78
Somerset East	C. Harris	0·96	1·46	— 0·50	9·91	13·27	— 3·36	25·27	21·69	+ 3·58
Stutterheim	F. C. Bousfield	1·01	1·15	— 0·14	26·21	15·77	+10·44	46·34	25·06	+21·28
Uitenhage	H. Inggs	0·71	1·34	— 0·63	8·68	7·78	+ 0·90	22·68	15·11	+ 7·57
Umtata	Miss N. Dix-Peek	0·49	1·18	— 0·69	19·20	13·50	+ 5·70	33·48	20·92	+12·56
Unionsdale	The Gaoler	1·65	1·51	+ 0·14	5·34	5·83	— 0·49	10·43	11·53	— 1·10
Upington	The Gaoler	1·65	0·48	+ 1·17	8·34	5·12	+ 3·22	9·19	6·14	+ 3·05
Victoria West	The Gaoler	0·82	0·82	+ 0·00	7·71	6·85	+ 0·86	8·81	8·98	— 0·17
Vryburg	Chas. Butler	0·45	0·57	— 0·12	15·82	13·00	+ 2·82	—	14·75	—
Worcester	The Gaoler	1·24	1·70	— 0·46	2·13	3·93	— 1·80	5·57	10·34	— 4·77
Wynberg (Convent)	Mother Superior	7·63	5·92	+ 1·71	11·72	11·94	— 0·22	26·98	36·41	— 9·43
Basutoland—										
Maleteng	F. Hodgson	2·74	1·54	+ 1·20	25·09	18·64	+ 6·45	36·46	25·49	+10·97
South-West Africa—										
Tsumeb	Ing. Schetter	0·29	0·32	— 0·03	26·50	16·75	+ 9·75	32·28	24·23	+ 8·05
Waterberg	D. Hahn	0·61	0·42	+ 0·19	25·54	14·91	+11·63	27·94	19·99	+ 7·95
Omaruru	The Postmaster	0·53	0·08	+ 0·45	20·04	9·22	+20·82	21·52	11·41	+10·05
Usakos	Rev. Diehl	0·00	0·24	— 0·24	8·23	4·23	+ 4·00	8·81	5·16	+ 3·65
Duesternbrook	I. Matthiessen	0·51	0·42	+ 0·09	22·88	10·08	+12·80	24·93	12·49	+12·44
Gobabis	Rev. Irbe	0·44	0·27	+ 0·17	18·20	11·74	+ 6·46	19·43	15·70	+ 3·73
Gr. Witvley	B. Rueckert	1·06	0·49	+ 0·57	18·79	11·15	+ 7·64	21·01	14·67	+ 6·34
Windhoek	Observatory	2·62	0·32	+ 2·30	26·87	10·90	+15·97	31·46	14·03	+17·43
Maltahoehe	E. Just	0·15	0·09	+ 0·06	10·19	5·19	+ 5·00	11·02	6·16	+ 4·86
Voigtsgrund	A. Voigts	0·09	0·21	— 0·12	25·06	4·49	+20·57	26·11	5·89	+20·22
Gibeon	Rev. Spellmeyer	0·00	0·04	— 0·04	11·95	4·74	+ 7·21	12·59	5·93	+ 6·66
Bethany	Rev. Peter	1·30	0·11	+ 1·19	10·63	3·34	+ 7·29	10·65	4·14	+ 6·51
Aus	F. Erni	0·00	0·18	— 0·18	2·79	2·21	+ 0·58	4·73	3·46	+ 1·27
Keiracharbis	Rev. Father Eder	1·66	0·13	+ 1·53	5·11	2·81	+ 2·30	5·32	3·85	+ 1·47

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. IV. JUNE, 1923. No. 6.

MEAN atmospheric pressure from one-tenth to one-twentieth of an inch below normal; mean temperature about half a degree lower than usual, with days cooler and nights slightly warmer than the average, except in the Transvaal, where both were subnormal; frequent frosts, but of less intensity than usual; occasional cold blustering winds, particularly in the first and third weeks of the month; an excess of rainfall over the greater part of the Union, but with a deficiency in the north and east of the Transvaal, Swaziland, the easterly parts of Natal, Zululand, Kaffraria, parts of the south-east Cape, small portions of the Karroo, and over the northern border; absolute drought in parts of the Barberton, Carolina, Lydenburg, and Waterberg divisions of the Transvaal, and of the northern border of the Cape; a slight fall of snow at a few stations in the east of the Cape, but principally on the mountains from Robertson in the west to the Drakensberg, including the southern ranges; a few falls of hail and sleet, with a number of thunderstorms, particularly on the 3rd and 17th; these were the outstanding features of the weather of June, 1923.

Pressure.—As will be seen from the accompanying map, the mean pressure for June was generally below normal, although the relative distribution is approximately the same as usual. Over the central and eastern Transvaal and Natal the mean barometric readings were one-tenth of an inch, and over the centre of the Cape as well as along the south and south-west coasts it was about one-twentieth of an inch lower than usual. Anticyclonic conditions prevailed over the greater part of the Union throughout the month, although several low-pressure areas affected the more southerly and easterly portions at intervals. Thus, on the morning of the 1st a low-pressure area was affecting the south and south-west, with a minimum reading of 29·87 inches at Cape Agulhas; on the 2nd an isobar of 29·95 inches was lying along the south-east between Port Elizabeth and the northern Natal coast; on the 3rd this was replaced by a lower isobar of 29·85 inches along the Natal coast, the "low" having pushed farther on to the land, so that the 29·95 inch isobar stretched from Mossel Bay to the north of Lourenco Marques. This depression had passed off by the morning of the 4th, pressure having risen to 30·06 inches at

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Durban. On the 6th another depression lay along the south and south-west, with the lowest pressure of 29·85 inches over Cape Agulhas and fresh north-westerly winds; on the 7th it had pushed northward and north-eastwards, the isobar of 29·75 lying off the south coast; on the 8th the barometer had fallen still further along the coast, reading 29·68 inches at Cape St. Francis, with congested isobars over the south-west, the whole depression having penetrated well inland; on the 9th the lowest isobard was 30 inches over the south and east. Pressure continued high till reaching a maximum on the 12th until the 15th, when the pressure at Port Elizabeth had fallen to 29·91 inches; the barometer fell still further on the 16th, being 29·84 inches at Cape Agulhas; on the 17th it had pushed to the north-east, with the lowest reading 29·69 inches at Durban, and was passing off on the 18th, when the lowest reading was only 29·94 inches at Durban. Pressure once more continued high till the 21st, when the outskirts of a low, with the minimum of 29·91 inches at Durban, lay over the south-east; on the 22nd, pressure had fallen all along the south, the minimum of 29·75 inches again occurring at Cape Agulhas; on the 23rd this low pressure had practically passed off, the lowest isobar of 29·95 inches lying along the south coast. Thereafter, anticyclonic conditions prevailed till the end of the month, although the tip of a low, with a reading of 29·94 inches at Cape Agulhas, threatened on the 29th.

Temperature.—The mean temperature of June (52·3 degrees) was 0·6 degree lower than usual. The defect was due to the day temperature (65·5 degrees) being 1·5 degree lower, whereas the night temperature (39·2 degrees) was 0·3 degree higher than the corresponding normals. A monthly temperature lower than usual was shown by all the Provinces, Natal with 55·9 degrees having the greatest shortage (viz., 1·2 degree), whilst the deficit was least (0·3 degree) in the Cape Province, where the mean for the month was 53·7 degrees. Intermediate values in the departures from the normal were shown by the other two Provinces, the Free State with 45·7 degrees, being 0·9 degree, and the Transvaal with 51·1 degrees, being 0·8 degree, cooler than usual. Similarly, subnormal mean maximum or day temperatures were common to all the Provinces, although varying considerably in their departures from the average. Thus, the mean maximum of 58·7 degrees for the Orange Free State was 3·4 degrees lower than the normal, Natal with 69·8 degrees was 2·4 degrees, the Cape with 64·9 degrees was 1·6 degree, whilst the Transvaal with 67·2 degrees was only 0·5 degree cooler than the corresponding average temperatures. The mean minima were lower than usual by 1·2 degree in the Transvaal, where the nights showed a mean value of 35·0 degrees; in Natal the nights were almost normal, the mean of 42·0 degrees for this month being only one-tenth less than usual. In the Orange Free State and the Cape Province, however, the nights were warmer than usual, the former with 32·7 degrees, being 1·6 degree, and the latter with 42·5 degrees, being 1·0 degree, in excess of the average values. At the individual stations the mean temperature was mostly subnormal by about one degree. The exceptional stations were situated in the eastern low veld, the Zoutpansberg, the Potchefstroom, and Bloemhof Districts of the Transvaal, and the south of the Free State, where there was an excess varying between 0·2 degree at Potchefstroom and 1·7 degree at Barberton; at Ermelo the monthly temperatures were normal. In the Cape Province temperature was supranormal over the northern border, Bechuanaland, the greater part of the northern Karroo, the eastern Karroo and most of the coast stations; a normal temperature was experienced at Groot Drakenstein in the south-west. There the excesses ranged between 0·4 degree at East London and 2·7 degrees at Carnarvon. Elsewhere, temperature was lower than usual, generally by 1–2 degrees in the

Transvaal, the largest negative departure being 3·9 degrees at Belfast and the smallest 0·1 degree at Pilgrims Rest. In the Orange Free State the deficits varied between 0·4 degree at Kroonstad and 1·9 degree at Lindley. In Natal the temperature of the month was subnormal by amounts between 0·5 degree at Durban and 2·8 degrees at Dundee. Stanger and Hlabisa (Zululand) were warmer than usual. In the Cape Province the deficits ranged from 0·1 degree at Capetown to 2·3 degrees at Kokstad. Although the mean day temperatures were mostly below and the mean night temperatures above the corresponding normals over the greater portion of the Cape, Free State, and Natal, a different state of affairs prevailed over the Transvaal and the northern part of the Free State and Natal. In the Transvaal, the days were warmer than usual over the more easterly section and Swaziland, the excesses varying from 0·2 degree at Mbabane in Swaziland to 3·1 degrees at Barberton and Louis Trichardt, whereas the nights were cooler than usual by 0·6 degree at Louis Trichardt and 3·5 degrees at Mbabane and Komatipoort. Over the rest of the Province, both days and nights were cooler than usual, except at Potchefstroom, Bloemhof, and Pretoria, where the mean minima were higher than usual, and Nylstroom, where the days showed a normal mean maximum temperature. The mean maxima and minima were also lower than usual at Dundee and Estcourt in Natal, at Lindley in the Free State, and Kokstad, Grahamstown, Murraysburg, Port Elizabeth, Sydney's Hope, and Uitenhage in the Cape Province. In the Free State and Cape Province, the mean maxima were mostly 2–4 degrees lower and the nights 1–3 degrees higher than usual. At Kimberley and Port St. Johns, however, both days and nights were warmer than the average. The mean warmest station was Stanger in Natal, with 65·0 degrees for the month, closely followed by Port St. Johns with 64·7 degrees. In the Transvaal the highest temperature for the month was 62·3 at Komatipoort, whilst in the Free State the corresponding value was only 47·0 degrees at Bethulie. The coolest stations in the several Provinces were Belfast in the Transvaal, with a mean of 42·2 degrees; Harrismith in the Orange Free State with 43·9 degrees; Murraysburg in the Cape with 45·6 degrees; and Estcourt in Natal with 48·4 degrees. There was a difference of 22·8 degrees between the mean warmest and mean coolest stations in the Union. The highest values of the mean day temperatures were 81·4 degrees at Komatipoort in the Transvaal; 75·9 degrees at Stanger in Natal, 73·7 degrees at Port St. Johns in the Cape, and 62·0 degrees at Kroonstad in the Orange Free State. The lowest mean minima in the respective Provinces were 24·7 degrees at Belfast in the Transvaal, 29·2 degrees at Lindley in the Free State, 31·3 degrees at Estcourt in Natal, and 32·4 degrees at Murraysburg in the Cape. The highest readings were recorded on 19 days of the month, viz., 3rd, 5th to 10th, 12th to 17th, 24th to 28th, and on 31st, but most widely between the 6th and 8th, particularly on the 7th. The maxima for the month were 92·0 degrees as Komatipoort, Transvaal, on the 3rd; at East London, Cape, on the 7th; 91·6 degrees at Stanger, Natal, and 70·7 degrees at Bethulie, Orange Free State, also both on the 7th. The lowest temperature was confined to 13 days, viz., 3rd to 6th, 10th to 12th, 15th and 16th, 18th to 20th, and 23rd, but most generally on the 5th. Frosts, although frequent, were generally less intense than usual. The extreme minima were 13·0 degrees at Belfast, Transvaal; 18·5 degrees at Lindley, Orange Free State; 19·5 degrees at Murraysburg, Cape; and 23·0 degrees at Dundee and Estcourt, Natal, all on the 5th. The extreme range over the Union during the month was 79·0 degrees.

Precipitation.—During the month of June, precipitation was mostly above normal by amounts of less than half an inch over the southern half of the Transvaal, where the excess ranged from 0·04 inch at Piet Retief to 0·47

inch at Strathmore, near Klerksdorp; in the north-west of Natal the surplus amounts were similar, ranging from 0·08 inch at Vryheid to 0·32 inch in Dundee; in the Orange Free State, excesses were general and larger in amount, varying from 0·21 inch at Boshof in the west to 1·28 inch at Ladybrand in the east; and in Basutoland, Mafeteng showed an excess of 0·90 inch. In the Cape Province, rainfall was supranormal over Bechuanaland, the greater part of the northern Karroo, and of the south-east, the north-east, the east of the central Karroo and the southern Karroo, the west and south coast, and the south-west, including the Cape Peninsula. Generally speaking, the excesses were small—a few hundredths of an inch—in the more inland portions and increased to east, south, and west, particularly towards the west-south-west, rising to 4·44 inches at Wynberg and 3·61 inches at Groot Drakenstein; elsewhere, the excesses were generally between half an inch and 1½ inch. Small deficits were common to the remainder of the country, usually under half an inch, but reaching 1·77 inch at Port St. Johns and 2·89 inches at Driefontein (Franschhoek). Absolute drought prevailed throughout the month at a number of stations in the Barberton, Carolina, Lydenburg, and Waterberg Districts of the Transvaal and in the northern border of the Cape Province. Light rains in the Transvaal were practically confined to the 20th, but occurred during the first and third weeks in the Free State and Natal, also in Bechuanaland and Kaffraria. The rains were more frequent and more or less continuous in the west, south-west, and over the Cape Peninsula, but were lighter and distributed at intervals throughout the month.

No rain fell over the greater part of South-West Africa. Small quantities, however, fell in excess of the normal in the neighbourhood of Waterberg and Omaruru in the north-central area, whilst in the extreme south-east at Heirachabis there was a shortage of 93 per cent., only 0·05 inch being registered as against an average of 0·71 inch. At Aus, in the south-west, the total of 1·41 inch for the month was 70 per cent. in excess of the average amount. Thunder and lightning were unusually frequent for the season of the year, particularly at the beginning, middle, and end of the month. The rainfall in the neighbourhood of Thebus Waters (Steynsberg) was sufficiently intense to bring down the river in flood, although only 0·54 inch was registered at the station itself, whilst heavy rain on the 22nd at Lourensford (Division Stellenbosch) sufficed to cause a flood in the Lourens River. At Grassridge (Cradock) the river was in flood on the 21st and became normal on the 24th. Light showers of snow, sleet, and hail were of frequent occurrence over the Cape Province, principally on the 2nd, 3rd, 16th–17th, but were localized on 7th, 21st, and 29th, and other days. The Drakensberg Mountains were stated to have been covered with snow during the greater part of the month, and drifts 3 feet in depth were reported on the mountains near Lauriston (Division Barkly East) on the 19th. The accumulated rainfall during the twelve months, commencing 1st July, 1922, was generally considerably above the normal, particularly in the east and north-east of the Transvaal, Swaziland, Basutoland, and Kaffraria, where excesses of 10–20 inches and over occurred. Over the centre and south-east of the Transvaal the surplus amounts decreased to between 5 and 10 inches and fell off still further to under 2 inches in the west and south-west, being only 0·49 inch at Strathmore near Klerksdorp. In the Free State there was an excess generally of 4–6 inches, but decreasing to 1·42 inch at Bethulie in the south. Excess quantities in Natal varied between 0·16 inch at Howick and 6·65 inches at Vryheid. In the Cape Province the plus amounts were largest, 5–10 inches or over in the south and east, decreasing to 1–2 inches or less in the west and centre. In the south-west and parts of the northern Karroo, deficits occurred, particularly over the Cape Peninsula, where Wynberg showed a shortage of 4·99 inches. Similar deficient amounts

occurred over parts of Natal and in Zululand, the totals of the twelve months at Weenen and Hlabisa being 6·42 and 7·31 inches respectively less than usual, whereas Stanger was only about 2½ inches under the average. A few stations in the north and south-west of the Transvaal also had a rainfall for this period under normal, e.g. Bloemhof, where the shortage was 4·43 inches. In South-West Africa the total rainfall during the twelve months was everywhere supranormal, varying between 20·13 inches at Voigtsgrund and 0·81 inch at Heirachabis, that is to say, between 337 and 18 per cent. above the corresponding averages. The totals for the first six months of the current year were also commonly above the average, although the areas of deficient rainfall were more extensive than during the twelve months. The excesses in the east and north-east were slightly less than in the longer period, in the centre and south-east considerably less, and about the same in the west and south-west. Subnormal totals for the half-year were registered at a number of stations in the north and over a considerable portion of the eastern high veld, Ermelo having 6·48 inches less than usual. Deficits were also experienced in the south and south-west Transvaal, extending into the north and north-east of the Free State and the greater part of Natal.

Deficient rains also occurred in the south of the Free State, the east, south, and south-west of the northern Karroo, the central and southern Karroo, the south coastal area between Cape Agulhas and Port Elizabeth, and the coast of Kaffraria and portions of the south-east. On the other hand, the minus quantities in the south-west have been connected with plus amounts about as much above normal as the twelve month's totals were below normal. A larger rainfall than usual was recorded over the south-central portion of the Free State, at Stanger in Natal, and the portions of the Cape Province other than those mentioned above. In South-West Africa the totals for the half-year were largely in excess of the averages, the actual surplus varying from 20·91 inches at Omaruru (226 per cent. over normal) and 20·48 inches (plus 447 per cent.) at Voigtsgrund to 1·16 inch (plus 38 per cent.) at Aus in the south-west.

The *Aurora Australis* was reported to have been seen at Stutterheim between 7 p.m. and on the 28th and 5 a.m. on the 29th, the effect however being practically spoiled by bright moonlight.

Taken as a whole the month was favourable to agriculture, the rains which were in some instances record amounts for the month enabling ploughing to be carried out; the heavy rains at the beginning of the month in the south-west of the Cape Province, however, proved detrimental to the seed already sown; the cold strong winds that occurred at intervals during the month in some areas adversely affected stock, whilst at Rugby (Division Bethlehem) in the Free State, the moist condition of the atmosphere delayed the reaping of the mealie crops. The cold wind on the morning of the 5th injured a number of young eucalyptus trees at the West End Plantation, Pretoria, and a black frost on the 10th and 11th damaged low-lying trees and crops at Zwagershoek (Division Lydenburg). The greatest amount of harm however was wrought by locusts, which destroyed grain crops and ate up the veld in many places.

OBSERVERS' NOTES FOR JUNE, 1923.

TRANSVAAL.

Carolina.—Threatening and cloudy weather all through the month, and very cold spells with stormy days. Rainfall: 0·25 inch on one day.—G. J. Mijnhardt.

Barberton.—The country is now very dry, although the springs are running well. Rainfall: 0·01 inch on one day.—W. Grubb.

Middelburg.—This, the midwinter month, has been characterized this year by frost almost every night, but of only medium severity, the mean temperature for the month being 47·1 degrees as compared with 44 degrees for the coldest months and 52 degrees registered for the mildest June recorded. There have been very few windy days. A small amount of rain fell on the 20th (0·28 inch), but rain threatened and the weather became unsettled on several occasions. Conditions suggest an early breaking up of the winter this year, and possibly early rains. Rainfall: 0·33 inch on four days.—Dr. H. A. Spencer.

Louis Trichardt.—Exceptionally good weather during the month. Little damage done by frost. Mealie crops excellent. Vegetables plentiful. Stock are in good condition. Rainfall: 0·10 inch on one day.—F. J. Labuschagne.

Standerton.—Cold mornings with bright sunny weather have been the chief feature of the month. Light breezes were frequent. On the 17th a very strong wind from north-west, developing to almost a gale from 11 a.m. to late in the afternoon. The evenings were very cold. Rainfall: 0·31 inch on one day.—W. J. Madge.

Gemboksfontein (Middelburg).—Frosts were frequent during the month, the ground being white practically every morning. Cloudy weather was experienced at the close of the month. Rainfall: 0·21 inch on one day.—G. M. van Coller.

Krugersdorp.—The early part of the month was raw and cold, but during the last week ideal climatic conditions for this period existed. During practically the whole of the month considerable numbers of locusts have been all over the surrounding district and, whilst little damage can be done at present, the general opinion appears to be that considerable trouble will be experienced during the coming summer, as a good deal of egg-laying is probably taking place now. Rainfall: 0·44 inch on one day.—H. Sharp.

Jakhalsfontein (Pietersburg).—Generally fine throughout month, with occasional cold snaps. Locusts reported in the district but none at observation station. Rainfall: Nil.—Rev. James C. Palmer.

Ermelo.—It has been an unusually cold and severe month, especially the first week. Cold affecting stock, which are in a poor condition.—Dr. E. B. Theunissen.

Lichtenburg.—Middle part of month very cold at night. Swarms of locusts settled in town. Farmers busy cutting mealies and planting corn. Rainfall: 0·46 inch on one day.—E. Newton.

White River (Barberton).—Cold strong winds from south-west; cold and drizzly on 20th and 21st. Generally speaking, the weather was fine and bright. Country in neighbourhood very dry. Rainfall: 0·12 inch on two days.—H. P. Pooley.

Pretoria (West End Plantation).—The severe cold wind during early morning of the 5th injured a number of young trees—"Eucalyptus" trees that stand severe frosts. It was the wind that did the damage—this plantation being exposed. Rainfall: 0·24 inch on one day.—W. H. Foster.

Zwagershoek (Lydenburg).—10th and 11th June heavy black frost: damage to low-lying trees and crops. Rainfall: 0·16 inch on two days.—J. D. Stirling.

Boschfontein No. 607 (Rustenburg).—Winter crops of corn, wheat, etc., destroyed by locusts. Tobacco and mealie crops are better than previous season. Rainfall: 0·58 inch on one day.—J. Skinner.

Swaziland.

Mbabane.—Grazing very poor owing to want of rain. Sheep farmers are consequently losing lambs. Rainfall: 0·03 inch on one day.—R. C. S. Markham.

Orange Free State.

Belladale (Frankfort).—A month of very changeable weather; much high wind. The constant changes do not agree with stock, and cattle are not looking well. Rainfall: 0·70 inch for one day.—D. McCalman.

Alma (Ladybrand).—This is a record rain for June from the time I have been here (1892), the average during that time being 0·39 inch. Rainfall: 1·65 inch on four days.—H. W. Stockdale.

Rugby (Bethlehem).—A month of hoar frosts alternating with hot, damp weather, no severe frosts having been experienced throughout the month. Ground exceptionally damp for the time of year, and ploughing in old recently cultivated lands possible, though impossible on account of standing mealie crops, the reaping of which has been retarded by the moisture in the atmosphere. The whole country round about is infested with locusts, which have eaten off all green winter crops and a good deal of the veld grasses. Locusts now actively laying and dying off. Old residents of the district contend that the locusts eggs will not hatch out, being destroyed by the moisture in the ground, which causes the ground to be frozen to a depth below that at which the eggs are deposited. Winds have not been so prevalent as last month, and stock generally have improved in condition. Rainfall: 0·70 inch on two days.—A. C. Glynn Baker.

Natal.

Dundee.—A lot of wind during the day preceding rain on 20th. This rain was most welcome and generally improved the weather conditions, since which we have had perfect June days. Rainfall: 0·49 inch on one day.—West Thorrold.

Ladysmith.—A cold, dry month. Parts of the Drakensberg have been covered with snow during practically the whole of the month. Rainfall: 0·44 inch on two days.—D. A. R. Leathern.

Maritzburg (Mental Hospital).—June has been very dry, only 0·12 inch on two days. Very cold morning and evening.—The Staff.

Port Shepstone.—Very dry; rain badly needed. Rainfall: 0·49 inch on three days.—E. K. Andreasen.

Nottingham Road.—Minimum temperature variable. Very dry. Rainfall: 0·06 inch on five days.—Miss E. Smythe.

Newcastle (Convent).—Several windy days. Sky overcast on many occasions. Very frosty mornings. Rainfall: 0·07 inch on one day.—The Mother Superior.

Ingwangwane.—Severe frosts have been experienced from 5th to 29th. Rainfall: Nil.—F. H. Houshold.

Mid-Illovo.—Rain fell on three days, including nice light rains of 0·18 inch on each day, 17th and 20th; total rainfall 0·38 inch. Maximum temperature, 79 degrees on 15th and 16th; minimum, 38 degrees on 19th. Pretty sky effect evening of 8th, tinted mackerel streaks. Stock holding their own fairly well.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Newcastle (Gaol).—During the month very high winds during the day and night. Rainfall 0·10 inch on one day.—The Gaoler.

Rongpoort (*Weenen*).—Very heavy frost on the 4th; everything frozen. Severe frosts throughout the month, often white as snow and plenty of ice. Unusually windy for June. Rainfall: 0·24 inch on two days.—J. H. Bartholomew.

CAPE.

Somerset East.—Heavy frosts during the second and third weeks, ending with spring-like weather during the closing week. Westerly winds daily. Rainfall: 1·53 inch on seven days.—C. Harris.

Aliwal North.—June has been very mild; with a few exceptions, little or no frost. Generally cloudy with light gentle rains amounting to 1·20 inch on ten days.—Alex. Alcock.

Clanwilliam.—Soft soaking rains; weather remained mild throughout month. Rainfall: 3·08 inches on twelve days.—P. E. Scholtz.

Kokstad.—Mostly clear, calm sunny days. Snow on mountains on 17th. Rainfall: 0·27 inch on four days.—H. D. Coyte.

Mafeking (*Convent*).—The month was generally mild; frost registered only on four days. Wednesday, the 20th, was a wild day: the wind was strong and the dust blinding. Small branches were torn from the trees. The wind abated in the evening and rain threatened. It began later and continued to fall gently during the night, registering 0·42 inch; there was a heavy mist next morning. The 29th and 30th were windy without dust. Rainfall: 0·44 inch on three days. The Mother Superior.

Queenstown.—Hoar frost eight mornings. Sixteen days strong westerly to northerly winds. All green crops eaten off by locusts, also the best of the veld. Rainfall: 1·15 inch on six days.—H. Holley.

Stutterheim.—28th: *Aurora Australis*, 7 p.m. to 5 a.m. Very fine, but much spoiled by bright moonlight. Locusts causing great havoc. Rain badly needed. Rainfall: 0·68 inch on nine days.—F. C. Bousfield.

Liwandi (*Addo, Uitenhage*).—With the exception of a few mornings we have had no really cold weather. A total rainfall of 1·50 inch on nine days replenished water-tanks. Locusts in great swarms arrived early in the month and have been with us ever since. They hardly touched lucerne, but it is feared that they have harmed winter-grazing considerably. They are now pairing and are located all over the Addo Bush between Coerney and Addo. It is not known at present how far east they extend. If they have laid their eggs on the flats instead of in the bush it would be much easier to deal with them later in the voetganger stage.—Major J. Kreft.

Lovedale.—Temperatures very close to the June normal. Rainfall about 25 per cent. above average. Frosts on seven nights. Lowest grass temperature, 24 degrees. Locusts here for the latter half of month. They did some damage on the commonage and on some farms. Their first visit since 1909. Rainfall: 1·28 inch on seven days.—Charles A. Pilson.

Sydney-on-Vaal (*Barkly West*).—Unusually mild month and considerably more moisture in atmosphere than is general in June. Although precipitation was very light it was frequent, and a large proportion of cloudy days were experienced. Only one hard frost (27·7 degrees on 5th), and this appeared to end the epidemic of horse-sickness, and the "koring kriks," or "tock-tockies," also gradully died out. Rainfall: 0·18 on five days.—J. G. Richards.

Kraaipan (*Mafeking*).—Weather generally fine. Very little wind. Rainfall: 0·33 inch on one day.—P. J. Hart.

Rietfontein (*Aliwal North*).—Very windy, with plenty of rain for the month of June. Rainfall: 2·58 inches on nine days.—A. G. Smith.

Queenstown.—On the whole a mild month for winter; only three severe frosts. Westerly winds prevailed in early part of month. Rainfall: 1·06 inch on six days.—J. F. C. Rein.

Darling (*Malmesbury*).—A good continuance of May rains. The season has been rather too wet for most farms in immediate neighbourhood, and quite considerable damage occurred through spooling and seed getting drowned in the heavy rains at the commencement of the month. Otherwise, conditions were favourable. Rainfall: 4·86 inches on sixteen days.—P. H. Drake.

Cathcart.—Strong northerly winds during the earlier part of the month. Occasional frosts. Rainfall: 0·60 inch on two days.—C. E. Whibley.

Elsenburg (*Stellenbosch*).—The rainfall (6·26 inches on fifteen days) was considerably above the average (4·99 inches) for June, but much lower than the rainfall for June last year (8·26 inches). It was, however, much better distributed than the May rainfall, and little damage was done by washing. —D. C. Crawford.

Grootfontein School of Agriculture (*Middelburg*).—Stormy and windy, with light rain during early part of month; much more quiet and mild towards end of month. Rainfall: 0·74 inch on five days.—The Principal.

Ceres: Weather generally very calm, and soaking rains; also warmer than usual. Rainfall: 8·07 inches on fifteen days.—A. Heatlie.

Grassridge (*Cradock*).—The month has again been one of varying conditions and temperature as instanced by heavy frost on 19th and 20th, followed by rain on the night of 20th. The river was in flood on 21st, but became normal again on the 24th. Rainfall: 0·50 inch on three days.—F. Cooper.

Capetown.—A wet and squally spell at the beginning of the month was succeeded by more than a week of fine weather and south-easters. The wind then veered to north and north-west, and the remainder of the month was unsettled—generally cloudy and showery, with a few breaks of fine days.—A. Russell Fraser.

Danger Point.—Veld looking grand. Rainfall: 4·57 inches on ten days.—H. H. Hews.

Kakamas (*Kenhardt*).—Winter has been very mild up to now. Potatoes on higher ground away from the river have not yet been frost-bitten. Rainfall: 0·15 inch on four days.—M. J. Oosthuizen.

Riversdale.—The country is in excellent condition. The grain lands are promising a good harvest this year. Rainfall: 1·79 inch on eight days.—Rev. Carl Prozesky.

Vruchtbaar (*Wellington*).—Very heavy rainfall for June; soil too wet for ploughing; cereal crops look very promising. Rainfall: 7·57 inches on sixteen days.—P. J. Cillie.

Moira (*Uitenhage*).—Locusts still about and have done considerable damage to young crops of oats and barley in the Sundays River Valley. Rainfall: 1·28 inch on six days.—J. H. Champion.

Weltevreden (*Molteno*).—Cereal crops destroyed by locusts and will have to be resown. Cattle in poor condition. Rainfall: 1·71 on four days.—W. M. Steyn.

BECHUANALAND.

Dikgatlong Ranch.—There is nothing startling to report. The weather has been exceptionally mild. No locusts have been seen in the vicinity. *Rainfall : Nil.*—*Paul Jousse.*

BASUTOLAND.

Mafeteng.—Nice rains fell during the month. Cloudy days with cold nights. Small swarms of locusts still about. Rainfall : 1·62 inch on seven days.—F. Hodgson.

WEATHER CHARACTERISTICS FOR THE MONTH OF AUGUST.

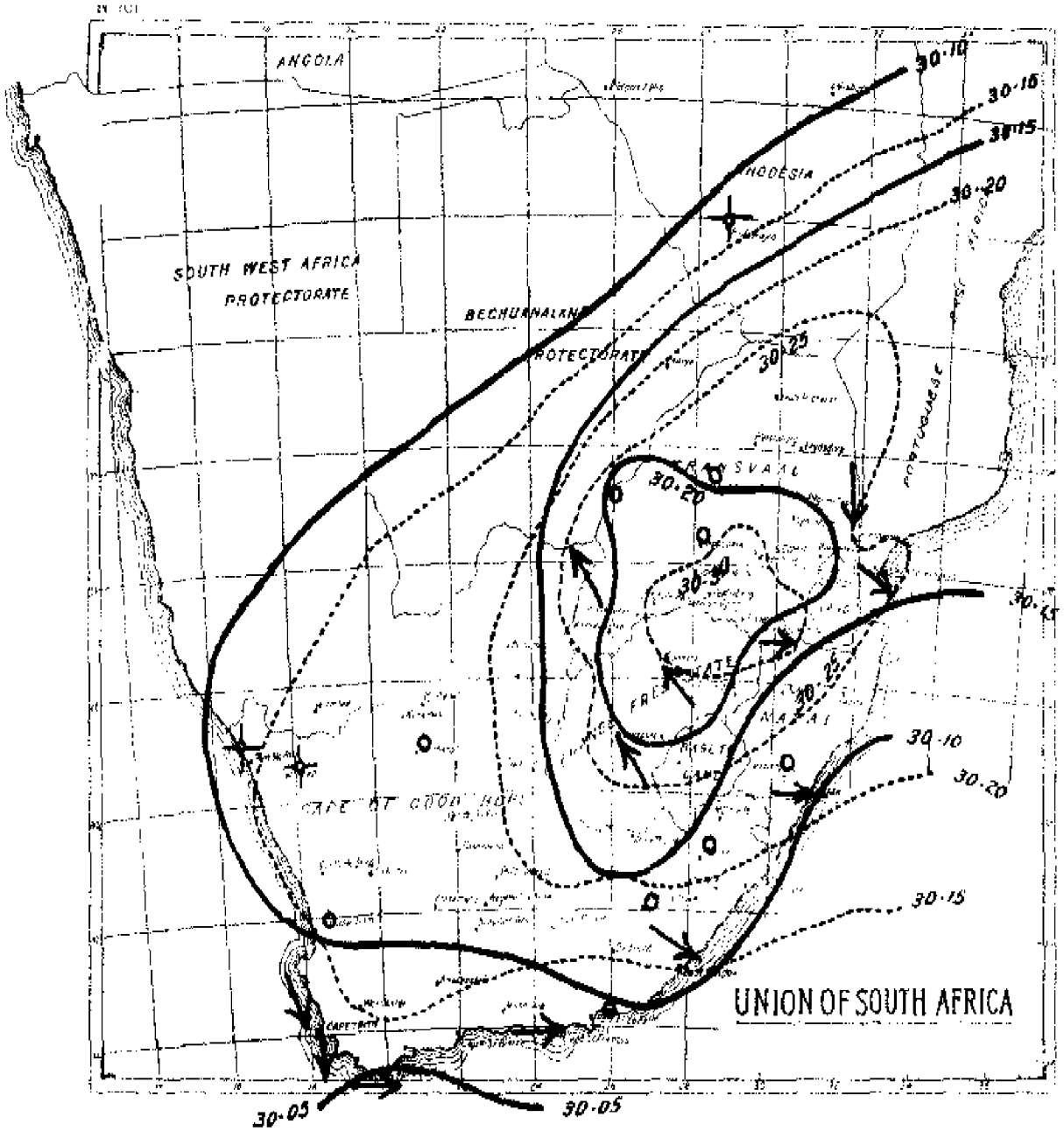
Along the west coast and over the Cape Peninsula the rainfall during the month of August is decreasing, but in the south-western districts the precipitation usually exceeds that of the previous month, The general tendency over the remainder of the Union is towards an increase, although the month may be quite rainless inland. The normal rainfall is about 6 inches over the Cape Peninsula ; 3 inches in the Cape south-western districts ; 2 inches along the south coast ; 1·5 inch in the south-west 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.

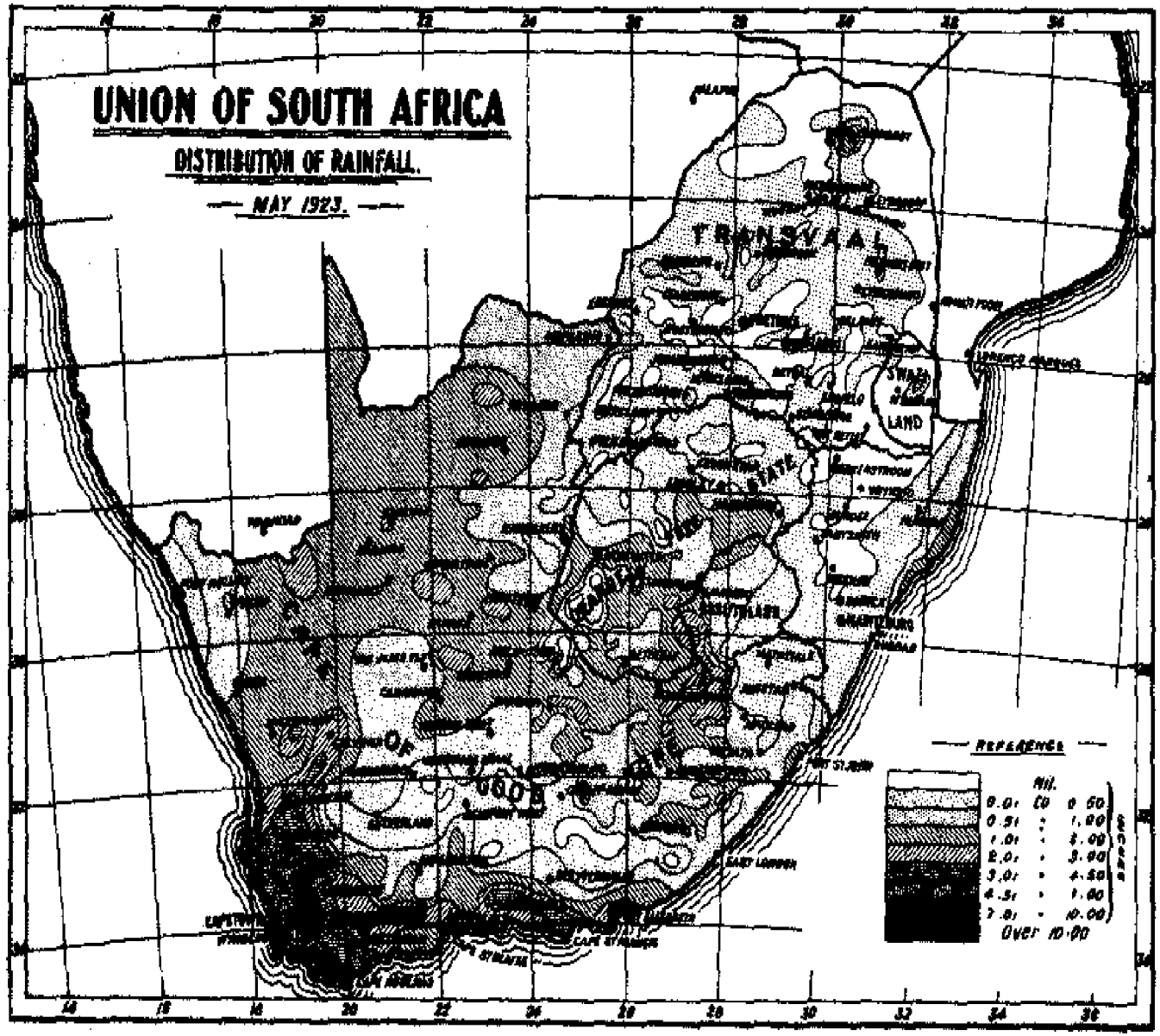
Compared with July there is a marked increase in frequency over the Transvaal of north and north-westerly winds, but a decrease in all other directions ; north-north-west is still the prevailing wind. In the south-east of the Cape Province, on the other hand, there is a decrease in frequency of north-westerly 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.



June, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for June.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
MAY 1923.
TRANSVAAL
LAND
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
Over 10.00

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), JUNE, 1923.

Station.	Observer.	Month—June, 1923. Mean Max.	Month—June, 1923. 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	74·3	47·6	61·0	59·3	+ 1·7	83·0	8th	41·0	4th and 5th.
Belfast	The Forester	59·7	24·7	42·2	46·1	- 3·9	65·0	8th	13·0	5th.
Bigenhof	A. Adamson	65·1	35·4	50·2	49·7	+ 0·5	73·8	7th	28·0	5th.
Ermelo	The Forester	64·5	30·2	47·4	47·4	± 0·0	74·0	6th	20·5	4th.
Johannesburg (Observatory)	The Staff	59·1	39·7	49·4	50·4	− 1·0	63·5	26th and 28th	27·8	4th.
Klerksdorp (Strathmore)	Chas. Scott	65·4	31·4	48·4	50·3	1·9	72·0	6th, 7th, and 16th	23·0	5th.
Komatipoort	H. J. Evans	81·4	43·2	62·3	63·1	- 0·8	92·0	3rd	34·0	15th.
Louis Trichardt	F. J. Labuschagne	72·4	43·6	58·0	56·8	+ 1·2	79·0	8th	35·0	5th.
Middelburg	Dr. H. A. Spencer	66·4	27·8	47·1	48·6	- 1·5	72·0	24th	18·0	5th.
Nylstroom	G. Bakker	69·8	34·5	52·2	53·5	− 1·3	76·0	8th	22·5	5th.
Pietersburg	P. Roos	66·5	37·4	52·0	53·8	− 1·8	74·0	8th	20·0	5th.
Piet Retief	J. Werner	67·3	37·9	52·6	54·2	− 1·6	79·0	17th	29·1	5th.
Pigeonhole (New Agatha)	Jno. McCallum	64·6	49·6	57·1	—	—	74·0	8th and 9th	42·0	20th.
Pilgrims Rest	A. Kiernander	68·8	35·4	52·1	52·2	- 0·1	75·0	6th and 25th.	25·5	4th.
Potchefstroom (Exp. Farm)	The Manager	66·4	32·4	49·4	49·2	+ 0·2	73·3	6th	21·5	16th.
Pretoria (Meteorological Office)	The Staff	67·0	36·5	51·8	52·6	0·8	72·6	24th	28·8	5th.
Standerton	W. J. Madge	63·6	25·5	44·6	45·4	− 0·8	68·0	7th and 30th.	16·5	10th and 11th.
Zeerust	H. Dietrich	65·5	32·2	48·8	50·5	− 1·7	75·3	17th	24·0	5th.
Swaziland—										
Mbabane	Swaziland Police	67·2	41·6	54·4	56·1	− 1·7	77·0	9th	31·0	12th and 19th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	58·6	35·5	47·0	46·5	+ 0·5	70·7	7th	23·5	5th.
Bloemfontein	G. A. Schepers	58·9	34·4	46·6	47·1	- 0·5	68·9	7th	23·2	5th.
Harrismith	The Forester	55·2	32·6	43·9	45·7	− 1·8	61·0	25th	23·0	4th.
Kroonstad	S. R. Northfield	62·0	30·4	46·2	46·6	- 0·4	70·6	7th	18·8	5th.
Ladybrand	The Forester	57·1	33·9	45·5	46·8	− 1·3	66·0	28th	24·0	5th.
Lindley	J. Collister-Oates	60·6	29·2	44·9	46·8	− 1·9	67·8	7th	18·5	5th.
Natal—										
Dundee	West Thorrold	67·3	33·2	50·2	53·0	- 2·8	73·0	6th, 8th, and 10th	23·0	5th.
Durban (Point)	The Port Captain	73·0	55·8	64·4	64·9	- 0·5	80·4	8th	49·2	6th.
Estcourt	The Town Clerk	65·6	31·3	48·4	51·4	− 3·0	74·0	7th	23·0	5th.
Hlabisa	*The Gaoler*	*80·3*	*55·8*	*68·0*	*63·7*	+ 4·3	*86·0*	8th	50·0	26th.
Ladysmith	D. A. R. Leathern	66·2	35·4	50·8	52·4	- 1·6	74·0	8th	28·0	5th.
Maritzburg (Mental Hospital)	The Staff	71·0	42·1	56·6	57·6	− 1·0	81·0	8th	33·5	5th.
Stanger	Cecil C. Foss	75·9	54·2	65·0	63·5	+ 1·5	91·6	8th	47·6	4th.
Weenen	The Gaoler	—	—	—	52·0	—	—	—	—	—

AIR TEMPERATURES, JUNE, 1923—(*continued*).

Station.	Observer.	Month—June, 1923.		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—										
Aliwal North	Alex. Alcock	59·6	32·8	46·2	46·6	− 0·4	70·0	7th	21·5	5th.
Bedford	Thos. C. Hall	63·7	42·8	53·2	55·2	− 2·0	76·0	7th	30·0	20th.
Capetown (Royal Observatory)	The Staff	61·2	49·7	55·4	55·5	− 0·1	72·2	12th	38·7	11th.
Carnarvon	A. P. Malherbe	57·1	36·4	46·8	44·1	+ 2·7	67·0	14th	26·0	5th.
Clanwilliam	P. E. Scholtz	65·2	43·0	54·1	54·9	− 0·8	73·2	12th	34·6	5th.
East London	The Port Captain	71·5	50·2	60·8	60·4	+ 0·4	92·0	7th	39·0	5th.
Graaff-Reinet	B. E. D. Treadwell	65·4	43·7	54·6	54·5	+ 0·1	76·3	14th	31·5	19th.
Grahamstown	The Vet. Res. Officer	66·5	40·2	53·4	54·6	− 1·2	81·4	7th	27·6	12th.
Groot Drakenstein	Lionel Baker	62·2	46·7	54·4	54·4	± 0·0	75·9	12th	38·4	19th.
Kenhardt	R. Seydell	66·6	39·4	53·0	52·2	+ 0·8	76·0	6th and 28th.	30·0	23rd.
Kimberley	F. W. J. Schmidt	64·4	39·7	52·0	50·2	+ 1·8	75·0	7th	30·0	5th.
Kingwilliamstown	W. A. Kindness	69·0	42·0	55·5	56·6	− 1·1	84·0	7th	32·0	5th and 12th.
Kokstad	H. D. Coyte	63·3	32·9	48·1	50·4	− 2·3	73·0	7th	23·0	5th.
Maiseking (Convent)	The Mother Superior	67·6	37·3	52·4	53·4	− 1·0	73·2	7th	28·8	5th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	65·1	52·7	58·9	58·4	+ 0·5	82·0	6th	45·0	4th and 18th.
Murraysburg	W. H. Rose-Innes	58·9	32·4	45·6	46·8	− 1·2	69·5	27th	19·5	19th.
O'okiep	J. Burrows	59·8	45·0	52·4	54·0	− 1·6	71·9	13th	37·0	3rd.
Port Elizabeth	The Lightkeeper	66·1	50·4	58·2	59·1	− 0·9	81·0	7th	40·0	20th.
Port Nolloth	The Lightkeeper	63·8	47·8	55·8	55·4	+ 0·4	84·0	5th	41·0	10th.
Port St. Johns (Cape Hermes)	The Lightkeeper	73·7	55·7	64·7	62·2	+ 2·5	85·0	15th	47·0	18th.
Queenstown	H. Holley	62·0	38·2	50·1	51·2	− 1·1	73·0	7th	23·0	12th.
Somerset East	C. Harris	64·0	42·7	53·8	54·0	− 0·2	76·8	16th	30·4	12th.
Stutterheim	F. C. Bousfield	65·9	42·5	54·2	54·4	− 0·2	78·4	7th	30·1	12th.
Sydney's Hope	Rev. S. Rippon	63·3	46·0	54·6	57·0	− 2·4	77·0	7th	37·0	4th and 19th.
Uitenhage	H. Ingge	69·6	41·8	55·7	57·4	− 1·7	83·2	7th	29·8	12th.
Umtata	Miss N. Dix Peek	70·5	35·6	53·0	53·5	− 0·5	82·2	7th	24·6	5th.
Vryburg (Armoedsvlakte)	C. Butler	66·5	34·6	50·6	49·7	+ 0·9	73·0	7th, 9th, and 28th	22·0	6th.
Wynberg (Convent)	The Mother Superior	62·4	48·3	55·4	56·2	− 0·8	69·8	5th	41·5	15th.
Basutoland—										
Maseteng	F. Hodgson	54·0	34·9	44·4	48·0	− 3·6	62·0	7th, 16th, and 28th	25·0	5th.

RAINFALL, JUNE, 1923.

Station.	Observer.	Month. June, 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Transvaal—		*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Barberton	W. Grubb	0·01	0·22	− 0·21	19·57	17·77	+ 1·80	33·23	31·79	+ 1·44
Belfast	The Forester	0·21	0·16	+ 0·05	14·73	16·52	− 1·79	36·26	32·45	+ 3·81
Bethal	H. F. Joubert	0·38	0·07	+ 0·31	16·43	14·00	+ 2·43	37·41	29·61	+ 7·80
Bloemhof	A. A. Adamson	0·39	0·16	+ 0·23	9·89	11·82	− 1·93	13·93	18·36	− 4·43
Clarkemont	S.A. Police	0·00	0·02	− 0·02	12·42	10·75	+ 1·67	19·05	18·68	+ 0·37
Ermelo	The Forester	0·30	0·14	+ 0·16	8·07	14·55	− 6·48	35·82	31·67	+ 4·15
Haenertsburg	S.A. Police	0·00	0·29	− 0·29	35·15	24·38	+10·77	49·14	38·37	+10·77
Heidelberg	W. ter Horst	0·35	0·06	+ 0·29	14·16	14·35	− 0·19	30·08	28·38	+ 1·70
Johannesburg	The Staff	0·47	0·09	+ 0·38	17·27	16·35	+ 0·92	32·54	30·73	+ 1·81
Klerksdorp (Strathmore)	C. Scott	0·01	0·14	+ 0·47	14·23	13·48	+ 0·75	23·77	23·28	+ 0·49
Komatipoort	H. J. Evans	0·01	0·23	− 0·22	30·89	17·74	+13·15	43·04	27·65	+15·39
Louis Trichardt	F. J. Labuschagne	0·10	0·46	− 0·36	33·04	18·19	+14·85	40·71	30·10	+10·61
Middelburg	Dr. H. A. Spencer	0·33	0·11	+ 0·22	16·19	14·86	+ 1·33	38·10	29·00	+ 9·10
Nylstroom	G. Bakker	0·08	0·19	− 0·11	17·01	14·11	+ 2·90	31·61	24·87	+ 6·74
Pietersburg	P. Roos	0·00	0·04	− 0·04	10·09	11·38	− 1·29	20·31	21·28	− 0·97
Piet Retief	J. Werner	0·17	0·13	+ 0·04	17·67	15·56	+ 2·11	44·00	32·02	+11·98
Pigeonhole (New Agatha)	J. McCallum	0·10	0·19	− 0·09	55·58	28·85	+26·73	72·46	47·66	+24·80
Pilgrims Rest	A. Kiernander	0·00	0·32	− 0·32	38·77	25·75	+13·02	56·00	40·09	+15·91
Potchefstroom (Exp. Farm)	The Manager	0·54	0·15	+ 0·39	13·72	12·66	+ 1·06	26·40	23·66	+ 2·74
Pretoria (Meteorological Office)	The Staff	0·22	0·07	+ 0·15	17·71	15·92	+ 1·79	36·02	29·39	+ 6·63
Roodberg	N. H. Monro	0·04	0·06	− 0·02	15·72	14·17	+ 1·55	30·25	24·83	+ 5·42
Rustenburg	A. Streatfield	0·50	0·09	+ 0·41	18·22	14·49	+ 3·73	28·11	26·44	+ 1·67
Standerton	W. J. Madge	0·31	0·08	+ 0·23	18·41	14·87	+ 3·54	37·52	31·15	+ 6·37
Wakkerstroom	F. Grant	0·32	0·13	+ 0·19	—	16·82	—	—	32·22	—
Woodbush	The Forester	0·00	0·44	− 0·44	70·15	45·23	+24·92	90·51	71·31	+19·20
Zeerust	H. Dietrich	0·22	0·05	+ 0·17	17·16	14·17	+ 2·99	25·07	23·90	+ 1·17
Swaziland—										
Mbabane	Swaziland Police	0·03	0·44	− 0·41	43·44	29·53	+13·91	72·76	53·04	+19·72
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·78	0·50	+ 0·28	11·12	11·41	− 0·29	19·02	17·60	+ 1·42
Bloemfontein	G. A. Schepers	0·85	0·37	+ 0·48	20·58	13·89	+ 6·69	26·16	21·68	+ 4·47
Boshof	The Postmaster	0·44	0·23	+ 0·21	20·61	12·09	+ 8·52	26·05	19·45	+ 6·60
Harrismith	The Forester	0·99	0·22	+ 0·77	13·39	15·52	− 2·13	35·53	29·50	+ 6·03
Kroonstad	S. R. Northfield	0·82	0·28	+ 0·54	12·53	14·31	− 1·78	28·61	24·25	+ 4·36
Ladybrand	The Forester	1·59	0·31	+ 1·28	15·83	15·28	+ 0·55	26·97	27·27	− 0·30
Lindley	J. Collister-Oates	0·85	0·23	+ 0·62	13·75	13·54	+ 0·21	28·43	24·20	+ 4·23
Natal—										
Dundee	West Thorrold	0·49	0·17	+ 0·32	13·10	17·66	− 4·56	38·44	32·09	+ 1·35
Durban (Point)	The Port Captain	0·30	1·18	− 0·88	17·93	20·79	− 2·86	43·97	41·51	+ 2·46

RAINFALL, JUNE, 1923—(*continued*).

Station.	Observer.	Month. June, 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Natal—(continued).		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Estcourt	The Town Clerk	0·23	0·24	− 0·01	13·03	16·57	− 3·54	29·36	28·91	+ 0·45
Klaksa	The Gaoler	0·09	0·68	− 0·59	17·53	22·82	− 5·29	37·32	43·74	− 6·42
Howick	The Gaoler	0·07	0·45	− 0·38	15·74	18·31	− 2·57	33·50	33·34	+ 0·16
Ladysmith	D. A. R. Leathern	0·44	0·20	+ 0·24	12·79	16·22	− 3·43	31·47	28·47	+ 3·00
Maritzburg (Mental Hospital)	The Staff	0·12	0·35	− 0·23	18·11	20·01	− 1·90	40·97	37·27	+ 3·70
Stanger	Cecil C. Foss	0·19	1·00	− 0·81	22·37	20·16	+ 2·21	40·20	42·66	− 2·46
Vryheid	The Gaoler	0·30	0·22	+ 0·08	11·13	18·24	− 7·11	41·60	35·01	+ 6·65
Weenen	The Gaoler	0·06	0·21	− 0·15	7·29	15·24	− 7·95	20·03	27·34	− 7·31
Cape—										
Aliwal North	A. Alcock	1·30	0·56	+ 0·74	14·14	12·60	+ 1·54	25·12	17·47	+ 7·65
Beaufort West	The Gaoler	0·23	0·36	− 0·13	5·51	6·08	− 0·57	8·99	8·49	+ 0·50
Bedford	T. C. Hall	1·52	0·98	+ 0·54	16·71	15·57	+ 1·14	31·50	23·21	+ 8·29
Brittstown	The Gaoler	0·66	0·43	+ 0·23	7·02	8·21	− 1·19	8·13	10·31	− 2·18
Calvinia	The Gaoler	1·85	1·06	+ 0·79	6·44	4·74	+ 1·70	10·95	7·86	+ 3·09
Capetown (Royal Observatory)	The Staff	5·49	4·45	+ 1·04	14·96	12·65	+ 2·31	23·96	24·86	− 0·90
Ceres	A. Heatlie	8·07	6·95	+ 1·12	22·27	18·68	+ 3·59	35·65	40·45	− 4·80
Carnarvon	A. P. Malherbe	0·40	0·33	+ 0·07	6·70	5·65	+ 1·05	7·68	6·87	+ 0·81
Clanwilliam	P. E. Scholtz	3·08	1·51	+ 1·57	7·07	4·33	+ 2·74	10·16	8·44	+ 1·72
Concordia	F. H. Carstens	2·91	0·86	+ 2·05	5·81	3·70	+ 2·11	9·60	6·40	+ 3·20
East London	A. Downie	0·77	1·42	− 0·65	19·23	16·49	+ 2·74	45·35	29·55	+15·80
French Hoek (Driefontein)	The Forester	20·39	23·28	− 2·89	45·91	41·56	+ 4·35	71·05	74·97	− 3·92
Fraserburg	The Gaoler	0·94	0·38	+ 0·56	4·54	4·71	− 0·17	5·35	5·98	− 0·63
Grahamstown	Vet. Res. Officer	0·94	1·37	− 0·43	10·39	14·23	− 3·84	31·03	25·50	+ 5·53
Garies	The Gaoler	1·47	0·85	+ 0·62	2·99	2·47	+ 0·52	6·38	4·84	+ 1·54
Graaff-Reinet	S. E. D. Treadwell	0·66	0·55	+ 0·11	5·81	8·18	− 2·37	11·76	12·48	− 0·72
Groot Drakenstein	Lionel Baker	9·89	6·28	+ 3·61	27·39	17·01	+10·38	40·06	34·49	+ 5·57
Griquatown	The Gaoler	0·00	0·40	− 0·40	9·60	9·21	+ 0·39	11·68	11·13	+ 0·55
Hanover	The Gaoler	0·63	0·48	+ 0·15	10·25	9·13	+ 1·12	14·09	11·55	+ 2·54
Hopetown	The Gaoler	0·49	0·36	+ 0·13	9·45	8·80	+ 0·65	11·85	10·67	+ 1·18
Kenhardt	R. Seydell	0·31	0·25	+ 0·06	8·76	4·23	+ 4·53	9·44	5·19	+ 4·25
Kimberley	F. W. J. Schmidt	0·27	0·28	− 0·01	10·83	10·32	+ 0·51	15·73	13·72	+ 2·01
Kuruman	The Gaoler	2·90	2·14	+ 0·76	15·66	13·60	+ 2·06	31·91	26·47	+ 5·44
Kokstad	H. D. Coyte	0·27	0·47	− 0·20	21·28	15·39	+ 5·89	34·96	22·52	+12·44
Kingwilliamstown	W. A. Kindness	0·59	0·88	− 0·38	13·93	13·43	+ 0·50	31·41	22·55	+ 8·86
Kuruman (Abtonia)	A. T. Sitwell	0·11	0·22	− 0·11	14·16	11·94	+ 2·22	15·42	13·58	+ 1·84
Mafeking (Convent)	The Mother Superior	0·44	0·04	+ 0·40	13·53	13·34	+ 0·19	21·77	18·37	+ 3·40
Mossel Bay (Cape St. Blaize)	The Lightkeeper	1·22	1·26	− 0·04	8·70	8·71	− 0·01	15·27	16·02	− 0·75
Murraysburg	W. H. Rose-Innes	0·82	0·42	+ 0·40	8·18	7·32	+ 0·86	10·01	9·78	+ 0·23
O'okiep	J. Burrows	2·73	1·04	+ 1·69	5·37	3·67	+ 1·70	9·03	6·76	+ 2·27
Philipstown	The Gaoler	0·67	0·46	+ 0·21	7·75	9·29	− 1·54	9·81	11·76	− 1·95

RAINFALL, JUNE, 1923—(*continued*).

Station.	Observer.	Month. June, 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1922.	Normal.	Difference from Normal.
Cape—(continued).		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Piquetberg	The Gaoler	5·31	3·15	+ 2·16	13·06	9·41	+ 3·65	20·08	20·29	− 0·21
Port Elizabeth	The Lightkeeper	2·08	1·67	+ 0·41	12·56	10·25	+ 2·31	25·21	21·17	+ 4·04
Port St. Johns (Cape Hermes)	The Lightkeeper	0·15	1·92	− 1·77	24·78	25·04	− 0·26	48·75	43·09	+ 5·66
Port Nolloth	The Lightkeeper	0·48	0·34	+ 0·14	1·40	1·28	+ 0·12	2·89	2·29	+ 0·60
Prieska	The Gaoler	0·28	0·26	+ 0·02	8·54	7·23	+ 1·31	10·01	8·42	+ 1·59
Queenstown	H. Holley	1·15	0·60	+ 0·55	14·65	13·97	+ 0·68	26·94	19·43	+ 7·51
Steytlerville	The Gaoler	0·46	0·37	+ 0·09	6·88	5·59	+ 1·29	11·78	8·49	+ 3·29
Sutherland	The Gaoler	1·26	1·06	+ 0·20	4·84	5·41	− 0·57	7·42	8·78	− 1·36
Swellendam	The Gaoler	2·75	2·18	+ 0·57	14·98	16·25	− 1·27	28·23	29·44	− 1·21
Sydney's Hope	Rev. S. Rippon	1·47	1·19	+ 0·28	9·09	11·65	− 2·56	22·57	20·51	+ 2·06
Somerset East	C. Harris	1·53	0·99	+ 0·54	11·44	14·26	− 2·82	26·80	22·68	+ 4·12
Stutterheim	F. C. Bousfield	0·68	0·85	− 0·17	26·89	16·62	−10·27	47·02	25·91	+21·11
Uitenhage	H. Ingge	1·22	1·02	+ 0·20	9·90	8·80	+ 1·10	23·90	16·13	+ 7·77
Umtata	Miss N. Dix-Peek	0·36	0·96	− 0·60	19·56	14·46	+ 5·10	33·84	21·88	+11·96
Uniondale	The Gaoler	0·50	1·10	− 0·60	5·84	6·93	− 1·09	10·93	12·63	− 1·70
Upington	The Gaoler	0·04	0·09	− 0·05	8·38	5·21	+ 3·17	9·23	6·23	+ 3·00
Victoria West	The Gaoler	0·27	0·38	− 0·11	7·98	7·23	+ 0·75	9·08	9·36	− 0·28
Vryburg	Chas. Butler	0·34	0·23	+ 0·11	16·16	13·23	+ 2·93	—	14·98	—
Worcester	The Gaoler	2·68	1·94	+ 0·74	4·81	5·87	− 1·06	8·25	12·28	− 4·03
Wynberg (Convent)	Mother Superior	12·82	8·38	+ 4·44	24·54	20·32	+ 4·22	39·80	44·79	− 4·99
Basutoland—										
Maseteng	F. Hodgson	1·62	0·72	+ 0·90	26·71	19·36	+ 7·35	38·08	26·21	+11·87
South-West Africa—										
Tsumeb	Ing. Schetter	0·00	0·03	− 0·03	26·50	16·78	+ 9·72	32·28	24·26	+ 8·02
Waterberg	D. Hahn	0·05	0·05	± 0·00	25·59	14·96	+10·63	27·99	20·04	+ 7·95
Omaruru	The Postmaster	0·13	0·04	+ 0·09	20·17	9·26	+20·91	21·65	11·51	+10·14
Usakos	Rev. Diehl	0·01	0·01	± 0·00	8·24	4·24	+ 4·00	8·82	5·17	+ 3·65
Duesternbrook	I. Matthiessen	0·00	0·00	0·00	22·88	10·08	+12·80	24·93	12·49	+12·44
Gobabis	Rev. Irbe	0·00	0·06	− 0·06	18·20	11·80	+ 6·40	19·43	15·76	+ 3·67
Gr. Witvley	B. Rueckert	0·00	0·07	− 0·07	18·79	11·22	+ 7·57	21·01	14·74	+ 6·27
Windhoek	Observatory	0·00	0·03	− 0·03	26·87	10·93	+15·94	31·46	14·06	+17·40
Maltahoehe	E. Just	0·00	0·01	− 0·01	10·19	5·20	+ 4·99	11·02	6·17	+ 4·85
Voigtsgrund	A. Voigts	0·00	0·09	− 0·09	25·06	4·58	+20·48	26·11	5·98	+20·13
Gibeon	Rev. Spellmeyer	0·00	0·04	− 0·04	11·95	4·78	+ 7·17	12·59	5·97	+ 6·62
Bethany	Rev. Peter	0·00	0·04	− 0·04	10·63	3·38	+ 7·25	10·65	4·18	+ 6·47
Aus	F. [illegible]ni	1·41	0·83	+ 0·58	4·20	3·04	+ 1·16	6·14	4·29	+ 1·85
Keirachabis	Rev. Father Eder	0·05	0·71	− 0·66	5·16	3·52	+ 1·64	5·37	4·56	+ 0·81

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. IV. JULY, 1923. No. 7.

MEAN barometric pressure lower than usual in the north, east, and centre, but practically normal in the west and south; temperature: mean temperature half a degree lower than usual, with days about 2 degrees colder and nights a degree warmer than the corresponding averages; frequent and severe frosts, particularly on the 27th and 29th; an excess of rainfall over the south and west of the Transvaal, the north and east of the Free State, the greater part of Natal, the Cape Province, with the exception of the south, south-west, Namaqualand, Bechuanaland, and Gordonia; some exceptionally heavy falls causing floods in the Transkei on the 19th to 21st; also at Capetown on the 24th; snow with some hail at the higher stations over an extensive area, including a large portion of the Cape, parts of the Free State and Natal on 4th to 5th, 20th to 21st, and 24th to 25th; strong, cold west to south-west winds; absolute drought at many stations in most of the districts of the Transvaal, parts of Bechuanaland and Natal; these were the principal features of the weather of July, 1923.

Pressure.—Mean atmospheric pressure during July was practically a tenth of an inch lower than the average over the Transvaal, Free State, and Natal, and half a tenth over Rhodesia and the centre of the Cape, but practically normal on the west and south coasts. Anticyclonic conditions persisted throughout the month over practically the whole Union. Decided low-pressure areas affected the coastal districts on only three occasions. On the mornings of the 18th and 19th there were indications of a low-pressure system lying near the south coast, and by the next day this was seen to be lying off the Natal coast, the lowest reading of the barometer being 29·87 inches at Durban. Again, on the 24th, northerly to north-westerly winds over the south-west and the pressure of a 30-inch isobar pointed to the oncoming of the depression which lay well over the land from south-west to north-east with a 29·75-inch isobar passing through East London and running north-east to south-west along the coast; this system had disappeared on the 26th. On the 27th, however, a third "low" made its appearance off the south and south-east coast with a minimum reading of 29·88 inches at Cape St. Francis. Although these were the only cases in which the low-pressure areas actually reached the land, there

were strong indications on the 4th and 5th of a "low" passing to the immediate south and south-east of the Union; there were similar indications between the 9th and 13th. During the remainder of the month the country lay under decided high-pressure conditions, the cores of the "highs" fluctuating considerably in position, at one time being in the south-west, at another over the centre, and again over the north-east or east. From this it would appear that the low-pressure areas pursued a path farther south than usual during this month as was indicated by the occasional protrusion southwards of the outer isobars of the equatorial tongue of low pressure.

Temperature.—The mean temperature over the Union during July was 52·3 degrees or 0·4 degree lower than the average. This was entirely due to the mean maximum or day temperature (65·4 degrees) being 1·9 degree lower, whereas the mean minimum or night temperature (39·2 degrees) was 1·1 degree higher than the corresponding normals. A similar state of affairs prevailed over the Provinces, with the exception of the Transvaal, where the mean temperature (51·4 degrees) for the month was 0·3 degree above the average. In this Province the deficit in the mean day temperature (67·0 degrees) was only 0·4 degree, whereas the mean night temperature (35·8 degrees) was 1 degree higher than usual. In Natal, where the mean of the month (57·0 degrees) was sub-normal by 0·7 degree, the mean maximum (69·8 degrees) was 3·4 degrees lower and the mean minimum (44·1 degrees) 1·9 degree higher than the corresponding averages. In the Cape Province, although the temperature of the month (53·1 degrees) was sub-normal by the same amount as in Natal, viz., 0·7 degree, the mean of the day temperatures (64·7 degrees) was only 2·3 degrees lower, whilst the night temperatures with 41·5 degrees were 1·0 degree higher than the average. Conditions in the Free State closely approximated to those in the Cape, the month's mean (46·4) being 0·6 degree below the normal, due to the days with 60·4 degrees being 2·2 degrees below and the nights with 32·4 degrees being 1·0 degree higher than the corresponding normal values. The mean daily range was therefore less than usual in all cases, but the reduction was about four times greater in Natal than in the Transvaal. At the individual stations an excess in mean temperature was confined mainly to the east, south-east, south, and south-west of the Transvaal, Swaziland, the south of the Orange Free State, parts of the north-east, the central Karroo, Kaffraria, Bechuanaland, and the northern border, also at the Royal Observatory in the Cape Peninsula and at Stanger in Natal. At Pietersburg in the north of the Transvaal and Kroonstad in the north of the Free State temperature was normal, but lower than usual elsewhere. The excesses varied between 0·2 degree at Ermelo and 2·6 degrees at Barberton; elsewhere they were about 1 degree or under, falling to 0·1 degree at the Royal Observatory, but rising to 2·7 degrees at Port St. Johns. The deficits showed a similar variation, ranging from 0·4 degree at Zeerust to 2·5 degrees at Belfast in the Transvaal, from 1·6 degree at Harrismith to 0·4 degree at Bloemfontein in the Free State, between 0·2 degree at Durban and Ladysmith and 2·6 degrees at Dundee in Natal; between 1 and 2 degrees in the south-east of the Cape, but commonly a degree or less in the other sections of that Province, although the shortage at Clanwilliam was higher, viz., 1·7 degree. Over the Cape the deficiencies varied between 0·3 degree at Kokstad and Mossel Bay and 2·6 degrees at Grahamstown. Days and nights were both warmer than usual in the eastern Transvaal, in the south-east at Piet Retief, at Potchefstroom in the south-west, and in the northern border of the Cape. On the other hand, both mean maxima and minima were below normal over a portion of the Transvaal high veld between Belfast and Johannesburg, in the east of the Free State, the north of the Transvaal, parts of the south-east and the west coast of the Cape Province, and in Namaqualand. Elsewhere the days were cooler and

the nights warmer than the average. The excesses in the maximum temperatures were mostly between 1 and 2 degrees, but rose to 3·2 degrees at Barberton. The deficits in the day temperatures, although mostly between 2 and 3 degrees, were frequently less than 1 degree over the Transvaal and rose to 5 and 6 degrees at several stations in the Cape, Natal, and Free State. The surplus amounts in the case of the night temperatures were mostly between 1 and 2 degrees, occasionally rising to 3 and 4 degrees, and even in a few instances to 5 and 6 degrees. The warmest station was Stanger, with a mean temperature for the month of 64·8 degrees, and the coldest Belfast, with 42·3 degrees, a difference of 22·5 degrees. The warmest and coldest stations in the Free State were Bethulie with 47·4 degrees and Harrismith with 44·8 degrees, a difference of only 2·6 degrees; in Natal, Stanger with 64·8 degrees and Estcourt with 50·5 degrees, a difference of 14·3 degrees; in the Cape Province, Port St. Johns with 64·2 degrees and Murraysburg with 44·8 degrees, a difference of 19·4 degrees; in the Transvaal, Komatipoort with 64·2 degrees and Belfast with 42·3 degrees, a difference of 21·9 degrees. The highest mean maximum was 81·6 degrees at Komatipoort, and the lowest mean minimum 24·7 degrees at Belfast, a mean range of 56·9 degrees over the country. The highest readings were recorded on sixteen days of the month, viz., 2nd, 4th, 8th, 10th to 13th, 15th to 20th, 25th, 30th, and 31st, most generally over the Transvaal, Free State, and parts of the Cape and Natal on the last day of the month, and frequently on the 17th and 18th in the Cape and on the 11th in Natal. Komatipoort, with an extreme maximum of 91·0 degrees on the 25th, was the only station exceeding 90 degrees during the month. In the other Provinces the highest readings were 88·3 degrees at Stanger in Natal on the 11th; 88·0 degrees at East London and Port St. Johns in the Cape, both on the 18th; and 70·8 at Bethulie in the Free State on the 31st. The lowest readings were registered on thirteen days, viz., 8th to 10th, 15th, 16th, 21st, and 25th to 31st, most widely on the 27th and 29th. The extreme minima were 13·0 degrees at Belfast (Transvaal Province) on the 29th; 18·2 degrees at Lindley (Free State) on the 27th; 21·0 degrees at Vryburg (Cape Province) on the 29th, and 22·0 degrees at Estcourt (Natal) on the 27th. The extreme range was therefore 78·0 degrees during the month, the stations showing the highest and lowest being situated in the Transvaal. In the Cape Province the extreme range was 67·0 degrees, in Natal 66·3 degrees, and in the Free State 52·6 degrees. Radiation frosts, with occasional "freezes," were of almost daily occurrence, particularly in parts of the Transvaal and Free State.

Precipitation.—July is usually the driest month over the Union, as a whole, except in the west and south-west, including the Cape Peninsula, which receive the bulk of their moisture during the winter months. At comparatively few stations in the interior and in the east does the average rise to an inch or more, so that an excess of precipitation can be caused by what may be a comparatively insignificant total rainfall and the deficiencies can be but small under the worst conditions. Light rains occurring at this season, however, may serve a useful purpose in the way of refilling tanks, etc. It is therefore unusual to find such exceptionally heavy rains in the south-east of the Cape and Kaffraria as fell between the 19th and 21st, when quantities between 2 and 10 inches were registered there, causing the rivers to run bank high. Similarly, at Capetown, a heavy rain on the evening of the 24th, described as a "cloudburst" in the daily papers—although the total for the twenty-four hours at Tamboers Kloof only amounted to 2·04 inches—flooded the streets and basements and disorganized the train and tram services for several hours as a consequence of the large quantities of mud brought down from the slopes of Signal Hill. As a result of the unusual rains, which recall in amount and distribution the quantities associated with the snowstorm of 9th to 12th June, 1902, excesses occurred

over the south and west of the Transvaal, the north and east of the Free State, Natal, the east of the Cape, the centre, south, and east of the northern Karroo, the central Karroo, and parts of the south-west, and of the Cape Peninsula. The surplus amounts were mostly from a few hundredths to under 1 inch, except in the south-east of the Cape, where they varied between amounts exceeding 1 inch and 10·9 inches at Port St. Johns; the excesses were also more than an inch at Stanger (Natal) and at one or two stations in the south-west Cape. Over the rest of the Union the rainfall was below normal, commonly by a few hundredths or tenths over the interior, but by amounts exceeding 1 inch in parts of the south-west and by more than 2 inches at Wynberg in the Cape Peninsula, in marked contrast to an excess of 0·18 inch at the Royal Observatory. Although light rains occurred in various divisions of the Transvaal on the 4th, 5th, 7th, 16th, 17th, 19th, and 21st. "nil" was reported from stations in two-thirds of the divisions. Local showers occurred on the 4th in the Free State, particularly in the east and north and light rains were fairly general throughout the Province on the 19th and 20th. In Natal light showers occurred generally in the first and third weeks, good rains being fairly widely experienced on the 21st. Small hail, sleet, and snow, with thunderstorms in a number of places, occurred over a wide area at the higher stations, and particularly on the mountain ranges between Clanwilliam and Kokstad, on the 4th to 6th, 11th, 19th to 21st, 24th to 26th. Hail fell as far north as the district of Kuruman, and snow was most widely reported on the 20th and 21st. Although snow was reported over a very wide area, it appears to have lain on the ground at comparatively few stations, e.g. at Malpas (Division Barkly East) snow fell for twenty-three hours, the total precipitation amounting to 3·09 inches; the snow measured 12½ inches in depth and was stated to be the heaviest since 1900; at Barkly East the ground was white on the 20th; at Elands Heights (Division Maclear) the snow was reported to be 2 feet deep on the 20th; at Avoca (Division Barkly East) snow lay round the house; on some farms to the north-west of Kokstad the snow was stated to be over a foot deep. The heavy rains of the 19th to 21st constituted not only record totals for July at a number of stations, but also included the maximum amounts recorded in twenty-four hours during any month. Rivers rose to flood-level, as at Lusikisiki, Kokstad, etc.; the bridge at Emfundisweni was submerged; at Butterworth a passenger train was derailed, the fireman killed and driver injured, etc. Not only were the rivers in the Transkei affected, but some of the Karroo rivers had a fair run of water, as at Cromdale (Division Aberdeen) and Groot Hoek (Division Graaff-Reinet). In the Caledon District rivers were also flooded on the 25th as at Dunghye Park. The following data will give some idea of the intensity of precipitation from 19th to 21st. At Lusikisiki, the following amounts were recorded: 18th, 0·80 inch; 19th, 3·75 inches; 20th, 9·30 inches; 21st, 0·15 inch; total, 14·00 inches. At Sebeni (District Ngqeleni): 19th, 0·80 inch; 20th, 7·75 inches; 21st, 1·90 inch; total, 10·45 inches. At Libode: 19th, 0·38 inch; 20th, 6·68 inches; 21st, 2·30 inches; total, 9·36 inches. At Port St. Johns: 19th, 3·82 inches; 20th, 7·35 inches; 21st, 0·29 inch; total for three days, 11·46 inches. In South-West Africa there were areas of absolute drought alternating with areas of light rainfall. Thus, from Ondonga to Omaruru and Okandjose no rain fell, whilst in the latitude of Windhoek, between Swakopmund and Gobabis, small amounts of less than one-tenth of an inch were recorded. Farther south, at Rehoboth, absolute drought prevailed during the month; between Haribes and Gibeon and south as far as Keetmanshoop, again, a few tenths were registered; at Aus to the south-west of Bethany the total for the month rose to 0·26 inch; whilst in the south, at Gabis, 0·13 inch was recorded, although at Heirachabis, farther west, only one-hundredth of an inch fell.

The accumulated rainfall since the beginning of the year is mostly above normal except in patches in the north, the eastern high veld, and the south-west of the Transvaal; the north and north-east and south of the Free State, practically the whole of Natal and Zululand, small detached portions of the south-east, central, southern and northern Karroos, and of the south coast and south-west areas. The excesses in the Transvaal varied between 0·43 inch at Heidelberg and 26·04 inches at Pigeonhole; the surplus amounts in the south and west were mostly between 1½ and 3 inches, whereas in the north and east they were generally about 10 inches. The deficits were between 1½ and 3 inches. In the Free State the surplus amounts ranged between 0·45 inch at Lindley to 8·51 inches at Boshof and the shortages from 0·30 inch at Bethulie to 1·56 inch at Kroonstad. In Natal the only excess was that of 3·32 inches at Stanger, and the deficits varied from 1·76 inch at Maritzburg to 8·13 inches at Weenen. In the Cape Province the excess quantities varied between 0·03 inch at Mafeking and 10·90 inches at Kokstad; they were least, under 1 inch, in the south-west of the northern Karroo, the west central Karroo, and the south coast, increasing to 2 to 4 inches in the south-west and northwards towards the Orange River, and to 1½ to 7 inches in the south-east, and 8 to 11 inches in Kaffraria. In Namaqualand the surplus was between ½ inch and 1½ inch. The deficits varied from 0·55 inch at Sutherland to 2·49 inches at Grahamstown. The grand totals since the beginning of the year are above the average, with the exceptions of Franzfontein in the north-west, where there is a shortage of 0·18 inch or 2 per cent., and Swakopmund on the coast, where the amount is normal. Over the rest of the stations the excess ranged between 21 per cent. at Gabis in the south and 309 per cent. at Voigtsgrund in the south central area to the north-west of Gibeon. Almost half the stations had quantities more than double the usual amounts, the largest actual excess being 18·94 inches at Voigtsgrund, although eleven others had surplus amounts over 10 inches. A general idea of the state of the country is contained in the notes below.

OBSERVERS' NOTES FOR JULY, 1923.

TRANSVAAL.

Barberton.—A mild dry month. Rainfall: 0·01 inch on one day.—Walter Grubb.

Bloemhof.—Cold and windy days towards end of month with occasional heavy dust. Rainfall: 0·09 inch on one day.—A. Adamson.

Ermelo.—A bitterly cold month; in fact, the coldest and most trying winter so far of the five I have experienced here. Veld dry, as in this time of year. Stock very poor and struggling gamely against cold. Locusts observed the last fortnight of this month; lots settled; swarms trekked in easterly direction.—Dr. E. B. Theunissen.

Middelburg.—The month has been unusually cold, only two nights being without frost, and the mean maximum temperature being below the average. Cold, biting breezes prevailed, though the days were bright; moderate winds prevailed, though on two or three occasions it increased to "fresh," from westerly to south-westerly. The small amounts of rain which fell were also ususual in the usually rainless month. There are evidences of the break of winter and of the near approach of spring in breaking buds just waiting for a few warm days to open. Rainfall: 0·08 inch on three days.—Dr. H. A. Spencer.

Pietersburg.—Heavy frosts, low temperature, and bitterly cold south winds. Rainfall: 0·07 inch on two days.—W. J. Frankleyne.

Piet Retief.—Very windy month. Rainfall: 0·03 inch on three days.—J. Werner.

Pigeonhole (*New Agatha*).—Very high winds. Rainfall: 0·18 inch on three days.—Jno. McCallum.

Standerton.—Bright, mild weather with good soaking rains on 4th and 5th, when 1·02 inch fell. Hail was present and gave the country a heavy frosty appearance. Rainfall: 1·02 inch on two days.—W. J. Madge.

Wakkerstroom.—Scattered swarms of locusts passed over on the 11th and 12th, but none settled in town. Reports from farms to the south-west show that the locusts are laying there. Rainfall: 0·41 inch on three days.—F. J. Grant.

Gemboksfontein (*Middelburg*).—The weather during the month was very cold; the ground was white with frost practically every morning. Rainfall: 0·12 inch on two days.—C. M. van Coller.

Mosdene (*Naboomspruit*).—A rainless month of bright sunshine, unusually mild till the 27th inst., when a strong south-westerly wind brought about a cold snap, which culminated on the 29th with a drop in temperature to 23·6 degrees.—Ernest E. Galpin.

Carolina.—The month was windy, cold, and dusty. Rainfall: 0·03 inch on one day.—G. F. Mijnhardt.

Lichtenburg.—A month of cold nights, but genial during the day. Farmers busy preparing their ground for crops; also busy shelling their mealies. The wheat seems to be thriving. Rainfall: 0·56 inch on two days.—E. Newton.

Pampoenkraal (*Wakkerstroom*).—Another month of this severe winter gone. The weather has been abnormally cold the last few days. About the 19th a genial feeling came into the atmosphere and filled us with hope of better days coming for the poor quarantined cattle, but all ended in disappointment. Old residents in these parts tell me they have never experienced such a hard winter here. Rainfall: 0·04 inch on one day.—Mrs. S. M. Nicolson.

Krugersdorp.—Climatic conditions during the month have not been unpleasant, for although the mean temperature has been below the average no very severe extremes have been experienced. Rain was recorded on four days, the total amount being 0·94 inch. This amount is well above the average, and has only on one occasion, namely, 1915, been exceeded since records have been kept here.—H. Sharp.

Groeneboom (*Rustenburg*).—Winter up to the end of the month very mild. A few heavy frosts on station during last week. The month marked itself by strong winds, very cold when blowing from south-south-east. Beginning of month grass still greenish, and few veld fires. After the frosts, grass dry and veld burning everywhere. Locusts all over the veld. All winter sowings (wheat) destroyed by locusts. Cattle in good condition. Rainfall: 0·05 inch on one day.—F. N. van Nouhuys.

Zwaartfontein (*Middelburg*).—Locusts all over farm. Rainfall: 0·23 inch on one day.—C. S. Hodgson.

Riverside (*Middelburg*).—Very cold the whole month. Wheat and oats frostbitten. Large swarm of locusts here; a great portion destroyed by burning veld. Rainfall: Nil.—M. Scher.

Badfontein (*Lydenburg*).—Winter crops looking well. Veld very dry. Rainfall: Nil.—L. Parker.

White Hills (*Barberton*).—Considerable damage done to five acres of cabbages, tomato plants, and seedling gum-trees by the hail on 7th, which fell from 4 p.m. to 4.40 p.m. Hail much larger on lower half of farm. Rainfall: 0·94 inch on one day.—L. Lownds.

Kamhlabane Ranch (*Barberton*).—The cattle are in rather poor condition, and if we do not have rain soon there will be no feeding at all for them.—Rainfall: Nil.—H. B. Trollip.

SWAZILAND.

Mbabane.—The country is very dry and stock are suffering generally, especially sheep wintering in the country. Rainfall: Nil.—R. C. S. Markham.

ORANGE FREE STATE.

Holfontein (*Kroonstad*).—Some very cold nights were experienced during the month—the days, however, were fine. Stock in general are still in fair condition. Most of the farmers in the neighbourhood have completed their thrashing and are busy ploughing again. Rainfall: 0·52 inch on two days.—L. C. McInerney.

Modderpoort (*Ladybrand*).—On the 25th it was calm in the morning, but after midday we had a duststorm, with a strong south wind. The heaviest frost (8·2 degrees) was on the 29th. Rainfall: 0·79 inch on three days.—J. E. Berry.

Rugby (*Bethlehem*).—A month of wind, varying from west to south-west and south; at times bitterly cold. Sheep suffering much from depredations of locusts, and losses generally are rather heavy, especially among lambing ewes. Winter-sown crops in many cases were eaten down below crowns, and have not and will not recover. Rainfall: 0·95 inch on two days.—A. C. Glynn Baker.

Middelfontein (*Bethulie*).—On the whole, so far, the winter has been mild and prospects are fairly favourable. There has been no recurrence of the locusts. Rainfall: 0·62 inch on two days.—H. J. Joubert.

Smithkraal (*Boshof*).—It is characteristic of the mildness of this winter that horses have never ceased to die from horse-sickness. Rainfall: 0·16 inch on one day.—K. Leo.

Prospect (*Vrede*).—The weather during the month has been very variable. The first rain (4th) was followed by mild weather; the latter (20th) was cold and succeeded by cold winds. There was an unusual number of windy days for July. There were constantly locusts about during the early part of the month, and they bred. Many died and many disappeared before the month ended. Rainfall: 0·47 inch on two days.—T. Pitcairn.

NATAL.

Dundee.—A very fine month generally. Frost and ice continued on and off until the last day of the month. This month has been much more severe generally than 1922. Rainfall: 0·32 inch on three days.—West Thorrold.

Durban (*Point*).—Commencing dull and gloomy to fine and genial weather remainder of month. Rainfall: 0·84 inch on four days.—The Port Captain.

Hlabisa.—Good rains fell on the 22nd, which were badly needed. Rainfall: 1·05 inch on one day.—F. W. Olmesdahl.

Ladysmith.—With the exception of a few windy days, a very pleasant month. Rainfall: 1·57 inch on four days. This is rather unusual for July and is the heaviest fall for this month for some years.—D. A. R. Leathern.

Mid-Illovo.—Rainfall: 1·46 inch on six days, including 1·16 inch on 21st, accompanied by thunder. Maximum temperature: 80·0 degrees on 11th. Minimum temperature: 40·0 degrees on 27th. Grass-burning after the rains, 19th to 22nd, resulted in patches of green veld here and there.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Newcastle.—During the month we had high winds and heavy frost. The month has been very dry. Rainfall: 0·11 inch on three days.—The Gaoler.

Impendhle.—A very calm month. Cold nights and occasional cold snaps from snow on adjacent hills in the daytime. Cattle in good winter condition. Rainfall: 0·95 inch on five days.—F. H. Biddulph.

Nottingham Road.—Mild nights followed by very frosty nights made the winter very trying for stock and vegetation. Many trees have died from drought. Rainfall: 0·84 inch on eight days.—Miss E. Smythe.

Goedgeraden (Louwsburg).—Heavy losses amongst the stock owing to the dry veld. Rainfall: Nil.—J. C. Klopper.

Rongpoort (Weenen).—Exceedingly severe month; frost and ice almost every morning. Sleet on the 20th and a slight fall of snow during the night of the 21st. No sign of anything springing owing to severe cold. Rainfall: 0·97 inch on five days.—J. H. Bartholomew.

CAPE.

Aliwal North.—Generally fine and bright days. Rainfall: 0·71 inch on seven days, of which 0·60 inch fell on the 19th.—Alex. Alcock.

Bedford.—Weather trying, owing to cutting, cold winds. Evidence of early spring as peach trees are showing a desire to blossom. Rainfall: 1·42 inch on five days.—Thos. C. Hall.

Carnarvon.—Soft, soaking general rains—18th, 0·33 inch, and 19th, 0·38 inch—at very opportune time.—A. P. Malherbe.

Clanwilliam.—Greater part of month fairly warm during day; last week frost several mornings. Very cold during morning. Snow on mountains for several days. Rainfall: 0·94 inch on five days.—Mrs. M. A. Scholtz.

Grahamstown.—Exceptionally dry until rain fell on 19th (2·39 inches in 22½ hours). Many swarms of locusts in district laying eggs. Worm infestation of Persian sheep abating; now located in several Merino flocks. Rainfall: 2·49 inches on four days.—The Veterinary Research Officer.

Groot Drakenstein.—Temperature normal, days cooler, but nights warmer than usual. Fruit trees blossoming early. Almonds are in blossom, and apricots and plums beginning to blossom. Oaks budding. Sunshine deficient. Rainfall: 6·55 inches on fifteen days.—Lionel Baker.

Kokstad.—Exceptionally heavy rains 19th, 20th, and 21st; on latter date 4·31 inches fell—a record here for one day's fall, the nearest being 3·22 inches on 31st May, 1905. Rivers ran bank-high, and several travellers had narrow escapes. Snow over a foot deep was reported on some farms north-west of town. Snow still on Mount Currie on 31st. Rain will do immense good. Rainfall: 5·24 inches on six days.—H. D. Coyte.

Murraysburg.—Soft, soaking rains—0·98 inch on three days. Slight fall of snow on 27th. Prospects for the spring much improved. Farmers are optimistic for good lambing season. Winter milder than last year.—W. H. Rose-Innes.

Port St. Johns.—Rainfall: on 19th, 3·82 inches, and 20th, 7·35 inches—heaviest known here for past fourteen years. Four miles inland registered 16·30 inches during same period. Heavy wind during rainfall. Rivers in district all in flood. Umgazi River running to 25 feet.—A. W. Edwards.

Queenstown.—Unusual rain for July—1·38 inch on four days. Every prospect of an early spring.—H. Holley.

Stutterheim.—Splendid rains—19th, 1·64 inch, and 20th, 0·81 inch; weather mild. All green crops and new grass destroyed by locusts. Rainfall: 2·67 inches on four days.—F. C. Bousfield.

Cathcart.—25th, fine in the forenoon, clouded over at 2 p.m. with rain and sleet, cleared at 3 p.m. Strong northerly winds all through the month, occasionally veering to the west and east. Rainfall: 1·07 inch on four days.—C. E. Whibley.

Queenstown.—Mild month, on the whole, for winter. Four severe frosts only. A good deal of wind from the west. Rainfall: 1·19 inch on four days.—J. F. C. Rein.

Liwandi, Addo (Uitenhage).—This has been a very uninteresting month from an observer's point of view. The 2·26 inches of rain on the 19th is a cheerful feature of the month. Locusts are laying eggs over a large area in the Addo Bush as well as in sandy patches on the Settlements. What a legacy for years to come! The end of the month brought a very cold snap with frost on two mornings. Lake Mentz has 36 feet of water in it, and a watering is being given to irrigators during the last week of August. Rainfall: 2·55 inches on five days.—Major J. Kreft.

Darling (Malmesbury).—No particular features—conditions quite good. Rainfall: 2·78 inches on fourteen days.—P. H. Drake.

Louisvale (Upington).—The weather has been exceptionally fine during the month. Cloudless days and clear nights. Frost was only registered on eight occasions. Cattle and stock are in good condition. Wheat crop promises well. Rainfall: 0·05 inch on one day.—Stuart M. Smith.

Danger Point.—Very cold winds. Strong south-westerly seas running irrespective of winds. Rainfall: 12·52 inches on eleven days.—H. H. Hews.

Sydney-on-Vaal (Barkly West).—Exceedingly mild month as there were comparatively few frosts and the maximum temperatures were frequently high. Deciduous trees did not lose their leaves until the end of the month, and rosebushes started shooting afresh early in the month.—Rainfall: Nil. J. G. Richards.

Capetown.—The weather during the first three weeks was variable—dull, rainy, and fine days. On the evening of the 24th a "cloud burst" over the city, flooded basements, disorganized train and taxi services, causing much inconvenience to such frequenters of places of amusements as were unprepared, but no serious damage has been reported. The remainder of the month was dull and showery, with occasional fine days.—A. Russell Fraser.

Upington.—Veld dry. Exceedingly fine weather during July. Rainfall: 0·04 inch on two days.—E. H. Jones.

Moira (Uitenhage).—Locusts in small numbers throughout the month. The recent rains are freshening up the veld and crops eaten off by these pests. Rainfall: 2·17 inches on five days.—J. H. Champion.

Sledmere (Cathcart).—Wheat, barley, and oats have been destroyed by locusts, so there will be no crops in this district. Rainfall: 2·07 inches on four days.—J. C. Froneman.

Bechuanaland.

Dikgatlong Ranch.—There is nothing very unusual to report for this month. Weather has been normal for the time of year. Several swarms of flying locusts have passed from the west, probably bent on laying their eggs. Rainfall: Nil. —Paul Jousse.

Kalamarie.—Small swarms of flying locusts have been all around this district during the month and are still hanging around right on to Mahalapye station.—E. Smith.

Mahalapye.—Mildness of the month most marked. Veld still green underneath long grass. Locusts reported from all parts. Rainfall: Nil.—Miss M. Giles.

BASUTOLAND.

Mafeteng.—Fine soaking rains fell on the 19th—0·75 inch. Cold nights; fine sunny days. Rainfall: 0·85 inch on two days.—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.

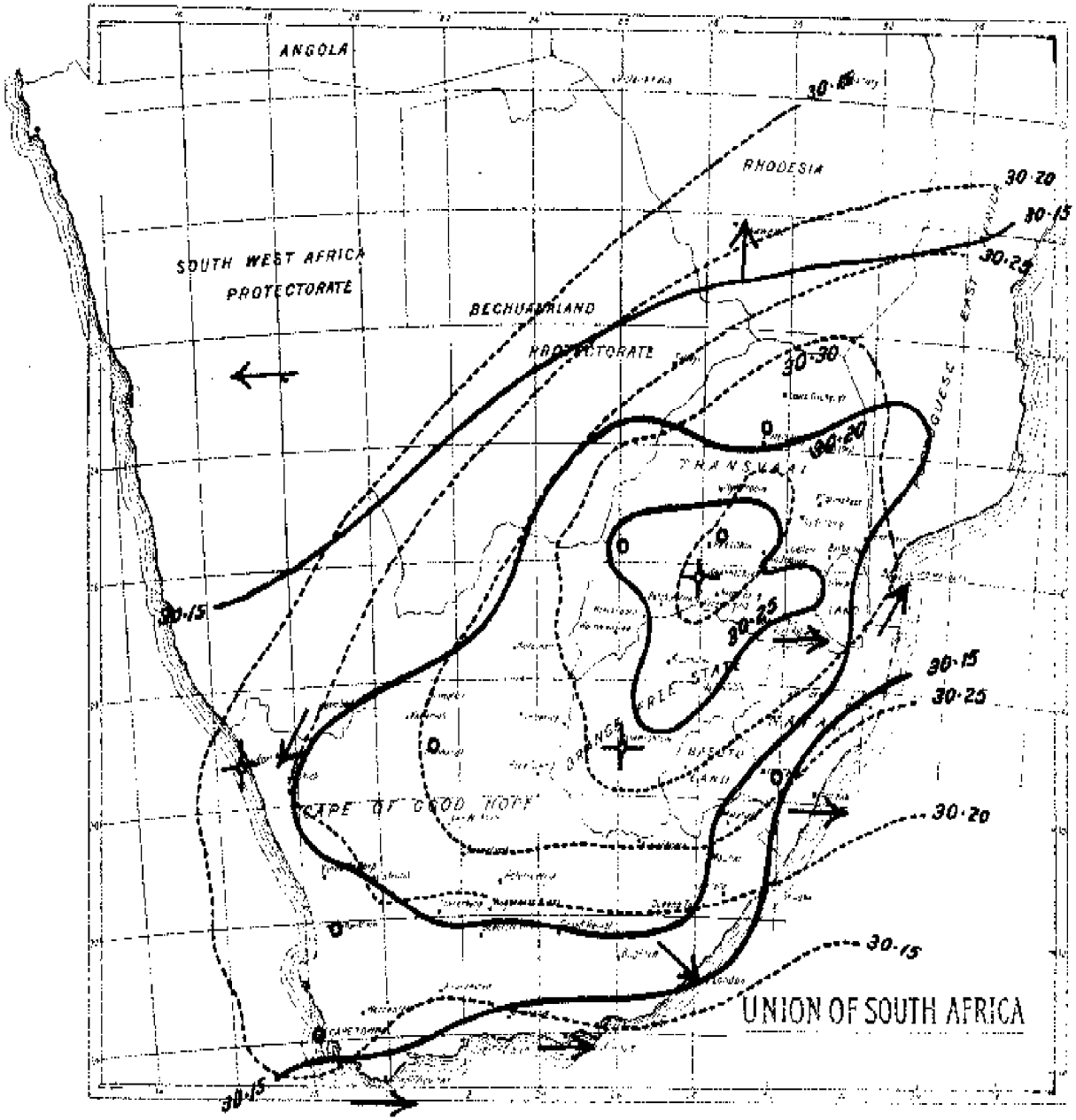
There will be a general rise in temperatures, the normals ranging from about 66 degrees in Natal and the eastern Transvaal, through 60 degrees on the Transvaal high veld, and 58 degrees in the Orange Free State, to 55 degrees in Basutoland and on the northern Karroo. Frosts may, nevertheless, reasonably 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 points between south-east round by east to north-north-west, particularly of those from north, but a decrease of all others, more especially of those from south, south-south-west, and north-west; at Kimberley the reverse obtains, viz., a diminution in frequency of winds between north-north-west and east-south-east, chiefly of those from north-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.

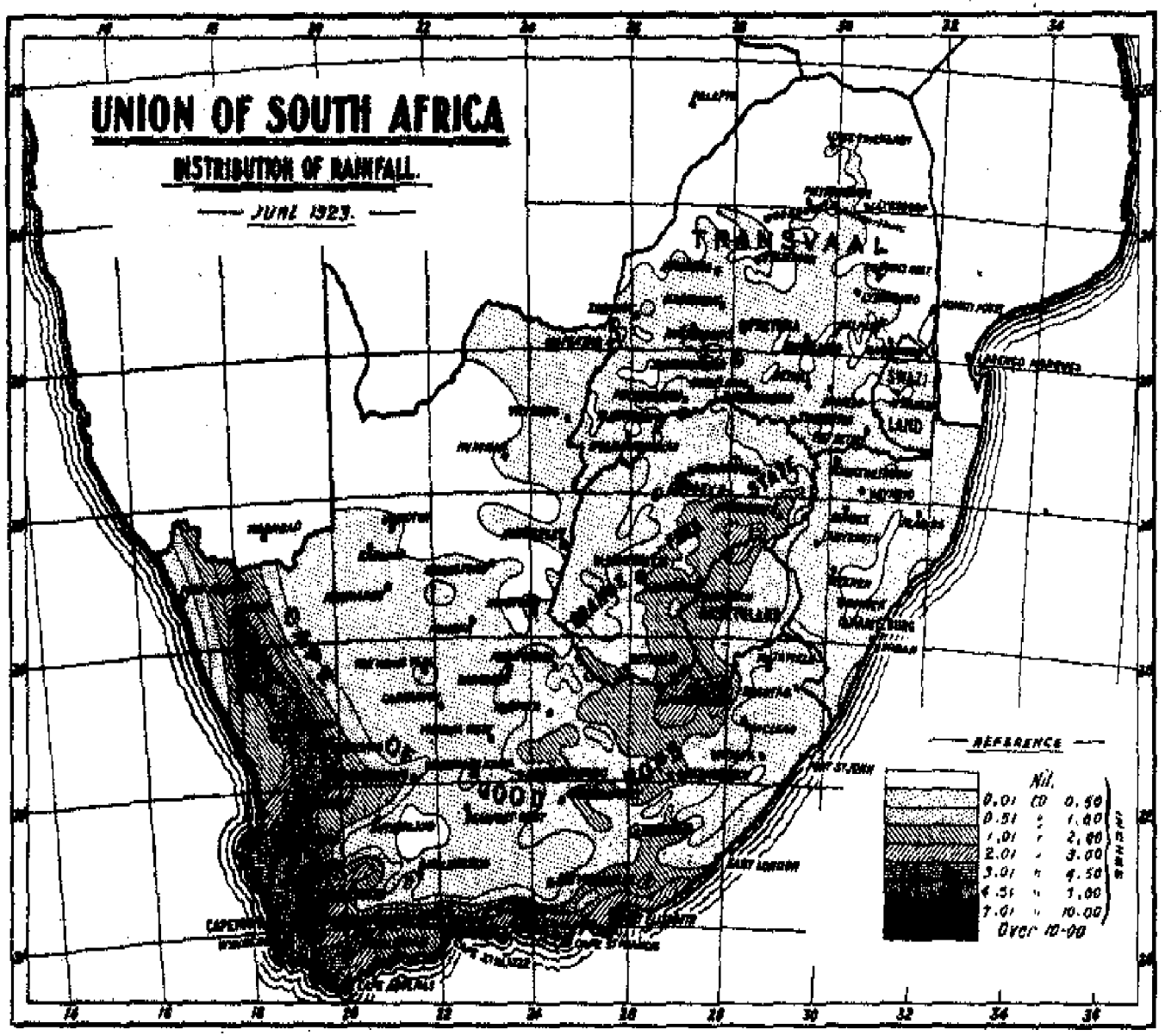
C. STEWART,
Chief Meteorologist.

Pretoria.

N°101.



July, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for July.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
JUNE 1923.
TRANSVAAL
SWAZI LAND
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
Inches

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), JULY, 1923.

Station.	Observer.	Month—July, 1923. Mean Max.	Month—July, 1923. 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	74·6	49·3	62·0	59·4	+ 2·6	83·0	12th and 31st	43·0	29th and 30th.
Belfast	The Forester	59·9	24·7	42·3	44·8	− 2·5	69·0	31st	13·0	29th.
Bloemhof	A. Adamson	66·8	35·8	51·3	49·0	+ 2·3	77·3	31st	22·0	29th.
Ermelo	Dr. E. B. Theunissen.	61·6	32·8	47·2	47·0	+ 0·2	68·8	4th	22·2	29th.
Johannesburg (Observatory)	The Staff	58·6	40·0	49·3	50·4	− 1·1	65·0	16th and 31st	28·8	26th.
Klerksdorp (Strathmore)	Chas. Scott	65·8	33·0	49·4	50·2	− 0·8	74·0	30th	20·0	27th.
Komatipoort	Messrs. H. J. Evans B. J. Fothergill	81·6	46·9	64·2	63·0	+ 1·2	91·0	25th	37·0	10th.
Louis Trichardt	—	—	—	—	55·7	—	—	—	—	—
Middelburg	Dr. H. A. Spencer	66·8	28·0	47·8	48·2	− 0·4	75·0	31st	19·0	27th and 29th.
Nylstroom	G. Bakker	69·6	34·5	52·0	52·6	− 0·6	77·0	31st	25·9	27th.
Pietersburg	W. J. Frankleyne	68·4	36·7	52·6	52·6	± 0·0	77·0	31st	29·0	27th and 30th.
Piet Retief	J. Werner	67·2	39·8	53·5	53·1	+ 0·4	74·0	12th	29·5	29th.
Pigeonhole (New Agatha)	Jno. McCallum	65·5	49·5	57·5	—	—	72·0	12th and 31st	43·0	21st.
Pilgrims Rest	A. Kiernander	69·0	36·1	52·6	51·8	+ 0·8	79·0	31st	30·0	10th and 29th.
Potchefstroom (Exp. Farm)	The Manager	67·2	34·8	51·0	48·9	+ 2·1	74·5	30th	22·0	27th and 29th.
Pretoria (Meteorological Office)	The Staff	66·6	37·4	52·0	51·7	+ 0·3	72·5	16th	26·8	27th.
Standerton	W. J. Madge	63·0	27·0	45·3	44·6	+ 0·7	69·6	—	14·6	30th.
Zeerust	H. Dietrich	65·9	34·0	50·0	50·4	− 0·4	72·1	25th	21·3	29th.
Swaziland—										
Mbabane	Swaziland Police	67·7	43·5	55·6	55·4	+ 0·2	75·0	30th	37·0	8th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	61·6	33·3	47·4	47·0	+ 0·4	70·8	31st	25·0	9th and 29th.
Bloemfontein	G. A. Schepers	60·9	33·6	47·2	47·6	− 0·4	69·3	31st	22·2	29th.
Harrismith	The Forester	55·0	34·1	44·8	46·4	− 1·6	65·0	13th	25·0	29th.
Kroonstad	*S. R. Northfield*	*53·0*	*31·3*	*47·2*	*47·2*	*± 0·0*	*69·8*	*31st*	*19·2*	*27th.*
Ladybrand	The Forester	59·4	32·7	46·0	46·8	− 0·8	67·0	30th and 31st	23·0	27th.
Lindley	J. Collister-Oates	61·6	29·6	45·6	47·0	− 1·4	68·0	31st	18·2	27th.
Natal—										
Dundee	West Thorrold	67·2	36·4	51·8	54·4	− 2·6	75·0	11th and 30th	25·0	10th.
Durban (Point)	The Port Captain	72·5	56·4	64·4	64·6	− 0·2	86·2	18th	50·0	27th.
Estcourt	The Town Clerk	67·0	34·0	50·5	51·6	− 1·1	79·0	2nd and 11th.	22·0	27th.
Ladysmith	D. A. R. Leathern	67·0	38·7	52·8	53·0	− 0·2	76·0	30th	29·0	9th.
Maritzburg (Mental Hospital)	The Staff	70·7	43·8	57·2	58·6	− 1·4	85·2	11th	36·0	26th.
Stanger	Cecil C. Foss	74·3	55·3	64·8	63·8	+ 1·0	88·3	11th	46·0	27th.
Weenen	The Gaoler	—	—	—	52·3	—	—	—	—	—

AIR TEMPERATURES, JULY, 1923—(*continued*).

Station.	Observer.	Month—July, 1923.		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—										
Aliwal North	A. Alcock	61·3	32·4	46·8	46·4	+ 0·4	70·0	31st	21·5	29th.
Bedford	T. C. Hall	63·7	43·0	53·4	54·5	− 1·1	76·5	18th	33·0	29th.
Capetown (Royal Observatory)	The Staff	62·0	47·8	54·9	54·8	+ 0·1	75·6	8th	37·3	28th.
Carnarvon	A. P. Malherbe	59·6	33·0	46·3	47·0	− 0·7	69·0	10th	25·0	8th.
Clanwilliam	Mrs. M. A. Scholtz	65·8	39·2	52·5	54·2	− 1·7	82·0	17th	33·8	9th.
East London	The Port Captain	69·5	49·4	59·4	60·0	− 0·6	88·0	18th	42·0	27th.
Graaff-Reinet	S. E. D. Treadwell	65·1	41·7	53·4	53·0	+ 0·4	76·4	30th	33·5	28th.
Grahamstown	The Vet. Res. Officer	63·9	40·4	52·2	54·8	− 2·6	80·4	10th	32·4	30th.
Groot Drakenstein	Lionel Baker	62·6	44·4	53·5	54·0	− 0·5	76·7	17th	36·6	31st.
Kenhardt	R. Seydell	66·5	35·3	50·9	51·3	− 0·4	78·0	30th	26·0	27th.
Kimberley	F. W. J. Schmidt	65·9	37·5	51·7	50·6	+ 1·1	75·0	31st	27·0	27th.
Kingwilliamstown (Club)	W. A. Kindness	67·6	43·9	55·8	57·3	− 1·5	82·0	18th	34·0	29th.
Kokstad	H. D. Coyte	63·0	34·1	48·6	48·9	− 0·3	73·6	11th	23·9	29th.
Mafeking (Convent)	The Mother Superior	67·5	36·9	52·2	53·6	− 1·4	75·0	31st	23·0	27th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	63·9	51·2	57·6	57·9	− 0·3	82·0	17th	41·0	25th.
Murraysburg	W. H. Rose-Innes	59·8	29·9	44·8	45·9	− 1·1	69·0	30th	22·7	20th.
O'okiep	J. Burrows	62·0	42·5	52·2	53·2	− 1·0	74·7	15th	33·4	26th.
Port Elizabeth	The Lightkeeper	65·2	49·1	57·2	58·8	− 1·6	80·0	17th	40·0	20th.
Port Nolloth	The Lightkeeper	64·2	44·4	54·3	55·0	− 0·7	85·0	17th	37·0	16th and 31st.
Port St. Johns (Cape Hermes)	The Lightkeeper	71·5	56·9	64·2	61·5	+ 2·7	88·0	18th	50·0	27th and 29th.
Queenstown	H. Holley	61·4	37·9	49·6	51·4	− 1·8	73·0	31st	27·0	29th.
Somerset East	C. Harris	64·4	41·2	52·8	54·2	− 1·4	77·6	18th	30·8	29th.
Stutterheim	F. C. Bousfield	64·5	43·5	54·0	54·8	− 0·8	75·4	10th	32·8	29th.
Sydneys Hope	Rev. S. Rippon	62·4	45·2	53·8	56·0	− 2·2	75·2	18th	38·0	13th.
Ultenhage	H. Inggs	69·6	42·4	56·0	57·4	− 1·4	84·5	17th	31·0	29th.
Umtata	Miss N. Dix Peek	68·5	38·5	53·5	54·0	− 0·5	79·3	17th	27·9	9th.
Vryburg	Chas. Butler	66·3	32·9	49·6	48·9	+ 0·7	75·0	31st	21·0	29th.
Wynberg (Convent)	The Mother Superior	62·0	47·2	55·0	56·0	− 1·0	76·8	17th	41·0	29th.
Basutoland—										
Mafeteng	F. Hodgson	56·1	34·9	45·5	48·4	− 2·9	64·0	31st	26·0	26th.

RAINFALL, JULY, 1923.

Station.	Observer.	Month. July, 1923.	Normal.	Difference from Normal.	From 1st January, 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—							
Barberton	W. Grubb	0·01	0·30	− 0·29	19·58	18·07	+ 1·51
Belfast	The Forester	0·08	0·26	− 0·18	14·81	16·78	− 1·97
Bethal	H. F. Joubert	0·20	0·17	+ 0·03	16·63	14·17	+ 2·46
Bloemhof	A. Adamson	0·09	0·32	− 0·23	9·98	12·14	− 2·16
Claremont	S.A. Police	0·07	0·04	+ 0·03	12·49	10·79	+ 1·70
Ermelo	The Forester	0·09	0·28	− 0·19	8·16	14·83	− 6·67
Haenertsburg	S.A. Police	0·82	0·57	+ 0·25	35·97	24·95	+ 11·02
Heidelberg	W. ter Horst	0·93	0·31	+ 0·62	15·09	14·66	+ 0·43
Johannesburg (Observatory)	The Staff	1·04	0·33	+ 0·71	18·31	16·68	+ 1·63
Kierksdorp (Strathmore)	C. Scott	0·57	0·33	+ 0·24	14·80	13·81	+ 0·99
Komatipoort	H. J. Evans and R. J. Fothergill	0·72	0·31	+ 0·41	31·61	18·05	+ 13·56
Louis Trichardt	F. J. Labuschagne	0·90	0·49	+ 0·40	33·04	18·68	+ 14·36
Middelburg	Dr. H. A. Spencer	0·08	0·09	− 0·01	16·27	14·95	+ 1·32
Nylstroom	*G. Bakker*	*0·00*	*0·20*	*− 0·20*	*17·01*	*14·31*	*+ 2·70*
Pietersburg	W. J. Franklyne	0·07	0·23	− 0·16	10·16	11·61	− 1·45
Piet Retief	J. Werner	0·03	0·34	− 0·31	17·70	15·90	+ 1·80
Pigeonhole (New Agatha)	J. McCallum	0·18	0·87	− 0·69	55·76	29·72	+ 26·04
Pilgrims Rest	A. Kiernander	0·12	0·38	− 0·26	38·89	26·13	+ 12·76
Potchefstroom (Exp. Farm)	The Manager	0·30	0·32	− 0·02	14·02	12·98	+ 1·04
Pretoria (Meteorological Office)	The Staff	0·19	0·23	− 0·04	17·90	16·15	+ 1·75
Roodberg	N. H. Munro	0·08	0·28	− 0·20	15·80	14·45	+ 1·35
Rustenburg	A. Streatfield	0·45	0·40	+ 0·05	18·67	14·89	+ 3·78
Standerton	W. J. Madge	1·02	0·34	+ 0·68	19·43	15·21	+ 4·22
Wakkerstroom	F. J. Grant	0·41	0·39	+ 0·02	—	17·21	
Woodbush	The Forester	0·29	0·99	− 0·70	70·44	46·22	+ 24·22
Zeerust	H. Dietrich	0·39	0·23	+ 0·16	17·55	14·40	+ 3·15
Swaziland—							
Mbabane	Swaziland Police	0·00	0·67	− 0·67	43·44	30·20	+ 13·24
Orange Free State—							
Bethulie	J. J. Wardhaugh	0·35	0·36	− 0·01	11·47	11·77	− 0·30
Bloemfontein	G. A. Schepers	0·31	0·36	− 0·05	20·89	14·25	+ 6·64
Boshof	The Postmaster	0·30	0·31	− 0·01	20·91	12·40	+ 8·51
Harrismith	The Forester	1·22	0·35	+ 0·87	14·61	15·87	− 1·26
Kroonstad	S. R. Northfield	0·51	0·29	+ 0·22	13·04	14·60	− 1·56
Ladybrand	The Forester	0·77	0·50	+ 0·27	16·60	15·78	+ 0·82
Lindley	J. Collister-Oates	0·54	0·30	+ 0·24	14·29	13·84	+ 0·45
Natal—							
Dundee	W. Thorrold	0·32	0·23	+ 0·09	13·42	17·89	− 4·47
Durban (Point)	The Port Captain	0·84	1·21	− 0·37	18·77	22·00	− 3·23
Estcourt	The Town Clerk	0·87	0·26	+ 0·61	13·99	16·83	− 2·93
Hlabisa	The Gaoler	1·05	0·91	+ 0·14	18·58	23·73	5·15

RAINFALL, JULY, 1923—(*continued*).

Station.	Observer.	Month. July, 1923.	Normal.	Difference from Normal.	From 1st January, 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Howick	The Gaoler	0·51	0·32	+ 0·19	16·25	18·63	− 2·38
Ladysmith	D. A. R. Leuthern	1·57	0·20	+ 1·37	14·36	16·42	− 2·06
Maritzburg	The Staff	0·49	0·35	+ 0·14	18·60	20·36	− 1·76
Stanger	C. C. Foss	2·19	1·08	+ 1·11	24·56	21·24	+ 3·32
Vryheid	The Gaoler	0·00	0·37	− 0·37	11·13	18·61	− 7·48
Weenen	The Gaoler	0·63	0·18	+ 0·45	7·29	15·42	− 8·13
Cape Province—							
Aliwal North	A. Alcock	0·71	0·41	+ 0·30	14·85	13·01	+ 1·84
Beaufort West	The Gaoler	1·07	0·27	+ 0·80	6·58	6·35	+ 0·23
Bedford	T. C. Hall	1·42	0·65	+ 0·77	18·13	16·22	+ 1·91
Britstown	The Gaoler	0·50	0·24	+ 0·26	7·52	8·45	− 0·93
Calvinia	The Gaoler	1·00	0·91	+ 0·09	7·44	5·65	+ 1·79
Capetown (Royal Observatory)	The Staff	3·73	3·55	+ 0·18	18·69	16·20	+ 2·49
Ceres	A. Heatlie	5·01	6·07	− 1·06	27·28	24·75	+ 2·53
Carnarvon	A. P. Malherbe	0·71	0·21	+ 0·50	7·41	5·86	+ 1·55
Clanwilliam	Mrs. M. A. Scholtz	0·94	1·39	− 0·45	8·01	5·72	+ 2·29
Concordia	F. H. Carstens	0·53	0·67	− 0·14	6·34	4·37	+ 1·97
East London	A. Downie	5·93	1·23	+ 4·70	25·16	17·72	+ 7·44
French Hoek (Driefontein)	The Forester	11·92	11·60	+ 0·32	57·83	53·16	+ 4·67
Fraserburg	The Gaoler	0·50	0·29	+ 0·21	5·04	5·00	+ 0·04
Grahamstown	Vet. Res. Officer	2·49	1·14	+ 1·35	12·88	15·37	− 2·49
Garies	The Gaoler	0·71	0·71	± 0·00	3·70	3·18	+ 0·52
Graaff-Reinet	S. E. D. Treadwell	1·35	0·43	+ 0·92	7·16	8·61	− 1·45
Groot Drakenstein	L. Baker	6·55	5·25	+ 1·30	33·94	22·26	+ 11·68
Griquatown	The Gaoler	0·16	0·21	− 0·05	9·76	9·42	+ 0·34
Hanover	The Gaoler	0·36	0·37	− 0·01	10·61	9·50	+ 1·11
Hopetown	The Gaoler	0·60	0·26	+ 0·34	10·05	9·06	+ 0·99
Keuhardt	R. Seydell	0·23	0·20	+ 0·03	8·99	4·43	+ 4·56
Kimberley	F. W. J. Schmidt	0·35	0·30	+ 0·05	11·18	10·02	+ 0·50
Knysna	The Gaoler	1·07	2·15	− 1·08	16·73	15·81	+ 0·92
Kokstad	H. D. Coyte	5·24	0·23	+ 5·01	26·52	15·62	+ 10·90
Kingwilliamstown	W. A. Kindness	4·65	1·00	+ 3·65	18·58	14·43	+ 4·15
Kuruman (Abtonia)	A. T. Sitwell	0·16	0·24	− 0·08	14·32	12·18	+ 2·14
Mafeking (Convent)	The Mother Superior	0·24	0·40	− 0·16	13·77	13·74	+ 0·03
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·60	1·22	− 0·62	9·30	9·93	− 0·63
Murraysburg	W. H. Rose-Innes	0·98	0·29	+ 0·69	9·16	7·61	+ 1·55
O'okiep	J. Burrows	0·52	0·85	− 0·33	5·89	4·52	+ 1·37
Phillipstown	The Gaoler	0·37	0·29	+ 0·08	8·12	9·58	− 1·46
Piquetberg	The Gaoler	2·85	2·84	+ 0·01	15·91	12·25	+ 3·66
Port Elizabeth	The Lightkeeper	2·80	1·87	+ 0·93	15·36	12·12	+ 3·24
Port St. Johns (Cape Hermes)	The Lightkeeper	12·01	1·11	+ 10·90	36·79	26·15	+ 10·64
Port Nolloth	The Lightkeeper	0·20	0·33	− 0·13	1·60	1·61	− 0·01
Prieska	The Gaoler	0·25	0·21	+ 0·04	8·79	7·44	+ 1·35
Queenstown	H. Rolley	1·38	0·54	+ 0·84	16·03	14·51	+ 1·52

RAINFALL, JULY, 1923—(*continued*).

Station.	Observer.	Month. July, 1923.	Normal.	Difference from Normal.	From 1st January, 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Steytlerville	The Gaoler	0·98	0·21	+ 0·77	7·86	5·80	+ 2·06
Sutherland	The Gaoler	0·98	0·96	+ 0·02	5·82	6·37	− 0·55
Swellendam	The Gaoler	1·64	2·17	− 0·53	16·62	18·42	− 1·80
Sydney's Hope	Rev. S. Rippon	2·48	0·94	+ 1·54	11·57	12·59	− 1·02
Somerset East	C. Hargis	1·92	0·73	+ 1·19	13·36	14·99	− 1·63
Stutterheim	F. C. Bousfield	2·67	0·59	+ 2·08	29·56	17·21	+ 12·35
Uitenhage	H. Inggs	2·56	0·76	+ 1·80	12·46	9·56	+ 2·90
Umtata	Miss N. Dix Peck	3·68	0·52	+ 3·16	23·24	14·98	+ 8·26
Uniondale	The Gaoler	0·33	0·97	− 0·64	6·17	7·90	− 1·73
Upington	The Gaoler	0·04	0·12	− 0·08	8·42	5·33	+ 3·09
Victoria West	The Gaoler	0·93	0·28	+ 0·65	8·91	7·51	+ 1·40
Vryburg	C. Butler	0·00	0·25	− 0·25	16·16	13·48	+ 2·68
Worcester	The Gaoler	0·65	1·83	− 1·18	5·46	7·70	− 2·24
Wynberg (Convent)	The Mother Superior	5·46	7·65	− 2·19	30·00	27·97	+ 2·03
Basutoland—							
Mafeteng	F. Hodgson	0·85	0·58	+ 0·27	27·56	19·94	+ 7·62
South-West Africa—							
Aus	E. Marthins	0·00	0·26	− 0·26	4·20	3·29	+ 0·91
Bethanie	Rev. Peter	0·00	0·01	− 0·01	10·63	3·92	+ 6·71
Duesternbrook	I. R. Matthiessen	0·00	0·01	− 0·01	22·88	11·61	+ 11·27
Franzfontein	H. Jansen	0·00	0·00	± 0·00	7·68	7·86	− 0·18
Gabis	Rev. P. Behor	0·04	0·13	− 0·09	4·32	3·58	+ 0·74
Garinais	F. Bertling	0·00	0·06	− 0·06	10·31	4·59	+ 5·72
Gibeon	Rev. Spellmeyer	0·00	0·04	− 0·04	11·95	5·12	+ 6·83
Gobabis	Rev. Irle	0·00	0·02	− 0·02	18·20	12·08	+ 6·12
Grootfontein	Pitkowski	0·00	0·00	± 0·00	32·35	16·99	+ 15·36
Gr. Witvley	— Maass	0·00	0·01	− 0·01	18·79	11·45	+ 7·34
Haribes	Cpt. Meyer	0·00	0·01	− 0·01	16·25	6·05	+ 10·20
Heirachabis	Rev. P. Klemann	0·00	0·01	− 0·01	5·16	2·98	+ 2·18
Maltahoehe	E. Just	0·00	0·04	− 0·04	10·19	5·07	+ 5·12
Neu-Heusis	Liebig's Extract Co.	0·00	0·02	− 0·02	15·95	11·54	+ 4·41
Okahandja	B. Templin	0·00	0·04	− 0·04	22·96	11·61	+ 11·35
Okandjose	— von Gossler	0·00	0·00	± 0·00	28·35	13·33	+ 15·02
Okasangumingo	R. H. A. Schneider	0·00	0·00	± 0·00	25·46	12·76	+ 12·70
Omaruru	The Postmaster	0·00	0·00	± 0·00	20·17	9·08	+ 11·09
Rehoboth	The Postmaster	0·00	0·00	± 0·00	21·57	8·31	+ 13·26
Rietfontein	B. Leist	0·00	0·00	± 0·00	31·42	14·68	+ 16·73
Swakopmund	E. Sievert	0·00	0·01	− 0·01	0·38	0·38	± 0·00
Tsumeb	Ing. Schetter	0·00	0·02	− 0·02	26·50	17·13	+ 9·37
Usakos	Rev. Diehl	0·00	0·00	± 0·00	8·24	4·39	+ 3·85
Voigtsgrund	A. Voigts	0·00	0·01	− 0·01	25·06	6·12	+ 18·94
Waterberg	D. Hahn	0·00	0·00	± 0·00	25·59	15·19	+ 10·40
Windhoek	Observatory	0·00	0·04	− 0·04	26·87	10·42	+ 16·45

103—4/1/24—800

UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

1924

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. IV. AUGUST, 1923. No. 8.

UNUSUAL warmth and dryness; comparatively infrequent frosts of any great severity; a practically general shortage of rainfall, with large areas affected by absolute or partial drought; a few particularly windy and dusty days; mean pressure above normal; temperature of the month higher than usual over the greater part of the Union, but sub-normal in Natal and over parts of the west, centre, and south of the Cape Province; a few light falls of snow in the west and east of the Cape Province; a prevalence of winds with northerly and westerly components—these were the outstanding features of the weather of August, 1923.

Pressure during the month was on the whole slightly higher than usual, and over the Transvaal was half-a-tenth above normal. During practically the whole month the country was under anticyclonic conditions, the cores of the high-pressure areas varying in position, but lying principally over the Transvaal and Orange Free State. The variations in pressure and the paths apparently pursued by the low-pressure systems closely resembled those of the previous month, the heads actually reaching the south and east coasts on only a few occasions, whilst on others their pressure off the coast was indicated only by the wind-direction and force; also on one or two days there were indications of the equatorial low pressure. There were indications of a "low" off the south coast on the morning of the 2nd with a minimum pressure of 30·00 inches at Mossel Bay; by the next morning this isobar had moved to the north-east, with the lowest pressure 29·95 inches at Durban, and had passed off by the 4th. On the 10th pressure was low, 29·96 inches at Port Nolloth on the west coast; on the 11th the position of the minimum pressure had moved to the south coast, where Cape Agulhas showed 29·95 inches; the lowest pressure continued along the south coast on the 12th, Mossel Bay having 29·93 inches, but had disappeared next day, its place being taken by an isobar of 30·35 inches. On the 15th pressure had fallen to 29·96 inches over the south-west; on the 16th it had risen two-hundredths there, but had fallen between half-a-tenth to three-quarters further east at Port Elizabeth; on the 17th it had fallen slightly all along the south and south-east, so that the 29·95-inch isobar lay along that portion of the coast; by the 18th the "low" had pushed well on to the

land in the east and south-east, with the lowest reading of 29·69 inches at Durban, where the barometer rose to 30·16 inches next morning; on this occasion there was a protrusion southwards of the equatorial low-pressure area. On the 22nd pressure fell below 30·00 inches all along the south coast with a complementary low-pressure area over Rhodesia and South-West Africa. On the 23rd pressure had fallen to 29·85 inches all along the coast between Cape Agulhas and Durban, the 30·00-inch isobar lying from north-east to south-west between Lourenco Marques; on the 24th pressure had risen a tenth of an inch on the coast and the "low" had disappeared on the 25th on the east; but a pressure of 30·00 inches on the west coast gave indications of another "low" coming on; by the morning of the 26th practically the whole of that portion of the Union between Durban and Clanwilliam lay under its influence, the lowest reading of 29·74 inches occurring at Port Elizabeth. During the rest of the month the Union was covered by an anticyclone. On no occasion during this month did the forefront of these "lows" appear over South Africa, the coasts being affected entirely by the rear with its westerly and north-westerly winds.

Temperature.—The mean temperature of the Union during August (57·1 degrees) was 1·2 degree above the average. This excess was mainly due to the days with a mean temperature of 72·2 degrees, being 1·9 degree above normal, although the nights with 42·0 degrees were also warmer than usual, but by only half a degree (0·5 degree). An excess in the mean temperature was common to the Transvaal, Orange Free State, and Cape Province, but in Natal the month's temperature was lower than usual by 0·6 degree; the deficit was due to the days with 74·4 degrees, being 1·4 degree cooler, although the *nights with 47·2 degrees were 0·3 degree warmer than usual. In the Transvaal* the monthly mean for August (57·6 degrees) was 1·6 degree above the average, the mean maximum (74·6 degrees) being 2·1 degrees and the mean minimum (40·6 degrees) being 1·0 degree in excess of the corresponding normals. In the Orange Free State an excess of 1·8 degree in the mean day temperature (69·2 degrees) and of 1·1 degree in the night temperature (36·1 degrees) caused *the temperature of the month (52·6 degrees) to be 1·4 degree above the average.* In the Cape Province a normal mean minimum temperature (42·9 degrees) and an excess of 2·4 degrees in the mean maximum (71·0 degrees) caused the mean temperature of the month (57·0 degrees) to be 1·2 degree higher than the average.

At the individual stations the mean temperature of August was above *normal in the majority of cases, the exceptional areas consisting of practically* the whole of Natal, a few stations in the south-east of the Cape, Clanwilliam in the west coastal area, Carnarvon in the northern Karroo, and Belfast on the Transvaal high veld. The surplus amounts in the Transvaal ranged from half a degree at Klerksdorp to 3·5 degrees at Bloemhof, both in the south-west; in the Orange Free State from 0·5 degree at Ladybrand to 2·3 degrees at Harrismith; in the Cape Province from 0·2 degree at Port Nolloth to 4·8 degrees at Graaff-Reinet. In Natal, Stanger showed an excess of 1·5 degree. In Natal the deficits were mostly under 1 degree, but varied from 0·8 degree at *Estcourt, Ladysmith, and Maritzburg to 1·6 degree at Dundee. In the Cape* Province the sub-normal amounts lay between 0·1 degree at Mafeking and 1·2 degree at Uitenhage, whilst in the Transvaal Belfast was cooler than usual by only 0·3 degree. Wynberg in the Cape Peninsula had a normal temperature for this month.

Days here warmer than usual over the greater part of the Union, the *exceptional areas being practically the whole of Natal, Ladybrand in the east* of the Orange Free State, and Uitenhage in the south of the Cape Province.

The excesses in the Transvaal varied from 3·7 degrees at Potchefstroom

to 0·2 degree at Pretoria, in the Orange Free State they ranged between 3·7 degrees at Bethulie in the south and 0·6 degree at Harrismith in the north-east, and in the Cape Province between 5·7 degrees at Vryburg and Murraysburg and 0·2 degree at Mafeking. In Natal the deficits were fairly large, ranging from 3·2 degrees at Durban to 0·6 degree at Dundee, but small at Ladybrand (O.F.S.) and Uitenhage (C.P.), where the shortages were 0·1 degree and 0·5 degree respectively. The night temperatures were also higher than usual at more than half the stations and sub-normal, mostly by amounts less than a degree, at the remainder. In the Transvaal these sub-normal minimum temperatures occurred mainly in the east of the high veld, but also in portions of the low veld; the deficits varied from 0·1 degree at Komatipoort to 2·6 degrees at Belfast, whereas the excess amounts ranged from 4·1 degrees at Pretoria to 0·1 degree at Pilgrims Rest. In the Orange Free State the mean minimum was sub-normal at Bethulie by only 0·2 degree, whilst the super-normal quantities ranged from 4·1 degrees at Harrismith to 0·2 degree at Kroonstad. In Natal the deficits in the night temperatures were less than half a degree, whereas the surplus amounts varied between 1 degree and 2½ degrees. In the Cape Province, the nights were mostly cooler than usual, the shortages varying between 0·3 degree at Kingwilliamstown and 3·1 degrees at Clanwilliam and Carnarvon; on the other hand the excess amounts ranged from 6·1 degrees at Port St. Johns to 0·1 degree at Bedford. Both mean maximum and mean minimum temperatures were in excess of the average at the majority of stations and both below the average at only a few stations, principally in in Natal and at Uitenhage in the Cape Province. The mean warmest stations in the various Provinces were Komatipoort in the Transvaal with 68·2 degrees, Stanger in Natal with 66·7 degrees; Port St. Johns in the Cape Province with 65·1 degrees and Bethulie in the Orange Free State with 53·7 degrees. The coolest stations were Belfast in the Transvaal with 49·2 degrees, Carnarvon in the Cape with 50·8 degrees, Harrismith in the Orange Free State with 51·3 degrees, and Estcourt in Natal with 56·1 degrees. There was thus a difference of 19·0 degrees between the highest and lowest means in the Union, and these both in the Transvaal; then in decreasing order: 14·3 degrees in the Cape, 10·6 degrees in Natal, and only 2·4 degrees in the Orange Free State. The highest mean maximum was 84·1 degrees at Komatipoort and the lowest mean minimum 30·3 degrees at Belfast, a difference of 53·8 degrees, both stations being situated in the Transvaal. In the other Provinces the corresponding values were 77·4 degrees at Stanger and 39·4 degrees at Estcourt in Natal, 76·2 degrees at Mafeking and 33·1 degrees at Murraysburg in the Cape, 71·9 degrees at Kroonstad and 34·2 degrees at Lindley in the Orange Free State.

The highest temperatures were recorded on fifteen days of the month, viz.: 8th to 12th, 14th to 16th, 18th, 23rd to 26th, 30th, and 31st, generally over the Transvaal, Orange Free State and Natal on the 25th and 26th, and in the Cape Province on the 10th and 11th. The lowest temperatures were registered on seventeen days, viz.: 1st to 9th, 19th to 21st, and 26th to 30th, commonly during the first three days in the Transvaal and Natal, on the 6th in the Cape, and on the 20th in the Orange Free State. The extremes over the several Provinces were: in the Transvaal, 102·0 degrees on the 24th at Komatipoort and 21·1 degrees at Standerton on the 1st and 2nd and at Belfast on the latter date; in the Cape Province, 100·0 degrees at Port Nolloth on the 10th and 20·0 degrees at Murraysburg on the 4th; in Natal, 98·5 degrees at Stanger on the 26th and 30·0 degrees at Estcourt on the 3rd; in the Orange Free State, 81·4 degrees at Kroonstad on the 26th and 21·0 degrees at Ladybrand on the 20th. There was therefore an extreme range of 82·0 degrees over the Union during the month. Although shade temperatures at or below freezing-point were recorded at more than half the stations, frosts were generally less severe

than usual, although fruit blossoms are stated to have been destroyed at Lichtenburg on the 19th and the frosts at Goede Hoop (Middelburg, Transvaal) are considered to be the worst for years there; on the 26th a severe frost at Pylfontein (Steynsburg) killed the greater part of the fruit blossoms.

Precipitation.—Except in small portions of the north-east of the Orange Free State and the west and south of the Cape Province, precipitation during August was below the average, mostly by one-half to three-quarters of an inch. The deficits were greatest, between one and two inches, in the south-east of the Cape Province. Quantities exceeding one inch were confined to stations in the south-west and south of the Cape Province and parts of the Natal coast. In South-West Africa absolute drought prevailed at all stations except Gabis, where the small amount of 0·06 inch fell, or 51 per cent. less than usual. Light rains occurred over parts of the Transvaal on the 5th, 18th to 21st, and 28th to 30th. In the Orange Free State light rains were fairly general on the 21st, whilst local showers occurred on the 22nd and 28th. In Natal local showers occurred during the first and third weeks and were practically general during the last week. In the Cape Province rains occurred at frequent intervals over the Cape Peninsula and parts of the south-west; lighter rains in the west and south, with occasional showers mostly confined to one or two days over the eastern districts and the Karroos. Absolute drought prevailed at many stations in Bechuanaland, the northern Border, the northern and central Karroos, and parts of the south-east Cape; also in parts of the Bethlehem, Bethulie, Boshof, Edenburg, Fauresmith, Harrismith, Heilbron, Jacobsdal, and Vrede Districts of the Orange Free State, and portions of two-thirds of the districts in the Transvaal. Snow and sleet with some hail occurred at a few of the higher stations, but mainly on the mountain tops, in the Cape Province and parts of Natal, on the 2nd to 5th, 16th, 17th, 18th, 20th to 22nd, and 25th to 27th. The showers were mostly light, but from Lauriston (Division Barkly East) it is stated that the police reported 2 to 3 feet of snow at the camp in the mountains at an altitude of 10,500 feet.

The accumulated rainfall since the beginning of the year is above normal in the centre, east, west, and south-west of the Transvaal; the central, western, and eastern parts of the Orange Free State; in Basutoland, Swaziland, and at Stanger in Natal; the south of Bechuanaland, the northern Border, the greater part of the northern Karroo, the west and south-west, portions of the west-central Karroo, south coast and south-east, the north-east, and the Transkei in the Cape Province. The excesses exceed 10 inches in Swaziland, the east and north-east of the Transvaal, being 13·06 at Komatipoort and 25·89 inches at Pigeonhole; the surplus falls to between 1 and 3 inches in the central and western areas, and to less than an inch in the south-west. In the Orange Free State the plus amounts were between 7 and 8 inches in the centre and west, but only slightly over an inch in the east and less than half an inch in the north at Lindley. In the Cape Province excesses of over 10 inches are met with at Kokstad in Kaffraria and Groot Drakenstein in the south-west; the excesses continue large (5 to 9 inches) in other parts of Kaffraria and the south-east, decreasing south-westwards and westwards to 2·29 inches at Port Elizabeth and 1·01 inch at Queenstown. Surplus amounts of between 2 and 4 inches also occur in Bechuanaland, the west of the northern Border, and the south-west, including the Peninsula; elsewhere they lie generally between 1 and 2 inches. Stanger (Natal) shows an excess of 2·47 inches. The shortages in the Cape lie, mostly between 2 and 3 inches, but rising to 3·83 inches at Grahamstown and falling to 0·07 inch at Port Nolloth. In Natal the deficits were large, ranging from 2·07 inches at Maritzburg to 8·87 inches at Weenen. In the Orange Free State the amounts are sub-normal by much smaller quantities, viz., from about ¾ to 1¾ inch; in the Transvaal the deficits were mostly in

the neighbourhood of 2 inches, but rose to 6¾ inches at Ermelo. In South-West Africa only two stations out of twenty-six show a shortage since the beginning of the present year, viz., Franzfontein (lat. 20° 11′ S., long. 15° 4′ E.; altitude, 3,773 feet), where the total of 7·68 inches is 0·20 inch less than the average, and Swakopmund, where the aggregate of 0·38 inch is 0·04 inch lower than usual. Elsewhere the totals for the eight months vary from 3·85 inches, or 85 per cent., in excess to 19·92 inches, or 324 per cent., above the average. Eleven out of the twenty-six stations show excesses exceeding 10 inches. The totals since the commencement of the seasonal year in July are mostly below the average. Thus in the Transvaal small excesses of a tenth to a quarter of an inch are limited to Haenertsburg in the north and Johannesburg and Heidelberg in the south; the deficits over the remaining stations are mostly between one-third and three-quarters of an inch, but vary from 0·04 inch at Zeerust to 1·12 inch at Woodbush. In the Orange Free State excesses of a few hundredths to half an inch are met with in the north and east, and deficits of similar amounts in the south and west. In Natal surplus quantities of about a tenth to half an inch were limited to parts of the coast and the inland portion around Estcourt and Ladysmith; the deficits varied between 0·17 inch at Maritzburg and 1·29 inch at Weenen. In the Cape Province the totals for the two months were above the normals in Kaffraria, the south-east, part of the north-east, and the central Karroo, and the south coastal area and the southern parts of the northern Karroo, as well as at a few stations in the south-west and the west coastal district. The excesses were largest in the extreme east, being 9·23 inches at Port St. Johns and 4·99 inches at Kokstad, decreasing to between 2 and 3 inches at Umtata, East London, and Kingwilliamstown; in the remainder of the plus area the excesses lay generally between one-quarter and half an inch, but increased again to over an inch at Groot Drakenstein. The deficits elsewhere were mostly less than 0·50 inch, but increased to between ¾ and 1 inch in the west and Namaqualand and were between 1 and 2 inches in parts of the south-west and the western section of the south coastal area. In South-West Africa the totals for these two months are usually so small as to be negligible and during the current year amounted to "nil" at all stations except Gabis (lat. 28° 08′ S., long. 18° 34′ E.; approx. altitude, 2,950 feet), which was 0·16 inch, or 62 per cent., below normal.

There may be mentioned as possibly of more than passing interest, especially when viewed in conjunction with the excessive rains and floods at the beginning of the present year in the Transvaal and Rhodesia, the exceptionally heavy rains in the Sudan during the first fortnight of August. Khartoum, more than half of which was under water, was cut off from Egypt except by way of the sea from Port Sudan and Suakin. Both the Blue and White Niles were simultaneously very high, an unusual occurrence. Immense washaways occurred on the railway between Halfa and Atbara and between Abu Hamid and Halfa and on the Red Sea Railway. The heaviest rains appear to have occurred on the 2nd, 6th, 9th, and 12th, on the last of which dates the Khor Arab came down and damaged the Red Sea line again extensively between Einha and Shidiab.

In the Rustenburg division of the Transvaal the cotton, maize, and kaffir corn crops harvested were normal; the citrus yielded an average crop, but tobacco fell short of expectations. Owing to the mildness of the month, fruit trees were in blossom in the Lichtenburg division, but the blossoms were destroyed by a frost on the 19th; potato planting was proceeding and tomatoes were almost ready for planting. Stock were in fairly good condition in the Pietersburg division, but had gone off considerably in Middelburg and Ermelo owing to the dry conditions, whilst numbers of sheep were lost in Ermelo owing to the same reason and large trees had shrivelled up. In the Orange Free State,

the veld was still in good condition in a number of the districts, and there were prospects of a good lambing season in the Winburg division, although both sheep and cattle had fallen off more than usual there. Trees had started into bud and blossom in the Vrede District and the Riet River had still a good stream of water in the Fauresmith section. In Natal fruit trees were in blossom and others in bud at Ladysmith; the veld was green and early maize had come up at Mid-Illovo. Stock were in fair condition at Cape St. Lucia, but had fallen off considerably in condition or were dying from starvation at Newcastle, Rongpoort, Weenen, Ntambanana, and elsewhere. In the Cape Province crops were showing well in the south-west, fruit trees were in blossom at Stutterheim, and spring growth generally forward in Somerset East, Stutterheim, etc. Stock were in good condition in the Bathurst division and in Basutoland, but the veld was poor at Mafeking, Kimberley, Graaff-Reinet, etc. Locusts were reported as hatching out in parts of the Murraysburg, Stutterheim, and Butterworth districts.

OBSERVERS' NOTES FOR AUGUST, 1923.

TRANSVAAL.

Gemboksfontein (*Middelburg*).—A very dry and hot month was experienced. Rainfall: Nil.—C. M. van Coller.

Krugersdorp.—The month under review has been an exceptionally fine one. A moderate cold snap on the 20th was the only unpleasant break in the weather. On the 25th a maximum temperature of 81 degrees was recorded, an unusually high temperature for August. Rainfall: 0·02 inch on one day. —H. Sharp.

Lichtenburg.—Genial weather at beginning of month. Every tree in blossom. Farmers busy planting potatoes. Tomato seeds planted, getting ready for planting out. Turned very cold again on the 19th, 5 degrees of frost being recorded, when blossoms on fruit trees were destroyed. Warm again on the 21st. Small showers of rain on 22nd. Grass looking green, but we need much more rain. Rainfall: 0·22 inch on one day.—E. Newton.

Rustenburg.—A very dry month, with strong winds towards the end. Veld in a bad state owing to the locusts, and cattle have fallen off in condition. The harvesting of the cotton, maize, and kaffir corn crops now complete, but only normal crops were reaped. Citrus, which yielded an average crop, is nearly complete. Tobacco fell short of expectations. Farmers are waiting for rains to damp the tobacco in order that same may be packed. All roads throughout the district in a very bad state of repair. Veld fires becoming prevalent. Rainfall: 0·06 inch on one day.—A. Streatfield.

Mosdene (*Naboomspruit*).—A bright and an unusually mild month, the temperature falling below freezing-point only on the 1st and 2nd, when 31·3 and 31·2 degrees respectively were registered. Rainfall: Nil.—Ernest E. Galpin.

Jakhalsfontein (*Pietersburg*).—Dry and dusty throughout the month. Stock on the whole in fairly good condition. Rainfall: 0·04 inch on one day.—Rev. James C. Palmer.

Pietersburg.—Bright days, fairly cool. Rainfall: 0·04 inch on one day. —W. J. Frankleyne.

Middelburg.—Warm days and cold nights characterized the weather during the month. Cold winds from east-south-east, alternating with hot and dust-laden winds from west-north-west. The weather has shown every

indication of breaking, the sky being sometimes overcast and banking clouds in the south-west, but all this disappeared, the weather returning to that of winter. Rainfall: Nil.—Dr. H. A. Spencer.

Ermelo.—Very dry month. Cattle, etc., suffering badly. Trees, such as big gum trees, are shrivelled. The rainfall of 0·54 inch on the 29th was very welcome, and means thousands of pounds of good value to the district. Farmers who annually take their sheep to the low veld lost heavily of their stock through drought. Many returned here too early, with the same result. The rainfall also enabled the mealie farmers to start planting early. Rainfall: 0·56 inch on two days.—Dr. E. B. Theunissen.

Barberton.—Dry warm weather prevailed during the month. Springs running well, considering the long spell of rainless weather. Rainfall: 0·42 inch on one day.—Walter Grubb.

Goede Hoop (Middelburg).—The frosts this winter were the worst experienced for years. Cattle in poor condition. No rain since 28th February.—H. L. Koppeschaar.

Swaziland.

Mbabane.—The grazing is still very poor, but should soon improve through recent rains. Rainfall: 0·81 inch on five days.—R. C. S. Markham.

Orange Free State.

Holfontein.—A very mild month. Veld is coming on fast, and all that is wanted now is a little rain. Rainfall: 0·66 inch on one day.—L. C. McInerney.

Kroonstad.—The month has been very mild, with absence of continued winds. Rainfall: 0·34 inch on one day.—S. R. Northfield.

Doornplaat (Bloemfontein).—A mild month, with a few cold snaps. Rainfall: 0·25 inch on one day.—C. G. Oertel.

Tembani (Fauresmith).—Veld is very good this year, and dams still have water. The Riet River has quite a good stream still. Farmers have sown a lot of wheat, but we have had one swarm of locusts already. Cattle farmers are in a serious plight, as there is no sale even for fat cattle, except at ruinous prices. Rainfall: 0·13 inch on one day.—M. F. Schickerling.

Heilbron.—Crops: It would appear that the maize crop has now been harvested. Threshing is still in progress in certain sections. Returns are most gratifying, and it is safe to say that the crop results are averaging better than was anticipated earlier in the season.

Stock: Stock are in low condition as usual; little or next to nothing is done in the way of providing for winter feeding.

Diseases: There has been no disease, nor have any deaths been reported during the month. Rainfall for month: 0·13 inch on one day.—P. A. du P. Naudé.

Woudzicht (Vrede).—This month was exceptionally mild, and all trees started early. Rain is, however, badly wanted. Rainfall for month: 0·38 inch on three days.—J. N. Köhler.

Paardekraal (Winburg).—Grass good for sheep after rains. Great promise of good lambing. A mild warm month, with little or no frost. Sheep and cattle have fallen off more than usual, particularly the latter. Rainfall: 0·73 inch on three days.—G. S. Lowe.

Natal.

Dundee.—Owing to prolonged drought, we are experiencing a very dry spring. Stock suffering from poverty. Rainfall: 0·32 inch on four days.—West Therrold.

Durban (Point).—Weather throughout month generally fine and hazy. A few hours of heavy fog at beginning of month and a fair amount of dew. Rainfall: 1·42 inch on four days.—A. P. White.

Ladysmith.—A dry month, with a few exceptionally windy days. Country is very dry and rain is needed. Fruit trees in full bloom and other trees in bud. Rainfall: 0·11 inch on two days.—D. A. R. Leathern.

Newcastle.—The month has been very cold, with heavy frost, which must harm the fruit trees, which are in full bloom. We have had some very windy days and nights. Drought still continues; rain is badly wanted. Cattle and sheep are dying from starvation. The farmers are losing heavily in lambs. Rainfall: 0·10 inch on three days.—J. F. Torlage.

Nottingham Road.—Very dry and in consequence not enough grass for sheep. Rainfall: 0·25 inch on seven days.—Miss E. Smythe.

Mid-Illovo.—Veld green; early maize patches planted, and up. Rainfall: 0·86 inch on six days.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Cape St. Lucia.—Weather generally cloudy, with strong north-easterly winds. Veld very dry, but stock in fair condition. Rainfall: 0·44 inch on one day.—J. Murphy.

Ntambanana. (Nagana Research Laboratory).—Rainfall, 0·37 inch on one day, has been disappointingly little; warm winds from north-east have been the general rule. Sky has been clear except for a few days near the commencement of August and during the latter part of the month. The grazing, which was dried up at the beginning of the month, has since continued to grow very steadily, but is not yet fit for cattle. Farmers have been ploughing throughout this period, but have been unable to break up fresh soil except during the first two weeks. All farmers are ploughing for cotton. Nagana has been rather prevalent, and frequent deaths in cattle from poverty have occurred.—M. W. Sheppard.

Edendale (Klip River).—Rain badly wanted; no frost during month. Rainfall: 0·10 inch on two days.—T. N. Niland.

Middleton (Umvoti).—Condition of veld very dry; cattle very thin; if no rain soon, losses may be heavy. Rainfall: 0·03 inch on three days.—O. L. Nel.

Rongpoort (Weenen).—Terribly dry month. No sign of grass springing, even in the old grass. Stock of all descriptions starving. Cattle and sheep dying of poverty. Owing to such a dry autumn, could make but poor provision for the winter. No grazing to be had in this district. All farmers losing heavily. Rainfall: 0·24 inch on two days.—J. H. Bartholomew.

Cape.

Darling (Malmesbury).—Good rains, rather more than required. Crops showing fine except in low-lying parts where soil became sodden in June. Rainfall: 3·35 inches on thirteen days.—P. H. Drake.

Ceres.—Weather generally less wintry than usual and spring more advanced than normal. Rainfall: 5·02 inches on nine days.—A. Heatlie.

Queenstown.—A good deal of strong north-westerly winds. Some frost on six mornings—2nd, 5th, 6th, 7th, 20th and 28th. Country dry. Much dust in town. Rain needed. Rainfall: 0·05 inch on one day.—J. F. C. Rein.

Kraaipan (Mafeking).—Very dry. Veld bad and stock in poor condition. Rainfall: 0·05 inch on one day.—P. J. Hart.

Graaff-Reinet (Convent).—Temperature during the day rather high for August, especially in the earlier part of the month. Nights mostly cold. A few days very windy and dusty.—The Mother Superior.

Lovedale.—August was more extreme than usual. The absolute maximum temperature was very little above normal, but the mean maximum temperature was about 3 degrees above normal, whilst the mean minimum was almost 3 degrees below normal. The minimum thermometer in the screen recorded 4 degrees of frost on the 6th. The month was abnormally dry, the total precipitation being only 0·17 inch on two days. The average for the period 1880–1922 was 0·92 inch. The country is very dry. The month was less windy than usual, but about 10 or 11 a.m. a hot, dusty wind has frequently developed from north-west. Throughout the month the wind had a westerly component.—H. R. Storey.

Graaff-Reinet.—Summer heat during greater part of the month, with cool evenings generally; on the 12th, however, the minimum temperature was 62 degrees. Winds cold and hot and very trying. Country very dry. Rainfall: 0·12 inch on one day.—S. E. D. Treadwell.

Murraysburg.—August, true to type, has been a month of almost continuous wind and no rain whatsoever. Veld continues fair, and farmers are very busy with their lambing season. Locusts are reported hatching on two farms in the district. Farmers anticipate very strenuous times this season with this pest.—W. H. Rose-Innes.

Queenstown.—A month of strong westerly to northerly winds. Dust. Country dry. Rain wanted. Rainfall: 0·06 inch on one day.—H. Holley.

Somerset East.—The month has been marked by unusual warmth, light clouds, bright sunshine, westerly winds, and unusually low rainfall. Spring growth very forward. Destructive mountain fire on Boschberg during the second week reputed to be the most severe for forty years. Rainfall: 0·17 inch on three days.—C. Harris.

Stutterheim.—Rain badly needed. Locusts plentiful. Fruit trees in blossom. Burnt pasture showing up nice and green. Rainfall: 0·02 inch on one day.—F. C. Bousfield.

Upington.—Abnormal heat for August. Rainfall: Nil.—E. H. Jones.

Jansenville.—Much wind during latter part of month. Rainfall: Nil.—E. H. Egan.

Sydney-on-Vaal (Barkly West).—Mild month, absence of usual season's high winds. Three sharp frosts in the month, with high temperatures otherwise. Veld is rapidly assuming drought conditions. Rainfall: 0·09 inch on one day.—J. G. Richards.

Rietfontein (Aliwal North).—Quiet month, only a few windy days. Heavy frosts after spell of warm weather. Ground beginning to get dry. Rainfall: 0·26 inch on one day.—A. G. Smith.

Palapye Road.—The coolest day in August was on the 1st, when we had 3·8 degrees of frost. Highest temperature 91·5 degrees on the 25th. Cattle still keeping in nice condition. Rainfall: Nil.—Thos. W. Shaw.

Liwandi (Addo, Uitenhage).—To have the wind from an easterly direction so often was exceptional. Conserved water from Lake Mentz arrived on the 28th, and irrigation is still proceeding. Rainfall: 0·49 inch on four days.—Major J. Kreft.

Aliwal North.—August has been dry. Rain is now badly needed. Rainfall: 0·11 inch on one day.—Alex. Alcock.

Clanwilliam.—During first week of month there were thick mists every morning, and then heavy frost again for a couple of mornings. Rainfall: 0·81 inch on five days.—Mrs. M. Scholtz.

Steenbergs Cove (*Malmesbury*).—Crops look promising. The veld vegetation is exceptionally good. Rainfall: 0·74 inch on six days.—D. C. Burrell.

Port Alfred (*Bathurst*).—Rain badly needed. Gardens, lands, and veld very dry. Stock generally in good condition. Rainfall: 0·77 inch on two days.—W. H. Pascoe.

Butterworth (*the Gaol*).—Large swarms of locusts in and around the town doing a lot of damage. Rainfall: Nil.—Thos. Griffiths.

BASUTOLAND.

Mafeteng.—Nice soaking rain fell on the 21st, registering 0·35 inch, this being the total rainfall for the month. Cold nights. Few windy days, with light dust storms. More rain needed to bring on veld and wheat. Stock looking well.—F. Hodgson.

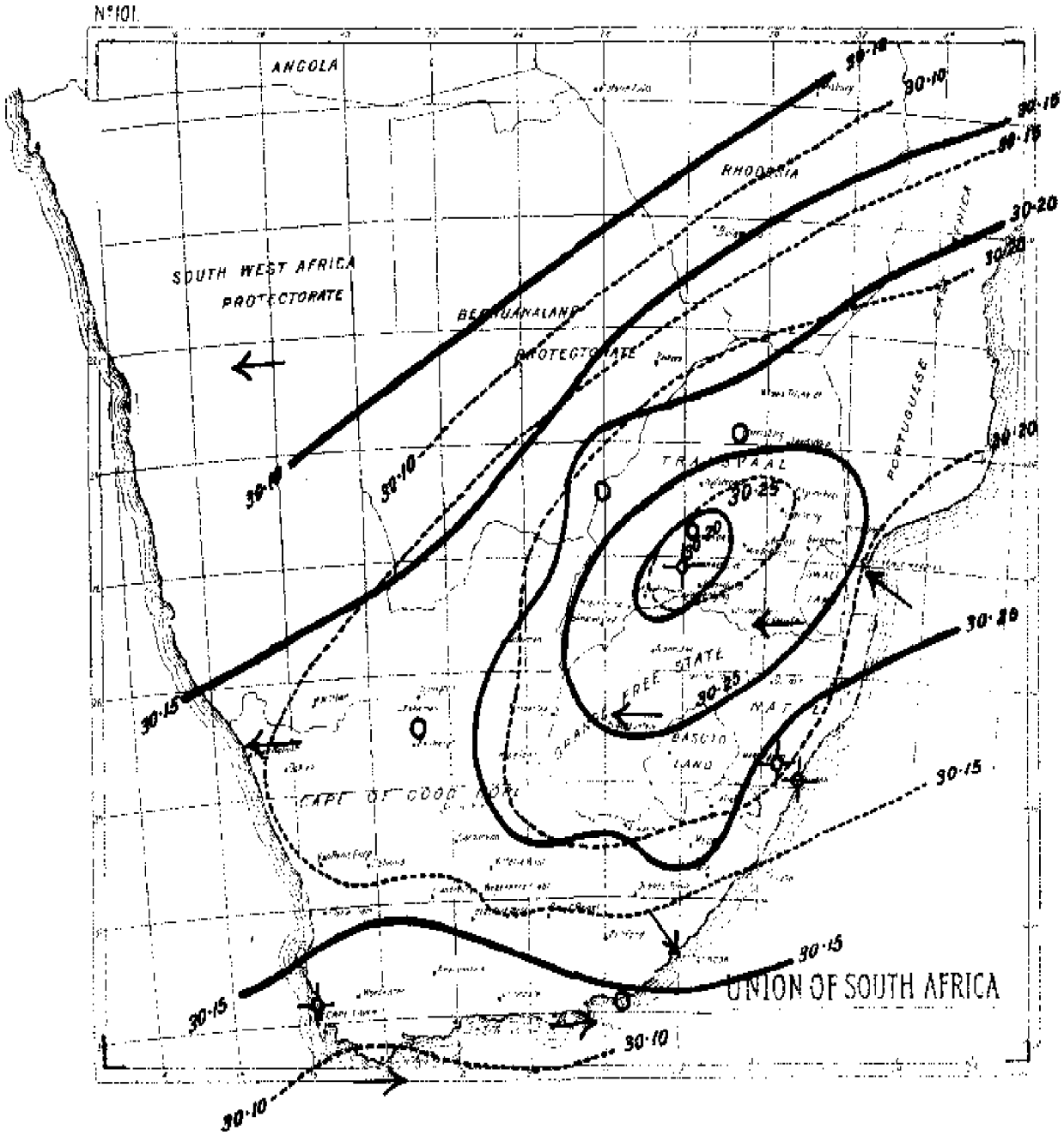
OCTOBER WEATHER CHARACTERISTICS.

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 eastern Transvaal and the northern borders of the Cape Province. The normal in Kaffraria is about 61 degrees; in the Cape coastal districts, 62 degrees; on the Peninsula, 60 degrees; and in the south-west, 61 degrees. On the high veld the mean temperature should range from 63 degrees in the Transvaal and Orange Free State to 60 degrees in Basutoland and on the northern Karroo. Frosts are unusual. Of the total possible number of hours of bright sunshine, about 80 per cent. should be enjoyed over the northern borders of the Cape Province; 58 per cent. in the south-eastern districts; 61 per cent. on the Peninsula; and 65 per cent. in the Transvaal. During this month the winds over the east and interior of the country attain their maximum velocity, whilst over the south-west they are also increasing in force. Compared with the previous month, there is a general decrease in frequency at all stations of those winds blowing between north and north-west, and a general increase of southerly and south-westerly breezes and of north-easterly winds in addition over the summer rainfall area. The prevailing wind directions are south-south-west at Kimberley, north at Johannesburg, north-east at East London, and southerly at Capetown.

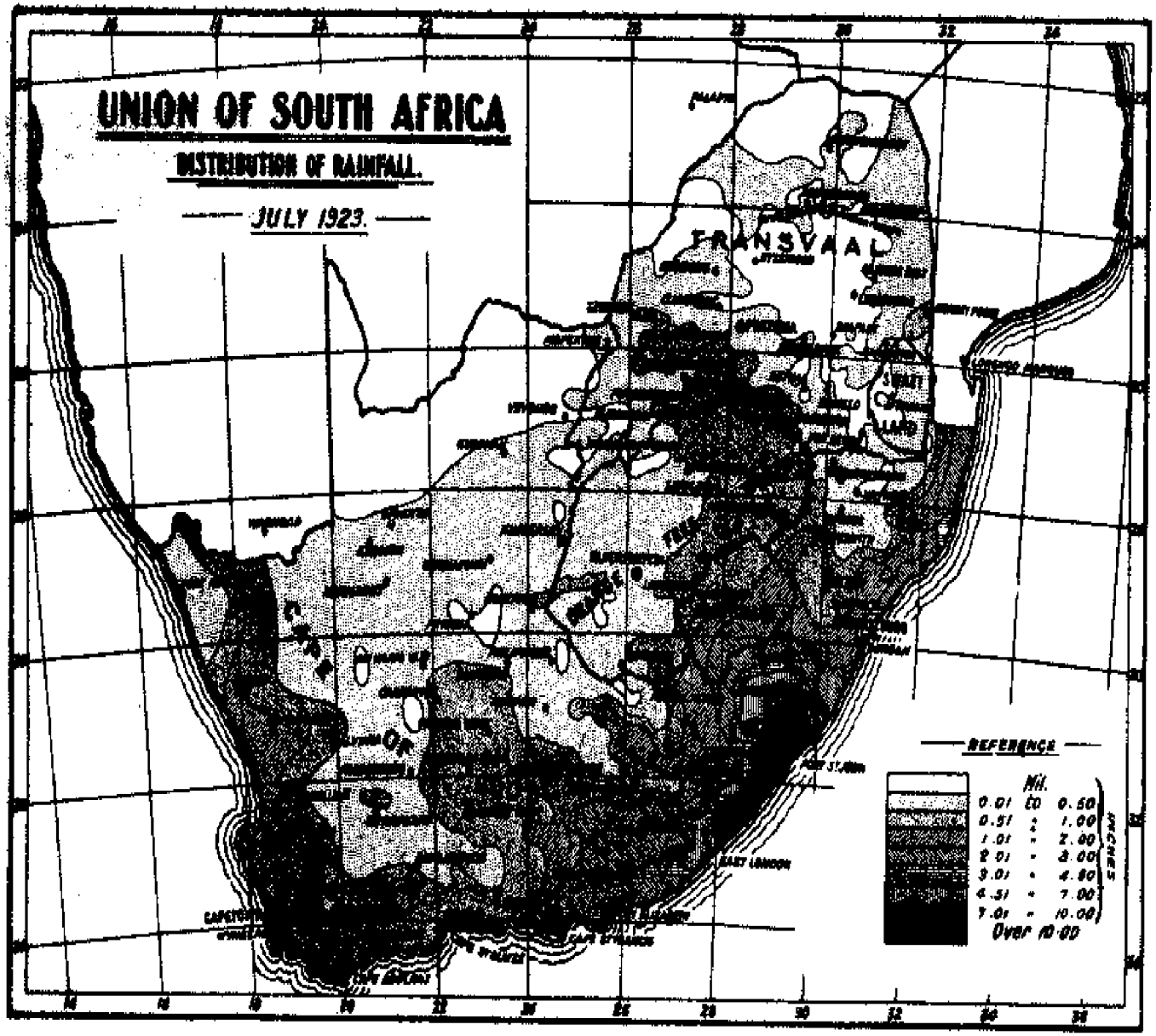
During October destructive hailstorms are of frequent occurrence, affecting wide areas.

C. STEWART,
Chief Meteorologist.

Pretoria.



August, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for August.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
JULY 1923.
TRANSVAAL
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
Over 10.00
INCHES
EAST LONDON

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), AUGUST, 1923.

Station.	Observer.	Month—Aug., 1923. Mean Max.	Month—Aug., 1923. 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	79·1	52·8	66·0	63·4	+ 2·6	94·0	24th	48·0	8th and 21st.
Belfast	The Forester	68·1	30·3	49·2	49·5	− 0·3	79·0	25th	21·0	2nd.
Bloemhof	A. Adamson	75·8	39·0	57·4	53·9	+ 3·5	83·0	24th	25·0	20th.
Ermelo	Dr. E. B. Theunissen.	70·6	37·7	54·2	52·6	+ 1·6	79·8	25th	26·5	19th.
Johannesburg (Observatory)	The Staff	68·3	46·7	57·5	54·6	+ 2·9	78·3	25th	31·3	19th.
Klerksdorp (Strathmore)	Chas. Scott	75·1	36·8	56·0	55·5	+ 0·5	86·0	25th	23·0	20th.
Komatipoort	Messrs. H. J. Evans									
Louis Trichardt	B. J. Fothergill	84·1	52·4	68·2	67·4	+ 0·8	102·0	24th	41·0	9th.
Middelburg	—	—	—	—	60·0	—	—	—	—	—
Nylstroom	Dr. H. A. Spencer	74·4	34·1	54·2	53·8	+ 0·4	84·0	25th	24·0	1st.
Pietersburg	G. Bakker	77·3	40·5	58·9	58·0	+ 0·9	88·0	25th	30·0	5th.
Piet Retief	W. J. Frankleyne	77·1	41·4	59·2	57·6	+ 1·6	90·0	25th	35·0	1st., 2nd., 3rd
Pigeonhole (New Agatha)	J. Werner	72·1	44·4	58·2	56·9	+ 1·3	85·4	26th	36·0	2nd.
Pilgrims Rest	Jno. McCallum	68·2	50·9	59·6	—	—	84·0	24th and 25th	46·0	21st.
Potchefstroom (Exp. Farm)	A. Kiernander	73·7	40·8	57·2	56·1	+ 1·1	87·0	26th	32·0	3rd and 4th.
Pretoria (Meteorological Office)	The Manager	76·3	38·1	57·2	54·0	+ 3·2	86·7	25th	25·0	20th.
Standerton	The Staff	73·9	43·7	58·8	56·6	+ 2·2	83·2	25th	35·1	3rd.
Zeerust	W. J. Madge	73·1	32·3	52·7	50·0	+ 2·7	81·0	9th	21·0	1st and 2nd.
	H. Dietrich	75·2	39·4	57·3	56·6	+ 0·7	86·8	25th	28·8	3rd.
Swaziland—										
Mbabane	Swaziland Police	71·6	45·9	58·8	58·6	+ 0·2	88·0	26th	39·0	2nd and 8th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	71·6	35·8	53·7	52·0	+ 1·7	77·7	10th	22·3	6th.
Bloemfontein	G. A. Schepers	69·3	37·1	53·2	51·9	+ 1·3	77·5	25th	24·4	20th.
Harrismith	The Forester	64·9	37·7	51·3	49·0	+ 2·3	74·0	26th	26·0	20th.
Kroonstad	S. R. Northfield	71·9	35·4	53·6	52·2	+ 1·4	81·4	26th	21·2	20th.
Ladybrand	The Forester	66·9	36·5	51·7	51·2	+ 0·5	76·0	25th	21·0	20th.
Lindley	J. Collister-Oates	70·4	34·2	52·3	51·0	+ 1·3	80·0	26th	24·2	19th and 20th.
Natal—										
Dundee	West Thorrold	73·4	40·0	56·7	58·3	− 1·6	87·0	26th	31·0	2nd.
Durban (Point)	The Port Captain	72·6	57·6	65·1	66·0	− 0·9	79·4	10th and 18th	49·6	7th.
Estcourt	The Town Clerk	72·8	39·4	56·1	56·9	− 0·8	85·0	26th	30·0	3rd.
Hluhluwe	—	—	—	—	65·6	—	—	—	—	—
Ladysmith	D. A. R. Leathern	74·5	42·7	58·6	59·4	− 0·8	87·0	26th	35·0	1st and 2nd.
Maritzburg (Mental Hospital)	The Staff	75·4	47·7	61·6	62·4	− 0·8	92·0	26th	34·5	7th.
Stanger	Cecil C. Foss	77·4	56·0	66·7	65·2	+ 1·5	98·5	26th	46·6	8th.
Weenen	—	—	—	—	58·0	—	—	—	—	—

AIR TEMPERATURES, AUGUST, 1923—(*continued*).

Station.	Observer.	Month—Aug., 1923. Mean Max.	Month—Aug., 1923. 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	70·0	33·7	51·8	50·9	+ 0·9	78·0	12th	21·5	6th.
Bedford	T. C. Hall	72·8	43·1	58·0	57·0	+ 1·0	87·0	11th	28·0	6th.
Capetown (Royal Observatory)	The Staff	64·2	48·4	56·3	55·6	+ 0·7	87·6	10th	39·2	4th.
Carnarvon	A. P. Malherbe	67·7	33·9	50·8	51·2	− 0·4	78·0	30th and 31st	24·0	20th.
Clanwilliam	Mrs. M. A. Scholtz	71·5	38·3	54·9	55·8	− 0·9	92·0	31st	31·0	5th.
East London	The Port Captain	72·5	50·0	61·6	60·9	+ 0·7	96·0	11th	39·0	7th.
Graaff-Reinet	S. E. D. Treadwell	74·6	45·7	60·2	55·4	+ 4·8	87·2	11th	34·7	6th.
Grahamstown	The Vet. Res. Officer.	71·4	39·3	55·4	56·4	− 1·0	87·8	11th	28·4	28th.
Groot Drakenstein	Lionel Baker	65·8	44·3	55·0	54·4	+ 0·6	87·6	10th	37·0	20th.
Kenhardt	R. Seydell	74·9	38·1	56·5	55·8	+ 0·7	86·0	14th and 31st	25·0	6th.
Kimberley	F. W. J. Schmidt	73·6	41·6	57·6	55·5	+ 2·1	84·0	25th	31·0	6th.
Kingwilliamstown (Club)	The Chairman	75·4	44·4	59·9	59·5	+ 0·4	95·0	11th	33·0	6th.
Kokstad	H. D. Coyte	69·3	35·6	52·4	49·8	+ 2·6	83·0	23rd	25·8	6th.
Mafeking (Convent)	The Mother Superior.	76·2	43·0	59·6	59·7	− 0·1	87·0	25th	33·0	1st.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	66·3	51·4	58·8	58·0	+ 0·8	84·0	12th and 15th	45·0	27th.
Murraysburg	W. H. Rose-Innes	69·8	33·1	51·4	48·4	+ 3·0	80·0	31st	20·0	4th.
O'okiep	J. Burrows	68·3	44·3	56·3	53·8	+ 2·5	84·1	31st	33·0	10th.
Port Elizabeth	The Lightkeeper	68·7	50·7	59·7	59·3	+ 0·4	91·0	11th	39·0	6th.
Port Nolloth	The Lightkeeper	64·6	44·4	54·4	54·2	+ 0·2	100·0	16th	38·0	1st and 30th.
Port St. Johns (Cape Hermes)	The Lightkeeper	72·8	57·4	65·1	61·6	+ 3·5	88·0	16th	49·0	6th.
Queenstown	H. Holley	71·2	38·0	54·6	53·4	+ 1·2	80·0	8th, 11th, 30th	22·0	6th.
Somerset East	C. Harris	72·4	44·1	58·2	56·6	+ 1·6	85·0	11th	30·2	6th.
Stutterheim	F. C. Bousfield	73·6	45·0	59·3	56·2	+ 3·1	87·0	11th	27·7	6th.
Sydneys Hope	Rev. S. Rippon	69·2	48·3	58·8	56·3	+ 2·5	87·0	11th	38·5	19th.
Uitenhage	H. Inggs	76·1	41·3	58·2	59·4	− 1·2	94·7	31st	30·0	6th.
Umtata	Miss N. Dix Peek	75·1	39·8	57·4	57·0	+ 0·4	86·8	12th	29·7	6th.
Vryburg	Chas. Butler	75·3	37·9	56·6	52·7	+ 3·9	87·0	25th	24·0	20th.
Wynberg (Convent)	The Mother Superior.	66·3	47·0	56·6	56·6	+ 0·0	83·5	10th	41·5	5th.
Basutoland—										
Maleteng	F. Hodgson	64·1	37·9	51·0	50·1	+ 0·9	72·0	26th	24·0	26th.

RAINFALL, AUGUST, 1923.

Station.	Observer.	Month. Aug., 1923.	Normal.	Difference from Normal.	From 1st. Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1923.	Normal.	Difference from Normal.
Transvaal—		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Barberton	W. Grubb	0·42	0·58	− 0·16	20·00	18·65	+ 1·35	0·43	0·88	− 0·45
Belfast	The Forester	0·00	0·55	− 0·55	14·81	17·33	− 2·52	0·08	0·81	− 0·73
Bethal	H. J. Joubert	0·02	0·62	− 0·60	16·65	14·79	+ 1·86	0·22	0·79	− 0·57
Bloemhof	A. Adamson	0·09	0·32	− 0·23	10·07	12·46	− 2·39	0·18	0·64	− 0·46
Claremont	S.A. Police	0·00	0·40	− 0·40	12·49	11·19	+ 1·30	0·07	0·44	− 0·37
Ermelo	The Forester	0·68	0·76	− 0·08	8·84	15·59	− 6·75	0·77	1·04	− 0·27
Hanneritsburg	S.A. Police	0·30	0·30	± 0·00	36·27	25·25	+ 11·02	1·12	0·87	+ 0·25
Heidelberg	W. ter Horst	0·02	0·53	− 0·51	15·11	15·19	− 0·08	0·95	0·84	+ 0·11
Johannesburg (Observatory)	The Staff	0·02	0·58	− 0·56	18·33	17·26	+ 1·07	1·06	0·91	+ 0·15
Klerksdorp (Strathmore)	C. Scott	0·08	0·40	− 0·32	14·88	14·21	+ 0·67	0·65	0·73	− 0·08
Komatipoort	H. J. Evans and B. J. Fothergill	0·00	0·50	− 0·50	31·61	18·55	+ 13·06	0·72	0·81	− 0·09
Louis Trichardt	—									
Middelburg	Dr. H. A. Spencer	0·00	0·48	− 0·48	16·27	15·43	+ 0·84	0·08	0·57	− 0·49
Nylstroom	G. Bakker	0·00	0·48	− 0·48	17·01	14·79	+ 2·22	0·00	0·68	− 0·68
Pietersburg	W. J. Frankleyne	0·04	0·24	− 0·20	10·20	11·85	− 1·65	0·11	0·47	− 0·36
Piet Retief	J. Werner	0·21	0·75	− 0·54	17·91	16·65	+ 1·26	0·24	1·09	− 0·85
Pigeonhole (New Agatha)	J. McCallum	0·36	0·51	− 0·15	56·12	30·23	+ 25·89	0·54	1·38	− 0·84
Pilgrims Rest	A. Klernander	0·03	0·57	− 0·54	38·92	26·70	+ 12·22	0·15	0·95	− 0·80
Potchefstroom (Exp. Farm)	The Manager	0·00	0·46	− 0·46	14·02	13·44	+ 0·58	0·30	0·78	− 0·48
Pretoria (Meteorological Office)	The Staff	0·09	0·55	− 0·46	17·99	16·70	+ 1·29	0·28	0·78	− 0·50
Roodberg	N. H. Monro	0·00	0·66	− 0·66	15·80	15·11	+ 0·69	0·08	0·94	− 0·86
Rustenburg	A. Streatfield	0·06	0·56	− 0·50	18·73	15·45	+ 3·28	0·51	0·96	− 0·45
Standerton	W. J. Madge	0·37	0·70	− 0·33	19·80	15·91	+ 3·89	1·39	1·04	+ 0·35
Wakkerstroom	F. Grant	0·19	0·85	− 0·66	—	16·06	—	0·60	1·24	− 0·64
Woodbush	The Forester	0·55	0·97	− 0·42	70·99	47·19	+ 23·80	0·84	1·96	− 1·12
Zeerust	H. Dietrich	0·03	0·23	− 0·20	17·58	14·63	+ 2·95	0·42	0·46	− 0·04
Swaziland—										
Mbabane	Swaziland Police	0·81	1·18	− 0·37	44·25	31·38	+ 12·87	0·81	1·85	− 1·04
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·06	0·47	− 0·41	11·53	12·24	− 0·71	0·41	0·83	− 0·42
Bloemfontein	G. A. Schepers	0·50	0·52	− 0·02	21·39	14·77	+ 6·62	0·81	0·88	− 0·07
Boshof	The Postmaster	0·14	0·66	− 0·52	21·05	13·06	+ 7·99	0·44	0·97	− 0·53
Hartsmith	The Forester	0·29	0·81	− 0·52	14·90	16·68	− 1·78	1·51	1·16	+ 0·35
Kroonstad	S. R. Northfield	0·34	0·51	− 0·17	13·38	15·11	− 1·73	0·85	0·80	+ 0·05
Ladybrand	The Forester	1·00	0·76	+ 0·24	17·60	16·54	+ 1·06	1·77	1·26	+ 0·51
Lindley	J. Collister-Oates	0·50	0·47	+ 0·03	14·79	14·31	+ 0·48	1·04	0·77	+ 0·27
Natal—										
Dundee	W. Thorrold	0·32	0·86	− 0·54	13·74	18·75	− 5·01	0·64	1·09	− 0·45
Durban (Point)	The Port Captain	1·42	1·59	− 0·17	20·19	23·59	− 3·40	2·26	2·80	− 0·54
Estcourt	The Town Clerk	0·23	0·70	− 0·47	14·13	17·53	− 3·40	1·10	0·96	+ 0·14
Hlabisa	The Gaoler	—	1·20	—	—	24·93	—	—	2·11	—

RAINFALL, AUGUST, 1923—(*continued*).

Station.	Observer.	Month. Aug., 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Kowiet	The Gaoler	0·51	0·92	− 0·41	16·76	19·55	− 2·79	1·02	1·24	− 0·22
Ladysmith	D. A. R. Leathern	0·11	0·92	− 0·81	14·47	17·34	− 2·87	1·68	1·12	+ 0·56
Maritzburg	The Staff	0·68	0·99	− 0·31	19·28	21·35	− 2·07	1·17	1·34	− 0·17
Stanger	C. C. Foss	0·46	1·31	− 0·85	25·02	22·55	+ 2·47	2·65	2·39	+ 0·26
Vryheid	The Gaoler	0·16	0·75	− 0·59	11·29	19·36	− 8·07	0·16	1·12	− 0·96
Weenen	The Gaoler	0·08	0·82	− 0·74	7·37	16·24	− 8·87	0·71	1·00	− 0·29
Cape Province—										
Aliwal North	A. Alcock	0·11	0·73	− 0·62	14·96	13·74	+ 1·22	0·82	1·14	− 0·32
Beaufort West	The Gaoler	0·11	0·31	− 0·20	6·69	6·66	+ 0·03	1·18	0·58	+ 0·60
Bedford	T. C. Hall	0·39	0·91	− 0·52	18·52	17·13	+ 1·39	1·81	1·56	+ 0·25
Britstown	The Gaoler	0·00	0·21	− 0·21	7·52	8·66	− 1·14	0·50	0·45	+ 0·05
Calvinia	The Gaoler	0·73	0·87	− 0·14	8·17	6·52	+ 1·65	1·73	1·78	− 0·05
Capetown (Royal Observatory)	The Staff	3·18	3·43	− 0·25	21·87	19·63	+ 2·24	6·91	6·98	− 0·07
Ceres	A. Heatile	5·02	5·84	− 0·82	32·30	30·59	+ 1·71	10·03	11·91	− 1·88
Carnarvon	A. P. Malherbe	0·03	0·31	− 0·28	7·44	6·17	+ 1·27	0·74	0·52	+ 0·22
Clanwilliam	Mrs. M. A. Scholtz	0·81	1·11	− 0·30	8·82	6·83	+ 1·99	1·75	2·50	− 0·75
Concordia	F. H. Carstens	0·44	0·73	− 0·29	6·78	5·10	+ 1·68	0·97	1·40	− 0·43
East London	A. Downie	0·16	1·98	− 1·82	25·32	19·70	+ 5·62	6·09	3·21	+ 2·88
French Hoek (Driefontein)	The Forester	10·86	10·67	+ 0·19	68·69	63·83	+ 4·86	22·78	22·27	+ 0·51
Fraserburg	The Gaoler	0·00	0·32	− 0·32	5·04	5·32	− 0·28	0·50	0·61	− 0·11
Grahamstown	Vet. Res. Officer	0·22	1·56	− 1·34	13·10	16·93	− 3·83	2·71	2·70	+ 0·01
Garies	The Gaoler	0·85	0·75	+ 0·10	4·55	3·93	+ 0·62	1·56	1·46	+ 0·10
Graaff-Reinet	S. E. D. Treadwell	0·12	0·52	− 0·40	7·28	9·13	− 1·85	1·47	0·95	+ 0·52
Groot Drakenstein	L. Baker	4·52	4·73	− 0·21	38·46	26·99	+ 11·47	11·07	9·98	+ 1·09
Griquatown	The Gaoler	0·00	0·25	− 0·25	9·76	9·67	+ 0·09	0·16	0·46	− 0·30
Hanover	The Gaoler	0·00	0·33	− 0·33	10·61	9·83	+ 0·78	0·36	0·70	− 0·34
Hopetown	The Gaoler	0·00	0·25	− 0·25	10·05	9·31	+ 0·74	0·60	0·51	+ 0·09
Kenhardt	R. Seydell	0·00	0·16	− 0·16	8·99	4·59	+ 4·40	0·23	0·36	− 0·13
Kimberley	F. W. J. Schmidt	0·17	0·28	− 0·11	11·35	10·90	+ 0·45	0·52	0·58	− 0·06
Kuyana	The Gaoler	2·73	2·49	+ 0·24	19·46	18·30	+ 1·16	3·80	4·64	− 0·84
Kokstad	H. D. Coyte	0·62	0·64	− 0·02	27·14	16·26	+ 10·88	5·86	0·87	+ 4·99
Kingwilliamstown	W. Kindness	0·15	1·09	− 0·94	18·73	15·52	+ 3·21	4·80	2·09	+ 2·71
Kuruman (Abtonia)	A. T. Sitwell	0·08	0·19	− 0·11	14·40	12·37	+ 2·03	0·24	0·43	− 0·19
Mafeking (Convent)	The Mother Superior	0·09	0·43	− 0·34	13·86	14·17	− 0·31	0·33	0·83	− 0·50
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·72	1·44	− 0·72	10·02	11·37	− 1·35	1·32	2·66	− 1·34
Murraysburg	W. H. Rose-Innes	0·00	0·37	− 0·37	9·16	7·98	+ 1·18	0·98	0·66	+ 0·32
O'okiep	J. Burrows	0·59	1·00	− 0·41	6·48	5·52	+ 0·96	1·11	1·85	− 0·74
Philipstown	The Gaoler	0·00	0·36	− 0·36	8·12	9·94	− 1·82	0·37	0·65	− 0·28
Piquetberg	The Gaoler	2·00	2·90	− 0·90	17·91	15·15	+ 2·76	4·85	5·74	− 0·89
Port Elizabeth	The Lightkeeper	1·17	2·12	− 0·95	16·53	14·24	+ 2·29	3·97	3·99	− 0·02
Port St. Johns (Cape Hermes)	The Lightkeeper	0·36	2·03	− 1·67	37·15	28·18	+ 8·97	12·37	3·14	+ 9·23
Port Nolloth	The Lightkeeper	0·23	0·29	− 0·06	1·83	1·90	− 0·07	0·43	0·62	− 0·19
Prieska	The Gaoler	0·00	0·19	− 0·19	8·79	7·63	+ 1·16	0·25	0·40	− 0·15
Queenstown	H. Holley	0·06	0·57	− 0·51	16·09	15·08	+ 1·01	1·44	1·11	+ 0·33

RAINFALL, AUGUST, 1923—(*continued*).

Station.	Observer.	Month. Aug., 1923.	Normal.	Difference from Normal.	From 1st Jan., 1923.	Normal.	Difference from Normal.	From 1st July, 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Steytlerville	The Gaoler	0·03	0·48	− 0·45	7·89	6·28	+ 1·61	1·01	0·69	+ 0·32
Sutherland	The Gaoler	0·89	0·90	− 0·01	6·71	7·27	− 0·56	1·87	1·86	+ 0·01
Swellendam	The Gaoler	1·71	2·32	− 0·61	18·33	20·74	− 2·41	3·35	4·49	− 1·14
Sydney's Hope	Rev. S. Rippon	0·42	1·17	− 0·75	11·99	13·76	− 1·77	2·90	2·11	+ 0·79
Somerset East	C. Harris	0·17	0·98	− 0·81	13·53	15·97	− 2·44	2·09	1·71	+ 0·38
Stutterheim	F. C. Bousfield	0·02	0·97	− 0·95	29·58	18·18	+ 11·40	2·69	1·56	+ 1·13
Uitenhage	H. Inggs	0·23	1·31	− 1·08	12·69	10·87	+ 1·82	2·79	2·07	+ 0·72
Umtata	Miss N. Dix Peek	0·29	0·76	− 0·47	23·53	15·74	+ 7·79	3·97	1·28	+ 2·69
Uniondale	The Gaoler	0·23	1·30	− 1·07	6·40	9·20	− 2·80	0·56	2·27	− 1·71
Upington	The Gaoler	0·00	0·10	− 0·10	8·42	5·43	+ 2·99	0·04	0·22	− 0·18
Victoria West	The Gaoler	0·00	0·27	− 0·27	8·91	7·78	+ 1·13	0·93	0·55	+ 0·38
Vryburg	C. Butler	0·00	0·30	0·30	16·16	13·78	+ 2·38	0·00	0·55	− 0·55
Worcester	The Gaoler	0·82	1·56	− 0·74	6·28	9·26	− 2·98	1·47	3·39	− 1·92
Wynberg (Convent)	The Mother Superior	8·16	7·07	+ 1·09	38·16	35·04	+ 3·12	13·62	14·72	− 1·10
Basutoland—										
Mafeteng	F. Hodgson	0·35	0·89	− 0·54	27·91	20·83	+ 7·08	1·20	1·47	− 0·27
South-West Africa—										
Aus	E. Marthins	0·00	0·35	− 0·35	4·20	3·64	+ 0·56	0·00	0·61	− 0·61
Bethanie	Rev. Peter	0·00	0·02	− 0·02	10·63	3·94	+ 6·69	0·00	0·03	− 0·03
Duesternbrook	I. R. Matthiessen	0·00	0·05	− 0·05	22·88	11·66	+ 11·22	0·00	0·06	− 0·06
Franzfontein	H. Jansen	0·00	0·02	− 0·02	7·68	7·88	− 0·20	0·00	0·02	− 0·02
Gabis	Rev. P. Rehor	0·06	0·13	− 0·07	4·38	3·71	+ 0·67	0·10	0·26	− 0·16
Garinais	F. Bertling	0·00	0·07	− 0·07	10·31	4·66	+ 5·65	0·00	0·13	− 0·13
Gibeon	Rev. Spellmeyer	0·00	0·00	± 0·00	11·95	5·12	+ 6·83	0·00	0·04	− 0·04
Gobabis	Rev. Irle	0·00	0·08	− 0·08	18·20	12·16	+ 6·04	0·00	0·10	− 0·10
Grootfontein	Pitkowski	0·00	0·00	+ 0·00	32·35	16·99	+ 15·36	0·00	0·00	± 0·00
Gr. Witvley	— Maass	0·00	0·01	− 0·01	18·79	11·46	+ 7·33	0·00	0·02	− 0·02
Haribes	Cpt. Meyer	0·00	0·00	± 0·00	16·25	6·05	+ 10·20	0·00	0·01	− 0·01
Heirachabis	Rev. P. Klemann	0·00	0·06	− 0·06	5·16	3·04	+ 2·12	0·00	0·07	− 0·07
Maltahohe	E. Just	0·00	0·00	± 0·00	10·19	5·07	+ 5·12	0·00	0·04	− 0·04
Neu-Heusis	Liebig's Extract Co.	0·00	0·01	− 0·01	15·95	11·55	+ 4·40	0·00	0·03	− 0·03
Okahandja	B. Templin	0·00	0·06	− 0·06	22·96	11·67	+ 11·29	0·00	0·10	− 0·10
Okasangumingo	E. H. A. Schneider	0·00	0·16	− 0·16	25·46	12·92	+ 12·54	0·00	0·16	− 0·16
Okandjose	— von Gossler	0·00	0·30	− 0·30	28·35	13·63	+ 14·72	0·00	0·30	− 0·30
Omaruru	The Postmaster	0·00	0·00	± 0·00	20·17	9·08	+ 11·09	0·00	0·00	± 0·00
Rehoboth	The Postmaster	0·00	0·08	− 0·08	21·67	8·39	+ 13·18	0·00	0·08	− 0·08
Riettontein	B. Liest	0·00	0·02	− 0·02	31·42	14·71	+ 16·71	0·00	0·02	− 0·02
Swakopmund	E. Sievert	0·00	0·04	− 0·04	0·38	0·42	− 0·04	0·00	0·05	− 0·05
Tsumeb	Ing. Schetter	0·00	0·00	± 0·00	26·50	17·13	+ 9·37	0·00	0·02	− 0·02
Usakos	Rev. Diehl	0·00	0·00	± 0·00	8·24	4·39	+ 3·85	0·00	0·00	± 0·00
Voigtsgrund	A. Voigts	0·00	0·02	− 0·02	25·06	6·14	+ 19·92	0·00	0·03	− 0·03
Waterberg	D. Hahn	0·00	0·06	− 0·06	25·59	15·25	+ 10·34	0·00	0·06	− 0·06
Windhoek	Observatory	0·00	0·06	− 0·06	26·87	10·48	+ 16·39	0·00	0·10	− 0·10

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

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A GENERAL shortage of rainfall, amounting to partial or absolute drought, affecting large areas in all the Provinces; an excess of precipitation confined to a small portion of the south-west Cape; a few local thunderstorms with one or two falls of hail; mean temperature about 1½ degree higher than usual; exceptionally warm days, particularly towards the end of the month; nights slightly above normal, but with some killing frosts, causing considerable damage to fruit, blossoms, etc.; persistent hot, drying north to north-west winds and frequent duststorms; these unsatisfactory conditions following on unfavourable rainfall conditions during the preceding winter months caused *the outlook for agriculturists and pastoralists to be rather gloomy at the* close of September.

Pressure.—Mean atmospheric pressure during this transition month was practically the same as usual, except in the north-east where it was two to three hundredths lower than usual, and Natal where it was half a tenth to a tenth of an inch below normal. Anticyclonic conditions prevailed, high-pressure areas having been present each day of the month. During the first two days of the month the country lay under high-pressure centred over the north-east with a minimum isobar of 30·05 inches along the coast. On the 3rd a "low" had appeared on the south coast with the lowest isobar (29·90) inches along the south-east coast; on the 4th it had pushed further on to the land and a lower isobar (29·85 inches) extended some distance parallel with the south coast and off the east coast as far as Durban; on the 5th the disturbance had moved from the south-coast, the lower isobars (29·95 and 29·90 inches) being confined to Portuguese East Africa and Zululand. On the 6th the entire country was once more under high-pressure conditions, but the northerly portion of a second depression had appeared and occupied practically the same position as the previous one on the 3rd and on the 8th; on the 8th the 29·90-inch *isobar lay along the east coast in Portuguese East Africa and the* Zululand coast. From the 9th to 14th pressure continued high, although on the 11th there were indications of the head of a "low" off the south-west coast. On the 15th, pressure had fallen over the Transvaal interior, and on

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the 16th the low-pressure area had pushed slightly further south and east with two additional lower isobars over the inland; by the 17th, the isobars along the south coast had increased by 0·15 inch and the equatorial tongue had been pushed further northwards, two of the lowest isobars having disappeared off the map. By the morning of the 18th the high-pressure along the south coast had passed off and the "low" over the interior had reasserted itself pushing southwards almost to the coast, where the highest isobar was only 30·00 inches, whilst the western part of an anticyclone lay over the Transvaal and Portuguese East Africa. On the 19th the low-pressure over the interior had pushed further south on to the coast, an isobar of 29·80 inches lying over the Natal coast, whilst a decided high-pressure area lay over the west and south-west and the outermost isobars of another high-pressure area over the north-east. On the 20th the western high-pressure area covered practically the whole country, the lowest isobar on the coast having risen to 29·95 inches and a lower isobar of 29·90 inches over the northern part of the interior. On the 21st another depression was affecting the south coast, the lowest isobar being 29·85 inches and a complementary low-pressure area was indicated over the interior with highs to east and west; on the 22nd the 29·85 inch isobar lay along the Natal and Portuguese East African coast, the greater part of the interior being under the influence of the eastern portion of an anticyclone with the highest isobar reading 30·15 inches. High-pressure was general over the Union on the 23rd, being highest in the east and lowest in the west, but on the morning of the 24th a low-pressure area lay over the south and east coast with the minimum barometric reading of 29·67 inches at Durban. On the 25th this "low" had passed off and the country was covered by a high-pressure area which continued till the 28th, when part of a "low," with the lowest pressure 29·82 inches lay over the south-east. Apparently as the result of a low-pressure over the western part of the interior, coupled with the advance of a high on the west coast, pressure had risen on the 29th to 29·90 inches along the south coast; at the close of the month the northern part of an anticyclone lay over the Union with the highest pressure, 30·35 inches at Cape Agulhas.

Temperature.—The mean temperature for September was 61·8 degrees or 1·4 degree higher than the average. This excess was almost entirely due to the day temperature (76·6 degrees) being 2·5 degrees, whereas the night temperature (46·9 degrees) was only 0·2 degree higher than the corresponding normals. An increased value of the mean monthly temperature was common to all the Provinces: thus, the Orange Free State with a mean of 59·5 degrees was 1·7 degree in excess; the Transvaal with 63·4 degrees and the Cape Province with 60·6 degrees were both 1·5 degree warmer than usual, whereas Natal, with 65·3 degrees was only 0·3 degree above the average. In all the Provinces the days were warmer than usual, whereas a small excess in the night temperature was common to Natal and the Cape Province, the remaining two having mean minima somewhat under the normal. Taking the different Provinces separately, the mean maximum in the Free State (76·3 degrees) was 3·8 degrees, the Transvaal with a corresponding value of 80·3 degrees was 3·1 degrees, the Cape Province with 74·0 degrees was 2·4 degrees, and Natal with 78·9 degrees was only 0·2 degree above the corresponding normal day values. With regard to the nights, Natal with a mean minimum of 51·7 degrees, and the Cape Province with 47·1 degrees, were both half-a-degree above the corresponding averages; but in the Free State, the mean night temperature of 42·7 degrees, and in the Transvaal the mean minimum of 46·5 degrees were 0·4 degree and 0·1 degree lower than the usual averages. The mean temperature at the individual stations was above normal except over the west coastal area, part of the south-west, a few stations in the south

and south-east of the Cape and in the inland portion of Natal; as also at Belfast on the Transvaal High Veld. In the Transvaal the excesses ranged from 3·3 degrees at Johannesburg to 0·4 degrees at Komatipoort; in the Free State from 0·4 degree at Lindley to 3·2 degrees at Ladybrand; in Natal the surplus amounts lay between 0·2 degree at Estcourt and Ladysmith and 2·4 degrees at Stanger; in the Cape Province they were mostly between 2 and 4 degrees over the interior, but decreased to 1 degree and under along the south coast and over the Cape Peninsula, varying, however, between 0·1 degree at Port Elizabeth and 4·2 degrees at Graaff-Reinet. A few stations were normal, as Durban and Maritzburg in Natal, and Middelburg in the Transvaal. The deficits were between 1 and 2 degrees in the west of the Cape Province and at Belfast (Transvaal), but less than 1 degree in the south-west, south, and south-east, and in Natal. The day temperatures were above normal at all stations in the Transvaal and Orange Free State, at about half of those in Natal and at by far the greater proportion of those in the Cape Province. These excesses in the maximum temperature were large (4–6 degrees) in many cases in all the Provinces except Natal, where they varied between 1 and 2 degrees. In the Transvaal, they varied between half-a-degree at Pretoria and 5·2 degrees at Bloemhof; in the Free State from 2·2 degrees at Lindley to 6·3 degrees at Ladybrand and in the Cape Province from 0·3 degree at Port Elizabeth to 7·0 degrees at Stutterheim. Deficits in the day temperature were met with in Natal at Durban, Pietermaritzburg, and Ladysmith, lying between 0·4 degree at the second and 2·6 degrees at the first of these stations. In the Cape Province, shortages in the day temperature occurred chiefly in the west where they varied between 1·2 degree at Clanwilliam and 0·1 degree at Wynberg, but were less than a degree at Port St. Johns and Uitenhage in the east and south. Sub-normal night or minimum temperatures occurred in the Transvaal over part of the eastern high veld, the more northerly portion and in the south-west at Klerksdorp, varying from 5·4 degrees at Belfast to 0·3 at Standerton. The excesses in that Province were generally in the neighbourhood of 1 degree, but ranged from 0·2 degree at Piet Retief to 2·5 degrees at Bloemhof. In the Free State deficits in the minima occurred in the north and centre and excesses in the east and south; the surplus amounts were less than a degree and the deficits varied between 1·8 degree at Kroonstad and 0·4 degree at Bloemfontein. In Natal, the mean night temperatures were mostly above normal varying between half a degree at Maritzburg and 2·8 degrees at Stanger, whereas at Dundee and Estcourt they were lower than usual by 3·0 degrees and 1·4 degree respectively. In the Cape Province sub-normal night temperatures occurred along the west coastal area, in the south-west, portions of the north-east, south-east, and the Northern Border and Kaffraria, the amounts ranging from 0·1 degree at Kokstad to 2·3 degrees at Kenhardt; elsewhere the mean minima were above the average mostly by 1 and 2 degrees, but varying from 0·2 degree at Uitenhage to 4·4 degrees at Port St. John's. The mean warmest station was Komatipoort, in the Transvaal, with a temperature for the month of 73·2 degrees; in Natal the highest mean temperature during the month was 69·0 degrees at Stanger; in the Cape Province 66·7 degrees at Mafeking and in the Free State 61·4 degrees at Kroonstad. The mean coolest station was Port Nolloth in the Cape Province with a temperature of 53·7 degrees; in the Transvaal, Belfast with 54·0 degrees; in the Free State, Harrismith with 57·0 degrees, and in Natal, Estcourt with 62·2 degrees. There was therefore a difference of 19·5 degrees between the mean warmest and coolest stations during September; in the Transvaal, the difference was 19·2 degrees; in the Cape Province 16·0 degrees; in Natal 6·8 degrees, and in the Free State only 4·4 degrees. The highest mean maxima reached 80 degrees or over in all the Provinces, being 88·4 degrees at Komatipoort

(Transvaal Province), 84·1 degrees at Mafeking (Cape Province), 81·6 degrees at Ladysmith (Natal Province), and 80·0 degrees at Kroonstad (Orange Free State). The lowest mean minima were 34·7 degrees at Belfast (Transvaal Province), 37·9 degrees at Murraysburg (Cape Province), 41·4 degrees at Ladybrand (Orange Free State), and 44·8 degrees at Estcourt (Natal Province). The extreme maxima during the month were recorded on fifteen days of the month, viz., 1st to 3rd, 10th to 12th, 17th, 22nd to 25th, and 27th to 30th, most generally on the last three days, particularly the 30th. Temperatures of 100 degrees or over among the stations in the list appended were confined to Komatipoort and East London, the former registering 110 degrees on the 22nd and the latter 100 degrees on the 3rd, but 100·5 degrees was also recorded at Palapye Road in Bechuanaland. In Natal, the highest reading was 97·5 degrees at Stanger on the 28th and in the Orange Free State 92·8 degrees at Kroonstad on the 29th. The extreme minima occurred during several cold spells, lasting from the 1st to 7th, on the 12th, 13th, from 16th to 19th, and on the 21st, most widely on the 6th and 18th. The lowest reading was 20·0 degrees on the 12th at Belfast, in the Transvaal; in the other Provinces the minima for the month were, in the Cape Province 27·0 degrees on the 6th and 18th at Murraysburg, in the Free State, 28·0 degrees at Bethulie on the 6th; and in Natal 32·2 degrees at Dundee on the 1st. There was thus an extreme range of 90 degrees over the Union during this month. More than two-thirds of the stations had extreme maxima of 90 degrees or over, these maxima being record temperatures at a number of stations having twenty years records or more. On the other hand screen temperatures of 32° F. or lower were registered at less than one-third of the stations. Killing frosts occurred in various parts of all the Provinces, particularly on the 6th and 18th, destroying fruit blossoms, young fruit, and early vegetables.

Precipitation.—Rainfall during September was scanty, infrequent, and below normal except at a few stations in the south-west, where small excesses of less than three-quarters of an inch occurred. Very light, local showers occurred in parts of the Transvaal on the 5th, 10th to 15th, 18th, 19th, 29th, and 30th, but absolute drought prevailed at many stations in most divisions. In Natal light rains fell on the 11th, 15th to 20th, 26th, and 30th, although it continued rainless at a few stations throughout the month. In the Free State small quantities varying between a few hundredths and half-an-inch fell principally over parts of the north-east and south on the 18th; a few stations in the Bethulie district received similar amounts, also on the 12th, while further showers occurred in the Bethlehem district on the 19th, 29th, and 30th. Drought, however, continued throughout the month in the western and central divisions as well as at many stations in portions of most of the remaining districts. In the Cape Province light rains were most frequent over the Cape Peninsula, the south-west, the more southerly portions of the west coastal area and the south coast. Local showers occurred at intervals over Kaffraria and the north-east, principally on the 14th to 16th in the south-east; on the 5th–14th and 15th over the southern Karoo, and on the 15th and 16th in the east central Karoo. No rain fell over Bechuanaland, the northern border, northern Karoo, the west central Karoo, parts of the north-east and the north portions of the more northerly section of the west coastal area, as well as over the whole of South-West Africa. Light showers of snow fell mainly in the Uniondale district on the 4th, and over the southern and central Karoos, portions of the south-east and north-east and in Kaffraria as far east as Mount Ayliff between the 15th and 17th mainly on the mountains. Hail fell on the 15th at Nottingham Road and Edendale (Division, Klip River), in Natal, knocking off the young fruit at the latter station but soaking the veld well at the former. The accumulated rainfall since the beginning of the year is above

the average over the greater part of the Transvaal, the centre and west of the Orange Free State, the south of Bechuanaland, parts of the northern border and northern Karoo, the west coastal area with the exception of the Namaqualand coast, portions of the south-west including the Cape Peninsula, parts of the east central Karoo, the south coast and south-east together with practically the whole of the north-east Cape and Kaffraria; apparently Basutoland had also an excess during this period. The exceptional areas in the Transvaal included some stations in the north-east, east, south-east, and extreme south-west where the totals for the nine months were lower than usual. This period's rainfall was also sub-normal over the north, east, and south of the Free State and almost the whole of Natal, the north of Bechuanaland, part of the northern border, the east and south-west of the northern Karoo, the greater portion of the central Karoo and the south coast, the southern Karoo, some stations in the south-west and south-east. The excesses in the Transvaal varied between 0·08 inch at Potchefstroom and 25·33 inches at Pigeonhole; in the Free State about 6–7 inches, and in the Cape Province between 0·05 inch at Queenstown, and 11·65 inches at Groot Drakenstein in the south-west, and 9·71 inches at Kokstad in Kaffraria in the east. The deficits in the Transvaal ranged from half-an-inch at Heidelberg in the south to 7·59 inches at Ermelo in the south-east. In Natal, Stanger showed a small excess of a third of an inch, but elsewhere deficits occurred ranging from 3·53 inches at Ladysmith to 9·93 inches at Weenen. In the Cape Province the shortages lay between 0·13 inch at Kimberley and 5·29 inches at Grahamstown. In South-West Africa, the only stations having totals below normal for the first nine months were Franzfontein in the north-west (lat. 20° 11′ S., long. 15° 04′ E.) and Swakopmund on the coast, where deficits of 0·28 inch and 0·09 inch respectively occurred. Elsewhere the excesses ranged between 0·30 inch at Aus, in the district of Luderitz in the south-west and 18·81 inches at Voigtsgrund (lat. 24° 50′ S. and long. 17° 26′ E.) in the Gibeon district.

The total precipitation since the beginning of the seasonal year on the 1st July, is below normal except in Kaffraria, the coastal portion of the south-east and portions of the south-west of the Cape Province; thus showing that the excess rainfall for the nine months was due mainly to the heavy rains at the beginning of the year. The deficits in the Transvaal were mostly less than 1½ inches, but varied from 2·48 inches at Woodbush to 0·09 inch at Zeerust; in the Free State they were mostly less than an inch, but ranged from 1·59 inch at Boshof in the west to 0·52 inch at Harrismith in the north-east. In Natal the shortages lay generally between 1 and 2 inches, but varied from 0·10 inch at Ladysmith to 2·47 inches at Durban. In the Cape Province the deficient amounts were least over the interior but increased towards the west and south coasts, ranging from 0·06 inch at Beaufort West to 3·15 inches at Ceres. The excesses in the Cape Province ranged from 1·22 inch at Kingwilliamstown to 6·31 inches at Port St. Johns. In South-West Africa absolute drought prevailed at all stations during these three months with the exception of Gabis, where a tenth of an inch was recorded, so that the rainfall there is less than usual by a third of an inch or less except at Aus where the shortage is 0·87 inch.

Owing to the unusually warm days, the continued absence or deficiency of rain and drying winds, the veld with few exceptions is very poor; cattle and sheep are suffering from scarcity of grazing or actually dying in a number of districts, e.g. Ermelo, Wakkerstroom, etc.; ploughing has been impracticable; in some areas fruit blossoms were killed by frost, as at Ermelo and Lichtenburg; wheat crops were in a bad way, water was getting scarce and plantations shrivelling up. A similar state of affairs prevailed in the Free State, aggravated by the ravages of locusts, apparently more so than in the Transvaal.

Although the lambing season started well the ewes were refusing the lambs at the end of the month (Paardekraal District, Winburg). In Natal, the season was also backward, and pasturage scarce; where early growth on the veld had started it was either checked or withered up, as in the Free State; considerable losses in stock in some districts; hot winds and duststorms frequent. Many trees were reported as dead or dying from lack of moisture at Dundee. In the Cape Province rain was badly needed over practically the whole area except in the south-west where conditions were particularly favourable to veld and crops; killing frosts were widespread, destroying fruit and vegetables; locusts were hatching out apparently more widely than in either the Free State or Transvaal.

OBSERVERS' NOTES FOR SEPTEMBER, 1923.

TRANSVAAL.

Barberton.—A very dry month with occasional unusually high maximum temperatures. The nights have remained consistently cool. Rainfall: 0·03 inch on one day.—Walter Grubb.

Bloemhof.—Drought very severe, grazing scarce. Rainfall: Nil.—F. Osborne.

Ermelo.—A very dry and trying month. Stock suffering severely on account of the drought. Sheep and cattle dying. Mealie farmers' could not continue to plough, so mealie crop is not in yet which is very late. Weather often promising but rain did not materialize. Good rains soon will mean thousands of pounds in value to this district. Most of the fruit crop has been spoilt by the frost killing the blossoms, e.g. peaches, plums, etc., and apples prove to be a very poor crop, if the hail does not take what is left. Rainfall: 0·14 inch on one day.—Dr. E. B. Theunissen.

Klerksdorp.—Scarcity of rain. Rainfall: 0·12 inch on one day.—Chas. Scott.

Middelburg.—Hot, dry, dusty weather, with cool nights have obtained; on four occasions, at the end of the month, temperatures of over 90 degrees were recorded in the screen, on the 30th the maximum temperature being 95 degrees, and although this is a record for September during twenty years, 95 degrees and 96 degrees were recorded on October 15th and 16th, 1920, after sixteen days without rain. Threatenings of rain have occurred frequently during the month, but by 4 p.m. they have culminated in wind storms followed by clear, cool nights, and repetition of the routine weather, the following day. The wind has blown from the east-south-east regularly during the nights and early mornings, but by 10 a.m. it swings round by the north to north-north-west and west, blowing moderately to fresh. The rainfall for the month amounting to only 0·12 inch on five days is exceptionally low—as little having fallen during only six years in the last twenty years.—Dr. H. A. Spencer.

Pietersburg.—Very hot and dry. Pools drying up. Veld in bad state. Rain badly needed. Rainfall: 0·18 inch on one day.—W. J. Frankleyne.

Piet Retief.—Exceptionally dry month. For the past week every indication of rain. Country suffering from drought. Rainfall: 0·01 inch on one day.—J. Werner.

Pigeonhole (Pietersburg).—Country very dry. Several deaths reported of stock dying owing to the drought. Rainfall: 0·16 inch on five days.—Jno. McCallum.

Pilgrims Rest.—For the last ten days the weather has been exceptionally hot and dry. Rainfall: 0·26 inch on four days.—A. Kiernander.

Standerton.—Warm bright days, with occasional cold snaps. Usually breezy in afternoons. The district is suffering severely through prolonged drought. Rainfall: 0·45 inch on two days.—W. J. Madge.

Lichtenburg.—Very dry and hot month, especially the latter part. Rain needed badly. Prospects of the fruit season not very bright, frost caught some of the blossoms. Crops of wheat in a very bad way; what with the locusts, rust, and the drought, farmers have a lot to contend with. Rainfall: 0·35 inch on one day.—E. Newton.

Wakkerstroom.—The drought remains unbroken; hundreds of cattle are dying in the district, and it is beginning to look very serious for the farmers. Rainfall: 0·40 inch on two days.—F. J. Grant.

Myrthley (Standerton).—Excessively hot and dry; high winds usually from the north-west and west of a hot drying character. Sharp thunderstorm on the 18th lasting about forty minutes with a fall of 0·47 inch followed by about two hours drizzle adding a further 0·15 inch.—J. L. Ellis.

Krugersdorp.—During the first-half of month climatic conditions were cool and pleasant. From the 22nd till the end of the month the weather was very hot and trying, the temperature on the 30th reaching 91 degrees, a record for September, since readings have been taken here which covers a period of thirteen years. A short sharp thunderstorm (0·62 inch) was experienced on the morning of the 18th, but the rainfall for the month was slightly under the average and at date of writing rain is badly needed. Rainfall: 0·75 inch on three days.—H. Sharp.

Mosdene (Naboomspruit).—A very hot month, a maximum temperature of 98 degrees being recorded on the 25th. During the four years that records have been kept the highest September temperature previously recorded was 93·6 degrees on the 29th September, 1921. Rainfall: 0·21 inch on two days.—Ernest E. Galpin.

Piet Retief.—This has been the driest September for the past five years. Farmers are behind with their work. Cattle and sheep are poor. Rainfall: 0·06 inch on four days. The Manager, Government Tobacco Station.

Gemboksfontein (Middelburg).—Strong drying winds have prevailed throughout the month. Rain is badly required as grazing is very poor. The heat has been excessive. Rainfall: 0·06 inch on three days.—C. M. van Coller.

Nooitgedacht No. 777 (Warmbaths).—Weather unusually dry, although rain threatened on two occasions only a few drops fell. On the 10th, rain appeared to be falling far to the west. There has been a fair amount of wind which tended to freshen as the day advanced and did not always drop at nightfall. The veld in the immediate neighbourhood remains surprisingly good and cattle are in fair condition; until rain falls ploughing is restricted to the black turf which can be dealt with throughout the winter.—E. Gordon Brown.

Zwartkopjes (Heidelberg).—Exceptional heat (94·4 degrees) on the last day of month which was accentuated by the lack of wind. Rainfall: 0·50 inch on two days.—E. Taylor.

White River (Barberton).—The weather has been unusually warm, and although 0·37 inch of rain fell on four days, the hot winds have counteracted any good effects and rain is badly needed.—H. C. Pooley.

Kamhlabane Ranch (Barberton).—The grass is very poor and all stock very thin. Rainfall: 0·05 inch on one day.—H. B. Trollip.

Davel (*Bethal*).—Drought is most serious. Ploughing impossible. Rainfall: 0·22 inch on one day.—H. A. Wollenberg.

Morgenster (*Ermelo*).—Cattle falling off—while half the lambs are dying. Unless there is rain within ten days serious losses will follow. Rainfall: 0·10 inch on one day.—M. E. Jooste.

Badfontein (*Lydenburg*).—13th, frost damaged early gardens and wheat. All stock in bad condition. Winter crops promise remarkably well. Rainfall: 0·04 inch on one day.—L. Parker.

Zwagershoek (*Lydenburg*).—Stock in poor condition; no grazing, especially on veld yearly burnt. Irrigated crops promising. Rainfall: 0·28 inch on three days.—J. D. Stirling.

Mimosa Park (*Potchefstroom*).—Very dry, but stock have not suffered so much this September as in September of previous years. Rainfall: 0·41 inch on one day.—J. G. Dixon.

Palmford (*Wakkerstroom*).—General heavy losses among cattle and sheep due to drought. No crops planted by majority owing to the dryness of the soil. Rainfall: Nil.—W. Stephens.

Innerleithen (*Zoutpansberg*).—Cattle falling off in condition and water getting scarce. Rainfall: 0·22 inch on one day.—F. Halse.

Driefontein No. 1928 (*Zoutpansberg*).—Cattle and sheep in very poor condition. Rainfall: 0·01 on one day. H. J. Knauer Juntzen.

Swaziland.

Stegi (*Ubombo*).—Dry. Some waterholes still holding out. Rainfall: 0·10 inch on two days. W. J. D. Crawford.

Matapa.—Very serious drought. Impossible to plough. Rainfall: 0·08 inch on two days.—A. R. Torrens.

Dinedor.—The veld is getting very dry and plantations are shrivelling up. Rainfall: 0·01 inch on one day.—Messrs. Lewis and Waller.

Transvaalia.—Condition of stock serious—no ploughing as ground too hard. Rainfall: Nil.—J. H. Coates.

Orange Free State.

Kroonstad.—Absence of strong wind during this month very noticeable. Rainfall: 0·01 inch on one day.—S. R. Northfield.

Holfontein (*Kroonstad*).—A very bad month nothing but wind and dust. If we do not get rain soon a number of farmers will suffer heavy losses. A number of farmers have no grazing for their stock. Locusts are simply overrunning the country. Side farmers cannot keep the large swarms in check that are coming from all directions. Rainfall: Nil.—L. C. McInerney.

Glen (*Bloemfontein*).—A steady increase in temperature and during the day the winds have increased a good deal. Rainfall: Nil.—E. G. L. Smith.

Pakpoort (*Bloemfontein*).—Severe frosts; no fruit on river farms. Rainfall: Nil.—L. S. Evans.

Doornplaat (*Bloemfontein*).—September proved a changeable month; very hot and cold snaps accompanied by frost damaging fruit crops. Voetgangers hatched out plentifully. Rainfall: Nil.—C. G. Oertel.

Wildealspoort (*Fauresmith*).—Veld now getting very dry. What green grass there was has mostly wilted. Locusts are hatching out in fairly large quantities along the north bank of the Riet River and in the middle veld. They had a good shower of rain there which did not touch this station. Rainfall: Nil.—J. M. Blakeney.

Heilbron.—Live stock are suffering as natural feed is very scarce. Report from the district reveal the same deplorable state of affairs. Quite a number of cattle have died from poverty. Dry hot winds prevail and any plant growth that was started by the light shower on the 18th has since disappeared. Even fruit trees seem to be suffering already. So far as can be ascertained no ploughing has been done. All are waiting on the much needed rain. Rainfall: 0·15 inch on one day.—P. A. du P. Naudé.

Prospect (*Vrede*).—The month has been warm and dry with frequent strong winds which dry up what little moisture remains. Rain on the 18th and 19th was helpful, but by the end of the month conditions were again dry. Live stock are getting rather weak and there are some losses among cattle and sheep. Rainfall: 0·36 inch on two days.—T. Pitcairn.

Woudzicht (*Vrede*).—Owing to only 0·35 inch of rain for the whole month and to the dry west winds, there is very little grass growing and the stock are in poor condition. Many losses occur owing to stock sticking in the mud as water is getting scarce. Rainfall: 0·35 inch on one day.—J. N. Köhler.

Springbokvlakte (*Vredefort*).—Things very bad and stock are almost starving: Rainfall: 0·07 inch on one day.—M. E. Brindley.

Paardekraal (*Winburg*).—Lambing started off well, but 50 per cent. of ewes refuse the lambs at end of month in spite of heavy feeding. Cattle wretched. Conditions most depressing. Month much warmer than usual. Hopper locusts everywhere. Rainfall: 0·11 inch on two days.—G. S. Lowe.

Smaldeel (*Winburg*).—Very dry, hot winds. Young locusts in abundance. Grass getting scarce. Rainfall: Nil.—C. M. Saayman, J.P.

NATAL.

Dundee.—A very dry and changeable month varying from frosty mornings to 96 degrees maximum. Season very backward and much lives tock reported dead owing to all feed being exhausted; those farmers who have mealies on hand are feeding them to stock. Position generally is very serious. Many trees dead and dying for want of moisture. Rainfall 0·05 inch on one day.—West Thorrold.

Ladysmith.—A very dry month for the time of year and the little rain that fell did no good. Strong, hot winds during the latter portion of month have dried things up worse than ever. There is practically no feed for stock and farmers in most parts of the district report heavy losses. Lambs are being killed in an endeavour to save the ewes. The position is daily becoming more serious and unless there is a heavy fall of rain shortly the losses in stock will be enormous. An exceptional duststorm occurred on the afternoon of the 29th, lasting about ten minutes. During this storm even the outlines of large objects (trees, etc.), could not be distinguished at a distance of 20 yards. Rainfall: 0·29 inch on two days.—D. A. R. Leathern.

Maritzburg.—September has been very dry—only 0·16 inch on two days. Country is suffering from drought. Feed for cattle is very scarce.—The Staff (Mental Hospital).

Stanger.—Month of very windy days. The temperature (93·7 degrees) on the 24th was the highest I have registered at 8.30 a.m. Rainfall: 1·07 inch on five days.—Cecil C. Foss.

Greytown.—Terribly dry, though rain of 15th (0·44 inch) was very heavy in places, but taken as a whole position is very serious.—J. M. Handley.

Empangeni.—A hot, dry, and windy month with a total rainfall of 0·35 inch on six days. Rainfall is badly needed.—W. G. W. Cochrane.

Mid-Illovo.—Drought felt, especially in early part of month as no rain until 15th. Ploughing impossible; early growth on veld checked and stock pulled down a bit, otherwise this district has not suffered to any great extent. Rainfall: 1·14 inch on seven days.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Newcastle.—Heavy winds during the month. Drought continues. Cattle are suffering very badly. Rain is badly needed. Rainfall: 0·06 inch on two days. The Gaoler.

Nottingham Road.—Very dry, but hailstorm on the 15th soaked the veld well, and the grass is good though short. Stock of all kinds healthy. Rainfall: 0·59 inch on three days.—Miss E. Smythe.

Paulpietersburg.—Serious drought. Considerable losses of stock. Rainfall: 0·08 on five days.—Dr. Niel Lipscomb.

Cape St. Lucia.—Veld very dry and stock in poor condition. Rainfall: 0·16 inch on two days.—J. Murphy.

Edendale (Klip River).—Rain badly wanted. No ploughing done so far; cattle in very poor condition; sheep still good. Rainfall: 0·30 inch on two days. 15th, small hail knocked off most of early fruit.—T. N. Niland.

Glückstadt (Vryheid).—The drought is most intense and the toll amongst cattle is daily increasing, owing to the extremely low condition the animals are in. The veld is simply parched and those farms which are devoid of vleis present a pitiful aspect. On the neighbouring farm over forty cattle have perished. If the first rain should be a cold one, then the loss in cattle will be tremendous. The ploughing season is approaching and the outlook is gloomy. Rainfall: 0·13 inch on three days.—F. W. J. Schumann.

Mfongosi (Nkandhla) (Zululand).—Unprecedented drought. Rainfall: 0·21 inch on one day.—W. E. Jones.

Middleton (Umvoti).—Drought position very black. Cattle losses heavy; sheep in no danger. Rainfall: 0·52 inch on two days.—O. L. Nel.

Rongpoort: Weenen.—Still no rain to speak off; grass not springing. All stock very low and heavy losses all round. Awful winds and duststorms such as I have never experienced before. White frosts on the 6th and 11th. Worst season for stock in my experience. Rainfall: 0·36 inch on two days.—J. H. Bartholomew.

Maputa (Ingwavuma).—Country very dry and parched. Rainfall: 0·11 inch on two days.—G. W. Austin.

CAPE.

Graaff-Reinet.—A very dry month, but deposits of mist in the morning. Some days exceedingly warm. Winds variable; frequent duststorms. Rainfall: Nil.—The Convent, The Mother Superior.

Aliwal North.—A dry and fairly hot month. Stock and crops suffering. Rainfall: 0·35 inch on two days.—Alex Alcock.

Bedford.—Fruit trees indicate abnormal conditions—some are very dormant, others budding, some in blossom and some with fruit of fair size. The dry season is almost developing into a drought and if rain does not come within a fortnight drought conditions will prevail here. Dams on many farms empty, but when rain does come there will be a big hatching of locusts. Rainfall: 0·74 inch on five days.—Thos. C. Hall.

Carnarvon.—An uneventful month: winds northerly for the first part of the month and thereafter south-westerly. Frost on the 5th and 6th destroyed young fruit. Rain badly needed, many farmers having to trek. Rainfall: Nil.—A. P. Malherbe.

Kokstad.—Very dry. Rainfall: 0·16 inch on one day, 15th; severe frosts have damaged peaches and apricots.—H. D. Coyte.

O'okiep.—Continued dry weather adverse to crops, September being critical month. Rainfall: 0·04 inch on one day.—J. Burrows.

Murraysburg.—September like August passed with no rain whatsoever. Rain is very badly needed in the westerly portion of the district, and even the other portions of the district are looking forward to a good fall of rain. The hatching of locusts has been very limited; those hatched seem to have been cleared off by the veld birds.—W. H. Rose-Innes.

Queenstown.—Warm, dry, windy month. Hazy towards end. Rain badly wanted. Country suffering from drought. Rainfall: 0·11 inch on three days.—H. Holley.

Somerset East.—An exceptionally dry September following an equally dry August. Warm days followed by cool south-easters at night; late frosts during night of 17th. With drought prevailing and hatching out of locusts approaching, the conditions are far from good. Rainfall: 0·23 inch on three days.—C. Harris.

Stutterheim.—Locusts hatching from 21st to 30th. Cattle in low condition; sheep fair. Greatly in need of rain. Rainfall: 0·63 inch on five days.—F. C. Bousfield.

Grassridge (*Cradock*).—The month has been fine and dry with no rainfall. Frequent dust storms.—W. la C. Loftus.

Lovedale.—The month opened with a hot spell, and later during the month there have been several hot days. There was frost on two nights but mean temperatures have been close to normal. During the early part of the month hot winds regularly sprang up in late forenoon. During the latter part of the month cool winds from south-east have sprung up in the afternoon. Rain has fallen (in intermittent light showers) totalling 0·33 inch on three days, but the total for the month is well below the average; precipitation for September (1·60 inch). The district is very dry; rain is sorely needed.—H. R. Storey.

Louisvale (*Upington*).—A favourable month for farmers of irrigable ground along the Orange River. All crops are promising well and there is no shortage of water in the river. Rainfall: Nil.—Stuart M. Smith.

Kraaipan (*Mafeking*).—No rain. Wind moderate but very changeable. Water scarce, and stock in poor condition.—P. J. Hart.

Darling (*Malmesbury*).—Very favourable conditions. The nice rains in the latter part of the north excellent for crops. Rainfall: 1·76 inch on twelve days.—P. H. Drake.

Liwandi—Addo (*Uitenhage*).—Winds from an easterly direction have again been experienced throughout the month. Old residents firmly believe in the rain-bringing properties of a south-east wind. After two days of strong south-east wind (12th and 13th), we had 0·34 inch on the 14th to 16th. Little or no good resulted as wind in between the showers dried out the ground again. As a result of a thorough irrigation late in August much lucerne is being cut this month. Rainfall: 0·35 inch on four days.—Major J. Kreft.

Rietfontein (*Aliwal North*).—Cold windy month. Rain wanted at end of month. Rainfall: 0·54 inch on two days.—A. G. Smith.

Cathcart.—A hot, dry month with drying winds chiefly northerly and westerly. Rainfall: 0·19 inch on three days.—C. E. Whibley.

Ceres.—Weather generally more cloudy than usual but otherwise normal. Rainfall: 2·94 inches on nine days.—A. Heatlie.

Queenstown.—Strong north-westerly winds prevailed. Frost on three mornings, that on the 18th being particularly severe (26·5 degrees), destroying grapes, plums, figs, beans, tomatoes, potatoes, etc. Country very dry and town very dusty. Rain overdue. Rainfall: 0·07 inch on one day.—J. F. C. Rein.

Sydney-on-Vaal (*Barkly West*).—Very dry and exceptionally high temperatures. No grazing for live stock. There will be heavy losses in live stock should drought continue another week or two. Usual high winds late in month. Rainfall: 0·01 inch on one day.—J. G. Richards.

Riversdale.—A good soaking rain is much needed. The farmer begins to look seriously at the thirsty grain lands. Rainfall: 0·70 inch on six days. —Rev. Carl Prozesky.

Danger Point (*Caledon*).—Veld in splendid condition. Not been like it for years. As for flowers it is as walking on a carpet. Rainfall 2·51 inches on ten days.—The Lightkeeper.

Rooi River (*Uniondale*).—Crops are very poor on account of the drought. Locusts have appeared on some farms in the neighbourhood. Rainfall: 0·27 inch on three days.—W. G. Schaap.

Hillandale (*Laingsburg*).—Crops in this district are far below normal owing to the drought. Rainfall: 0·08 inch on one day.—V. A. Young.

New Bethesda (*Graaff-Reinet*).—Drought serious; severe frosts. Fruit destroyed. Rainfall: 0·21 inch on two days.—A. G. Erlank.

Glencoe (*Middelburg*).—Rain badly wanted; farmers are beginning to lose cattle. Sheep still doing fairly well. Rainfall: 0·02 inch on one day.—C. L. Hart.

Bechuanaland.

Serowe.—Temperatures rose considerably during latter part of month. Rainfall: 0·20 inch on one day.

Dikgatlong Ranch (*Tuli Block*).—Nothing unusual to report. Country very dry even for time of year. No signs of locusts. Rainfall: 0·12 inch on one day.—Paul Jousse.

Palapye Road.—Highest maximum temperature for September registered 100·5 degrees on the 25th as compared with 96·8 degrees on the 28th September, 1922. Some heavy duststorms during the month. Hoping for an October shower to settle the dust. Rainfall: Nil.—Thos. W. Shaw.

Basutoland.

Maseru.—Swarms of locusts hatching out in the south of Basutoland. Very dry. Cattle getting in low condition. Cold during nights and early mornings until the 16th. If rain does not fall during the next fortnight the cattle will suffer severely and ploughing will be difficult. Rainfall: 0·01 on one day.—J. G. Green.

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 Karoo 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.

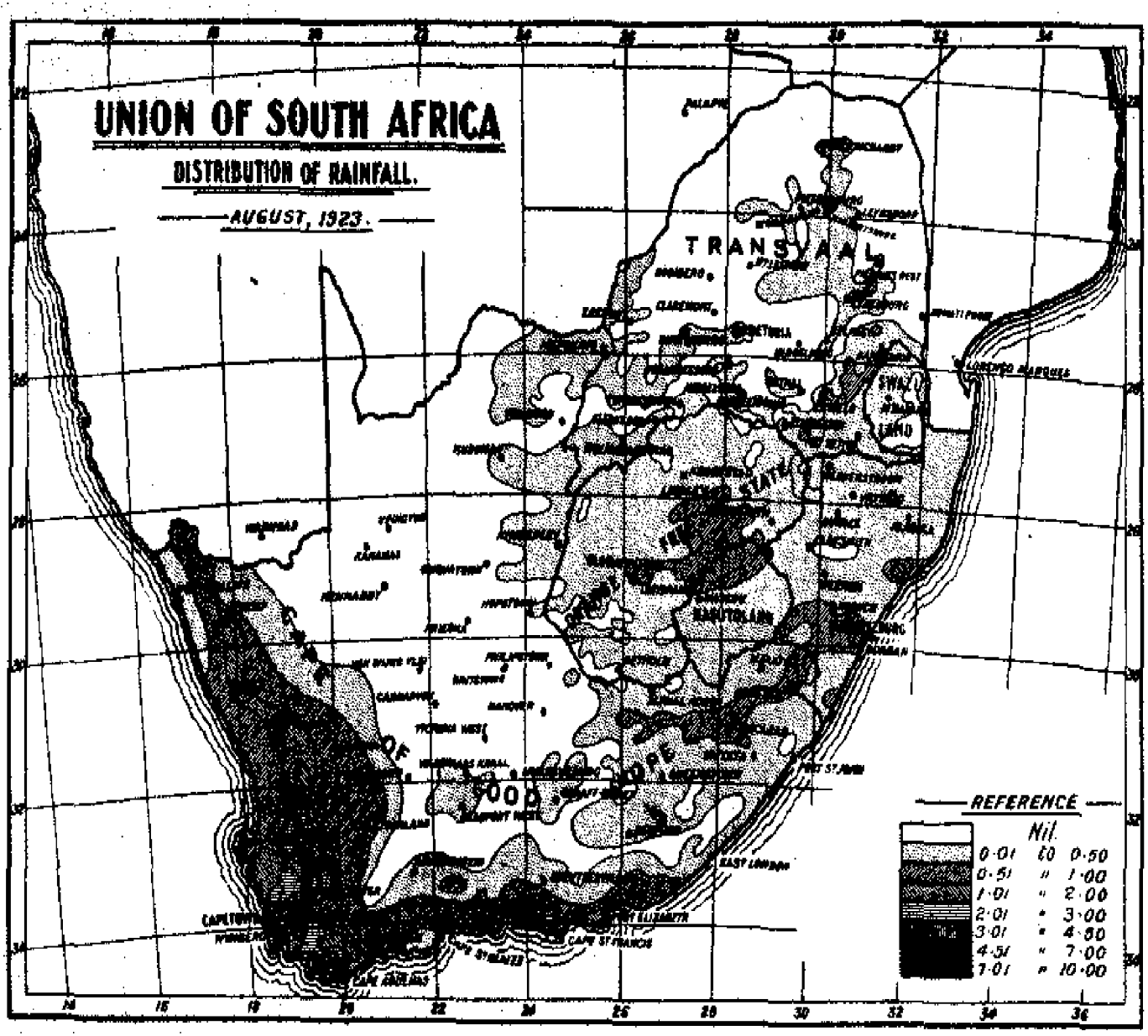
The highest mean daily temperature is now experienced over the northern borders of the Cape Province, where the normal is 72 degrees. In Natal and the eastern Transvaal a mean temperature of 71 degrees may be anticipated, and on the west-central Karoo, 69 degrees; on the southern Karoo, 68 degrees; on the east-central Karoo 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.

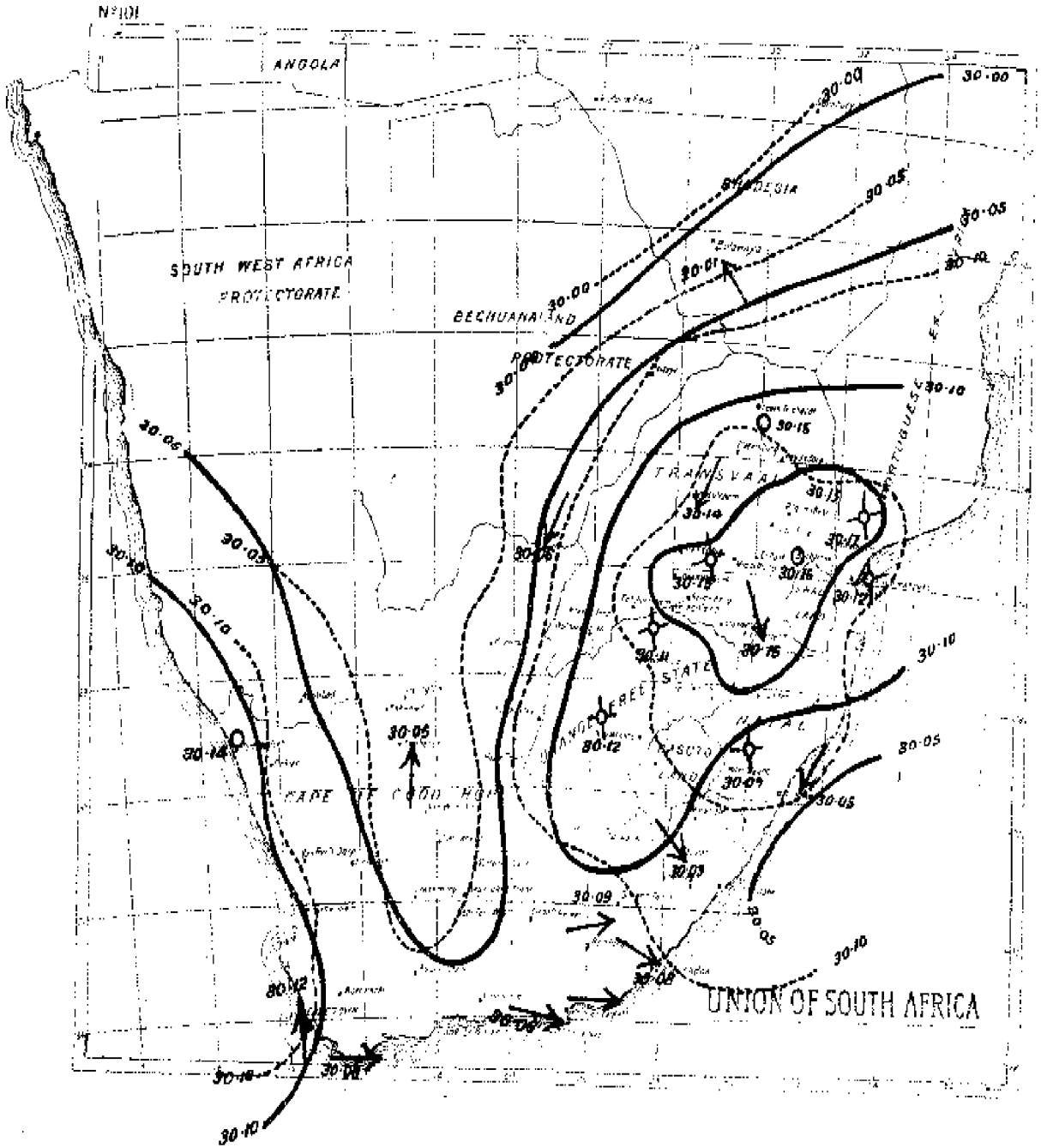
Wind shows a decrease in the mean velocity compared with October, except over the south-west, where there is a slight increase in force. The prevalent directions are north-north-west over the Transvaal, south-south-west over the northern border, north-east over the south-east of the Cape Province, and 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, 1923.
TRANSVAAL
BASUTOLAND
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



September, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for September, 1923

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AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), SEPTEMBER, 1923.

Station.	Observer.	Month—Sept., 1923.		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	83·2	56·1	69·6	66·6	+ 3·0	90·0	22nd and 29th	46·0	12th.
Belfast	The Forester	73·3	34·7	54·0	55·2	− 1·2	87·0	25th and 29th	20·0	12th.
Bloemhof	F. Osborne	83·2	48·1	65·6	61·8	+ 3·8	99·0	30th	33·0	6th.
Ermelo	Dr. E. B. Theunissen	75·3	43·9	59·6	58·6	+ 1·0	89·7	20th	28·8	12th.
Johannesburg (Observatory)	The Staff	74·7	50·1	62·4	59·1	+ 3·3	89·1	30th	38·4	6th.
Klerksdorp (Strathmore)	Chas. Scott	82·6	45·2	63·9	63·3	+ 0·6	96·0	30th	30·0	6th.
Komatipoort	B. J. Fothergill	88·4	58·1	73·2	72·8	+ 0·4	110·0	22nd	49·0	18th.
Louis Trichardt	—	—	—	—	60·0	—	—	—	—	—
Middelburg	Dr. H. A. Spencer	80·3	40·2	60·2	60·2	± 0·0	95·0	30th	32·0	3rd, 12th and 13th.
Nylstroom	G. Bakker	83·2	47·2	65·2	64·5	+ 0·7	96·0	25th and 30th	36·0	6th.
Pietersburg	W. J. Frankleyne	81·8	46·0	63·9	62·9	+ 1·0	98·5	25th	37·0	7th and 12th.
Piet Retief	J. Werner	76·8	47·5	62·2	61·0	+ 1·2	94·8	29th	36·5	12th.
Pigeonhole (New Agatha)	Jno. McCallum	73·6	53·4	63·5	—	—	90·0	22nd	41·0	1st.
Pilgrims Rest	A. Kleinsander	78·2	46·7	62·4	60·6	+ 1·8	95·5	25th	34·0	12th.
Potchefstroom (Exp. Farm)	The Manager	82·9	45·4	64·2	61·1	+ 3·1	95·5	30th	32·6	6th.
Pretoria (Meteorological Office)	The Staff	79·9	48·5	64·2	63·4	+ 0·8	96·0	30th	42·1	2nd.
Standerton	W. J. Madge	78·4	38·0	58·2	56·6	+ 1·6	94·0	30th	27·0	—
Zeerust	H. Dietrich	83·4	48·0	65·7	63·4	+ 2·3	97·6	30th	32·1	6th.
Swaziland—										
Mbabane	The Swaziland Police	77·3	49·2	63·2	61·2	+ 2·0	97·0	24th	38·0	6th and 12th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	76·1	43·0	59·6	58·2	+ 1·4	—	—	28·0	6th.
Bloemfontein	G. A. Schepers	77·5	44·6	61·0	59·1	+ 1·9	89·6	30th	33·2	6th.
Harrismith	The Forester	71·5	42·6	57·0	54·6	+ 2·4	85·0	30th	30·0	6th.
Kroonstad	S. R. Northfield	80·0	42·9	61·4	60·6	+ 0·8	92·8	29th	34·0	21st.
Ladybrand	The Forester	75·4	41·4	58·4	55·2	+ 3·2	88·0	30th	30·0	6th.
Lindley	J. Collister-Oates	77·2	41·7	59·4	59·0	+ 0·4	90·5	29th	31·7	17th.
Natal—										
Dundee	West Thorrold	80·3	44·0	62·6	63·0	− 0·4	96·0	29th	32·0	1st.
Durban (Point)	The Port Captain	73·9	61·3	67·6	67·6	± 0·0	80·2	28th	52·4	18th.
Estcourt	—	79·6	44·8	62·2	62·4	− 0·2	94·0	29th	35·0	6th, 12th and 18th.
Hlabisa	—	—	—	—	66·7	—	—	—	—	—
Ladysmith	D. A. R. Leathern	81·6	48·7	65·2	65·0	+ 0·2	96·0	29th	40·0	6th, 12th, and 18th.
Maritzburg (Mental Hospital)	The Staff	78·3	52·1	65·2	65·2	± 0·0	96·0	28th	42·0	6th and 18th.
Stanger	C. C. Foss	79·7	58·2	69·0	66·6	+ 2·4	97·5	28th	51·0	19th.
Weenen	The Gaoler	—	—	—	64·6	—	—	—	—	—

AIR TEMPERATURES, SEPTEMBER, 1923—(*continued*).

Station.	Observer.	Month—Sept., 1923.		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—										
Allwal North	Alex Alcock	76·6	40·2	58·4	56·7	+ 1·7	88·0	28th	28·5	6th.
Bedford	Thos. C. Hall	75·9	45·8	60·8	58·6	+ 2·2	91·0	29th	32·5	18th.
Capetown (Royal Observatory)	The Staff	65·4	50·2	57·8	57·0	+ 0·8	75·4	10th	43·5	4th.
Carnarvon	A. P. Malherbe	75·3	40·6	58·0	54·2	+ 3·8	85·0	28th and 30th	29·0	5th.
Clanwilliam	Mrs. M. A. Scholtz	73·8	41·8	57·8	59·6	− 1·8	--	--	--	—
East London	*The Port Captain*	*71·8*	*53·8*	*62·8*	*61·8*	+ *1·0*	*100·0*	3rd	*42·0*	18th.
Graaff-Reinet (Convent)	The Mother Superior	80·3	48·6	64·4	60·2	+ 4·2	97·7	28th	30·8	17th.
Grahamstown	The Vet. Res. Officer	71·3	44·5	57·9	58·2	− 0·3	90·0	3rd	32·6	18th.
Groot Drakenstein	Lionel Baker	67·4	47·4	57·4	58·3	− 0·9	82·4	10th	39·0	6th.
Kenhardt	R. Seydell	81·7	43·9	62·8	61·5	+ 1·3	94·0	28th	33·0	6th.
Kimberley	F. W. J. Schmidt	82·1	48·6	65·4	62·4	+ 3·0	94·0	30th	37·0	5th.
Kingwilliamstown	W. Kindness	*76·9*	*48·1*	*62·5*	*61·8*	+ *0·7*	*95·0*	*12th*	*35·0*	*18th and 19th.*
Kokstad	H. D. Coyte	73·2	43·0	58·1	56·8	+ 1·3	89·0	28th	28·8	6th.
Mafeking (Convent)	The Mother Superior	84·1	49·3	66·7	62·7	+ 4·0	96·0	30th	31·0	6th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	66·5	53·3	59·9	58·4	+ 1·5	79·0	11th	46·0	5th and 16th.
Murraysburg	W. H. Rose-Innes	74·3	37·9	56·1	53·6	+ 2·5	88·0	28th	27·0	6th and 18th.
Oakley	J. Burrows	73·0	48·5	61·2	58·8	+ 2·4	88·8	30th	35·0	5th.
Port Elizabeth	The Lightkeeper	66·9	52·6	59·8	59·7	+ 0·1	88·0	2nd	42·0	10th.
Port Nolloth	The Lightkeeper	62·6	44·8	53·7	54·7	− 1·0	80·0	17th	37·0	7th.
Port St. Johns (Cape Hermes)	The Lightkeeper	72·7	59·4	66·0	64·0	+ 2·0	85·0	1st and 3rd.	50·0	18th.
Queenstown	H. Holley	76·4	43·6	60·0	58·2	+ 1·8	91·0	28th	28·0	18th.
Somerset East	C. Harris	76·0	46·7	61·4	58·7	+ 2·7	90·0	28th	33·6	18th.
Stutterheim	F. C. Bousfield	76·6	47·2	61·9	57·8	+ 4·1	91·0	23rd	34·3	18th.
Sydney's Hope	Rev. S. Ripon	69·6	49·3	59·4	59·0	+ 0·4	87·0	11th	38·8	17th.
Uitenhage	H. Ingos	73·9	48·0	61·0	61·2	− 0·2	96·2	2nd	33·5	18th.
Umtata	Miss N. Dix-Peek	76·4	46·0	61·2	60·4	+ 0·8	94·8	28th	33·1	6th.
Vryburg	Chas. Butler	83·3	46·7	65·0	62·6	+ 2·4	96·0	30th	29·0	6th.
Wynberg (Convent)	The Mother Superior	67·3	49·6	58·4	58·2	+ 0·2	79·8	27th	43·5	5th.
Basutoland—										
Maseteng	F. Hodgson	71·4	42·3	56·8	55·8	+ 1·0	83·0	29th and 30th	32·0	6th.

RAINFALL, SEPTEMBER, 1923.

Station.	Observer.	Month. Sept., 1923.	Normal.	Difference from Normal.	From 1st January, 1923.	Normal.	Difference from Normal.	From 1st July, 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	0·03	1·02	− 0·99	20·03	19·67	+ 0·36	0·46	1·90	− 1·44
Belfast	The Forester	0·24	0·78	− 0·54	15·05	18·11	− 3·06	0·32	1·59	− 1·27
Bethal	H. F. Joubert	0·21	0·72	− 0·51	16·86	15·51	+ 1·35	0·43	1·51	− 1·08
Bloemhof	F. Osborne	0·00	0·76	− 0·76	10·07	13·22	− 3·15	0·18	1·40	− 1·22
Claremont	S.A. Police	0·12	0·13	− 0·01	12·61	11·32	+ 1·29	0·19	0·57	− 0·38
Ermelo	The Forester	0·16	1·00	− 0·84	9·00	16·59	− 7·59	0·93	2·04	− 1·11
Haenertsburg	S.A. Police	0·00	0·71	− 0·71	36·27	25·96	+ 10·31	1·12	1·58	− 0·46
Heidelburg	W. ter Horst	0·41	0·83	− 0·42	15·52	16·02	− 0·50	1·36	1·67	− 0·31
Johannesburg (Observatory)	The Staff	0·51	0·86	− 0·35	18·84	18·12	+ 0·72	1·57	1·77	− 0·20
Klerksdorp (Strathmore)	C. Scott	0·12	0·66	− 0·54	15·00	14·87	+ 0·13	0·77	1·39	− 0·62
Komatipoort	B. J. Fothergill	0·29	0·52	− 0·23	31·90	19·07	+ 12·83	1·01	1·33	− 0·32
Louis Trichardt	—	0·00	0·44	− 0·44	33·04	19·37	+ 13·67	0·00	1·18	− 1·18
Middelburg	H. A. Spencer	0·12	0·49	− 0·37	16·39	15·92	+ 0·47	0·20	1·06	− 0·86
Nylstroom	G. Bakker	0·25	0·47	− 0·22	17·26	15·26	+ 2·00	0·25	1·15	− 0·90
Pietersburg	W. Frankleyne	0·18	0·26	− 0·08	10·38	12·11	− 1·73	0·29	0·73	− 0·44
Piet Retief	J. Werner	0·01	1·18	− 1·17	17·92	17·83	+ 0·09	0·25	2·27	− 2·02
Pigeonhole (New Agatha)	J. McCallum	0·16	0·72	− 0·56	56·28	30·95	+ 25·33	0·70	2·10	− 1·40
Pilgrims Rest	A. Klernander	0·26	0·93	− 0·67	39·18	27·63	+ 11·55	0·41	1·88	− 1·47
Potchefstroom (Exp. Farm)	The Manager	0·17	0·67	− 0·50	14·19	14·11	+ 0·08	0·47	1·45	− 0·98
Pretoria (Meteorological Office)	The Staff	0·06	0·41	− 0·35	18·05	17·11	+ 0·94	0·34	1·19	− 0·85
Rootberg	N. H. Monro	0·11	0·33	− 0·22	15·91	15·44	+ 0·47	0·19	1·27	1·08
Rustenburg	A. Streatfield	0·30	0·59	− 0·29	19·03	16·04	+ 2·99	0·81	1·55	− 0·74
Standerton	W. J. Madge	0·45	0·91	− 0·46	20·25	16·82	+ 3·43	1·84	1·95	− 0·11
Wakkerstroom	F. J. Grant	0·04	0·99	− 0·95	—	19·05	—	0·04	2·23	− 1·59
Woodbush (I)	The Forester	0·28	1·64	− 1·36	71·27	48·83	+ 22·44	1·12	3·60	− 2·48
Zeerust	H. Dietrich	0·47	0·52	− 0·05	18·05	15·15	+ 2·90	0·89	0·98	− 0·09
Swaziland—										
Mbabane	Swaziland Police	0·21	1·86	− 1·65	44·46	33·24	+ 11·22	1·02	3·71	− 2·69
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·57	0·71	− 0·14	12·10	12·95	− 0·85	0·98	1·54	− 0·56
Bloemfontein	G. A. Schepers	0·00	0·86	− 0·86	21·39	15·63	+ 5·76	0·81	1·74	− 0·93
Boshof	The Postmaster	0·00	1·06	− 1·06	21·05	14·12	+ 6·93	0·44	2·03	− 1·59
Harrismith	The Forester	0·20	1·07	− 0·87	15·10	17·75	− 2·65	1·71	2·23	− 0·52
Kroonstad	S. R. Northfield	0·01	0·89	− 0·88	13·39	16·00	− 2·61	0·86	1·69	− 0·83
Ladybrand	The Forester	0·03	1·64	− 1·61	17·63	18·18	− 0·55	1·80	2·90	− 1·10
Lindley	J. Collister-Oates	0·03	1·00	− 0.97	14·82	15·31	− 0·49	1·07	1·77	− 0·70
Natal—										
Dundee	W. Thorrold	0·05	1·24	− 1·19	13·79	19·90	− 6·20	0·69	2·33	− 1·64
Durban (Point)	The Port Captain	1·19	3·12	− 1·93	21·38	26·71	− 5·33	3·45	5·92	− 2·47
Estcourt	The Town Clerk	0·62	0·98	− 0·36	14·75	18·51	− 3·76	1·72	1·94	− 0·22
Hlabisa	The Gaoler	—	2·28	—	—	27·21	—	—	4·39	—

RAINFALL, SEPTEMBER, 1923—(*continued*).

Station.	Observer.	Month. Sept., 1923.	Normal.	Difference from Normal.	From 1st January, 1923.	Normal	Difference from Normal.	From 1st July, 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Howick	The Gaoler	0·50	1·68	− 1·18	17·26	21·23	− 3·97	1·32	3·92	− 1·40
Ladysmith	D. A. R. Leathern	0·29	0·95	− 0·66	14·76	18·29	− 3·53	1·97	2·07	− 0·10
Maritsburg (Mental Hospital)	The Staff	0·16	2·32	− 2·16	19·44	23·67	− 4·23	1·33	3·66	− 2·33
Stanger	C. C. Foss	1·07	3·21	− 2·14	26·09	25·76	+ 0·33	3·72	5·60	− 1·88
Vrijheid	The Gaoler	0·10	1·47	− 1·37	11·39	20·83	− 9·44	0·26	2·59	− 2·33
Weenen	The Gaoler	0·00	1·06	− 1·06	7·37	17·30	− 9·93	0·71	2·06	− 1·35
Cape—										
Alfred North	A. Alcock	0·35	0·88	− 0·53	15·31	14·62	+ 0·69	1·17	2·02	− 0·85
Beaufort West	The Gaoler	0·00	0·66	− 0·66	6·80	7·32	− 0·63	1·18	1·24	− 0·06
Bedford	T. C. Hall	0·74	2·02	− 1·28	19·26	19·15	+ 0·11	2·55	3·58	− 1·03
Britstown	The Gaoler	0·00	0·58	− 0·58	7·52	9·24	− 1·72	0·50	1·03	− 0·53
Calvinia	The Gaoler	0·12	0·61	− 0·49	8·29	7·13	+ 1·16	1·85	2·39	− 0·54
Capetown (Royal Observatory)	The Staff	1·85	2·26	− 0·41	23·72	21·89	+ 1·83	8·76	9·24	− 0·48
Ceres	A. Heatlie	2·94	4·21	− 1·27	35·24	34·80	+ 0·44	12·97	16·12	− 3·15
Carnarvon	A. P. Malherbe	0·00	0·29	− 0·29	7·44	6·46	+ 0·98	0·74	0·81	− 0·07
Clanwilliam	P. E. Scholtz	0·08	0·79	− 0·71	8·90	7·62	+ 1·28	1·83	3·29	− 1·46
Concordia	F. H. Carstens	0·03	0·51	− 0·48	6·81	5·61	+ 1·20	1·00	1·91	− 0·91
East London	A. Downie	1·71	3·06	− 1·35	27·03	22·76	+ 4·27	7·80	6·27	+ 1·53
French Hoek (Driefontein)	The Forester	13·13	7·50	+ 5·63	81·82	71·33	+ 10·49	35·91	29·77	+ 6·14
Fraserburg	The Gaoler	0·00	0·29	− 0·29	5·04	5·61	− 0·57	0·50	0·90	− 0·40
Grahamstown	Vet. Res. Officer	0·97	2·43	− 1·46	14·07	19·36	− 5·29	3·68	5·13	− 1·45
Garies	The Gaoler	0·00	0·43	− 0·43	4·55	4·36	+ 0·19	1·56	1·89	− 0·33
Graaff-Reinet (Convent)	The Mother Superior	0·00	1·04	− 1·04	7·28	10·17	− 2·89	1·47	1·99	− 0·52
Groot Drakenstein	J. Baker	3·57	3·39	+ 0·18	42·03	30·38	+ 11·65	14·64	13·37	+ 1·27
Griquatown	The Gaoler	0·00	0·37	− 0·37	9·76	10·04	− 0·28	0·16	0·83	− 0·67
Hanover	The Gaoler	0·06	0·67	− 0·61	10·67	10·50	+ 0·17	0·42	1·37	− 0·95
Hopetown	The Gaoler	0·00	0·43	− 0·43	10·05	9·74	+ 0·31	0·60	0·94	− 0·34
Kenhardt	R. Seydell	0·00	0·18	− 0·18	8·99	4·77	+ 4·22	0·23	0·54	− 0·31
Kimberley	F. W. J. Schmidt	0·00	0·58	− 0·58	11·35	11·48	− 0·13	0·52	1·16	− 0·64
Knysna	The Gaoler	1·48	2·86	− 1·38	20·94	21·16	− 0·22	5·28	7·50	− 2·22
Kokstad	H. D. Coyte	0·16	1·33	− 1·17	27·30	17·59	+ 9·71	6·02	2·20	+ 3·82
Kingwilliamstown	W. Kindness	0·32	1·81	− 1·49	19·05	17·33	+ 1·72	5·12	3·90	+ 1·22
Kuruman (Abtonia)	—	—	0·41	—	—	12·78	—	—	0·84	—
Mafeking (Convent)	The Mother Superior	0·30	0·62	− 0·32	14·16	14·79	− 0·63	0·63	1·45	− 0·82
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·86	1·72	− 0·86	10·88	13·09	− 2·21	2·18	4·38	− 2·20
Murraysburg	W. H. Rose-Innes	0·00	0·58	− 0·58	9·16	8·56	+ 0·60	0·98	1·24	− 0·26
O'okiep	J. Burrows	0·04	0·62	− 0·58	6·52	6·14	+ 0·38	1·15	2·47	− 1·32
Philipstown	The Gaoler	0·00	0·61	− 0·61	8·12	10·55	− 2·43	0·37	1·26	− 0·89
Piquetberg	The Gaoler	1·56	2·26	− 0·70	19·47	17·41	+ 2·06	6·41	8·00	− 1·59
Port Elizabeth	The Lightkeeper	0·74	2·27	− 1·53	17·27	16·51	+ 0·76	4·71	6·26	− 1·55
Port St. Johns (Cape Hermes)	The Lightkeeper	1·28	4·20	− 2·92	38·43	32·38	+ 6·05	13·65	7·34	+ 6·31
Port Nolloth	The Lightkeeper	0·00	0·21	− 0·21	1·83	2·11	− 0·28	0·43	0·83	− 0·40
Prieska	The Gaoler	0·01	0·23	− 0·22	8·80	7·86	+ 0·94	0·26	0·63	− 0·37
Queenstown	H. Holley	0·11	1·07	− 0·96	16·20	16·15	+ 0·05	1·55	2·18	− 0·63

RAINFALL, SEPTEMBER, 1923—(*continued*).

Station.	Observer.	Month. Sept., 1923.	Normal.	Difference from Normal.	From 1st January, 1923.	Normal.	Difference from Normal.	From 1st July 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Steytlerville	The Gaoler	0·00	0·66	− 0·66	7·89	6·94	+ 0·95	1·01	1·35	− 0·34
Sutherland	The Gaoler	0·00	0·65	− 0·65	6·71	7·92	− 1·21	1·87	2·51	− 0·64
Swellendam	The Gaoler	0·89	2·76	− 1·87	19·22	23·50	− 4·28	4·24	7·25	− 3·01
Sydney's Hope	Rev. S. Rippon	0·62	1·94	− 1·32	12·61	15·70	− 3·09	3·52	4·05	− 0·53
Somerset East	C. Harris	0·23	1·99	− 1·76	13·76	17·96	− 4·20	2·32	3·70	− 1·38
Stutterheim	F. C. Bousfield	0·63	1·89	− 1·26	30·21	20·07	+ 10·14	3·32	3·45	− 0·13
Uitenhage	H. Inggs	0·36	1·75	− 1·39	13·05	12·62	+ 0·43	3·15	3·82	− 0·67
Umtata	Miss N. Dixpeek	0·66	1·76	− 1·10	24·19	17·50	+ 6·69	4·63	3·04	+ 1·59
Unionddale	The Gaoler	0·43	1·31	− 0·88	6·83	10·51	− 3·68	0·99	3·58	− 2·59
Upington	The Gaoler	0·00	0·14	− 0·14	8·42	5·57	+ 2·85	0·04	0·36	− 0·32
Victoria West	The Gaoler	0·00	0·53	− 0·53	8·01	8·31	− 0·60	0·93	1·08	− 0·15
Vryburg	Chas. Butler	0·00	0·37	− 0·37	16·16	14·15	+ 2·01	0·00	0·92	− 0·92
Worcester	The Gaoler	0·12	1·27	− 1·15	6·40	10·53	− 4·13	1·59	4·66	− 3·07
Wynberg (Convent)	The Mother Superior	4·47	4·74	− 0·27	42·63	39·78	+ 2·85	18·09	19·46	− 1·37
Basutoland—										
Maleteng	F. Hodgson	0·00	1·44	− 1·44	27·91	22·27	+ 5·64	1·20	2·91	− 1·71
South-West Africa—										
Aus	E. Marthins	0·00	0·26	− 0·26	4·20	3·90	+ 0·30	0·00	0·87	− 0·87
Bethanie	Rev. Peter	0·00	0·04	− 0·04	10·63	3·98	+ 6·65	0·00	0·07	− 0·07
Duesternbrook	J. and R. Mathiessen	0·00	0·11	− 0·11	22·88	11·77	+ 11·11	0·00	0·17	− 0·17
Franzfontein	H. Janson	0·00	0·08	− 0·08	7·68	7·96	− 0·28	0·00	0·10	− 0·10
Gabis	Rev. P. Reher	0·00	0·13	− 0·13	4·38	3·84	+ 0·54	0·10	0·39	− 0·29
Garinais	F. Bertling	0·00	0·01	− 0·01	10·31	4·67	+ 5·64	0·00	0·14	− 0·14
Gibeon	Rev. Spellmeyer	0·00	0·09	− 0·09	11·95	5·21	+ 6·74	0·00	0·13	− 0·13
Gobabis	Rev. Irle	0·00	0·13	− 0·13	18·20	12·29	+ 5·91	0·00	0·23	− 0·23
Grootfontein	Pitkowski	0·00	0·07	− 0·07	32·35	17·06	+ 15·29	0·00	0·07	− 0·07
Gr. Witvley	Maass	0·00	0·14	− 0·14	18·79	11·60	+ 7·19	0·00	0·16	− 0·16
Haralbes	Cpt. Meyer	0·00	0·28	− 0·28	16·25	6·33	+ 9·92	0·00	0·29	− 0·29
Heirachabis	Rev. P. Kleinann	0·00	0·00	± 0·00	5·16	3·04	+ 2·12	0·00	0·07	− 0·07
Maltahoehe	E. Just	0·00	0·05	− 0·05	10·19	5·12	+ 5·07	0·00	0·09	− 0·09
Neu-Heusis	Liebig's Extract Co.	0·00	0·17	− 0·17	15·95	11·72	+ 4·23	0·00	0·20	− 0·20
Okahandja	B. Templin	0·00	0·12	− 0·12	22·96	11·79	+ 11·17	0·00	0·22	− 0·22
Okandjose	— von Gossler	0·00	0·04	− 0·04	28·35	13·67	+ 14·68	0·00	0·34	− 0·34
Okasangumingo	R. H. A. Schneider	0·00	0·18	− 0·18	25·46	13·10	+ 12·36	0·00	0·34	− 0·34
Omaruru	The Postmaster	0·00	0·08	− 0·08	20·17	9·16	+ 11·01	0·00	0·08	− 0·08
Rehoboth	The Postmaster	0·00	0·14	− 0·14	21·57	8·53	+ 13·04	0·00	0·22	− 0·22
Rietfontein	B. Leist	0·00	0·04	− 0·04	31·42	14·75	+ 16·67	0·00	0·06	− 0·06
Swakopmund	E. Sievert	0·00	0·05	− 0·05	0·38	0·47	− 0·09	0·00	0·10	− 0·10
Tsumeb	Ing. Schetter	0·00	0·16	− 0·16	26·50	17·29	+ 9·21	0·00	0·18	− 0·18
Usakos	Rev. Diehl	0·00	0·08	− 0·08	8·24	4·47	+ 3·77	0·00	0·08	− 0·08
Voigtsgrund	A. Voigts	0·00	0·11	− 0·11	25·06	6·25	+ 18·81	0·00	0·14	− 0·14
Waterberg	D. Hahn	0·00	0·06	− 0·06	25·59	15·31	+ 10·28	0·00	0·12	− 0·12
Windhoek	Observatory	0·00	0·09	− 0·09	26·87	10·57	+ 16·30	0·00	0·19	− 0·19

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

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EXCEPTIONALLY hot, windy, dry, and dusty weather; pressure higher than usual in the east, almost normal elsewhere; persistent northerly winds over the greater part of the Union; frequent duststorms; mean temperature 4 degrees above normal with both days and nights considerably warmer than usual; a cold spell from 5th to 8th with killing frosts in several areas; a delay in the commencement of the summer rains till the end of the month; a practically general shortage of precipitation prolonging the drought of the previous months; frequent light hailstorms, particularly in the Free State; such were the unsatisfactory features of the month of October, 1923.

Pressure.—Mean barometric pressure was half-a-tenth higher than normal over the Transvaal, but practically normal over the rest of the country. High-pressure areas were present in one part or another on each day of the month with the exception of the 22nd to 24th, when pressure was generally low over the Union. The equatorial low was in evidence during the greater part of the month and at times attained considerable intensity, whilst low pressures were present on the coast on two days. On the 1st a high-pressure area lay over the whole country but on the morning of the 2nd an isobar of 29·90 inches lay along the south coast. Next day the barometer had fallen considerably in the south and east and risen in the west; the lowest pressure was 29·50 inches at Durban or half an inch less than the preceding day, whilst at Port Nolloth the barometer had risen about two-tenths. The isobars lying in a north-easterly–south-westerly direction were consequently close and the gradient steep, giving rise to strong westerly to north-westerly winds practically all over the Union. On the morning of the 4th, this low pressure was replaced by the northern side of an anticyclone in which the isobars ran practically east and west. The highest reading of the barometer this day was 30·49 inches at Cape Agulhas, the winds being principally easterly and south-easterly, and the gradients being from south to north. On the 5th, the north-west section of the anticyclone lay over the country with fresh to strong easterly and north-easterly winds, while the pressure varied from 30·62 inches at Durban to 30·00 inches at Port Nolloth. On the 6th, a low-pressure area

had made its appearance over South-West Africa, while the Union continued under anticyclonic conditions. By the 7th, pressure had fallen considerably over the Union, with indications of a "low" over the western interior (and the south-east). On the 8th, the low-pressure area over the interior had intensified with a slight increase of pressure along the coast and a greater increase in the east; on the 10th, the "low" over the interior had retreated and part of a "low" made its appearance in the south and south-east with high pressure over the east and west; on the 11th, the Union was under anticyclonic conditions with indications of a "low" over South-West Africa. On the 19th, the equatorial tongue of low-pressure had pushed southwards almost to the coast and lay over the western portion of the country, whilst a strong anticyclone lay over the east. On the 13th, pressure had increased in the west and south, forcing the western low-pressure to the north, whilst a portion of a second "low" area lay over Natal. Associated with this latter were strong northerly to north-westerly winds and excessive heat. By the morning of the 14th, the "low" over Natal moved away and was replaced by high-pressure, the western "low" extended further south and was being compressed between the western and eastern "highs." On the 15th, pressure had fallen in both the east and west and the isobars had opened out; strong northerly winds prevailed over the south and west of the Transvaal. On the 16th, high pressure existed over the east and south with a "low" projecting southwards from South-West Africa. On the 17th, the high pressure over the south had been replaced by the tip of a "low" complementary to that over the western interior. From 18th to 20th the Union was under anticyclonic conditions; and pressure was beginning to give way in the west on the 21st and on the 22nd, a well-developed equatorial "low" had extended southwards over the interior to the south-west coast with the remains of a "high" at Lourenco Marques and along the south-east coast. Low-pressure conditions continued to affect the whole country throughout the 23rd and 24th, although on the latter date there were indications of the approach of a "high" from westward. On the 25th, the "high" had passed on to the western margin of the country. By the morning of the 26th high pressure was covering practically the whole Union with gradients from south to north. On the 27th, the high pressure was confined to the eastern parts and a "low" had appeared over the western half. On the 28th, an additional isobar had appeared on the west coast and the interior "low" was somewhat more constricted between the eastern "high" and that to westward. On the 29th, pressure had fallen slightly in the east and the top of a complementary inverted V had appeared on the south coast. On the 30th, pressure was high along the south and relatively low over the interior, whilst the remains of the southern "low" of the previous day lay over the east coast. On the 31st, the "low" on the east had disappeared and pressure had fallen slightly in the south, but otherwise conditions were practically the same as on the previous day. The most noteworthy feature during the month was the exceptionally low-pressure on the 3rd, and the very high barometric reading on the 5th, the difference in the forty-eight hours exceeding 1 inch at Durban.

Temperature.—The mean temperature during October was 68·2 degrees, or 4 degrees higher than usual, the days with a mean of 81·8 degrees being 4·7 degrees, and the nights with 54·7 degrees being 3·4 degrees warmer than the corresponding average values. Such large excesses were common to all the Provinces. Thus the Orange Free State with a mean temperature of 68·1 degrees was 5·7 degrees in excess of normal, the mean maximum temperature (83·3 degrees) being 6·6 degrees and the mean minimum (53·0 degrees), being 5·0 degrees higher than usual. Again, over the Transvaal

the surplus of 4·5 degrees in the temperature for this month (70·2 degrees) was due to the days with 85·8 degrees, being 6·4 degrees and the nights with 54·6 degrees, being 2·5 degrees warmer than usual. Over the Cape Province, the mean of 66·4 degrees was in excess by 3·7 degrees, the mean day temperature (78·4 degrees) and the night temperature (54·3 degrees), being respectively 3·6 degrees and 3·7 degrees above the corresponding normals. In Natal, the excess of 3·4 degrees in the mean temperature for this month (71·5 degrees) was also almost equally divided between the days and nights, the former with 84·0 degrees being 3·2 degrees and the latter with 59·0 degrees being 3·5 degrees warmer than usual. At the individual stations the means for the month were everywhere considerably above normal, commonly by 3–6 degrees, the excess ranging from 0·2 degree at Port Nolloth to 8·8 degrees at Mafeteng, in Basutoland. In the Transvaal, the surplus amounts varied from 1·3 degree at Nylstroom to 8·4 degrees at Bloemhof; in the Free State from 4·4 degrees at Kroonstad to 6·9 degrees at Bloemfontein; in Natal from 1·5 degree at Durban to 4·5 degrees at Maritzburg, and in the Cape Province from 0·2 degree at Port Nolloth to 7·2 degrees at Kokstad. Both days and nights were almost generally warmer than usual. The exceptional stations were Belfast, Middelburg, and Nylstroom in the Transvaal, where the night temperatures were below normal by 3·0 degrees, 0·5 degree, and 0·7 degree respectively, and Port Nolloth where the day temperatures were 1 degree cooler than the average. The excesses in the mean maximum or day temperatures ranged from 9·5 degrees at Barberton to 3·1 degrees at Pretoria, in the Orange Free State from 9·2 degrees at Lindley to 5·2 degrees at Kroonstad; in Natal from 6·7 degrees at Dundee to 2·4 degrees at Ladysmith, and in the Cape Province from 10·5 degrees at Kokstad to 0·1 degree at Port St. Johns. The surplusages in the case of the mean mimimum or night temperatures varied in the Transvaal from 8·8 degrees at Bloemhof to 0·8 degree at Pietersburg; in the Orange Free State from 6·8 degrees at Ladybrand to 3·7 degrees at Kroonstad; in Natal between 4·9 degrees at Ladysmith and 1·0 degree at Dundee, and in the Cape Province between 7·8 degrees at Kimberley and 1·2 degree at Port Nolloth. The mean warmest station was Komatipoort with 79·4 degrees for the month and the coolest Port Nolloth with 57·4 degrees, a difference of 22 degrees Fahrenheit. The mean warmest stations and their temperatures in the separate Provinces were:—Transvaal: Komatipoort 79·4 degrees, which is 3·4 degrees in excess of the average; Orange Free State: Bloemfontein and Kroonstad, 70·2 degrees which are 6·9 degrees and 4·4 degrees respectively higher than usual; Natal: Ladysmith 73·4 degrees or 3·6 degrees higher than usual; Cape Province: Kimberley, 73·8 degrees or 5·6 degrees in excess of the average value. Similarly the coolest places in the Provinces were as follows:—Transvaal: Belfast, 60·8 degrees or 2·8 degrees in excess of the normal; Orange Free State: Harrismith, 64·3 degrees or 4·6 degrees higher than usual; Natal: Dundee, 69·8 degrees or 3·8 degrees above the average; Cape Province: Port Nolloth, 57·4 degrees or 0·2 degree warmer than the normal. There was thus a difference of 18·6 degrees between the mean warmest and coolest stations in the Transvaal, 5·9 degrees in the Free State; 3·6 degrees in Natal, and 16·4 degrees in the Cape Province. The highest temperatures during the month were registered on seventeen days, viz.: 1st to 3rd, 5th, 6th, 11th, 13th, 14th, 16th to 22nd, 24th and 29th. Temperatures of 100 degrees or over were registered at Barberton, Bloemhof, and Komatipoort in the Transvaal; at Maritzburg and Stanger in Natal, and at Kenhardt and Kimberley in the Cape Province. In the Free State the highest temperature was 95·8 degrees at Bloemfontein on the 22nd. The highest temperatures were recorded most widely on the 13th. The lowest readings occurred on eleven days of the month, viz., 1st,

3rd to 8th, 12th, 13th, 26th and 27th, most widely from 5th to 7th. Temperatures of 32 degrees Fahrenheit or lower were recorded at Belfast, Middelburg, and Standerton in the Transvaal, and Murraysburg in the Cape Province. The extreme readings for the month were 110 degrees at Komatipoort on the 24th, and 26 degrees at Belfast on the 7th, an extreme range of 84 degrees during October.

Ground Frosts were reported as occurring in the Standerton District on the 4th, Mbabane (Swaziland) on the 6th, at Queenstown on the 4th and 5th, and at Mafeteng (Basutoland) from 4th to 7th, and on the 25th at Ingwangwane (Natal); on the 6th the fruit blossoms were reported as having been destroyed by frost at Lichtenburg. Hot, drying winds were frequent throughout the month, the most noteworthy being on the 3rd when a hot north-westerly wind of almost gale force caused the temperature at a number of stations in Natal to rise considerably over 100 degrees; at Verulam it is stated to have risen to 111 degrees at 1 p.m. with a sudden drop in temperature about an hour later; at Stanger the temperature rose to 108·5 degrees on this date. Duststorms were frequent. On the 3rd at 5.30 p.m. a whirlwind approached Stegi (Ubombo) in Swaziland in the form of two cones about 50 yards apart, and passed through the village, loosening thatch on various buildings and removing some sheets of galvanized iron from roof of a shed.

Precipitation.—The rainfall during October was almost everywhere below normal and a state of absolute drought prevailed in portions of the Zoutpansberg (Transvaal Province), parts of the west central and northern Karoos and of the northern border, also in the more westerly parts of the northern half of South-West Africa, that is to say, northwards and westwards from Rehoboth. Within the Union a few isolated areas showed small excesses, e.g. Kroonstad (Orange Free State), had a surplus of ·34 inch; Vryheid in Natal had 0·06 inch more than the average; and Steytlerville in the Cape Province had a total about half-an inch above the normal. In South-West Africa supra-normal amounts were much more common, being practically general south of the latitude of Maltahoehe and Voigtsgrund (i.e. from about 24° 50′ S.), also at the more easterly stations in the northern half of the territory as well as at Windhuk. The excess amounts there varied from 0·05 inch at Maltahoehe to 2·59 inches at Aus. In other parts of the South-West Territory the amounts registered were below normal. Light showers occurred mainly over the south and west of the Cape Province during the first fortnight and also at the beginning of the month in the Lydenburg, Piet Retief, and Middelburg Districts of the Transvaal, and on the 8th in Natal, but were much more widespread from the 23rd onwards, particularly between the 28th and 31st, when rain occurred generally over the greater part of the summer rainfall area, although usually too small in amount to enable ploughing operations to be carried out, except in a few favoured areas. A destructive thunderstorm occurred about midnight on the 31st at Heidelberg (Transvaal Province) when the municipal stables were struck by lightning and burned down, whilst electric light installations were also severely damaged. Frequent hailstorms occurred in the Free State, while a few of these storms were also noted in the Transvaal and Natal, but no damage was reported. The accumulated rainfall since the beginning of the year was above the average in the east, north, and west and part of the south-east of the Transvaal, in Swaziland, the west and centre of the Free State, Basutoland, the south of Bechuanaland, parts of the Northern Border, and the northern Karoo, the west and south-west (including the Cape Peninsula) Kaffraria, parts of the south-east of the central Karoo, and the south coastal area. The excesses in the Transvaal varied between 0·03 inch at Rooiberg and 19·10 inches at Woodbush, being greatest in the

east and north-east; in the Free State they were between 5 and 6 inches; in the Cape Provinces the surplus amounts were greatest (5–10 inches) in the South-West and Kaffraria, decreasing to between 2 and 4 inches in the Northern Border, whilst elsewhere they were generally less than one inch; at Mbabane in Swaziland the excess was 9·24 inches, and at Mafeteng in Basutoland 4·58 inches. Over the rest of the country the totals for the ten months of the year were less than usual, particularly in Natal where the shortages varied between 4·08 inches at Stanger to 11·40 inches at Weenen. In the Transvaal the shortfalls lay mostly between 1 and 2 inches, but ranged from 0·58 inch at Piet Retief to 4·05 at Belfast. In the Orange Free State they were generally between 1 and 2 inches, but increased to 3·54 inches at Harrismith. In the Cape Province the minus quantities were largest in the southerly portions, being frequently 4 to 6 inches; but decreased to 2 inches or less at the more inland stations and on the south coast. In South-West Africa excesses were common to all stations except Swakopmund where there was a shortage of 0·15 inch or 28 per cent. of the normal. The excesses were frequently more than 10 inches, and ranged from 0·52 inch or 12 per cent. at Gabis to 19·36 inches or 300 per cent. at Voigtsgrund. The season's rainfall from the 1st July showed a deficiency except in the Transkei, one or two stations in the south-east, in the west central Karoo, and in the south-west of the Cape Province. The minus quantities in the Transvaal were mostly between 2 and 3 inches, but varied from 0·96 inch at Zeerust to 5·82 inches at Woodbush; in the Free State they were generally between 1 and 2 inches, ranging from 0·49 inch at Kroonstad to 2·42 inches at Lindley. In Natal the shortages were larger, varying from 1·64 inch at Estcourt to 6·28 inches at Stanger. In the Cape Province the deficits were greatest, 2 to 5 inches at short distance from the coast in the south and south-west, but diminished to 1½ inches or less in the inland portions; the deficits varied from 0·40 inch at Hopetown to 5·04 inches at Ceres. In South-West Africa excess amounts for the four months were met with in the southern third of the territory, i.e. from the district of Gibeon southwards; also at the more easterly and north-easterly stations and at Windhuk. The excesses ranged from 1·72 inch at Aus to 0·26 inch at Windhuk. The deficits over the rest of the country were small and ranged between 0·13 inch at Rietfontein in the Grootfontein district in the north to 0·59 inch at Okahandja to the north of Windhuk. Partly as a result of drought and partly owing to the ravages of locusts, cattle had fallen off in condition in parts of all the Provinces, and considerable losses of stock were experienced in portions of the Transvaal, Free State, and Natal. Owing to the lateness of the rains, but little ploughing had been carried out at the end of the month, but a start had been made in a number of places. In the Drakenstein district a plague of caterpillars caused considerable damage to fruit; Black Quarter Evil had broken out in the Uitenhage district shortly after the rains. The effects of the drought were shown by rivers in the Middelburg district having stopped running, while Macrocarpa trees of several years growth were dying in the township of Paulpietersburg; also trees in shallow ground were damaged in the Middelburg district, while there was a water shortage in some areas as in part of the Standerton district.

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.

OBSERVERS' NOTES FOR OCTOBER, 1923.

TRANSVAAL.

Nooitgedacht No. 777 (*Waterberg*).—Early part of month very dry with considerable wind, which varied very frequently, both in force and direction. Very little ploughing has been possible owing to the drought, which not only *lowered the condition of the oxen but rendered the soil too hard to work.* Mr. Sampson of the Dairy Division remarked on the exceptionally good condition of the cattle in the neighbourhood. On the 23rd after six months without rain, I tested the water-level in the borehole on the southern boundary of this farm; it stood as before, 21 feet from surface. Rainfall: 0·97 inch on three days.—E. Gordon Brown.

Sabie (*Lydenburg*).—Abnormally high temperatures prevailed during the month, while the rainfall was just one-half the average for past twenty-one years. Rainfall: 1·48 inch on five days.—W. Lea.

Piet Retief (*Government Tobacco Station*).—The 3rd was extremely hot (95·0 degrees) and a very high wind began in the morning and lasted all day.

The air was full of dust. The 13th was the hottest day (97·0 degrees) recorded here at this station. The rain on the 28th (1·35 inch) was enough for ploughing, and the farmers should be able to get their crops planted now. Rainfall: 3·81 inches on six days.—The Officer-in-Charge.

Mosdene (*Waterberg*).—An exceptionally hot month, the mean of the maximum daily temperature being 89·8 degrees as compared with an average of 82·8 degrees for the preceding years. The rainy season opened up in the usual time, at the end of the month, with a fall of 2·30 inches on four days. Farmers are all busy ploughing and prospects for the summer crops are so far good.—Ernest E. Galpin.

Ermelo.—Drought broken, though late, very welcome. Altogether a most trying month for all and everything concerned. Heavy losses in stock through drought and due to the condition of the veld. Rainfall: 2·05 inches on three days.—Dr. E. B. Theunissen.

Gemboksfontein (*Middelburg*).—Strong, drying winds prevailed during the month. The prolonged drought has damaged trees growing in shallow situations. Welcome rains fell at the close of the month. Rainfall: 0·39 inch on four days.—C. M. van Coller;

Jackalsfontein (*Pietersburg*).—A hot, windy month generally, with large variations in temperature. Veld and stock in poor condition. Rainfall: 0·34 inch on two days.—Rev. James C. Palmer.

Heidelberg.—On the 31st at about midnight a heavy thunderstorm passed over the town. Lightning struck the municipal stables, which were burned down and caused also severe damage to electric light installations. Rainfall: 1·00 inch on three days.—W. A. ter Horst.

Zwartkopjes Pumping Station (*Heidelberg*).—Very high temperature throughout month. Last year October maximum recorded on one day, 90·1 degrees. This year over 90 degrees were recorded on fifteen days. Maximum temperature for month 94·3 degrees; mean maximum for month 86·8 degrees which is a record for this station. Rainfall: 0·94 inch on four days.—E. Taylor.

Waterval Boven (*Carolina*).—Very hot and dry during month. Rainfall: 2·26 inches on three days.—G. Berry.

Strathmore (*Klerksdorp*).—Extremely hot scorching winds prevailed all month. Rainfall: 0·97 inch on three days.—Chas. Scott.

Barberton.—The month has been very hot and dry with a fairly persistent northerly wind during the day time. Rainfall: 1·01 inch on five days.—Walter Grubb.

Pampoenkraal No. 248 (*Wakkerstroom*).—The hottest month I have ever felt closed with beautiful rains and the outlook is hopeful. On the night of the 3rd a high wind got up about 3 a.m. and blew for eighteen hours without stopping—a perfect hurricane. I have never experienced such a wind and I noticed the shipping in the Indian Ocean suffered too. A soaking rain fell all day and night of the 31st (2·38 inches). The heat is still great but a return of the clouds brings nice rain very easily. Cattle died in hundreds during the rain of the 31st, although it was a fine warm rain. Rainfall: 3·26 inches on four days.—Mrs. S. M. Nicolson.

Louis Trichardt.—Variable hot weather with sudden changes to cool and windy. Country badly in need of rain.—Rainfall: Nil.—C. L. Cope.

Middelburg.—Very hot days have obtained during the month, the mean maximum temperature and the mean temperatures for the month being the highest recorded in twenty years. The nights were, however, cool. An unusual amount of wind and duststorms was experienced, apparently heralding rain which never came. The rainfall for the month is also the lowest on record for October, for the past twenty years. Since 31st of October, however, steady

rains appear to have set in with a promise of continuance. Rainfall: 1·12 inches on six days.—Dr. H. A. Spencer.

Pietersburg.—Heat and drought. Soft steady rain fell 7 p.m.–9 p.m., and during night of 31st. Rainfall: 0·53 inch on three days.—W. J. Frankleyne.

Standerton.—Frost reported on the 4th, although none was registered at the Station. On the 3rd a gale raged, and according to local old inhabitants it is considered to be the worst for twenty-three years. Not much damage was done. Hot, windy days were in the majority. The rains relieved the district of drought conditions, although the hot, windy weather following is tending to counteract the good effects of the rains. Rainfall: 1·67 inch on three days.—W. J. Madge.

Bloemhof.—Violent duststorms throughout the month. The few light showers of rain have made no difference to the severe drought. Rainfall: 0·70 inch on five days.—F. Osborne.

Myrthley (Standerton).—Very dry throughout month. The drought broke on the night of 27th with a very heavy hailstorm followed by some steady soaking rain. Rainfall: 1·85 inch on three days.—J. L. Ellis.

Lichtenburg.—Farmers complaining; hardly any fruit—no plums, very few peaches—frost caught blossoms. Cattle in very poor condition. Farmers want rain badly so as to plough and plant their mealies. Great prospect of rain at end of month. Rainfall: 0·27 inch on three days.—E. Newton.

Amatava (Waterberg).—Strong hot winds developing during the day with inclination to storm. Rainfall: 0·69 inch on six days.—A. R. Troye.

Groeneboom No. 444 (Rustenburg).—Month very hot and dry and much wind. Rains, though light, at the end of the month very welcome, country being parched. Cattle fell off rapidly. Very little ploughing has been done, soil being too hard. No locusts have appeared yet but are soon to be expected. Rainfall: 0·69 inch on three days.—F. van Nouhuys.

Parktown North (Johannesburg).—Winds, dust, unsettled and cloudy weather with a cold snap early part of month. High winds, north-north-east and variable. Heat intense and drought severe; farmers unable to plough. Veld parched and dry. Steady rains fell on the 28th and again on the 31st, both soaking rains. Rainfall: 0·67 inch on two days.—G. S. Garnett.

Krugersdorp.—The month was rainless until the 27th when a welcome change in weather conditions took place. Temperatures have been above the average, and, just prior to the rain on the 27th, evidence of plant life suffering from drought was becoming very noticeable. The total rainfall for the month, 1·21 inch on three days, is less than half the average recorded here in October during the past twenty years.—H. Sharp.

Piet Retief.—15th, Country suffering severely from drought. Heavy losses in stock have been reported from various parts of the district; 30th, drought now completely broken. Heavy soaking rains during last four days.—Rainfall: 3·57 inches on three days.—J. Werner.

Louieville (Barberton).—The drought is causing anxiety to the farmers. Ploughing has not yet been started and local stock are in a very poor condition. Rainfall: 0·13 inch on two days.—E. Roselt.

Kamhlabane Ranch (Barberton).—The heat and wind during the month have been very great and have helped to make the grass dry. Rainfall from 27th to 30th, and farmers and natives are busy in the lands, but it is getting rather late to plant mealies, etc. Rainfall: 0·86 inch on four days.—H. B. Trollip.

Highlands (Waterberg).—Heavy mortality in cattle from poverty. Rainfall: 1·48 inch on four days.—A. Mathewson.

Zwagershoek (*Lydenburg*).—Farmers busy harvesting oats and wheat crops, which are on the short side owing to lack of rain. Rainfall: 1·27 inch on six days.—J. D. Stirling.

Kaffirskraal (*Marico*).—Drought very severe and great scarcity of water for stock. Hopper locusts all over this part. Conditions very unfavourable for the farmers. Rainfall: 0·35 inch on three days.—A. E. Scheuble.

Reston (*Middelburg*).—Many farmers short of water; rivers have stopped running—grass only in vleis and spruit. Stock in fair condition, some planting done in dry ground. Rainfall: 0·82 inch on three days.—A. G. Purves.

Elandsfontein (*Potchefstroom*).—The loss is heavy in large and small stock. Rainfall: 0·10 inch on one day.—P. Davidtz.

Mimosa Park (*Potchefstroom*).—Hundreds of cattle died in this district during October. Rainfall: 1·04 inch on two days.—J. G. Dixon.

Leeuwkop (*Pretoria*).—Stock and crops very poor. Cattle dying from poverty. Rainfall: 1·00 inch on three days.—S.A. Police.

Grootvallei (*Standerton*).—Grass dried up. Cattle eating old vlei grass and being hand fed. Rainfall: 0·66 inch on two days.—W. Garnett.

Weltevreden (*Standerton*).—Terrible month of drought. Cattle fallen off and food finished—water short in many places, no ploughing, ground too hard and oxen in poor condition. Rainfall: 1·10 inch on four days.—D. Lane.

Brakfontein (*Waterberg*).—All cattle in very poor condition. Rainfall: 0·28 inch on five days.—W. J. Howard.

Broederstroom Drift (*Zoutpansberg*).—Very dry; cattle round this part dying. Rainfall: 0·04 inch on one day.—G. van Velden.

Mon Desir (*Zoutpansberg*).—My cattle, etc., falling off terribly, also other live stock in low country. Rainfall: Nil.—J. H. Travers.

Swaziland.

Matendele.—A very trying month, great heat, strong winds, and a parched country. Although an anxious period, central Swaziland suffered little from this period of drought. Not many losses in live stock. Those in bush veld in really good condition. Rainfall: 1·42 inch on four days.—H. S. Parry.

Transvaalia.—Drought broken and ploughing, though late, has started. Cattle poor but will come on now. Rainfall: 2·13 inches on four days.—J. H. Coates.

Mbabane.—At last the drought has broken and the country is freshening up though grazing is still very poor. All farmers are busy ploughing with the prospects of a good season. In the low country around Bremersdorp farmers can plant up to the 15th January with success, as frost is seldom known. The extraordinary part about this month is that our highest temperature for the month was on the 3rd, and on the 6th (temperature minimum 38 degrees), we had a heavy frost. Rainfall: 2·70 inches on eleven days.—R. C. S. Markham.

Stegi (*Ubombo*).—3rd, Whirlwind, at 5.30 p.m. approached rapidly from west in two cones about 50 yards apart, passing through Stegi village loosening portions of thatch on various buildings and removing some sheets of galvanized iron from roof of garage shed, Stegi Hotel. Rainfall: 1·77 inch on ten days.—W. J. D. Crawford.

Orange Free State.

Holfontein (*Kroonstad*).—Locusts still plentiful. Farmers are destroying dozens of swarms, and unless every endeavour is made to destroy the pest little hopes are left for the mealie crop this season. Stock were in a very poor condition and farmers in the neighbourhood have already lost from ten to twenty head of large stock through the drought. The rains came just in time,

but we are still looking forward for more and we are certainly in need of it. Rainfall: 1·62 inch on five days.—L. C. McInerney.

Harrismith.—Severe drought and frequent duststorms. Good rains fell during the latter part of the month. The drought appears to be completely broken. Rainfall: 2·43 inches on four days.—S. Wenning.

Kleinfontein (Bethlehem).—Heat and drought very intense. Crops poor; stock in fair condition. Rainfall: 1·87 inch on three days.—J. J. Viljoen.

Middelfontein (Bethulie).—We have had any amount of wind during the month, which kept the windmills going. Rain is badly needed and stock are beginning to suffer on account of the drought. Nearly all the locusts in the district have been destroyed with the exception of a few swarms. Rainfall: 0·30 inch on one day.—H. J. Joubert.

Brandfort (Bloemfontein).—The heat during this month has been most oppressive and drought conditions prevailed. Stock generally were in low condition with heavy losses here and there. Heavy hatchings of locusts occurred in the district but were generally got under. Rainfall: 0·62 inch on four days.—J. G. van Aswegen.

Belgrave (Bloemfontein).—Condition of stock fair—no fear of loss at present from poverty. Hair worm bad among sheep. Rainfall: 0·33 inch on four days.—W. W. Bridge.

Sterkstroom (Boshof).—Condition of stock good in some parts of district and bad in others. We are expecting heavy hatchings of locusts. The rains were accompanied by fine hail. Rainfall: 0·55 inch on two days.—J. B. Moolman.

Stanleyvale (Harrismith).—A very dry month. Cattle fair. All oats have died back on account of drought. Rainfall: 1·37 inch on four days. —G. C. Atkins.

Heilbron.—Crops: Owing to lateness of season no ploughing has been done and no crops put in. *Stock:* Stock in very poor condition. Rain came at a most opportune moment and saved the situation. *Diseases:* Nothing reported except a few donkeys, which on investigation were found to be suffering from the common "bots." Rainfall: 1·67 inch on four days.—P. A. du P. Naudé.

Prospect (Vrede).—Drought has been rather serious this month. Stock have been getting weak, though so far as I have heard no one in this neighbourhood has lost many animals. Sheep are being fed on mealies and keep pretty strong, but ewes have little milk and many lambs die. The rain at the end of the month was splendid—soft, soaking, and not cold, and grass is coming on well. During second week some swarms of locusts appeared and were killed by burning. Rainfall: 0·80 inch on four days.—T. Pitcairn.

Woudzicht (Vrede).—This month was exceptionally dry. Large stock suffered severely and all ploughing stopped owing to bad condition of oxen. Rainfall: 1·25 inch on three days.—J. N. Köhler.

NATAL.

Stanger.—The 3rd was the hottest day (108·5 degrees) that I have recorded since November, 1921. Rainfall: 1·10 inch on five days.—Cecil C. Foss.

Greytown.—Very droughty month. 3rd, a fearful day, very hot and still until 10·45 a.m., followed by terrific north-westerly wind of almost hurricane force. Sun obscured for hours by thick haze. Wind suddenly turned cold 4 p.m. and temperature suddenly dropped to 70 degrees. 4th, cold southerly wind sprang up about 9 a.m. and continued all day, too cold to be pleasant. Rest of month very droughty with intense heat, and cold or cool nights until change began to work up on the 21st. Drought really broke with thunderstorm on morning of 31st lasting from 9.30 a.m. to 1 p.m. Rainfall: 1·51 inch on seven days.—J. M. Handley.

Ladysmith.—3rd, wind at 8.30 a.m., wind-force 6, increased in strength and continued until after sundown. Exceptionally dusty. Worst day in memory of observer. An extremely dry, hot month for the time of year. Hot winds have tended to make matters worse—drying up any moisture that was left in the ground. Farmers throughout the district have lost a good deal of stock owing to scarcity of feed. Light rains fell during the last few days of the month and these have improved matters somewhat, but a lot more rain is necessary before any marked improvement can be expected. Rainfall: 1·07 inch on six days.—D. A. R. Leathern.

Maritzburg (Mental Hospital).—October has been very hot and dry. Feeding for stock very scarce. Rainfall: 1·16 inch on twelve days.—The Staff.

Dundee.—3rd, strong north-westerly wind commenced about midnight and continued with renewed strength throughout Wednesday, the country for miles round being overcast by heavy, dusty atmosphere. After a very serious month by way of continual excessive heat the prolonged drought broke on Sunday, 28th, by a heavy storm from south-west which appeared pretty general throughout the upper part of Klip River County; the rain came on in a heavy squall which uprooted a few trees. Rainfall: 2·35 inches on six days.—West Thorrold.

Hillary.—Since records have been kept at this station (1907), the 3rd provided a record for shade temperature, 106·9 degrees. Only in 1918 and 1919 has the rainfall been anything like so deficient as in the past month. Rainfall: 1·87 inch on nine days.—H. A. Thorpe.

Mid-Illovo.—Exceptionally dry, although rain was registered on thirteen days, totalling 2·71 inches, which, with occasional mists, kept the veld green, but the fields for cultivation are still too hard for the plough. A hot gale on the 17th ran the temperature up to 100 degrees in the shade.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Newcastle (Gaol).—The drought is now broken and grass is becoming green. Good rains started on the 28th. Rainfall: 2·09 inches on six days.—The Gaoler.

Verulam.—3rd, high warm wind from north-west began at 10.15 a.m. Maximum temperature went up to 103 degrees about 11 a.m., and at 1 p.m. was 111 degrees. At 1.45 p.m. a cool high wind was blowing from the west. Damage to young plants. Rainfall: 0·95 inch on eight days.—C. H. G. Cornelius.

Paulpietersburg.—Drought with hot northerly and north-westerly wind almost daily, continued until about the 28th. Considerable losses of cattle; sheep did not suffer so badly. Trees (Macrocarpa) of several years' growth dying in township. First storm (1·11 inch) on 28th came from south-east, an unusual direction. Total rainfall, 1st March to 27th October was 2·31 inches which appears to be the longest period of drought recorded in records of this station, the absence of any considerable fall in March and April being especially noticeable. Rainfall: 2·81 inches on five days.—Dr. Niel Lipscomb.

Ingwangwane (Polela).—From the 1st to 17th the days were hot and sultry with cumulus clouds forming, usually commencing about 11 a.m. These have usually turned into strato-cumulus or cirrus clouds. Frost was observed on the 6th instant. Since the 17th winds have blown daily, varying in force from fresh to moderate gales, blowing cumulus clouds away. Rainfall: 0·91 inch on seven days.—T. H. Houshold.

Cape St. Lucia.—Remarkably hot north-easterly winds from 3 p.m. to 6 p.m. on the 23rd. Weather generally cloudy and hazy. Welcome rains fell during the last week of the month, but much more is needed to bring on the grass for stock which are in a very poor condition. Rainfall: 1·37 inch on seven days.—J. Murphy.

Paddock.—The drought was broken in the district by the fine rain of 2·07 inches on the 8th, but conditions have not been nearly so severe as elsewhere in the Union. Stock are in good condition. The ploughing was delayed, but has been proceeded with now. We have been having a lot of mist, which has helped the young grass, but a good deal of hot wind in the interim. We may congratulate ourselves on being much better off than many places in the Union. Rainfall: 2·98 inches on fourteen days.—G. Victor Merriman.

Nottingham Road.—Very dry, though there is no shortage of grass for stock. On the 3rd a gale blew from the north, heaviest known for years. Next day almost as great a gale blew from the south. Very high north-westerly winds prevailed throughout the month. Towards the end of the month the drought broke. Rainfall: 1·32 inch on nine days.—Miss E. Smythe.

Edendale (Klip River).—The drought is this area has been terrible, practically no rain having fallen since the floods in February; a great many cattle have died from poverty. During the month hot scorching winds from west blew nearly every day. Rainfall: 1·50 inch on four days.—T. N. Niland

Gluckstadt (Vrijheid).—Drought broken on the 28th when several thunderstorms passed over this part of the country. Rainfall for day was 0·87 inch, and was followed on the 31st by 1·16 inch. Stock will soon regain their lost strength and vigour. The drought has been so severe that bees have perished from starvation. Rainfall: 2·23 inches on five days.—F. W. J. Schumann.

Mfongosi (Nkandhla).—Unprecedented drought. Cattle mortality high owing to poverty. Rainfall: 1·38 inch on two days.—W. E. Jones.

Rongpoort (Weenen).—Continued heavy losses in stock during this month. Just sufficient rain fell to start the grass springing. Hot and cold winds prevalent. Rainfall: 1·20 inch on six days.—J. H. Bartholomew.

Mehlomnyama (Port Shepstone).—Rains are badly wanted to enable ploughing to be done, but sufficient moisture has fallen to keep the grass green and growing, and all stock are fat. Rainfall: 2·46 inches on nine days.—D. MacIntyre.

CAPE.

Groot Drakenstein.—Several days of dense haze at the end of last and the beginning of this month, especially 30th September and 1st, 5th, and 6th October. Severe plague of caterpillars throughout this district did considerable damage to fruit. Fruit crops advanced. Rainfall: 1·43 inch on six day .—Lionel Baker.

Ceres.—Weather generally cloudy and cooler than usual. Rainfall: 1·71 inch on seven days.—A Heatlie.

Kakamas: There are prospects of a good wheat harvest. Rainfall: Nil. —M. J. Oosthuizen.

Grassridge (Cradock).—The month has been fine though very dry and windy; the wind blowing mostly from the north-west and south-east. Towards the end of month a little rain was experienced, though not sufficient to break the prevailing drought in the district. Rainfall: 0·12 inch on two days.—M. Loftus.

Grahamstown.—Locusts hatching in many parts of the district. Rainfall: 1·79 inch on nine days.—Edward T. George.

Mafeking (Convent).—Duststorms frequent during the month. A light thunderstorm on the evening of the 28th was accompanied by a shower registering 0·26 inch. On the 31st rain commenced to fall gently at 5.30 a.m. and continued until 6.30 p.m., registering 0·73 inch. Rainfall: 1·00 inch on three days.—The Mother Superior.

Somerset East.—Soaking rains are badly needed. On many occasions during the month the high humidity of the atmosphere has promised rain, but

subsequent cold spells and south-easters have dispelled all chances of a fall. Rainfall : 0·80 inch on seven days.—C. Harris.

Murraysburg.—Conditions becoming serious ; very dry in greater part of district. Rainfall very partial and tremendous swarms of voetganger locusts in parts where rain fell. Rainfall : 0·41 inch on three days.—W. H. Rose-Innes.

Stutterheim.—Rain badly needed. Locusts hatching everywhere. Weather excessively hot. Rainfall : 2·69 inches on sixteen days.—F. C. Bousfield.

Kimberley.—This month exceptionally hot during day and night. Veld very dry in the district. High winds with dust every day. Rainfall : 0·63 inch on three days.—F. W. J. Schmidt.

Aliwal North.—A month of very high temperature. Strong drying winds. A good deal of thunder but only light showers of rain, amounting to 0·47 inch on five days.—Alex. Alcock.

Kokstad.—Very hot and dry until the 31st when a succession of three storms lasting from 2 a.m. to 9 a.m., gave a fall of 1·54 inch and relieved the drought. This district has not suffered very severely from the drought as copious rains fell in July and green grass was still fairly plentiful. No locusts have visited this district. Rainfall : 1·86 inch on eight days.—H. D. Coyte.

Carnarvon.—District needing rain badly ; farmers are again trekking. Rainfall : Nil.—A. P. Malherbe.

Upington.—Weather excessively warm for October month. Veld very dry. Rainfall : 0·06 inch on one day.—E. H. Jones.

Louisvale.—No rain during this month, and river rapidly falling. Lucerne and wheat crops flourishing on irrigated lands. Outside veld becoming very dry.—Stuart M. Smith.

Darling (Malmesbury).—Adequate rain for time of year and conditions generally favourable. Considerable south-easterly winds in middle of month. Rainfall : 1·07 inch on seven days.—P. H. Drake.

Belvedere (Knysna).—The month has been unusually windy, generally blowing from south-east with furious gusts, as a rule dropping towards sunset as suddenly as they get up between 10 a.m. and noon. Rainfall : 2·47 inches on eight days.—F. Thornbury.

Tsolo.—Cattle are in fair condition. Sheep doing well. Veld wants rain badly. No disease amongst animals in district. On several days the wind has been severe, coming mostly from west and south-west. Rainfall : 1·51 inch on six days.—H. P. Tillard.

Kraaipan (Mafeking).—The rainfall at the end of the month will do a lot of good and be the saving of stock. A feature of the month was the strong northerly wind which blew almost continuously from the 10th to 22nd. Rainfall : 0·99 inch on two days.—P. J. Hart.

Queenstown.—Slight frosts on 4th and 5th, the last so far for the season. Strong north-westerly winds prevailed, followed generally by stiff south-easters in afternoon. Country languishing for rain. Rainfall : 0·38 inch on five days.—J. F. C. Rein.

Capetown.—Beginning of month dull and showery with occasional break followed from 19th to 22nd by a heat wave. From the 23rd to 25th a considerable drop of temperature with fog and drizzle ; with the exception of 29th, remainder of month fine and warm.—A. Russel Fraser.

Sydney-on-Vaal (Barkly West).—Abnormally hot and dry month. High winds prevalent, particularly in early part of month. Serious effects of drought now evident in all live stock throughout district. Conditions apparently very favourable for rain during latter end of month, but precipitation was disappointingly light, and has not relieved the situation. Rainfall : 0·18 inch on one day.—J. B. Richards.

Liwandi (Addo : Uitenhage).—Much cloudy weather during the middle of

the month. Excessive winds and duststorms during the latter part were the leading features of the month. A fair quantity of lucerne hay has been railed from Addo during the month. Rain is badly needed. The veld is getting dry. *Lake Mentz is empty for all practical purposes.* Rainfall: 1·53 inch on eight days.—Major J. Kreft.

Dunbrody (*Uitenhage*).—Black Quarter Evil broke out among cattle in the neighbourhood soon after the rain. All the voetgangers that have so far hatched out on the farm have been destroyed. Rainfall: 1·51 inch on six days.—Rev. Father Lallemand.

Postmasburg (*Hay*).—Wind and dust nearly all the month. Heavy winds starting from 10–12 noon and falling off in the evenings. Anthrax twenty miles east from here on the Kimberley road. Rainfall: 0·32 inch on three days.—D. Brown.

Lovedale (*Victoria East*).—Mean temperatures have been normal and the month has been very dry, though a marked feature has been the cloudiness with a predominance of the Cu-Nimbus type. The prospects agriculturally are poor as rain is badly needed. Voetgangers are reported in the immediate neighbourhood. Rainfall: 1·18 inch on five days.—H. R. Storey.

Rietfontein (*Aliwal North*).—Very dry and hot month. Locusts in abundance. Frost on 4th killed most fruit. Rainfall: 0·44 inch on four days.—A. G. Smith.

Graaff-Reinet (*Convent*).—A warm dry month; very windy. Wi ds variable. Rainfall: 0·05 inch.—The Mother Superior.

Graaff-Reinet (*Van Ryneveld's Pass*).—Country very dry; rain badly needed. Weather during month pleasant on the whole. Rainfall: 0·42 inch on two days.—K. R. Strand.

Bedford.—Locusts hatching out all over district excepting a comparatively small area. Many farmers are anxious about water as dams are low and dry. Rainfall: 1·48 inch on nine days.—Thos. C. Hall.

Queenstown.—Dry month with strong westerly to northery winds; duststorms frequent. Locusts hatching out on commonage and all over the district. Rainfall: 0·39 inch on five days.—H. Holley.

Windhoek (*Fraserburg*).—Rain badly needed, stock both large and small in very poor condition. Rainfall: 0·01 inch on one day.—A. Olivier.

Kei View (*Stutterheim*).—Drought serious. Locusts hatching out in quantities. No diseases among stock. Rainfall: 0·26 inch on three days.—M. E. Acton.

Copia (*Aliwal North*).—The little rain that fell this month did no good. Crops are drying up. Sheep in good condition, cattle poor. Country overrun with "Voetgangers" and no poison to be had. Rainfall: 0·41 inch on four days.—R. E. Orsmond.

BECHUANALAND.

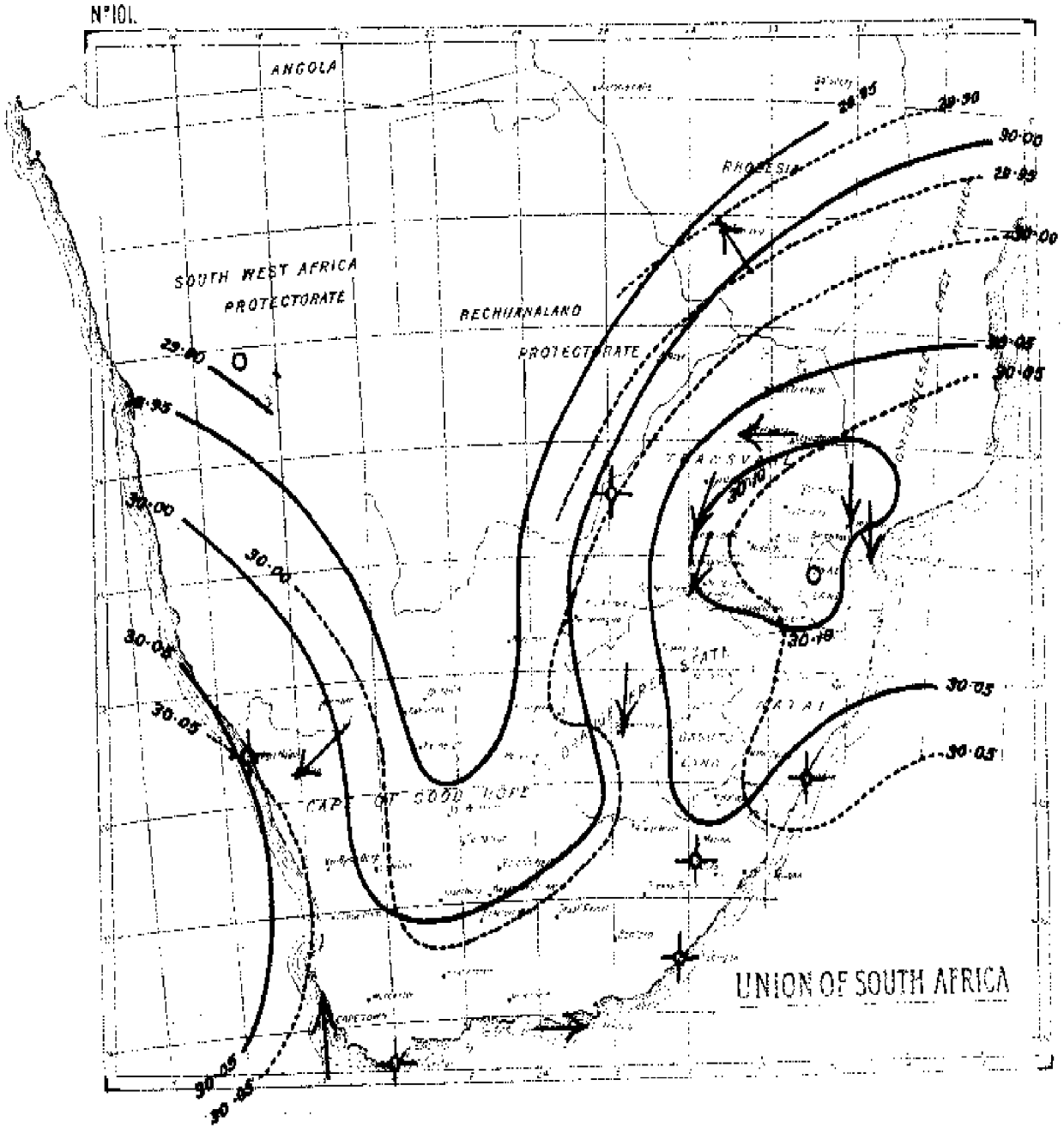
Serowe.—Very hot and close all through month. Rainfall: 0·02 inch on one day.—Resident Magistrate.

Dikgatlong Ranch.—Nothing unusual. Rain due. Country very dry. No locusts. Rainfall: 0·29 inch on three days.—Paul Jousse.

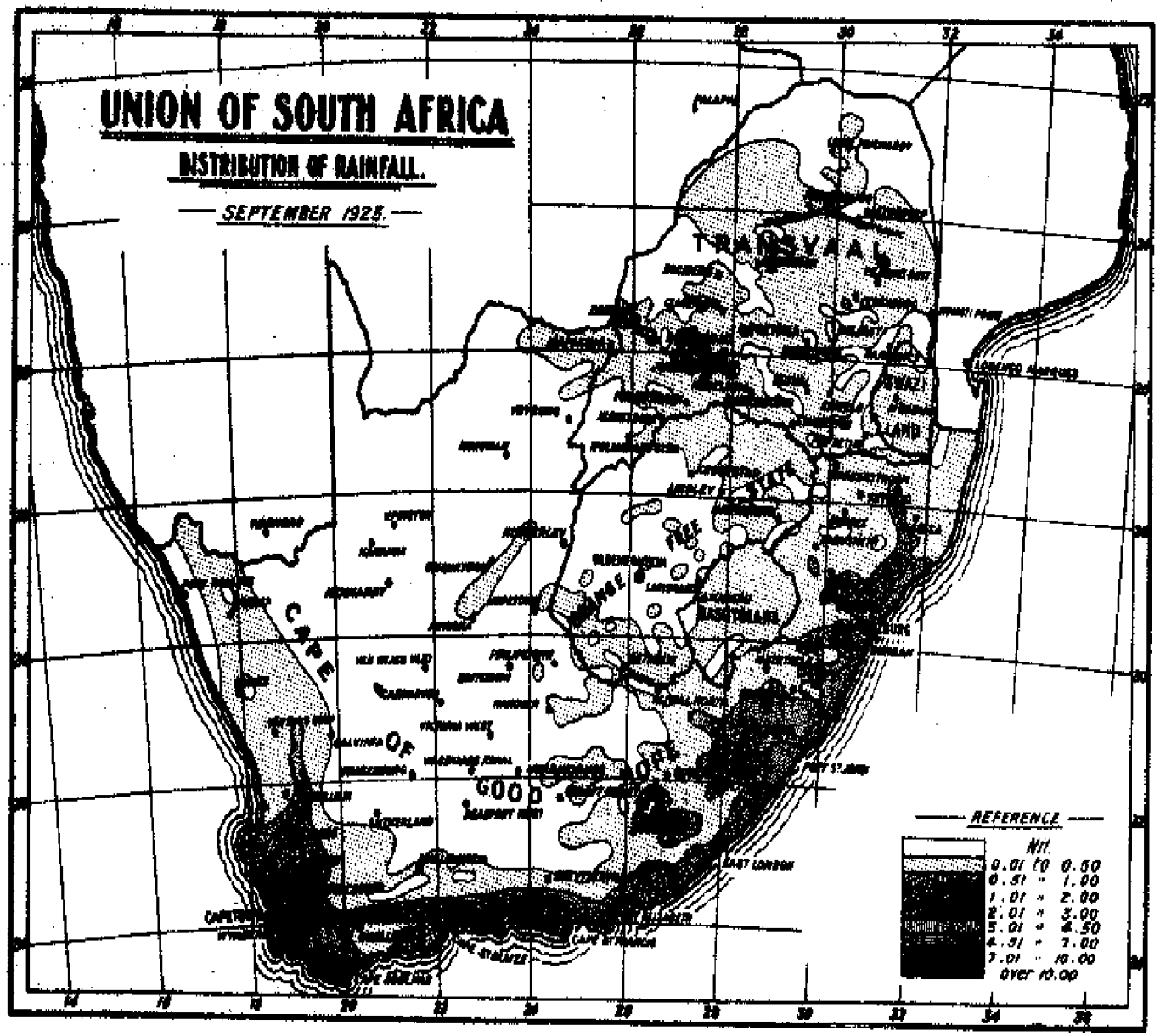
BASUTOLAND.

Maseru.—Nice soft rains; more rain badly wanted; weather promising; strong winds; dust storms. Locust officers are doing very good work and are destroying many swarms in Basutoland. Rainfall: 1·00 inch on six days.—J. G. Green.

Mafeteng.—Hot and dry the first three weeks of the month with duststorms almost daily. Nice showers fell during latter part of month which greatly refreshed the veld and wheat crops. Ground frosts from 4th to 7th and on 25th. Rainfall: 0·94 inch on six days.—F. Hodgson.



October, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for October.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
SEPTEMBER 1925.
TRANSVAAL
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
over 10.00

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), OCTOBER, 1923.

Station.	Observer.	Month—Oct., 1923.		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	88·4	62·0	75·2	68·8	+ 6·4	102·0	11th	48·0	6th.
Belfast	The Forester	79·6	41·9	60·8	58·0	+ 2·8	87·0	2nd and 11th	26·0	7th.
Bloemhof	F. Osborne	89·9	58·9	74·4	66·0	+ 8·4	100·0	13th	44·5	6th.
Ermelo	Dr. E. B. Theunissen	82·1	50·7	66·4	60·8	+ 5·6	90·4	13th	32·8	6th.
Johannesburg (Observatory)	The Staff	79·5	55·3	67·4	61·4	+ 6·0	87·8	2nd	35·0	5th.
Klerksdorp (Strathmore)	Chas. Scott	87·5	55·0	71·2	68·0	+ 3·2	95·0	1st, 2nd, 13th, and 22nd	43·0	7th.
Komatipoort	B. J. Fothergill and H. J. Evans	94·6	64·2	79·4	76·0	+ 3·4	110·0	24th	50·0	7th.
Louis Trichardt	C. L. Cope	86·1	60·0	73·0	67·2	+ 5·8	—	—	—	—
Middelburg	Dr. H. A. Spencer	85·1	48·5	66·8	64·0	+ 2·8	92·0	1st, 2nd, 11th, and 20th	32·0	6th.
Nylstroom	G. Bakker	87·6	53·4	70·5	69·2	+ 1·3	95·0	11th	39·0	7th.
Pietersburg	W. J. Frankleyne	86·2	54·5	70·4	66·9	+ 3·5	96·0	11th	39·0	7th and 8th.
Piet Retief	J. Werner	83·5	55·0	69·2	63·9	+ 5·3	94·5	3rd	38·0	6th.
Pigeonhole (New Agatha)	Jno. McCallum	79·8	58·7	69·2	—	—	93·0	24th	44·0	5th and 6th.
Pilgrims Rest	A. Kiernander	84·3	52·9	68·6	64·1	+ 4·5	96·0	24th	43·0	5th and 6th.
Potchefstroom (Exp. Farm)	The Manager	87·5	53·7	70·6	64·8	+ 5·8	96·1	1st	39·4	7th.
Pretoria (Meteorological Office)	The Staff	85·4	56·5	71·0	67·6	+ 3·4	92·1	11th	41·5	7th.
Standerton	W. J. Madge	84·9	48·4	66·6	61·8	+ 4·8	91·8	13th	30·0	6th.
Zeerust	H. Dietrich	87·2	57·0	72·1	69·0	+ 3·1	94·6	1st	43·0	7th.
Swaziland—										
Mbabane	The Swaziland Police	83·2	55·6	69·4	63·4	+ 6·0	99·0	3rd	38·0	6th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	84·6	52·4	68·5	62·8	+ 5·7	94·0	2nd	35·0	5th.
Bloemfontein	G. A. Schepers	84·5	56·0	70·2	63·3	+ 6·9	95·8	22nd	39·8	5th.
Harrismith	The Forester	79·0	49·6	64·3	59·7	+ 4·6	88·0	13th and 14th	35·0	5th and 6th.
Kroonstad	S. R. Northfield	86·0	54·5	70·2	65·8	+ 4·4	94·3	13th	37·0	7th.
Ladybrand	The Forester	81·4	52·7	67·0	61·0	+ 6·0	91·0	20th	35·0	5th.
Lindley	J. Collister-Oates	84·1	52·8	68·4	61·6	+ 6·8	92·5	2nd	34·0	7th.
Natal—										
Dundee	West Thorrold	86·5	53·2	69·8	66·0	+ 3·8	97·0	13th	33·0	6th.
Durban (Point)	The Port Captain	76·5	65·8	71·2	69·7	+ 1·5	82·4	24th	56·8	6th.
Estcourt	The Town Clerk	85·9	54·0	70·0	67·0	+ 3·0	97·0	13th	35·0	6th.
Hlabisa	—	—	—	—	67·5	—	—	—	—	—
Ladysmith	D. A. R. Leathern	88·4	58·5	73·4	69·8	+ 3·6	99·0	13th	42·0	6th.
Maritzburg (Mental Hospital)	The Staff	84·7	59·1	71·9	67·4	+ 4·5	100·6	13th	44·0	6th.
Stanger	C. C. Foss	82·1	63·6	72·8	69·0	+ 3·8	108·5	3rd	53·5	6th.
Weenen	The Gaoler	—	—	—	69·0	—	—	—	—	—

AIR TEMPERATURES, OCTOBER, 1923—(*continued*).

Station.	Observer.	Month—Oct., 1923. Mean Max.	Month—Oct., 1923. 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	82·9	50·1	66·5	61·0	+ 5·5	92·0	2nd and 22nd	32·5	5th.
Bedford	Thos. C. Hall	78·9	51·0	65·0	61·6	+ 3·4	96·3	29th	34·0	5th.
Capetown (Royal Observatory)	The Staff	71·4	55·0	63·2	60·6	+ 2·6	89·1	5th	48·6	4th.
Carnarvon	A. P. Malherbe	82·4	52·9	67·6	62·9	+ 4·7	94·0	21st and 22nd	37·0	4th.
Clanwilliam	—	—	—	—	64·6	—	—	—	—	—
East London	The Port Captain	73·8	59·4	66·6	63·8	+ 2·8	92·0	6th	48·0	5th.
Graaff-Reinet (Convent)	The Mother Superior	84·2	52·7	68·4	63·7	+ 4·7	98·5	17th	37·5	5th.
Grahamstown	The Vet. Res. Officer	74·5	50·1	62·3	60·7	+ 1·6	92·2	17th	38·6	5th.
Groot Drakenstein	Lionel Baker	76·4	53·1	64·8	61·1	+ 3·7	90·8	20th	46·0	12th.
Kenhardt	R. Seydell	89·5	57·0	73·2	67·5	+ 5·7	103·0	21st	46·0	3rd.
Kimberley	F. W. J. Schmidt	88·2	59·3	73·8	68·2	+ 5·6	100·0	22nd	45·0	4th.
Kingwilliamstown	W. Kindness	78·1	54·8	66·4	64·5	+ 1·9	93·0	17th and 29th	40·0	5th.
Kokstad	H. D. Coyte	80·3	50·0	65·2	58·0	+ 7·2	92·0	19th	33·8	6th.
Mafeking (Convent)	The Mother Superior	88·0	58·3	73·2	69·8	+ 3·4	97·0	1st	47·0	4th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	69·7	58·5	64·1	61·4	+ 2·7	89·0	6th	52·0	4th.
Murraysburg	W. H. Rose-Innes	80·8	48·6	64·7	61·8	+ 2·9	92·0	2nd	31·8	5th.
O'okiep	J. Burrows	79·2	55·0	67·1	61·6	+ 5·5	99·0	21st	42·0	3rd.
Port Elizabeth	The Lightkeeper	70·1	58·1	64·1	62·0	+ 2·1	93·0	6th	52·0	1st, 26th, and 27th.
Port Nolloth	The Lightkeeper	64·3	50·4	57·4	57·2	+ 0·2	98·0	5th	43·0	13th.
Port St. Johns (Cape Hermes)	The Lightkeeper	73·5	62·0	67·8	65·4	+ 2·4	93·0	17th	54·0	5th.
Queenstown	H. Holley	84·1	52·1	68·1	62·2	+ 5·9	95·0	18th and 19th	34·0	5th.
Somerset East	C. Harris	78·5	51·4	65·0	62·3	+ 2·7	96·0	2nd	37·5	5th.
Stutterheim	F. C. Bousfield	77·4	52·9	65·2	60·2	+ 5·0	93·0	29th	42·0	5th and 27th.
Sydney's Hope	Rev. S. Rippon	73·4	53·2	63·3	59·8	+ 3·5	89·8	29th	44·5	5th.
Uitenhage	H. Inggs	76·9	55·2	66·0	63·5	+ 2·5	96·0	6th	43·0	1st.
Umtata	P. Hackett	79·8	53·2	66·5	62·2	+ 4·3	97·8	17th	40·2	6th.
Vryburg	Chas. Butler	88·4	56·6	72·5	69·6	+ 2·9	97·0	1st, 2nd, and 13th	44·0	6th.
Wynberg (Convent)	The Mother Superior	72·2	54·0	63·4	59·8	+ 3·6	85·5	5th	45·8	4th.
Basutoland—										
Mafeteng	F. Hodgson	78·6	58·5	68·6	59·8	+ 8·8	88·0	11th, 16th, and 22nd	44·0	26th.

RAINFALL, OCTOBER, 1923.

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		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	1·01	2·47	− 1·46	21·04	22·14	− 1·10	1·47	4·37	− 2·90
Belfast	The Forester	2·37	3·36	− 0·99	17·42	21·47	− 4·05	2·69	4·95	− 2·26
Bethal	H. F. Joubert	1·16	3·44	− 2·28	18·02	18·95	0·93	1·59	4·95	− 3·36
Bloemhof	F. Osborne	0·70	1·23	− 0·53	10·77	14·45	− 3·68	0·88	2·63	− 1·75
Claremont	S.A. Police	—	1·31	—	—	—	—	—	—	—
Ermelo	*The Forester*	2·03	4·64	− 2·61	11·03	21·23	−10·20	2·96	6·68	− 3·72
Hanepertsburg	S.A. Police	0·60	2·79	− 2·19	36·87	28·75	+ 8·12	1·72	4·37	− 2·65
Heidelburg	W. ter Horst	1·00	2·68	− 1·68	16·52	18·70	− 2·18	2·36	4·35	− 1·99
Johannesburg (Observatory)	The Staff	0·84	2·74	− 1·90	19·68	20·86	− 1·18	2·41	4·51	− 2·10
Klerksdorp (Strathmore)	C. Scott	0·97	1·91	− 0·94	15·97	16·78	− 0·81	1·74	3·30	− 1·56
Komatipoort	B. J. Fothergill and H. J. Evans	0·12	1·96	− 1·84	32·02	21·03	+10·99	1·13	3·29	− 2·16
Louis Trichardt	C. L. Cope	0·00	2·13	− 2·13	33·04	21·50	+11·54	0·00	3·31	− 3·31
Middelburg	Dr. H. A. Spencer	1·12	2·95	− 1·83	17·51	18·87	− 1·36	1·32	4·01	− 2·69
Nylstroom	G. Bakker	1·31	1·99	− 0·68	18·57	17·25	+ 1·32	1·56	3·14	− 1·58
Pietersburg	—	0·53	1·85	− 1·32	10·91	13·96	− 3·05	0·82	2·58	− 1·76
Piet Retief	J. Werner	3·57	4·24	− 0·67	21·49	22·07	− 0·58	3·82	6·51	− 2·69
Pigeonhole (New Agatha)	J. McCallum	0·46	2·92	− 2·46	56·74	33·87	+22·87	1·16	5·02	− 3·86
Pilgrims Rest	A. Kiernander	0·61	2·14	− 1·53	39·79	29·77	+10·02	1·02	4·02	− 3·00
Potchefstroom (Exp. Farm)	The Manager	0·81	2·16	− 1·35	15·00	16·27	− 1·27	1·28	3·61	− 2·33
Pretoria (Meteorological Office)	The Staff	0·60	2·69	− 2·09	18·65	19·80	− 1·15	0·94	3·88	− 2·94
Roodberg	N. H. Monro	1·21	1·65	− 0·44	17·12	17·09	+ 0·03	1·40	2·92	− 1·52
Rustenburg	A. Streatfield	0·30	2·53	− 2·23	19·33	18·57	+ 0·76	1·11	4·08	− 2·97
Standerton	W. J. Madge	1·67	3·64	− 1·97	21·92	20·46	+ 1·46	3·51	5·59	− 2·08
Wakkerstroom	F. Grant	—	3·28	—	—	—	—	—	—	—
Woodbush	The Forester	0·94	4·28	− 3·34	72·21	53·11	+19·10	2·06	7·88	− 5·82
Zeerust	H. Dietrich	0·79	1·66	− 0·87	18·84	16·81	+ 2·03	1·68	2·64	− 0·96
Swaziland—										
Mbabane	Swaziland Police	2·70	4·68	− 1·98	47·16	37·92	+ 9·24	3·72	8·39	− 4·67
Orange Free State—										
Bethulie	J. J. Wardhaugh	0·30	1·19	− 0·89	12·40	14·14	− 1·74	1·28	2·73	− 1·45
Bloemfontein	G. A. Schepers	0·79	1·69	− 0·90	22·18	17·32	+ 4·86	1·60	3·43	− 1·83
Boshof	The Postmaster	0·66	1·21	− 0·55	21·71	15·33	+ 6·38	1·10	3·24	− 2·14
Harrismith	The Forester	2·43	3·32	− 0·89	17·53	21·07	− 3·54	4·14	5·55	− 1·41
Kroonstad	S. B. Northfield	2·27	1·93	+ 0·34	15·66	17·93	− 2·27	3·13	3·62	− 0·49
Ladybrand	The Forester	1·75	2·44	− 0·69	19·38	20·62	− 1·24	3·55	5·34	− 1·79
Lindley	J. Collister-Oates	0·57	2·29	− 1·72	15·39	17·60	− 2·21	1·64	4·06	− 2·42
Natal—										
Dundee	W. Thorrold	2·35	3·05	− 0·70	16·14	23·04	− 6·90	3·04	5·38	− 2·34
Durban (Point)	The Port Captain	2·00	4·87	− 2·87	23·38	31·58	− 8·20	5·45	10·79	− 5·34
Estcourt	The Town Clerk	1·00	2·42	− 1·42	15·75	20·93	− 5·18	2·72	4·36	− 1·64
Hlabisa	The Gaoler	—	5·16	—	—	32·37	—	—	9·55	—

RAINFALL, OCTOBER, 1923—(*continued*).

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		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Howick	The Gaoler	1·17	3·29	− 2·12	18·43	24·52	− 6·09	2·69	6·21	− 3·52
Ladysmith	D. A. R. Leathern	1·07	2·75	− 1·68	15·83	21·04	− 5·21	3·04	4·82	− 1·78
Maritzburg (Mental Hospital)	The Staff	1·16	3·58	− 2·42	20·60	27·25	− 6·65	2·49	7·24	− 4·75
Stanger	C. C. Foss	1·10	5·51	− 4·41	27·19	31·27	− 4·08	4·82	11·11	− 6·29
Vrijheid	The Gaoler	3·90	3·84	+ 0·06	15·29	24·67	− 9·38	4·16	6·43	2·27
Weenen	The Gaoler	1·01	2·48	− 1·47	8·38	19·78	−11·40	1·72	4·54	− 2·82
Cape—										
Altwal North	A. Alcock	0·47	1·47	− 1·00	15·78	16·09	− 0·31	1·04	3·49	− 1·85
Beaufort West	The Gaoler	0·12	0·70	− 0·58	6·81	8·02	− 1·21	1·30	1·94	− 0·64
Bedford	T. C. Hall	1·48	2·31	− 0·83	20·74	21·46	− 0·72	4·03	5·89	1·86
Britstown	The Gaoler	0·50	0·57	− 0·07	8·02	9·81	− 1·79	1·00	1·60	− 0·60
Calvinia	The Gaoler	0·24	0·50	− 0·26	8·53	7·63	+ 0·90	2·09	2·89	− 0·80
Capetown (Royal Observatory)	The Staff	0·75	1·72	− 0·97	24·47	23·61	+ 0·86	9·51	10·96	− 1·45
Ceres	A. Beatlie	1·71	3·60	− 1·89	36·95	38·40	− 1·45	14·68	19·72	− 5·04
Carnarvon	A. P. Malherbe	0·00	0·44	− 0·44	7·44	6·90	+ 0·54	0·74	1·25	− 0·51
Clanwilliam	The Gaoler	0·31	0·56	− 0·25	9·21	8·18	+ 1·03	2·14	3·85	− 1·71
Concordia	F. H. Carstens	0·20	0·37	− 0·17	7·01	5·98	+ 1·03	1·20	2·28	1·08
East London	A. Downie	1·47	3·63	− 2·16	28·50	26·39	+ 2·11	9·27	9·90	− 0·63
French Hoek (Driefontein)	The Forester	2·45	2·46	− 0·01	84·27	73·79	+10·48	38·30	32·23	+ 6·13
Fraserburg	The Gaoler	0·00	0·32	− 0·32	5·04	5·93	− 0·89	0·50	1·22	− 0·72
Grahamstown	Vet. Res. Officer	1·79	3·07	− 1·28	15·86	22·43	− 6·57	5·47	8·20	− 2·73
Garies	The Gaoler	0·00	0·31	− 0·31	4·55	4·67	− 0·12	1·56	2·20	− 0·64
Graaff-Reinet (Convent)	The Mother Superior	0·05	1·18	− 1·13	7·33	11·35	− 4·02	1·52	3·17	− 1·65
Groot Drakenstein	L. Baker	1·43	2·68	− 1·25	43·46	33·06	+ 10·40	16·07	16·05	+ 0·02
Griquatown	The Gaoler	0·19	0·77	− 0·58	9·95	10·81	− 0·86	0·35	1·60	− 1·25
Hanover	The Gaoler	0·08	0·70	− 0·62	10·75	11·20	− 0·45	0·50	2·07	− 1·57
Hopetown	The Gaoler	0·67	0·73	− 0·06	10·72	10·47	+ 0·25	1·27	1·67	− 0·40
Kenhardt	R. Seydell	0·00	0·35	− 0·35	8·99	5·12	+ 3·87	0·23	0·89	− 0·66
Kimberley	F. Schmidt	0·63	1·12	− 0·49	11·98	12·60	− 0·62	1·15	2·28	− 1·13
Knysna	The Gaoler	2·25	2·72	− 0·47	23·19	23·88	− 0·69	7·53	10·22	− 2·69
Kokstad	H. D. Coyte	1·86	2·03	− 0·17	20·16	10·62	+ 9·54	7·88	4·23	+ 3·65
Kingwilliamstown	W. A. Kindness	1·71	2·53	− 0·82	20·76	19·86	+ 0·90	6·83	6·43	+ 0·40
Kuruman	—	—	0·43	..	—	13·21	..	..	1·27	.
Mafeking (Convent)	The Mother Superior	1·00	1·62	− 0·62	15·16	16·41	− 1·25	1·63	3·07	− 1·44
Mossel Bay (Cape St. Blaize)	The Lightkeeper	1·09	1·62	− 0·53	11·97	14·71	− 2·74	3·27	6·00	− 2·73
Murraysburg	W. H. Rose-Innes	0·41	0·65	− 0·24	9·57	9·21	+ 0·36	1·39	1·89	− 0·50
O'okiep	J. Burrows	0·40	0·44	− 0·04	6·92	6·58	+ 0·34	1·55	2·91	− 1·36
Philipstown	The Gaoler	0·25	0·71	− 0·46	8·37	11·26	− 2·89	0·62	1·97	− 1·35
Piquetberg	The Gaoler	1·07	1·76	− 0·69	20·54	19·17	+ 1·37	7·48	9·76	− 2·28
Port Elizabeth	The Lightkeeper	1·16	2·21	− 1·05	18·43	18·72	− 0·29	5·87	8·47	− 2·60
Port St. Johns (Cape Hermes)	The Lightkeeper	2·34	6·69	− 4·35	40·77	39·07	+ 1·70	15·99	14·03	+ 1·96
Port Nolloth	The Lightkeeper	0·43	0·12	+ 0·31	2·26	2·23	+ 0·03	0·86	0·95	− 0·09
Prieska	The Gaoler	0·15	0·44	− 0·29	8·95	8·30	+ 0·65	0·41	1·07	− 0·66
Queenstown	H. Holley	0·39	1·59	− 1·20	16·59	17·74	− 1·15	1·94	3·77	− 1·83

RAINFALL, OCTOBER, 1923—(*continued*).

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		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Steytlerville	The Gaoler	1·26	0·78	+ 0·48	9·15	7·72	+ 1·43	2·27	2·13	+ 0·14
Sutherland	The Gaoler	0·00	0·63	− 0·63	6·71	8·55	− 1·84	1·87	3·14	− 1·27
Swellendam	The Gaoler	2·35	3·02	− 0·67	21·57	26·52	− 4·95	6·59	10·27	− 3·68
Sydney's Rope	Rev. S. Rippon	2·24	2·45	− 0·21	14·85	18·15	− 3·30	5·76	6·50	− 0·74
Somerset East	C. Harris	0·80	2·27	− 1·47	14·56	20·23	− 5·67	3·12	5·97	− 2·85
Stutterheim	F. C. Bousfield	2·69	3·07	− 0·38	32·90	23·14	+ 9·76	6·01	6·52	− 0·51
Tiffendale	H. Inggs	1·62	1·65	− 0·03	14·67	14·27	+ 0·40	4·77	5·47	− 0·70
Uniondale	P. Hackett	0·96	2·43	− 1·47	25·15	19·93	+ 5·22	5·59	5·47	+ 0·12
Uniondale	The Gaoler	1·01	1·16	− 0·15	7·84	11·67	− 3·83	2·00	4·74	− 2·74
Upington	The Gaoler	0·06	0·44	− 0·38	8·48	6·01	+ 2·47	0·10	0·80	− 0·70
Victoria West	The Gaoler	0·00	0·61	− 0·61	8·91	8·92	− 0·01	0·93	1·69	− 0·76
Vryburg	Chas. Butler	0·51	1·00	− 0·49	16·67	15·15	+ 1·52	0·51	1·92	− 1·41
Worcester	The Gaoler	0·00	1·12	− 1·12	6·40	11·65	− 5·25	1·59	5·78	− 4·19
Wynberg (Convent)	The Mother Superior	1·01	3·42	− 2·41	43·64	43·20	+ 0·44	19·10	22·88	− 3·78
Basutoland—										
Mafeteng	F. Hodgson	0·94	2·00	− 1·06	28·85	24·27	+ 4·58	2·14	4·91	− 2·77
South-West Africa—										
Aus	E. Marthins	2·88	0·09	+ 2·59	6·88	3·99	+ 2·89	2·88	0·96	+ 1·72
Bethanie	Rev. Peter	0·66	0·18	+ 0·48	11·29	4·16	+ 7·13	0·66	0·15	+ 0·51
Duesternbrook	I. and R. Matthiessen	0·02	0·27	− 0·25	22·90	12·04	+10·86	0·02	0·44	− 0·42
Franzfontein	H. Janson	0·00	0·23	− 0·23	7·68	8·29	− 0·61	0·00	0·33	− 0·33
Gibis	Rev. P. Rehor	0·45	0·47	− 0·02	4·83	4·31	+ 0·52	0·55	0·86	− 0·31
Garinais	F. Bertling	0·52	0·23	+ 0·29	10·83	4·90	+ 5·93	0·52	0·37	+ 0·15
Gibson	Rev. Spellmeyer	0·36	0·20	+ 0·16	12·31	5·41	+ 6·90	0·36	0·33	+ 0·03
Gobabis	Rev. Irle	1·68	0·42	+ 1·26	19·88	12·71	+ 7·17	1·68	0·65	+ 1·03
Grootfontein	Pitkowski	0·48	0·66	− 0·18	32·83	17·72	+15·11	0·48	0·73	− 0·25
Gr. Witvley	Maass	0·43	0·45	− 0·02	19·22	12·05	+ 7·17	0·43	0·61	− 0·18
Haribes	Cpt. Meyer	0·30	0·32	− 0·02	16·56	6·66	+ 9·90	0·30	0·61	− 0·31
Heirachabis	Rev. P. Klemann	1·10	0·11	+ 0·99	6·26	3·15	+ 3·11	1·10	0·18	+ 0·92
Kalkfeld	E. Just	0·19	0·14	+ 0·05	10·38	5·26	+ 5·12	0·19	0·43	− 0·24
Neu-Barmen	Liebig's Extract Co.	0·06	0·39	− 0·33	16·01	12·11	+ 3·90	0·06	0·59	− 0·53
Okahandja	B. Templin	0·04	0·41	− 0·37	23·00	12·20	+10·80	0·04	0·63	− 0·59
Okandjoss	— von Gossler	0·18	0·22	− 0·04	28·53	13·89	+14·64	0·18	0·56	− 0·38
Okasangwandjo	R. H. A. Schneider	1·02	1·05	− 0·03	26·48	14·15	+12·33	1·02	1·39	− 0·37
Omaruru	The Postmaster	0·00	0·27	− 0·27	20·17	9·43	+10·74	0·00	0·35	− 0·35
Rehoboth	The Postmaster	0·00	0·35	− 0·35	21·57	8·88	+12·69	0·00	0·57	− 0·57
Rietfontein	B. Leist	0·97	1·04	− 0·07	32·39	15·79	+16·60	0·97	1·10	− 0·13
Swakopmund	E. Sievert	0·00	0·06	− 0·06	0·38	0·53	− 0·15	0·00	0·16	− 0·16
Tsumeb	Ing. Schetter	0·48	0·85	− 0·37	26·98	18·14	+ 8·84	0·48	1·03	− 0·55
Usakos	Rev. Diehl	0·00	0·22	− 0·22	8·24	4·89	+ 3·35	0·00	0·30	− 0·30
Voigtsgrund	A. Voigts	0·76	0·21	+ 0·55	25·82	6·46	+19·36	0·76	0·35	+ 0·41
Waterberg	D. Hahn	1·57	0·43	+ 1·14	27·16	15·74	+11·42	1·57	0·55	+ 1·02
Windhoek	Observatory	0·81	0·36	+ 0·45	27·68	10·93	+16·75	0·81	0·55	+ 0·26

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DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. IV. **NOVEMBER, 1923.** **No. 11.**

AN unusually hot, dry month, particularly over the greater part of the summer rainfall area; mean pressure about the average over the west coast, but subnormal over the east, south, and centre of the Union; mean temperature 2½ degrees above the average, due to both days and nights being considerably warmer than usual; continuous heavy rains over the south-west, producing record amounts at some stations, with excesses extending into the south coastal area, the southern and central Karroo, and the south-westerly part of the innermost plateau, also at several stations in the west of Natal, the centre and south of the Free State, in the north-east and west and south-west Transvaal, as also in Bechuanaland. Frequent light rains over the greater part of the rest of the Union, subnormal in amount, often highly localized and irregular in distribution; but with some intense showers over limited areas; a high percentage of cloud; some destructive hailstorms in the Transvaal and Cape Provinces; several lightning fatalities to man and beast; destructive windstorms in Zululand, Natal, and the Transvaal on the 9th; these were the leading features of the weather of November, 1923.

Pressure.—From the accompanying map it will be seen that atmospheric pressure was practically normal on the west coast, but subnormal by about half-a-tenth of an inch over the central and southern Cape, the Orange Free State, and the Transvaal. The equatorial low pressure was persistent, practically all through the month, frequently extending to the south coast, thus materially affecting the trend of the mean isobars for this month. High pressure areas were present on eleven days, viz., over the west to south-west on the 1st, 2nd, 4th to 6th, and 29th, and over south to east on the 3rd, 16th to 18th, and 26th.

Temperature.—The mean temperature during November (69·7 degrees) was 2·5 degrees higher than usual. This excess was almost equally divided between the days and nights, the temperature of the former (82·0 degrees)

being 2·3 degrees and of the latter (57·5 degrees) being 2·7 degrees above normal. An excess in mean monthly temperature was common to all the Provinces, the largest surplus (4·2 degrees) being met with in the Transvaal, where the temperature for the month was 72·2 degrees; in the Free State, where the month's mean was 68·0 degrees, the excess was only half this amount, viz., 2·1 degrees; whilst Natal, with a mean of 73·0 degrees, and the Cape Province, with 67·7 degrees, were both 1·7 degree warmer than usual. An excess in the mean maximum temperature prevailed in three of the four Provinces, the exception being Natal, where the day temperature of 84·2 degrees was 0·5 degree lower than usual; in the Transvaal the mean maximum of 85·3 degrees was 4·7 degrees in excess of normal; in the Free State the corresponding value (82·5 degrees) was 2·9 degrees, whilst in the Cape Province, where this mean was 79·2 degrees, it was only 1·4 degree higher than the average. The mean night temperatures were above normal in all the Provinces, the largest excess of 3·8 degrees being shown by Natal, with the mean minimum temperature of 61·7 degrees; in the Transvaal the excess of the mean minimum temperature (59·1 degrees) was only one-tenth of a degree less than that shown by Natal; in the Cape Province the excess of the mean night temperature (56·2 degrees) above normal was only 2·1 degrees; whilst in the Free State the excess had decreased to 1·3 degree, the mean minimum there being 53·5 degrees. Considering the mean temperature for this month in relation to the normals at the individual stations, it is seen that temperature was almost everywhere above the average, the surplus amounts being greatest (5–6 degrees) in the east and north and part of the south-west of the Transvaal; in this Province the excesses varied between 1·7 degree at Zeerust in the west and 6·2 degrees at Barberton in the east. In the Free State the excess in mean temperature ranged from 0·4 degree at Bethulie to 3·6 degrees at Ladybrand; in Natal, between 0·2 degree at Estcourt and 3·0 degrees at Stanger; and in the Cape Province, from 0·5 degree at Murraysburg to 3·9 degrees at Graaff-Reinet. A few stations in the last-mentioned Province, however, were slightly cooler than usual, for example, Grahamstown and Carnarvon were respectively 0·9 degree and 0·6 degree below their normals. Days were warmer than usual at all stations in the Transvaal and Free State, the excesses in mean maximum temperature frequently being more than 5 degrees, particularly in the north, east, and south of the Transvaal, and in Swaziland, where the departures from normal varied between 1·9 degree at Zeerust and 8·6 degrees at Barberton. In the Orange Free State the excesses were somewhat less, lying between plus 0·4 degree at Bethulie in the south and plus 4·9 degrees at Lindley in the north. In Natal, conditions during the day were more variable, the departures of the mean maxima ranging from minus 2·2 degrees at Ladysmith to plus 1·6 degree at Maritzburg. In the Cape Province the excesses in day temperature were greatest in the east, and, generally speaking, fell off considerably towards the west and the interior. These plus amounts lay between 4·5 degrees at East London and 0·2 degree at Uitenhage. A number of stations in the south-east, centre, and part of the south-west had mean maxima lower than the average, the deficits in these cases being between 0·1 degree at Groot Drakenstein and 2·1 degrees at Kimberley.

The nights were considerably warmer than usual at practically all stations in each of the Provinces, the only exceptions being Aliwal North and Grahamstown, where the mean minima were cooler than usual by a few tenths of a degree. The excesses in the mean night temperatures varied in the Transvaal between 6·6 degrees at Piet Retief and 0·8 degree at Belfast; in the Free State they were much smaller, lying between 0·4 degree at Bethulie

and 2·8 degrees at Ladybrand; in Natal they were much greater, the mean minima being supra-normal by amounts ranging from 5·5 degrees at Stanger to 1·9 degree at Estcourt; in the Cape Province these excesses were generally similar to those in the Free State, being commonly about 1–1½ degree, but ranging from 0·7 degree at Murraysburg to 4·3 degrees at Wynberg in the Cape Peninsula. The warmest station during November was Komatipoort with a mean of 82·1 degrees, and the coolest Port Nolloth with 59·0 degrees, a difference of 23·1 degrees. The warmest and coolest stations and their related temperatures in the different Provinces were as follows:—Transvaal: Komatipoort, 82·1 degrees; Belfast, 63·2 degrees; difference, 18·9 degrees. Orange Free State: Kroonstad, 70·2 degrees; Harrismith, 64·3 degrees; difference, 5·9 degrees. Natal: Weenen, 75·0 degrees; Estcourt, 70·6 degrees; difference, 4·4 degrees. Cape Province: Mafeking, 74·2 degrees; Port Nolloth, 59·0 degrees; difference, 15·2 degrees. The highest mean maximum for November was 94·6 degrees at Komatipoort, 6 degrees higher than usual, and the lowest mean minima 49·2 degrees at Belfast, 0·8 degree in excess of the average; showing a mean range of 45·4 degrees during the month. The highest temperatures of the month were registered on thirteen days, viz., 1st, 3rd, 5th, 6th, 18th to 20th, and 25th to 30th, more particularly on the 5th, 6th, 18th, and 30th. The lowest temperatures were almost entirely confined to the first thirteen days, with a few on the 16th to 24th and 25th; such readings occurred most widely on the 3rd, 7th, and 10th. Temperatures of 100 degrees Fahrenheit or over occurred at a few stations in the Transvaal, Natal, and Cape Provinces. The extreme maximum was 109·5 degrees at Komatipoort on the 25th, and the corresponding minimum 39·2 degrees at Grahamstown on the 7th. There was therefore an extreme range during November of 70·3 degrees. The only instance of *ground frost* noted during the month occurred at Mafeteng, in Basutoland, on the 26th.

Precipitation during November was in excess of the average over the southerly portions of the northern Karroo, the central and southern Karroos, the south coast, parts of the south-west of the Cape Province including the Peninsula, Bechuanaland, the Namaqualand plateau, and a few stations in the north-east and south-east of the Cape Province; also the centre and south of the Orange Free State, the west of Natal, and at a few stations in the west, south-west, and north, as well as in the high veld of the Transvaal. In the more central portions of the Cape Province the surplus amounts were generally less than half an inch, but exceeded 1 inch in parts of the south and south-east, rising to 2–6 inches in the south-west and Bechuanaland. The excesses varied over the Cape Provinces between 0·03 inch at O'okiep and Swellendam and 6·53 inches at Driefontein, in the French Hoek area of the south-west; in the Free State and Natal the plus amounts were about three-quarters of an inch or less, but in the Transvaal varied from 0·47 inch at Bloemhof to 1·95 inch at Zeerust. In the Transvaal and Swaziland the deficits were generally between 1 inch and 2 inches, but fell to 0·13 inch at Louis Trichardt and rose to 4·29 inches at Pigeonhole. Similar conditions obtained over the remainder of the Free State and Natal, ranging over the former Province from 0·45 inch at Boshof to 1·62 inch at Harrismith, and in the latter from 0·73 inch at Ladysmith to 3·16 inches at Maritzburg. In the more northerly portion of the northern Karroo, over the northern border and in the west coastal area, the totals for this month were generally subnormal by amounts of about half an inch or less, an entire absence of rain being reported from several stations, whilst in parts of the south-east and of the Transkei the deficits lay between 1 inch and 2 inches.

In South-West Africa an excess in precipitation was confined to the more southerly portions, the surplus amounts varying from 0·13 inch at Maltahöhe to 1·85 inch at Garinais, to the east-north-east of Keetmanshoop. Practically the whole of the country north of 25° S. latitude had a rainfall less than usual by amounts everywhere less than 1 inch, except at Rietfontein in the north, where the shortage amounted to 1·51 inch. Taken as a whole, the rains during this month, although frequent in parts of the east and south-central parts of the Transvaal, in Natal, portions of the north of the Free State, and round the southern and eastern margin of the Cape Province, were light or highly localized on most occasions. The benefit that would have accrued from these rains was frequently neutralized by evaporation, owing to the intense heat, so that ploughing operations in many cases had to be suspended owing to the weak condition of the cattle, while over large areas no attempt could be made at breaking ground. On several days, however, the rainfall was intense, particularly about the 13th, when quantities of from 2–4 inches in the twenty-four hours were by no means uncommon. Thunderstorms were numerous throughout the month, but, unfortunately, were frequently unaccompanied by any precipitation. There were some native and stock fatalities at Mid-Illovo (Natal) during a storm on the 1st. On the 15th, during a severe storm of this character, an Indian and horse were killed, four miles south-west from Zwartkopjes (Division Heidelberg), and considerable damage was done to the electrical transmission lines. Hailstorms were of frequent occurrence during the month, but comparatively little damage was reported, these storms being mostly light or of short duration. Among the destructive hailstorms during this month may be mentioned the following:—On the 13th, at Lake Mentz (Division Jansenville), in the Cape Province, during a storm, moving from west to east and having its centre eight miles north, there fell large, jagged pieces of ice, which killed some goats, pierced galvanized iron roofs, etc. At Steenberg's Cove (Division Malmesbury) thunderstorms on 13th and 14th, accompanied by hail, caused damage to rye crops—an unusual occurrence. A great deal of damage was caused by such a storm at Pietersburg on the 16th. Medium-sized hail fell at Mid-Illovo (Natal) on the 25th. At Vaalbank (No. 66) (District Bethal), on the 26th, hail fell for twenty-five minutes, accompanied by a strong wind; the stones, weighing 3 ounces and measuring 2½ inches by 3 inches, caused much damage, killing stock, perforating roofs, etc. On the same date a severe storm at Vaalbank (otherwise called Allendale), in the Standerton District, ruined crops. On the 27th, stones, 1 inch in diameter, severely damaged fruit and other crops at Klippan (District Middelburg). On the last day of the month a severe hailstorm was experienced seven miles east of Piet Retief, but no details of any damage are available. Hot winds were reported from parts of Natal, Free State, and the Transkei, and some unusually strong local winds occurred on several days of the month. Thus, on the 9th, a whirlwind from the north-west passed over Cape St. Lucia, uprooting trees, stripping them of their branches, and carrying away native huts; a 12-foot outhouse was blown a distance of 60 yards. On the same date, and practically at the same time (5 p.m.), what is described as a cyclone passed over Empangeni to the south-west of Cape St. Lucia, breaking off several trees in the plantation there. Whilst, again, on that day a "terrible duststorm" occurred at Deercroft (District Waterberg), in the Transvaal, damaging fruit, windmills, buildings, etc. At Teyateyaneng (Basutoland) strong gales blew on the afternoons of the 4th, 6th, and 7th, breaking branches of trees, tearing off iron roofs, and badly damaging those covered with thatch. The unusually heavy rains during the month over the south-west of the Cape Province caused damage to standing and cut crops, as well as fruit, causing apricots and plums to split badly. As a result of rains at Mafeking between the 11th and 23rd

the Molopo overflowed its banks, but caused no damage. At Sydney-on-Vaal there was a small flow of the river on the 30th, and on the same date the Orange River rose 3 feet at Upington. The rivers were reported as low at Kokstad in the Transkei, whilst at Paulpietersburg (Natal) it was stated that the spruits remained very low and springs had not yet reopened. Cut-worm was stated to be affecting mealies and potatoes at Stutterheim in the Cape Province.

The gross totals of precipitation since the beginning of the year were above normal in parts of the north, east, and west of the Transvaal, also in Swaziland, the excesses varying from 0·08 inch at Nylstroom to 18·58 inches at Pigeonhole. In the Free State there was a surplus 5–6 inches at stations in the centre and west, and in Basutoland of about 4½ inches. In the Cape Province the totals for the eleven months were above the average in Bechuanaland, parts of the northern border, the northern and central Karroos, the west, south-west and south-east and of Kaffraria. These excesses varied considerably, being greatest in the north, south-west, and east, Vryburg showing plus 6·06 inches, Groot Drakenstein 15·28 inches, Driefontein (French Hoek) 17·01 inches, and Kokstad 8·16 inches. The extremes were 0·28 inch at Victoria West and that for Driefontein, already noted. Over the rest of the country the totals were subnormal, by 4–11 inches in Natal, 2–5 inches in the Free State, by a few tenths of an inch to 8 inches in the Cape Province, and by half an inch to 12 inches in the Transvaal. The accumulated seasonal rainfall from the 1st of July was mostly subnormal, excesses being confined to very limited areas in the west of the Transvaal, to Bechuanaland, the south-west of the Cape Province, including the northern part of the Cape Peninsula, parts of the southern and central Karroos, of the south-east, and the Transkei. The surplus amounts varied from 0·03 inch at Mafeking to 12·66 inches at Driefontein. Amounts exceeding 2 inches were limited to a few stations in Bechuanaland, and the south, west, and east, the greater number of stations being less than 1 inch above the average. Deficits in Natal, where all stations were subnormal, varied from 0·89 inch at Estcourt to 9·27 inches at Stanger: in the Transvaal and Swaziland they were commonly between 2 and 4 inches, but ranged from 0·90 inch at Pietersburg to 9·60 inches at Woodbush; in the Free State the shortages lay between 1 inch and 4 inches; and in the Cape Province, from 0·13 inch at Port Nolloth and Beaufort West to 4·68 inches at Grahamstown. In South-West Africa the totals for the period from 1st January were generally in excess of normal, the surplus amounts varying from 1·57 inch at Gabis to 19·35 inches at Voigtsgrund. Deficits, however, were met with at Franzfontein in the north-west and Swakopmund, the former amounting to 0·77 inch and the latter to 0·16 inch. The cumulative amounts for the five seasonal months from 1st July were mostly above the average in that portion of the territory south of 25° S. latitude, and subnormal to the north of that parallel. The excesses ranged from 0·09 inch at Maltahöhe to 2·00 inches at Garinais, and the deficiencies from 0·17 inch at Swakopmund to 1·84 inch at Rietfontein.

JANUARY WEATHER CHARACTERISTICS.

Except along the west coast, where the minimum of 0·14 inch is reached, and in the south-western districts of the Cape, the rainfall is now increasing. Over the eastern half of the Union the precipitation is usually at its maximum during January. Swaziland and Basutoland, the latter with a normal of about 7·0 inches, are the districts where the heaviest rainfall may be expected. About 5·5 inches should fall in the Transvaal; 5·0 inches in Natal; 4·5 inches in Kaffraria and over the north-east of the Cape; 4·0 inches in the Orange

Free State and over the south-east of the Cape; 2·5 inches over the Cape northern border; 2·0 inches over the northern and east-central Karroo and along the south coast; 1·5 inch over the west-central Karroo; and less than an inch over the remainder of the Union.

The highest mean daily temperature is still experienced over the northern borders of the Cape Province, where the normal remains at 77 degrees; 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,

Pretoria. *Chief Meteorologist.*

OBSERVERS' NOTES FOR NOVEMBER, 1923.

TRANSVAAL.

Middelburg.—The weather this month has been unusually hot, with a maximum temperature of 95 degrees on the 6th; such a high maximum temperature has only once been recorded—in 1915, when a maximum temperature of 96 degrees was recorded. The mean temperature of the month is unusually high. The arrival of the rains at the end of the first week cooled off the weather as usual. Storms and rain many times passed on without falling here. Country now taken on its summer aspect. Rainfall: 5·21 inches on seventeen days.—Dr. H. A. Spencer.

Pietersburg.—Small amount of soft rains; one heavy hailstorm, doing a deal of damage. Rainfall practically confined to town and immediate vicinity. District suffering acutely. Rainfall: 3·79 inches on nine days.—W. J. Frankleyne.

Jackalsfontein (Pietersburg).—Various light rains during the latter part of the month. Ploughing in part of the district, but not throughout. Rainfall: 1·83 inch on one day.—Rev. James C. Palmer.

Barberton.—The rainfall has been disappointingly sparse. Such rains as we have had have been very local, and the small showers have been of very little use, owing to the evaporation caused by the intense heat. The young crops will suffer badly unless good rains occur shortly. Rainfall: 2·63 inches on eight days.—Walter Grubb.

Ermelo.—Rainfall unsatisfactory. District requires much more rain urgently, though enough grass is out for cattle. Most peculiar weather, taken all round, for this time of year, especially the daily prevailing winds. Thunder and lightning, resulting in no precipitation, which was not usual in previous years. Rainfall: 2·76 inches on seven days.—Dr. E. B. Theunissen.

Gemboksfontein (Middelburg).—The weather has been warm during the month. Showers have been very local. Rainfall: 3·63 inches on fourteen days.—C. M. van Coller.

Piet Retief.—Very little rain for November month, and farmers around this area complaining bitterly. Severe hailstorm experienced about seven miles east of Piet Retief on 30th. Rainfall: 2·96 inches on fourteen days.—J. Werner.

Lichtenburg.—Nice rains during the month, but not sufficient. Wheat cutting on the erven in town. Farmers took advantage of the rain to plough, but some of them were late, as ground is quite dry again. Grass nice and green, and cattle in better condition. Rainfall: 3·49 inches on nine days.—E. Newton.

Pigeonhole (New Agatha).—Heat and drought; practically no ploughing nor planting done. Rainfall: 1·84 inch on ten days.—Jno. MacCallum.

Mosdene (Naboomspruit).—A very hot month, with rainfall much below average. On the 6th the temperature reached 99 degrees in the shade, the highest in any month during the last three years. The mean temperature for the month was 74·2 degrees, compared with an average of 71·6 degrees for the last five years. Rainfall for the month: 3·55 inches on eleven days, compared with an average of 5·29 inches for the past seven years. It has been sufficient for ploughing and planting, and a record acreage is being put under crops. Germination has been quite good, and seedlings are looking well. The veld is in good condition, and stock are looking well.—Ernest E. Galpin.

Berlin Plantation (Barberton).—Owing to the drought breaking on the 22nd October and good rains this month, cattle are looking quite well and no more deaths are expected. Rainfall: 3·85 inches on seven days.—E. Edwards.

Bloemhof.—Drought has been slightly relieved by the few showers of rain during the month. Rainfall: 2·26 inches on six days.—F. Osborne.

Myrthley (Standerton).—Hot generally; rains distributed and light, with one or two sharp thunderstorms. Rainfall: 3·76 inches on twelve days.—J. L. Ellis.

Nooigedacht No. 777 (Waterberg).—The deficiency in the rainfall is hampering farming operations and threatens to compromise the harvest, although the fall has probably been rather better almost anywhere else in the near neighbourhood. There is enough grass for the cattle, which are looking fairly well. Winds have been very variable, both in force and direction. Rain has threatened on several occasions without falling. Many small swarms of locusts have hatched out to the west and south-west, and have been promptly dealt with. Rainfall: 1·63 inch on seven days.—G. Gordon Brown.

Krugersdorp.—The month of November presented no special features. Temperatures have been fairly uniform and more or less normal. From the 7th to the 22nd fine growing weather was experienced, but towards the end of the month dry hot weather was experienced. Rainfall: 3·82 inches on twelve days, against an average of 4·49 inches for the past twenty years.—H. Sharp.

Strathmore (Klerksdorp).—Hot, dry month. Rainfall: 1·14 inch on six days.—Chas. Scott.

Zwartkopjes Pumping Station (Heidelberg).—15th, severe lightning; an Indian and horse killed, four miles south-west from station, and considerable damage done to electrical transmission line. A very hot, dry month. Mean maximum temperature 85·1 degrees, not quite as high as October, but above normal. Mean minimum temperature 55·9 degrees. Rainfall: 2·85 inches on fourteen days.—E. Taylor.

Kamhlabane Ranch (Barberton).—The grass is looking nice and green, and the cattle are in good condition again. Rainfall: 1·60 inch on three days.—H. B. Trollip.

Vaalbank No. 66 (Bekkal).—26th, hail for twenty-five minutes, with fierce wind. Stones weighed 3 ounces and measured 2½ inches by 3 inches; did much damage in district. Killed young stock and perforated roofs. Rainfall: 4·67 inches on sixteen days.—I. Spitz.

Blaauwwildebeestpuit (Lichtenburg).—Ploughing going badly. Any quantity of voetgangers. Rainfall: 1·76 inch on seven days.—C. Hull.

Klippan (Middelburg).—27th, hailstorm. Severe damage done to fruit and crops; stones, 1 inch in diameter. Rainfall: 5·24 inches on ten days.—M. Potgieter.

Confidence (Piet Retief).—Getting very dry and prospects not too bright, as planting season is at hand and ploughing is being hung up. The young grass is dying and springs are very weak. Rainfall: 1·61 inch on seven days.—P. Viljoen.

Elandsfontein (Potchefstroom).—No grazing for stock. No ploughing and no reaping this year. Rainfall: 1·43 inch on five days.—P. Davidtz.

Weilaagte (Pretoria).—Water scarce; veld bad; maize crop small. Rainfall: 1·10 inch on two days.—M. Levinson.

Vaalbank (Standerton).—26th, severe hailstorm, crops ruined. Rainfall: 3·41 inches on eleven days.—R. Smith.

Weltevreden (Standerton).—Many farmers are unable to plough, and those who do only murder their oxen. This dry area extends for about ten miles in width. Rainfall: 2·67 inches on six days.—D. Lane.

Illawarra (Waterberg).—Grass is growing well, and stock getting fat. Rainfall: 6·60 inches on nine days.—J. A. Manson.

Deercroft (Waterberg).—9th, terrible duststorm, doing damage to fruit, windmills, buildings, etc. Rainfall: 3·63 inches on seven days.—G. R. Mitchell.

Kromdraai (*Witwatersrand*).—Crops suffering badly for want of rain. Rainfall: 3·07 inches on eight days.—W. Frost.

Brakpan (*Wolmaransstad*).—Ploughing has been started. Oxen in very poor condition. Rainfall: 1·85 inch on three days.—J. C. Lombard.

Winkelhaak (*Standerton*).—It is terribly hot and dry round Platrand. Most farmers have stopped ploughing, and things are looking rather serious. The mealie crop is poor, and there will be no oats at all. Rainfall: 3·23 inches on six days.—D. M. Lourens.

SWAZILAND.

Transvaalia (*Swaziland*).—Condition of stock is improving, but crops are backward, as we need more rain. Rainfall: 2·00 inches on eleven days.—J. H. Coates.

ORANGE FREE STATE.

Lindley.—Most unseasonable—and unreasonable—weather. Even when the thermometer reads 80 degrees, there is a touch of winter drought in the air. The country is overrun with locusts, and the future looks gloomy. On the last day of the month the heavens were black with heavy cumulus clouds, with every promise of an abundance of rain—it all ended in a precipitation totalling 0·10 inch. Rainfall: 1·46 inch on nine days.—J. Collister-Oates.

Modderpoort (*Ladybrand*).—The rain on the 20th (3·23 inches) seemed to be local, as nothing so much as this amount was reported from the immediate neighbourhood. Rainfall: 4·44 inches on five days.—E. Goodey.

Holfontein (*Kroonstad*).—Very hot winds were experienced during the month. The veld was getting on well, but the hot winds burnt it brown again. The locusts are still on the neighbouring farms, and the farmers are doing their best to destroy the pest. Maize crops require rain. Rainfall: 3·32 inches on four days.—L. C. McInerney.

Middelfontein (*Bethulie*).—A good rain would be welcome. The whole district is swarming with locusts. The farmers are trying their utmost to destroy them, but it will take some time to get rid of them completely. Sheep remain in good condition, but cattle are still rather poor for this time of the year. Rainfall: 1·65 inch on two days.—H. J. Joubert.

Belladale (*Frankfort*).—A most disappointing month. Veld is very backward. Cattle are thin and not healthy. Ticks are very bad. Sheep doing well. Ploughing very backward. Farmers are in for a very bad time. Rainfall: 1·42 inch on seven days.—D. McCalman.

Heilbron.—Crops: Very little ploughing has been done; numbers of farmers have not ploughed at all. Stock: Stock, in consequence of the drought, are in poor condition, as there is now very scant natural feeding and water is also becoming scarce. Diseases: Stock diseases have been nil. Rainfall for month: 1·51 inch on twelve days.—P. A. du P. Naudé.

Skaapplaas (*Senekal*).—The weather has generally been dry. Showers have occurred here and there, but there has been no general rainfall. Rainfall for month: 1·80 inch on five days.—J. C. Pretorius.

Woudzicht (*Vrede*).—Rainfall under the average and insufficient to keep on ploughing at the end of month. Grass still very short. Rainfall: 3·25 inches on seven days.—J. N. Köhler.

Prospect (*Vrede*).—The rain on and about the 11th helped much, but, in spite of slight rains thereafter, conditions were very dry by the end of the month. Some farmers have had to stop ploughing, and the veld grass has quite withered in patches. Live stock improving in condition. Rainfall: 2·86 inches on eight days.—T. Pitcairn.

Smaldeel (*Winburg*).—This area is practically free from locusts. Grazing is scarce owing to small rainfall and hot days. Rainfall: 1·33 inch on five days. —C. M. Saaijman, J.P.

NATAL.

Nottingham Road.—Still dry, though what rain there has been has brought on the veld well. Stock of all description fat and healthy. Potato and mealie crops very patchy. Rainfall: 6·44 inches on seventeen days.—Miss E. Smythe.

Paulpietersburg.—Warm and muggy weather, with rainfall below average, so that previous deficiency has in no way been made up, and spruits remain very low and springs not yet reopened. Nearly all storms seemed to form locally and cover small area, very few coming down from western high veld as in normal years. Ploughing suspended on many farms. Rainfall: 3·70 inches on fifteen days.—Dr. Niel Lipscomb.

Newcastle (*Gaol*).—The drought is now broken. Grass for stock plentiful. More rain is required for ploughing. Rainfall: 2·04 inches on eight days.—The Gaoler.

Howick (*Gaol*).—Days have been very hot and windy. Rainfall: 2·50 inches on eleven days.—The Gaoler.

Mid-Illovo.—Rainfall (4·23 inches on fifteen days) insufficient for ploughing purposes on hard soil. Maize acreage will be short unless good rains come soon. Very little water in streams. Grazing good and stock in fair condition. Thunder showers and medium-sized hailstones on the 25th. Natives and stock fatalities during storm on the 1st.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Maritzburg (*Mental Hospital*).—November has been hot and dry. Feeding for stock is scarce. Rainfall: 1·33 inch on twelve days.—The Superintendent.

Empangeni.—A poor rainfall for November (1·91 inch on eleven days). Several hot days with no wind. On the 9th a cyclone passed between 4.50 p.m. and 5.45 p.m., followed by light rain. Several trees were broken off in various parts of plantation.—W. G. Cochrane.

Dundee.—Drought and wind (principally north and north-west) have again prevailed; the rains at latter end of month were sufficient to bring on the grass and enable farmers to start ploughing; since then, everything has gone back, ploughing has ceased and grass showing signs of withering; the outlook generally from an agricultural point of view is serious. Rainfall: 2·07 inches on eleven days.—West Thorrold.

Paddock (*Port Shepstone*).—The mornings, as a rule, have been hot, with very slight wind, but generally clouding up in afternoons, with wind changing to south-west. On the whole we have had a fairly good month. Ploughing is proceeding. Stripping wattle bark has begun. Rainfall: 3·06 inches on fourteen days.—G. Victor Merriman.

Hillary.—Highest mean maximum temperature (78·7 degrees) since 1907, previous record (77·7 degrees) in 1920; also highest mean minimum temperature (65·8 degrees) since 1907, previous record (65·2 degrees) in 1908. Driest November (2·53 inches on sixteen days) since 1907, except 1913 when total fall was 2·44 inches.—H. A. Thorpe.

Newcastle (Convent).—This month has been very hot on the whole, with very few windy days.—The Mother Superior.

Greytown.—Good rains, with droughty intervals. East winds very prevalent in afternoons. Mealie planting nearly completed by end of month. Rainfall: 4·52 on thirteen days.—J. M. Handley.

Ladysmith.—Very hot, dry winds during month. Small rainfall of little or no use for agricultural purposes. Good rains are badly needed. The Municipal Council are now cutting off all water for gardening purposes; strictly domestic supply only being allowed. Rainfall: 2·12 inches on eleven days.—D. A. R. Leathern.

Cape St. Lucia Lighthouse.—On the 9th inst., at 5.10 p.m., a whirlwind passed over this station from north-west, travelling in a south-easterly direction. It did considerable damage to forest trees, thousands of which have been bared of their branches, while many more have been pulled up out of the ground. Many native huts have been blown away, but I have not heard of any loss of life. A 12-foot outhouse here was blown away a distance of 60 yards. While the whirlwind lasted it was impossible to see the sky owing to the amount of leaves, twigs, and sand blowing about. 0·23 inch of rain fell between 5.10 p.m. and 5.17 p.m. Then the wind came away from the west-south-west, blowing a fresh breeze. It had been blowing a moderate north-east gale up to 5.10 p.m. At 5.17 p.m. I went to have a look at the instruments in the Stevenson screen, and found them all thickly coated with sand and leaves. Before cleaning out the screen, I took the readings, which were as follows: Dry bulb, 75 degrees; wet bulb, 68 degrees; maximum, 85 degrees; and minimum, 75·6 degrees. The barometer reading was 29·480 at 5.20 p.m. I regret I was unable to get to the Lighthouse at the time the whirlwind was on to take the barometer reading, and although I expected a thunderstorm I got no indication from the sky that the whirlwind was coming along to the hill where the Lighthouse stands, being banked by a much higher range of hills 200 yards distant north-west of the Lighthouse. We had only a few flashes of lightning previous to the high wind reaching us, when we had heavy thunder and lightning from then on to 8 p.m. in the south-east and south-west. Only a few light showers fell from 5.17 p.m. to 8 p.m. No wind approaching this in strength has visited these parts during the seventeen years I have been here.—J. Murphy, Lightkeeper.

Bluebank (Klip River).—Drought very serious. Practically no ploughing done. Cattle still very thin. Very hot, strong winds from west and cold south-easterly winds. Cut-worm bad. Rainfall: 1·00 inch on six days.—T. N. Niland.

Glückstadt (Vrijheid).—On the whole the month has been very dry and hot, and ploughing had to be suspended towards the end of the month. The grass is beginning to wilt, but stock are still in good condition. Unless rain falls soon, little mealies will be sown. Rainfall: 2·63 inches on eight days.—F. W. J. Schumann.

Rongpoort (Weenen).—Weather on the dry side. Just enough grass for cattle. Little ploughing done. Grass going off again at the end of the month. Rainfall: 2·35 inches on eight days.—J. H. Bartholomew.

Sawoti (Umzinto).—Drought still prevailing; ploughing practically impossible; stock doing well. Rainfall: 2·21 inches on seventeen days.—Archibald & Co.

CAPE.

Riverside.—The harvest, mostly very unsatisfactory, is in full swing. The last rains have done a great deal of good to save the crops. Rainfall: 2·70 inches on seven days.—Rev. Carl Prozesky.

Darling (Malmesbury).—Extraordinary rains. Rainfall: 3·69 inches on eight days.—P. H. Drake.

Kraaipan (Mafeking).—The recent rains improved the veld immensely, but, unfortunately, locusts have hatched out in myriads and laid bare everything. Weather generally fine, with absence of high winds. Rainfall: 1·61 inch on five days.—P. J. Hart.

Bedford.—The weather has been most disappointing. Day after day the indications were favourable for rain, but it passed by—now a drop, then a misty shower. The storm on the 13th (0·92 inch) was heavy while it lasted—a few minutes—so that little soaked in. Result: drought conditions; fruit showing a tendency to drop; veld parched and brown. In town, water has been stopped for gardens, as supply only sufficient for domestic purposes. Locusts hatching out practically all over district. Rainfall: 1·72 on eleven days.—Thos. C. Hall.

Groot Drakenstein.—A most unseasonable month. Highest maximum temperature (89·4 degrees) lower than any year since 1900, with 89·0 degrees. The continuous heavy rains have seriously damaged the fruit crop, especially apricots and plums, which have split badly. Cloudiness about double the average, and sunshine lowest recorded for November. Forage crop has also suffered badly from wet. Rainfall: 6·39 inches on ten days.—Lionel Baker.

Murraysburg.—There is a decided improvement as to drought conditions, as you will note from the rainfall for the month, although the rains were not general throughout the district. The locust plague has been dreadful; wherever rain fell they hatched out in millions. Rainfall: 1·55 inch on six days.—W. H. Rose-Innes.

Postmasburg.—Anthrax and locuts (voetgangers) everywhere in the district. Rainfall: 0·66 inch on two days.—D. Brown.

Rietfontein (Aliwal North).—Hot, drying winds. Crops suffering; no ploughing done. Rainfall: 1·26 inch on four days.—A. G. Smith.

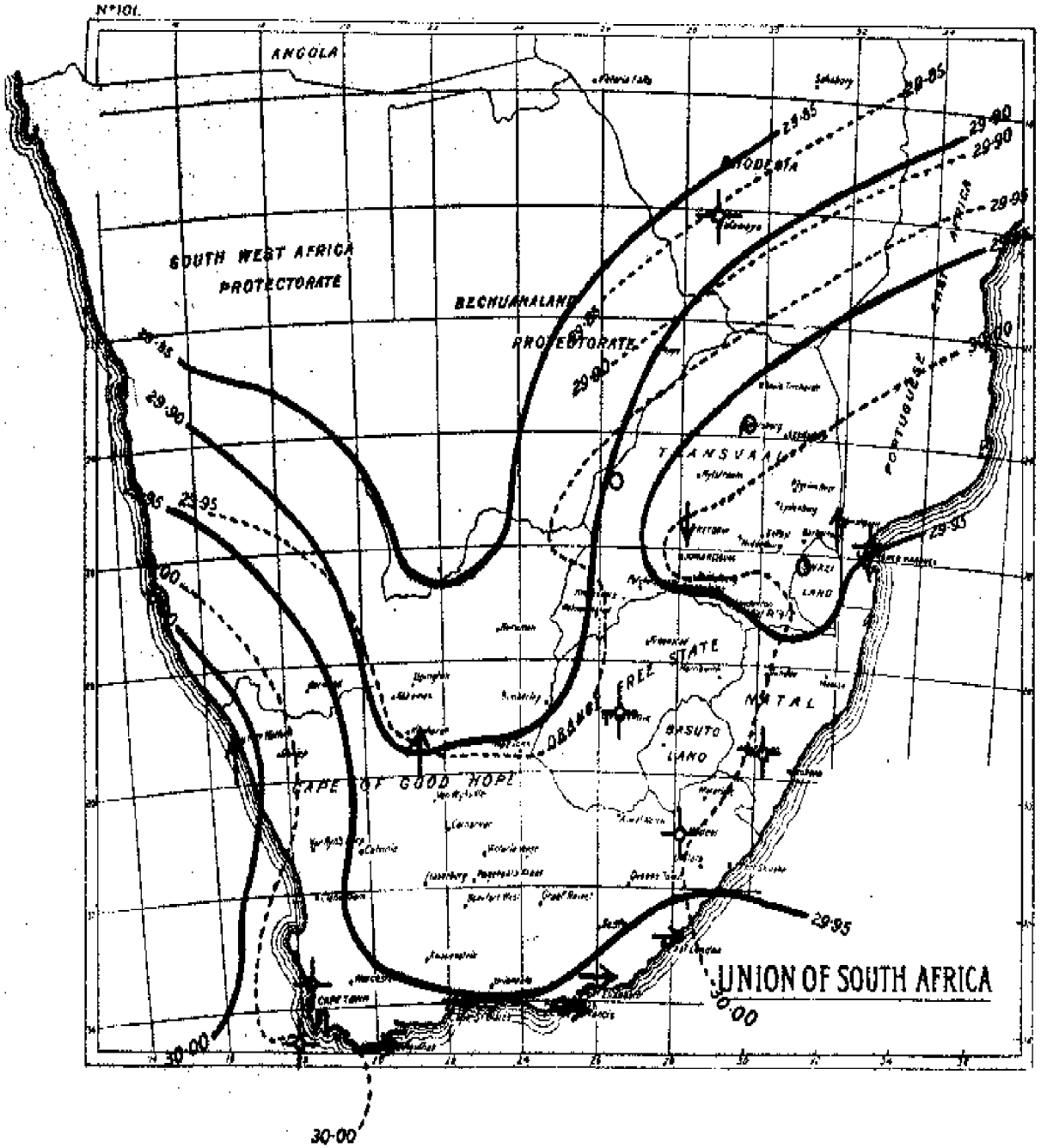
Mafeking (Convent).—Very welcome rains fell from 11th to 23rd. The river overflowed, but no damage was done. Rainfall: 4·05 inches on ten days.—The Mother Superior.

Van Rynevelds Pass (Graaff-Reinet).—Drought relieved to some extent, but intensity of rain on 13th (2·86 inches, 1 p.m. to 5 p.m.), too great to do much good. Weather has been fine; numerous small duststorms in the afternoons. Rainfall: 3·06 inches on four days.—R. K. Shand.

Sydney-on-Vaal (Barkly West).—Uniformly hot and very dry month. Grass which sprung after the rain on the 13th soon shrivelled up in subsequent hot sun. Rain was sufficient to hatch out locust eggs in large numbers. Small flow in river reached here on 30th, water which passed Riverton Weir on 15th. Rainfall: 0·55 inch on three days.—J. G. Richards.

Kakamas.—Harvest gathered in. Some people complain that it is not so good as it appeared to be. Swarms of voetgangers very numerous in district.—M. J. Oosthuizen.

Lake Mentz (Jansenville).—On the 13th rain started with a hailstorm, travelling west to east, very little rain (0·85 inch) here; storm centre passed eight miles to the north of main wall. Hailstones in large jagged pieces;



November, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for November, 1923.

killed some goats and penetrated galvanized iron roofs and cut to ribbons the tent of a motor-car caught in the storm. Rainfall: 1·07 inch on four days.—J. W. Vienings.

Carnarvon.—Soft rain, followed by a general hatching of locusts right through the district. Voetgangers entered the town and destroyed all vegetable gardens. Position was desperate, but farmers now report that voetgangers are mysteriously dying off in millions. Rainfall: 0·91 inch on five days.—A. P. Malherbe.

Tsolo.—Some ploughing has been done by the natives after the showers on the 13th, 19th, and 20th, but the heat since the 20th has been very severe, and the wind has been scorching. The veld wants rain again badly. Cattle and sheep look well, but moisture will improve them. There is no disease amongst animals in the district. Rainfall: 2·24 inches on seven days.—H. P. Tillard.

Grahamstown.—Many swarms of locusts hatching. Rainfall: 1·13 inch on seven days.—E. George.

Queenstown.—A dry month, with hot winds from west to north during day; south-east in afternoon and evening. Locusts in district. No forage or wheat except on irrigable lands. No ploughing for mealies yet—too dry. Rainfall: 1·01 inch on nine days.—H. Holley.

Kokstad.—Drought relieved somewhat, but rains very local. Country very dry; rivers low. Mealie crop threatened. Rainfall: 2·01 inch on seven days.—H. D. Coyte.

Aliwal North.—A hot and comparatively dry month. A good soaking rain very much wanted. Rainfall: 1·95 inch on seven days, as compared with 6·04 inches in 1922.—Alex. Alcock.

Lovedale.—The temperature for the month has been about normal. There have been a few hot oppressive days, though the temperature has only once reached 95 degrees. A marked feature of the month has been the great amount of cloudiness. Welcome rains have fallen, though the total precipitation (2·18 inches on eight days) is below the average—2.62 inches since 1880. The people have been able to plough. Mealies are just appearing, though crops are more backward than usual. Locusts threaten to be serious in the district.—H. R. Storey.

Somerset East.—Rain fell on nine days amounting to 4·25 inches, of which 3·60 inches fell during the afternoon of the 13th. The rainfall registered on that day varied greatly throughout the district. Irrigation restricted in town to three hours daily. Locusts reported throughout district.—C. Harris.

Port Alfred.—Country and gardens feeling effects of hot, dry winds; rain is badly needed. Stock generally in good condition. Rainfall: 2·64 inches on seven days.—W. H. Pascoe.

Belvedere (Knysna).—Strong winds have again been experienced this month, generally from south-west, and especially at night, when there were heavy gusts and squalls. Rainfall: 3·36 inches on thirteen days.—F. Thornbury.

Liwandi-Addo (Uitenhage).—The almost incessant wind during the last half of the month grew very trying. Irrigation from Lake Mentz took place 22nd to 27th. Rainfall: 1·85 inch on five days.—Major J. Kreft.

Upington.—Veld very dry. Orange River risen 3 feet, 30th. Rainfall: 0·24 inch of two days.—E. H. Jones.

Stutterheim.—Stock improving in condition. Mealies and potatoes troubled with cut-worm. Rainfall: 3·92 inches on twelve days.—F. C. Bousfield.

Lousivale (Upington).—*Only 0·02 inch rainfall this month, but quite* favourable to irrigation farmers. Outside veld is becoming dry, but stock are not yet suffering from scarcity of feed.—Stuart M. Smith.

Willowmore.—Locusts on outskirts of town. Rainfall: 1·75 inch on three days.—Mrs. B. M. Homens.

Steenberg's Cove (Malmesbury).—Thunderstorm on 13th and 14th, accompanied by hail, did some damage to rye crops. At about noon the flashes of lightning were almost directly overhead, at about 1,000 feet. This is uncommon here. Thunderstorms here are very rare. Rainfall: 1·20 inch on six days.—Donald C. Burrell.

Tussenbeide (Caledon).—An abnormal rainfall for this month; wind and rain did a lot of damage to standing and cut crops. Rainfall: 4·39 inches on five days.—S. D. J. de Wet.

The Towers (Malmesbury).—The wettest November on record here; a damp, unfavourable month for harvesting. Rainfall: 3·23 inches on seven days.—Fred. Duckkitt.

New Bethesda (Graaff-Reinet).—Drought very serious; stock dying; locusts bad. Rainfall: 0·56 inch on five days.—A. G. Erlank.

Graaff-Reinet (Convent).—A fine month on the whole. Winds variable. A heavy downpour (2·74 inches) on the 13th. Rainfall: 3·69 inches on six days.—Mother Superior.

BECHUANALAND.

Dikgatlong Ranch.—The drought cannot be said to be broken, as a few *showers did no more than cool the atmosphere for a few days. Heat has been* trying, reaching up to 105 degrees in the screen. This station is overrun with voetgangers, which hatched and thrived without hindrance in the Bamangwato Reserve, as some old pumps and poison left with ignorant natives do not serve a practical way of destroying the pest. Rainfall: 0·70 inch on five days.—Paul Jousse.

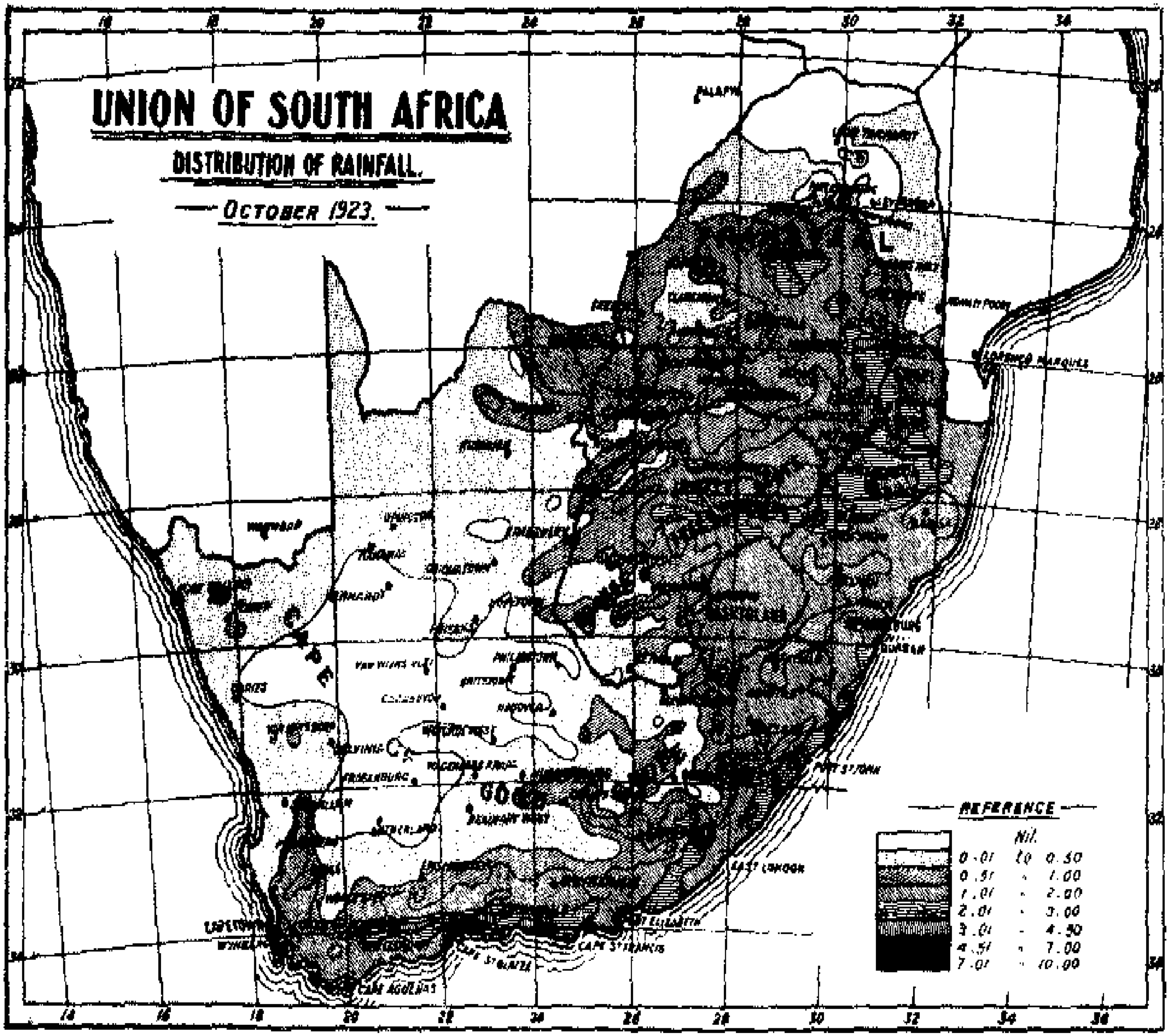
Serowe.—Hot and dry during month. Rainfall: 0·71 inch on six days.—Meteorological Observer.

Kalamari.—The rains which have fallen this month have only been sharp local showers. The veld in some parts is fairly good, others very dry. Cattle are dying through poorness. Where the showers of rain have fallen the voetgangers are on the move in the first stage, but they are being sprayed, and all natives are out with wagons. So far the swarms are only small in this district. Rainfall: 1·66 inch on seven days.—E. Smith.

BASUTOLAND.

Mafeteng.—Nice rains fell on the 13th (1·20 inch) and 20th (1·33 inch). Very hot and dusty latter portion of month. More rain badly needed. Ground frost on 26th. Rainfall: 2·64 inches on six days.—F. Hodgson.

Teyateyaneng.—Strong gale of wind on the afternoon of the 4th, 6th, and 7th. Iron roofs torn off. Thatched roofs badly damaged. Branches of trees broken off. Rainfall: 3·11 inches on eight days.—D. M. Greig.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
OCTOBER 1923.
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
CAPE TOWN
CAPE AGULHAS
CAPE ST FRANCIS
PORT ELIZABETH
EAST LONDON
PORT ST JOHN
DURBAN
LOURENCO MARQUES
CAPE

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), NOVEMBER, 1923.

Station.	Observer.	Month—Nov., 1923.		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	87·5	64·6	76·0	69·8	+ 6·2	100·0	28th	58·0	3rd and 4th.
Belfast	The Forester	77·3	49·2	63·2	60·2	+ 3·0	88·0	6th	42·0	4th and 25th.
Bloemhof	F. Osborne	88·4	60·5	74·4	70·4	+ 4·0	100·0	5th	51·5	1st.
Ermelo	Dr. E. B. Thennissen	80·6	54·1	67·4	62·2	+ 5·2	90·7	6th	49·0	24th.
Johannesburg (Observatory)	The Staff	78·5	56·7	67·6	63·0	+ 4·6	88·8	6th	48·9	10th.
Klerksdorp (Strathmore)	Chas. Scott	87·8	57·7	72·8	70·8	+ 2·0	95·0	29th and 30th	50·0	3rd and 10th.
Komatipoort	H. J. Evans	94·6	69·6	82·1	77·0	+ 5·1	100·5	25th	59·0	4th.
Louis Trichardt	C. L. Cope	85·2	63·9	74·6	69·0	+ 5·6	99·0	6th	58·0	4th.
Middelburg	Dr. H. A. Spencer	83·6	55·5	69·6	65·8	+ 3·8	95·0	6th	44·0	12th.
Nylstroom	G. Bakker	86·4	61·3	73·8	69·9	+ 3·9	97·0	6th	53·5	3rd.
Pietersburg	J. W. Frankleyne	85·0	59·3	72·6	68·5	+ 4·1	99·0	6th	52·0	3rd.
Piet Retief	*J. Werner*	*80·8*	*59·0*	*69·9*	*64·1*	+ 5·8	94·0	28th	51·0	3rd and 4th.
Pigeonhole (New Agatha)	Jno. McCallum	82·0	61·1	71·6	—	—	93·5	6th	52·0	3rd.
Pilgrims Rest	E. M. Skea	83·0	57·3	70·2	65·9	+ 4·3	97·5	6th	44·0	4th.
Potchefstroom (Exp. Farm)	The Manager	88·3	57·3	72·8	67·4	+ 5·4	96·8	5th	48·0	3rd.
Pretoria (Meteorological Office)	The Staff	84·8	60·0	72·4	69·2	+ 3·2	96·5	6th	52·7	3rd.
Rustenburg	H. J. Streatfield	89·0	59·3	74·2	71·3	+ 2·9	101·0	29th	54·0	3rd.
Standerton	W. J. Madge	—	—	—	64·2	—	—	—	—	—
Zeerust	H. Dietrich	87·7	59·7	73·7	72·0	+ 1·7	96·3	6th	51·0	3rd.
Swaziland—										
Mbabane	The Swaziland Police.	80·8	58·8	69·8	64·6	+ 5·2	92·0	25th	50·0	3rd.
Orange Free State—										
Bethulie	J. J. Wardhaugh	83·5	53·5	68·5	68·1	+ 0·4	93·0	18th	39·8	10th.
Bloemfontein	G. A. Schepers	83·8	55·5	69·6	67·8	+ 1·8	93·3	5th	42·6	10th.
Harrismith	The Forester	78·3	50·3	64·3	62·8	+ 1·5	86·0	5th and 30th	42·0	3rd and 11th.
Kroonstad	S. R. Northfield	85·2	55·1	70·2	67·7	+ 2·5	95·0	30th	45·2	10th.
Ladybrand	The Forester	79·6	53·9	66·8	63·2	+ 3·6	88·0	5th	45·0	13th.
Lindley	J. Collister-Oates	84·8	52·6	68·7	65·9	+ 2·8	92·5	30th	43·0	10th.
Natal—										
Dundee	West Thorrold	84·7	57·3	71·0	69·0	+ 2·0	96·0	5th and 28th	50·0	4th.
Durban (Point)	The Port Captain	79·2	68·0	73·6	72·8	+ 0·8	83·6	19th	60·0	7th.
Estcourt	The Town Clerk	83·6	57·5	70·6	70·4	+ 0·2	98·0	5th	51·0	8th and 16th.
Hlabisa	—	—	—	—	69·6	—	—	—	—	—
Ladysmith	D. A. R. Leathern	88·4	61·3	74·8	73·4	+ 1·4	100·0	28th	54·0	7th and 16th.
Maritzburg (Mental Hospital)	The Staff	82·9	60·3	71·6	69·1	+ 2·5	96·0	26th	49·0	7th.
Stanger	C. C. Foss	82·3	66·4	74·4	71·4	+ 3·0	97·3	20th	59·0	7th.
Weenen	The Gaoler	88·7	61·3	75·0	73·1	+ 1·9	96·0	28th	—	—

AIR TEMPERATURES, NOVEMBER, 1923—(*continued*).

Station.	Observer.	Month—Nov., 1923. Mean Max.	Month—Nov., 1923. 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—										
Alfwal North	Alex Alcock	82·9	50·7	66·8	65·4	+ 1·4	91·5	18th	40·5	10th.
Bedford	Thos. C. Hall	80·4	53·6	67·0	63·0	+ 4·0	95·0	18th	40·3	7th.
Capetown (Royal Observatory)	The Staff	74·3	57·4	65·8	64·2	+ 1·6	88·1	30th	49·7	5th.
Carnarvon	A. P. Malherbe	81·2	52·9	67·0	67·6	− 0·6	93·0	18th	40·0	10th.
East London	The Port Captain	76·0	61·3	68·6	65·8	+ 2·8	83·5	29th	54·9	3rd.
Graaff-Reinet (Convent)	The Mother Superior.	86·4	55·6	71·0	67·1	+ 3·9	101·6	18th	45·0	7th.
Grahamstown	The Vet. Res. Officer.	74·4	51·9	63·2	64·1	− 0·9	87·6	27th	39·2	7th.
Groot Drakenstein	Lionel Baker	76·4	54·6	65·5	64·4	+ 1·1	89·4	30th	41·8	7th.
Kenhardt	R. Seydell	88·8	57·6	73·2	71·4	+ 1·8	102·0	18th	48·0	2nd, 9th, and 10th.
Kimberley	F. W. J. Schmidt	88·1	59·9	74·0	73·2	+ 0·8	99·0	30th	48·0	10th.
Kingwilliamstown	W. A. Kindness	79·4	56·6	68·0	67·8	+ 0·2	93·0	27th	47·0	7th.
Kokstad	H. D. Coyte	78·7	52·2	65·4	63·5	+ 1·9	89·6	19th	44·0	10th.
Mafeking (Convent)	The Mother Superior	88·6	59·8	74·2	72·6	+ 1·6	98·0	6th	52·0	1st.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	71·6	61·2	66·4	64·8	+ 1·6	78·0	27th	54·0	6th.
Murrayaburg	W. H. Rose-Innes	80·8	50·5	65·6	65·1	+ 0·5	95·1	18th	39·5	10th.
O'okiep	J. Barrows	79·9	54·4	67·2	64·2	+ 3·0	95·5	29th	43·0	10th.
Port Elizabeth	The Lightkeeper	73·0	60·3	66·6	65·1	+ 1·5	82·0	3rd	52·0	8th.
Port Nolloth	The Lightkeeper	64·9	53·1	59·0	58·0	+ 1·0	71·0	30th	43·0	10th.
Port St. Johns (Cape Recinos)	The Lightkeeper	73·3	64·7	70·0	68·7	+ 1·3	79·0	1st, 20th, and 30th	59·0	7th.
Queenstown	H. Holley	83·5	54·5	69·0	66·8	+ 2·2	96·0	18th	44·0	2nd.
Somerset East	C. Harris	80·3	53·7	67·0	66·4	+ 0·6	94·8	18th	42·0	7th.
Stutterheim	F. C. Bousfield	77·6	54·3	66·0	63·8	+ 2·2	95·0	18th	45·1	7th.
Sydney's Hope	Rev. S. Rippon	74·2	54·7	64·4	62·2	+ 2·2	88·0	27th	46·0	7th.
Ultenhage	H. Inggs	77·8	58·5	68·2	66·0	+ 2·2	88·4	3rd	47·0	3rd.
Umtata	B. Hackett	81·3	56·5	68·9	66·5	+ 2·4	96·8	27th	47·5	3rd.
Vryburg	Chas. Butler	88·3	59·1	73·7	71·2	+ 2·5	98·0	5th	51·0	1st and 3rd.
Wynberg (Convent)	The Mother Superior.	74·7	57·2	66·0	62·2	+ 3·8	88·5	30th	47·0	6th.
Basutoland—										
Mafeteng	F. Hodgson	77·6	52·7	65·2	65·3	− 0·1	86·0	5th	38·0	10th.

RAINFALL, NOVEMBER, 1923.

Station.	Observer.	Month. Nov., 1923.	Normal.	Difference from Normal.	From 1st January, 1923.	Normal.	Difference from Normal.	From 1st July, 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Transvaal—										
Barberton	W. Grubb	2·63	4·91	− 2·28	23·67	27·05	− 3·38	4·10	9·28	− 5·18
Belfast	The Forester	6·30	5·15	+ 1·15	23·72	26·62	− 2·90	8·99	10·10	− 1·11
Bethal	H. F. Joubert	3·77	5·32	− 1·55	21·79	24·27	− 2·48	5·36	10·27	− 4·91
Bloemhof	F. Osborne	2·26	1·79	+ 0·47	13·03	16·24	− 3·21	3·14	4·42	− 1·28
Claremont	S.A. Police	—	—	—	—	—	—	—	—	—
Ermelo	The Forester	2·82	4·85	− 2·03	13·85	26·08	−12·23	5·78	11·53	− 5·75
Haenertsburg	S.A. Police	2·43	3·83	− 1·40	39·30	32·58	+ 6·72	4·15	8·20	− 4·05
Heidelburg	W. ter Horst	3·41	5·41	− 2·00	19·93	24·11	− 4·18	5·77	9·76	− 3·99
Johannesburg (Observatory)	The Staff	4·46	5·05	− 0·59	24·14	25·91	− 1·77	6·87	9·56	− 2·69
Klerksdorp (Strathmore)	C. Scott	1·14	2·84	− 1·70	17·11	19·62	− 2·51	2·88	6·14	− 3·26
Komatipoort	H. J. Evans	0·70	2·70	− 2·00	32·72	23·73	+ 8·99	1·83	5·99	− 4·16
Louis Trichardt	C. L. Cope	3·12	3·25	− 0·13	36·16	24·75	+11·41	3·12	6·56	− 3·44
Middelburg	Dr. H. A. Spencer	5·21	5·48	− 0·27	22·72	24·35	− 1·63	6·53	9·49	− 2·96
Nylstroom	G. Bakker	2·44	3·68	− 1·24	21·01	20·93	+ 0·08	4·00	6·82	− 2·82
Pietersburg	W. Franklyne	3·79	2·93	+ 0·86	14·70	16·89	− 2·19	4·61	5·51	− 0·90
Piet Retief	J. Werner	2·96	5·44	− 2·48	24·45	30·40	− 5·95	6·78	12·15	− 5·37
Pigeonhole (New Agatha)	J. McCallum	1·81	6·13	4·29	58·58	40·00	+18·58	3·00	11·15	− 8·15
Pilgrims Rest	E. M. Skea	4·31	4·53	− 0·22	44·10	34·30	+ 9·80	5·33	8·55	− 3·22
Potchefstroom (Exp. Farm)	The Manager	2·42	3·14	0·72	17·42	19·41	− 1·99	3·70	6·75	− 3·05
Pretoria (Meteorological Office)	The Staff	3·79	4·97	− 1·18	22·44	24·77	− 2·33	4·73	8·85	− 4·12
Roolberg	N. H. Monro	2·34	4·11	− 1·77	19·46	21·20	− 1·74	3·74	7·03	− 3·29
Rustenburg	A. Streatfield	4·52	3·47	+ 1·05	23·85	22·04	+ 1·81	5·63	7·55	− 1·92
Standerton	W. J. Madge	3·46	5·45	− 1·99	25·38	25·91	− 0·53	6·97	11·04	− 4·07
Wakkerstroom	—	—	—	—	—	—	—	—	—	—
Woodbush	The Forester	3·27	7·05	− 3·78	75·48	60·16	+15·32	5·33	14·93	− 9·60
Zoerust	H. Dietrich	5·51	3·56	+ 1·95	24·85	20·37	+ 3·98	7·19	6·20	+ 0·99
Swaziland—										
Mbabane	Swaziland Police	4·22	7·10	− 2·88	51·38	45·02	+ 6·36	7·94	15·49	− 7·55
Orange Free State—										
Bethulie	J. J. Wardhaugh	1·53	1·27	+ 0·26	13·93	15·41	− 1·48	2·81	4·00	− 1·19
Bloemfontein	G. A. Schepers	2·84	2·09	+ 0·75	25·02	19·41	+ 5·61	4·44	5·52	− 1·08
Boshof	The Postmaster	1·65	2·10	− 0·45	23·36	17·43	+ 5·93	2·75	5·34	− 2·59
Harrismith	The Forester	2·51	4·13	− 1·62	20·04	25·20	− 5·16	6·05	9·08	− 3·03
Kroonstad	S. R. Northfield	1·73	3·13	− 1·40	17·39	21·06	− 3·67	4·86	6·75	− 1·89
Ladybrand	The Forester	2·81	3·42	− 0·61	22·19	24·04	− 1·85	6·36	8·76	− 2·40
Lindley	J. Collister-Oates	1·46	2·91	− 1·45	16·85	20·51	− 3·66	3·10	6·97	− 3·87
Natal—										
Dundee	W. Thorrold	2·07	3·88	− 1·81	18·21	26·92	− 8·71	5·11	9·26	− 4·15
Durban (Point)	The Port Captain	2·42	5·01	− 2·59	25·80	36·59	−10·79	7·87	15·80	− 7·93
Estcourt	The Town Clerk	4·06	3·31	+ 0·75	19·81	24·24	− 4·43	6·78	7·67	− 0·89
Hlabisa	The Gaoler	—	5·38	—	—	37·75	—	—	14·93	—

RAINFALL, NOVEMBER, 1923—(*continued*).

Station.	Observer.	Month. Nov., 1923.	Normal.	Difference from Normal.	From 1st January, 1923.	Normal.	Difference from Normal.	From 1st July, 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Howick	The Gaoler	2·50	4·27	− 1·77	20·93	28·79	− 7·86	5·19	10·48	− 5·29
Ladysmith	D. A. B. Leathern	2·12	2·85	− 0·73	17·95	23·89	− 5·94	5·16	7·67	− 2·51
Maritzburg (Mental Hospital)	The Staff	1·33	4·49	− 3·16	21·93	31·74	− 9·81	3·82	11·73	− 7·91
Stanger	C. C. Foss	2·90	5·28	− 2·98	29·49	36·55	− 7·06	7·12	16·39	− 9·27
Vrijheid	The Gaoler	4·76	4·39	+ 0·37	20·05	29·06	− 9·01	8·92	10·82	− 1·90
Weenen	The Gaoler	4·29	3·63	+ 0·60	12·61	23·41	− 10·80	5·95	8·17	− 2·22
Cape—										
Aliwal North	A. Alcock	1·95	1·78	+ 0·17	17·73	17·87	− 0·14	3·59	5·27	− 1·68
Beaufort West	The Gaoler	1·22	0·71	+ 0·51	8·03	8·73	− 0·70	2·52	2·65	− 0·13
Bedford	T. C. Hall	1·72	2·31	− 0·59	22·46	23·77	− 1·31	5·75	8·20	− 2·45
Britstown	The Gaoler	0·66	0·77	− 0·11	8·68	10·58	− 1·90	1·66	2·37	− 0·71
Calvinia	The Gaoler	0·71	0·38	+ 0·33	9·24	8·01	+ 1·23	2·80	3·27	− 0·47
Capetown (Royal Observatory)	The Staff	3·21	1·07	+ 2·14	27·68	24·68	+ 3·00	12·72	12·03	+ 0·69
Ceres	A. Beattie	2·86	1·75	+ 1·11	39·81	40·15	− 0·34	17·54	21·47	− 3·93
Carnarvon	A. P. Malherbe	0·91	0·54	+ 0·37	8·35	7·44	+ 0·91	1·65	1·79	− 0·14
Clanwilliam	The Gaoler	0·44	0·31	+ 0·13	9·65	8·49	+ 1·16	2·58	4·16	− 1·58
Concordia	F. R. Carstens	0·16	0·21	− 0·05	7·17	6·19	+ 0·98	1·36	2·49	− 1·13
East London	A. Downie	2·58	3·11	− 0·53	31·08	29·50	+ 1·58	11·85	13·01	− 1·16
French Hoek (Driefontein)	The Forester	11·10	4·57	+ 6·53	95·37	78·36	+17·01	49·46	36·80	+12·66
Fraserburg	The Gaoler	0·98	0·41	+ 0·57	6·02	6·34	− 0·32	1·48	1·63	− 0·15
Grahamstown	Vet. Res. Officer	1·13	3·08	− 1·95	16·99	25·51	− 8·52	6·60	11·28	− 4·68
Garies	The Gaoler	0·00	0·19	− 0·19	4·55	4·86	− 0·31	1·56	2·39	− 0·83
Graaff-Reinet (Convent)	The Mother Superior	3·69	1·20	+ 2·49	11·02	12·55	− 1·53	5·21	4·37	+ 0·84
Groot Drakenstein	L. Baker	6·39	1·56	+ 4·83	49·85	34·62	+15·23	22·46	17·61	+ 4·85
Griquatown	The Gaoler	0·00	0·84	− 0·84	9·95	11·65	− 1·70	0·35	2·44	− 2·09
Hanover	The Gaoler	0·90	1·01	− 0·11	11·65	12·21	− 0·56	1·40	3·08	− 1·68
Hopetown	The Gaoler	0·59	1·07	− 0·48	11·31	11·54	− 0·23	1·86	2·74	− 0·88
Kenhardt	R. Seydell	0·73	0·25	+ 0·48	9·72	5·37	+ 4·35	0·96	1·14	− 0·18
Kimberley	F. J. Schmidt	0·93	1·48	− 0·55	12·91	14·08	− 1·17	2·08	3·76	− 1·68
Knysna	The Gaoler	2·69	2·29	+ 0·40	25·88	26·17	− 0·29	10·22	12·51	− 2·29
Kokstad	H. D. Coyte	2·01	3·39	− 1·38	31·17	23·01	+ 8·16	9·89	7·62	+ 2·27
Kingwilliamstown	W. A. Kindness	4·43	2·50	+ 1·93	25·19	22·36	+ 2·83	11·26	8·93	+ 2·33
Kuruman	—	--	1·42	—	—	14·63	—	.	2·69	—
Maleking (Convent)	The Mother Superior	4·06	2·59	+ 1·47	19·22	19·00	+ 0·22	5·69	5·66	+ 0·03
Mossel Bay (Cape St. Blaize)	The Lightkeeper	2·72	1·13	+ 1·59	14·69	15·84	− 1·15	5·99	7·13	− 1·14
Murraysburg	W. H. Rose-Innes	1·55	0·76	+ 0·79	11·12	9·97	+ 1·15	2·94	2·65	+ 0·29
O'okiep	J. Burrows	0·23	0·20	+ 0·03	7·15	6·78	+ 0·37	1·78	3·11	− 1·33
Philipstown	The Gaoler	0·56	0·96	− 0·40	8·93	12·22	− 3·29	1·18	2·93	− 1·75
Piquetberg	The Gaoler	0·48	0·99	− 0·51	21·02	20·16	+ 0·86	7·96	10·75	− 2·79
Port Elizabeth	The Lightkeeper	1·12	2·03	− 0·91	19·55	20·75	− 1·20	6·99	10·50	− 3·51
Port St. Johns (Cape Hermes)	The Lightkeeper	3·21	5·13	− 1·92	43·98	44·20	− 0·22	19·20	19·16	+ 0·04
Port Nolloth	The Lightkeeper	0·02	0·06	− 0·04	2·28	2·29	− 0·01	0·88	1·01	− 0·13
Prieska	The Gaoler	0·52	0·60	− 0·08	9·47	8·90	+ 0·57	0·93	1·67	− 0·74
Queenstown	H. Holley	1·01	2·12	− 1·11	17·60	19·86	− 2·26	2·05	5·89	− 2·94

RAINFALL, NOVEMBER, 1923—(*continued*).

Station.	Observer.	Month. Nov., 1923.	Normal.	Difference from Normal.	From 1st January, 1923.	Normal.	Difference from Normal.	From 1st July, 1923.	Normal.	Difference from Normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Steytlerville	The Gaoler	0·82	0·80	+ 0·02	9·97	8·52	+ 1·45	3·09	2·93	+ 0·16
Sutherland	The Gaoler	1·01	0·44	+ 0·57	7·72	8·99	− 1·27	2·88	3·58	− 0·70
Swellendam	The Gaoler	2·48	2·45	+ 0·03	24·05	28·97	− 4·92	9·97	12·72	− 3·65
Sydney's Hope	Rev. S. Rippon	1·00	2·35	− 1·35	15·85	20·50	− 4·65	6·76	8·85	− 2·09
Somerset East	C. Harris	4·25	2·41	+ 1·84	18·81	22·64	− 3·83	7·37	8·38	− 1·01
Stutterheim	F. C. Bousfield	3·92	2·95	+ 0·97	36·82	26·09	+10·73	9·93	9·47	+ 0·46
Uitenhage	H. Inggs	2·05	1·68	+ 0·37	16·72	15·95	+ 0·77	6·82	7·15	− 0·33
Umtata	B. Huckett	2·00	2·50	− 0·50	27·15	22·43	+ 4·72	7·50	7·97	− 0·38
Untondale	The Gaoler	2·18	1·00	+ 1·18	10·02	12·67	− 2·65	4·18	5·74	− 1·56
Uplington	The Gaoler	0·24	0·45	− 0·21	8·72	6·46	+ 2·26	0·34	1·25	− 0·91
Victoria West	The Gaoler	0·89	0·60	+ 0·29	9·80	9·52	+ 0·28	1·82	2·29	− 0·47
Vryburg	Chas. Butler	5·99	1·45	+ 4·54	22·66	16·60	+ 6·06	6·50	3·37	+ 3·13
Worcester	The Gaoler	2·10	0·49	+ 1·61	8·50	12·14	− 3·64	3·69	6·27	− 2·58
Wynberg (Convent)	The Mother Superior	4·88	1·74	+ 3·14	48·52	44·94	+ 3·58	23·98	24·62	− 0·64
Basutoland—										
Mafeteng	F. Hodgson	2·64	2·74	− 0·10	31·49	27·01	+ 4·48	4·78	7·65	− 2·87
South-West Africa—										
Aus	E. Matthins	0·07	0·09	− 0·02	6·95	4·08	+ 2·87	2·75	1·05	+ 1·70
Bethanie	Rev. Peter	0·74	0·18	+ 0·56	12·03	4·34	+ 7·69	1·40	0·43	+ 0·97
Duesternbrook	I. and R. Matthiessen	0·07	0·71	− 0·64	22·97	12·75	+10·22	0·09	1·15	− 1·06
Franzfontein	H. Janson	0·20	0·46	− 0·26	7·88	8·65	− 0·77	0·20	0·79	− 0·59
Gabis	Rev. P. Rohor	1·15	0·10	+ 1·05	5·98	4·41	+ 1·57	1·70	0·96	+ 0·74
Garinais	F. Bertling	2·44	0·59	+ 1·85	13·27	5·49	+ 7·78	2·96	0·96	+ 2·00
Gibeon	Rev. Spellmeyer	0·26	0·49	− 0·23	12·57	5·90	+ 6·67	0·62	0·82	− 0·20
Gobabis	Rev. Irle	0·41	1·16	− 0·75	20·29	13·87	+ 6·42	2·09	1·81	+ 0·28
Grootfontein	Pitkowski	1·62	1·77	− 0·15	33·45	19·49	+13·96	2·10	2·50	− 0·40
Gr. Witvley	Maass	0·40	0·93	− 0·53	19·62	12·98	+ 6·64	0·83	1·54	− 0·71
Haribes	Cpt. Meyer	0·07	0·45	− 0·38	16·62	7·10	+ 9·52	0·37	1·06	− 0·69
Heirachabis	E. Stroka	0·65	0·31	+ 0·34	6·91	3·46	+ 3·45	1·75	0·49	+ 1·26
Maltahoehe	E. Just	0·41	0·28	+ 0·13	10·70	5·54	+ 5·25	0·60	0·51	+ 0·09
Neu-Heusis	Liebig's Extract Co.	0·63	0·77	− 0·14	16·64	12·88	+ 3·76	0·69	1·36	− 0·67
Okahandja	B. Templin	0·27	0·55	− 0·28	23·27	12·75	+10·52	0·31	1·18	− 0·87
Okandjose	— von Gossler	0·64	1·28	− 0·64	29·17	15·17	+14·00	0·82	1·84	− 1·02
Okasangumingo	R. H. A. Schneider	1·19	1·90	− 0·71	27·67	16·05	+11·62	2·21	3·49	− 1·28
Omaruru	The Postmaster	0·27	0·50	− 0·23	20·47	9·93	+10·51	0·27	0·85	− 0·58
Rehoboth	The Postmaster	0·00	0·53	− 0·53	21·57	9·41	+12·16	0·00	1·10	− 1·10
Rietfontein	B. Leist	0·68	2·19	− 1·51	33·07	17·98	+15·09	1·65	3·49	− 1·84
Swakopmund	E. Slevert	0·01	0·02	− 0·01	0·39	0·55	− 0·16	0·01	0·18	− 0·17
Tsumeb	Ing. Schetter	0·96	1·87	− 0·91	27·94	20·01	+ 7·93	1·44	2·90	− 1·46
Usakos	Rev. Diehl	0·00	0·15	− 0·15	8·24	4·84	+ 3·40	0·00	0·45	− 0·45
Voigtsgrund	A. Voigts	0·33	0·34	− 0·01	26·15	6·80	+19·35	1·09	0·69	+ 0·40
Waterberg	D. Hahn	0·94	1·46	− 0·52	28·10	17·20	+10·90	1·51	2·01	− 0·50
Windhoek	Observatory	0·10	0·73	− 0·63	27·78	11·66	+16·12	0·91	1·28	− 0·37

UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

Vol. IV. DECEMBER, 1923. No. 12.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE,

With Supplement consisting of Average Annual Rainfall, Seasonal Distribution of Rainfall, and three Frost Maps.

PRETORIA
THE GOVERNMENT PRINTING AND STATIONERY OFFICE
1924

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UNION OF SOUTH AFRICA.

DEPARTMENT OF IRRIGATION.

MONTHLY WEATHER REPORT

OF THE

METEOROLOGICAL OFFICE.

Vol. IV. **DECEMBER, 1923.** **No. 12.**

MEAN pressure slightly higher than usual in the east and about half a tenth of an inch above normal in the west and south; mean temperature practically the same as usual, with days slightly cooler and nights warmer than the average; precipitation of greater depth than usual in the east, north, and west of the Transvaal, Swaziland, and several stations in Natal and the Cape Province; *subnormal elsewhere*; *absolute drought throughout the month in* parts of the south-west, the greater part of the west coastal area, the Karroos, the northern border, and portions of Bechuanaland in the Cape Province; also in parts of the west and south-west of the Orange Free State: rivers mostly low; several days of frost, destroying crops and vegetables, in the Barkly East District; hot drying winds; many destructive hailstorms, particularly during the last week of the month; such were the generally disappointing features of the weather of December, 1923.

Pressure.—Mean atmospheric pressure for December, as may be seen from the accompanying map, was practically normal over the interior, but about half a tenth in excess of the average in the south of the Cape Province and along the west coast. The equatorial low pressure was strongly in evidence throughout the month, at times extending to the south and south-east coasts. High-pressure areas were present on similar days of the month, and lay on the south coast on the 14th, 15th, 20th, 24th, 25th, and 28th to 30th; and on the south-east and east on the 3rd to 4th, 13th, and 26th.

Temperature.—The mean temperature during December was 70·1 degrees or 0·1 degree below the average, the mean maximum (81·9 degrees) being 0·5 degree in excess, and the mean minimum (58·3 degrees) being 0·3 degree short, of the corresponding normals. Considering the Provinces separately, the mean for the month over the Transvaal (70·5 degrees) was only a tenth higher than usual, the maximum day temperature (82·4 degrees) being a tenth of a degree lower and the mean night temperature (58·6 degrees) being 0·3

degree higher than their normals. In both the Orange Free State and the Cape Province the mean temperature (70·2 and 69·8 degrees respectively) was 0·6 degree higher than usual. In the Orange Free State this excess was due to the mean day temperature (84·8 degrees) being 1·7 degree higher, while the mean night temperature (55·6 degrees) was 0·5 degree lower, than usual. In the Cape Province, on the other hand, both days and nights were slightly warmer than usual, the former (81·1 degrees) by 0·4 degree and the latter (58·4 degrees) by 0·7 degree. Natal showed a marked contrast to the other Provinces, the deficit of 2·6 degrees in the mean temperature (71·6 degrees) of the month, being mainly due to the days with 82·3 degrees, being 5 degrees, whilst the nights with 60·8 degrees were only 0·3 degree, colder than usual. Turning to the individual stations, it is found that the temperature of this month was in excess of the average in the south-west, east, and centre of the Transvaal, as also in the eastern part of the high veld. The excesses varied between 0·2 degree at Nylstroom and Middelburg and 3·6 degrees at Potchefstroom. In other parts of the Transvaal the mean temperature for this month was below normal, mostly by about half a degree, the deficits ranging, however, from 0·4 degree at Pietersburg to 1·6 degree at Komatipoort. Excesses in mean monthly temperature were also experienced over the major portion of the Orange Free State, the surplus amounts being generally about 1½ degree, but varying from 1·4 degree at Ladybrand to 3 degrees at Lindley. In the extreme south and north-east, however, the mean for December was 1·8 degree lower than the average at Bethulie and Harrismith. In the Cape Province temperature was generally above normal mostly by 1 to 2 degrees, the excess increasing to 2 to 3 degrees in the Cape Peninsula and decreasing in the south-east to less than 1 degree, even changing to small deficits in parts there and in Kaffraria. The excess amounts varied from 0·1 degree at Mafeking, Stutterheim, and Port Elizabeth to 2·9 degrees at Wynberg in the Cape Peninsula. The deficiencies lay between 0·3 degree at Umtata and 3·2 degrees at Grahamstown. In Swaziland, Basutoland, and the whole of Natal the month was colder than usual by amounts varying from 0·4 degree at Mbabane to 3·8 degrees at Ladysmith and Dundee. The mean maxima or day temperatures in the Transvaal were generally somewhat lower than usual in the east, south-east, north-west, and centre, but were above normal in the south, south-west, and part of the high veld. The deficits varied from 3·2 degrees at Komatipoort to 0·2 degree at Nylstroom, whilst the excesses in the south and south-east lay between 2 and 4 degrees, ranging, however, from 0·9 degree at Barberton to 4·1 degrees at Potchefstroom. In the Orange Free State days were warmer than usual by amounts varying from 0·2 degree at Ladybrand to 5·5 degrees at Lindley. In the north-east, however, Harrismith showed a deficit of 2·6 degrees in its mean maximum temperature. The nights were mostly cooler than usual by amounts ranging from 0·1 degree at Kroonstad to 3·9 degrees at Bethulie. In the south-central parts, however, the night temperatures were in excess of normal by 0·3 degree at Bloemfontein and 2·5 degrees at Ladybrand. In Swaziland and Natal the days were generally considerably cooler than usual, the shortages in the mean maxima varying from 8 degrees at Ladysmith to 0·6 degree at Mbabane. The night temperatures in these areas were slightly above normal at about half the stations and below normal at the remainder. The excess temperatures were mostly a few tenths of a degree above the average, but rose to 1·5 degree at Estcourt, whilst the deficits ranged from 0·2 degree at Mbabane to 3·5 degrees at Dundee. In the Cape Province the day temperatures were mostly higher than the average, generally by amounts of between 2 and 3 degrees, but varying from 0·2 degree at Kimberley and Port Elizabeth to 4 degrees at Aliwal North. Over limited areas, such as parts of Bechuanaland, south-east, Kaffraria, the south coast,

and the east-central Karroo, as also in Basutoland, there was a deficiency in the mean maximum temperature ranging between 0·6 degree at Mossel Bay and 3·9 degrees at Kingwilliamstown, increasing to 5·3 degrees at Mafeteng. At Umtata the days were normal. Similarly, the nights were generally warmer than usual, mostly by slightly more than 1 degree, the excesses, however, lying between 0·3 degree at Bedford and 3·3 degrees at Kimberley and Groot Drakenstein. At a few stations in the south and east, the mean minima were subnormal, mostly by less than 1 degree; the deficits, however, lay between 0·1 degree at Port Elizabeth and 2·7 degrees at Grahamstown. The mean warmest station during December was Kenhardt with a temperature for the month of 80·3 degrees; and the coolest station was Port Nolloth with 60 degrees. There was thus a difference of 20·3 degrees between the coolest and warmest stations. The corresponding values for the different Provinces were as follows: Transvaal, 79 degrees at Komatipoort and 61·6 degrees at Belfast, a difference of 17·4 degrees; Orange Free State, 73·6 degrees at Bloemfontein and 63·6 degrees at Harrismith, a difference of 10 degrees; Natal, 73·6 degrees at Ladysmith, Stanger, and Weenen, and 68·2 degrees at Dundee, a difference of only 5·4 degrees. The highest mean maximum was 96·4 degrees at Kenhardt and the lowest mean minimum, 49·6 degrees, at Belfast. The highest temperatures of the month at the various stations were registered on nineteen days, viz., 1st, 4th to 6th, 8th to 11th, 15th, 19th to 24th, 27th, 28th, 30th, and 31st, most widely on the 5th. The lowest temperatures were recorded on an equal number of days, viz., 2nd, 3rd, 7th to 9th, 11th to 14th, 16th, 17th, 22nd to 25th, and 28th to 31st, mostly on the 2nd and 12th and to a less extent on the 29th. Temperatures of 100 degrees Fahrenheit or over occurred at one or two stations in the Transvaal and Natal, but were most common in the Cape Province, where such readings were recorded at seven stations, whereas temperatures of 40 degrees or lower were confined to one station. The extremes for the month were 112 degrees at Komatipoort on the 1st and 39 degrees at Belfast on the 9th, showing an extreme monthly range of 73 degrees. In the Orange Free State the highest temperature on any day during December was 97·5 degrees at Bloemfontein on the 27th and the lowest, 42 degrees, at Harrismith on the 2nd, a range of 55·5 degrees. In Natal the corresponding values were 100 degrees at Ladysmith on the 5th and 50 degrees at Dundee, Estcourt, and Weenen on five days of the month, showing a range of 50 degrees. In the Cape Province the highest maximum, 104 degrees, was recorded at Bedford on the 22nd, the lowest minimum, 42 degrees, at Kokstad on the 29th, a range of 62 degrees. Severe frost was reported as occurring at Kilcullen (Barkly East) on the 11th, 12th, and 13th, killing nearly all crops and destroying garden produce. In South-West Africa the maximum or day temperatures were exceptionally high from the 24th to 30th, being mostly between 90 degrees and 100 degrees Fahrenheit, but exceeding this latter value at several stations during this period. Thus, a temperature of 102 degrees was recorded at Okahandja on the 25th, 26th, and 27th, also at Haribis on the 27th; 106 degrees at Haribis on the 26th; 109 degrees at Tsumeb on the 29th; and 110 degrees at Usakos on the 26th. At Walvis Bay the temperature varied between 72 degrees and 78 degrees during this week, whilst at Windhoek it ranged from 87 degrees on the 29th to 96 degrees on the 26th and 27th.

Precipitation.—Taken as a whole the month was exceptionally dry over practically the whole country. There was a marked absence of prolonged steady soaking rains and of rains of any great intensity. As a result of these conditions comparatively little ploughing or sowing was carried out, whilst dams and rivers were generally very low; and wells, even boreholes of considerable depth, were failing in a number of instances and water getting

scarce. This unfortunate state in regard to water supply was reported from all four Provinces. Thus, at Bloemhof in the south-west, Jackhalsfontein (District Pietersburg) in the north, and Zandfontein (District Rustenburg) in the west of the Transvaal, wells and dams were drying up and rivers low; at Mid-Illovo, Paulpietersburg, and Rongpoort (District Weenen), in Natal, there was very little water in the rivers; in the Orange Free State it was reported from Tembani (District Fauresmith) that the Riet River was standing and all dams dry; at Katdoornput (District Bloemfontein) the underground supply was getting weak, and at Paardekraal (District Winburg) dams were drying up again; at Mafeteng (Basutoland) there was a scarcity of water in the camp. In the Cape Province water was scarce or becoming so at Knel (Division Steynsburg), Ezelsfontein (Division De Aar), and Thibet Park (Division Queenstown). The Orange River at Upington was stated to be very low and fears were expressed that unless rain fell towards the source, the river would cease to run within two months. From Rooi River (Division Uniondale) it was reported that water was always scarce for irrigation: the river never ran for a few consecutive days this year. The only station whose comments were of an opposite character to the foregoing was Mbabane (Swaziland), where a total rainfall of 13 inches (an excess of 4·98 inches or 62 per cent. above the average), distributed over twenty-seven days of the month, afforded reasonable grounds for the statement: "We could do with a little dry weather." Excess amounts of precipitation were also recorded over limited portions of the eastern Transvaal, of the Zoutpansberg, of the middle and west of the middle and low velds; also in Zululand and the neighbourhoods of Durban and Howick, in Natal; also parts of the south-east and south of the Cape Province. Elsewhere the rainfall during December was subnormal. The deficiencies over the Transvaal increased generally from north to south, varying from 0·02 inch at Pietersburg to over 2 inches in the south-west and south-east. In the Orange Free State there was a general shortage, mostly by more than 2 inches, but decreasing to under half an inch in the north-east and south. In Natal the subnormal amounts were mostly over 2 inches, but decreased to less than an inch at Dundee and to under half an inch at Stanger near the coast. Over the Cape Province the month's rainfall was generally lower than usual by less than an inch over the western half. Over Bechuanaland, the northern border, the south coast, and the major portion of the east the deficits lay mostly between 1 and 2 inches, but exceeded 2 inches in places, e.g. Bedford and Aliwal North. In South-West Africa surplus precipitation was confined to the south-central portion of the northern half of the territory, the excess varying from 1·36 inch at Okandjose to 0·16 inch at Okasangumingo. The number of rain-days in the Transvaal was greater, averaging about twenty-five in the middle of the east of the high veld, whence the frequency of rain decreased in all directions, but mainly to the west and south-west, where the number fell to between two and three. Similarly, in the Orange Free State, precipitation was most frequent, averaging about twelve days over the Harrismith Division, but decreased in frequency to two to three days in the west and south. In the Cape Province the number of rain-days was greatest in Kaffraria, over the south coast, and in the south-east, decreasing to one to two over the Karroos. Rains were also frequent over Natal. Although the number of rain-days in the east of the three Provinces (Transvaal, Orange Free State, and Cape) was large compared with those in the west, precipitation was by no means general, but occurred mostly in the form of light local showers. Absolute drought was experienced at many stations in the west and south-west of the Orange Free State, in parts of the south-west of the Cape Province and of Bechuanaland, over the major portion of the west coastal area, of the Karroos, and of the northern border. In South-West Africa a subnormal rainfall occurred over

the greater part of the territory, with the exception of the limited plus areas already mentioned, the deficiency amounting to absolute drought throughout December over the southern third of the territory (from the latitude of Maltahoehe southwards to the border), and to the east and east-north-east of Windhoek, at Swakopmund and Usakos. Although thunderstorms were frequent throughout the month, the rainfall was frequently light and small in amount or altogether wanting. Some moderate to heavy rains, however, occurred on the 17th and 19th over the south and east of the Cape Province and the greater part of the Orange Free State; also on the 27th in the east Cape and part of Natal—for example, the drought was broken at Glückstadt (Division Vryheid) on the 27th, when 2·52 inches fell in about 40 minutes, the hail and ensuing floods causing considerable damage; this was succeeded by 1·21 inch of steady soaking rain on the 28th. On the latter date also a windstorm, described as a cyclone, occurred in the neighbourhood of Kromdraai (District Standerton), which destroyed windmills, telegraph poles, etc. Details are frequently received of the behaviour of lightning and its effects on land, but similar information as to its effects on water is rare and has not been received up to the present in South Africa. The following account of the effects of lightning on bathers is therefore all the more interesting. Mr. A. E. Griffin, of Vredefort, Orange Free State, writing under date the 7th January, 1924, makes the following statement:—"I wish to relate an electrical occurrence of about a week ago . . . the facts are as follows:—During a picnic on the banks of the Vaal River, a party of about twenty-five ladies and gentlemen went into a pool of water for mixed bathing not noticing that a thunderstorm was gathering, and whilst disporting themselves some were startled by a blow to the body coincidently with a heavy flash of lightning, which must have struck somewhere close, as the thunder from the flash was only three or four seconds after. Different accounts were given me of the blow or shock: one party felt it between the shoulders as though she were suddenly pushed forward; another on the abdomen; others were affected in the arms, legs, etc.; another complained of a stiffness of the muscles at back of neck, a headache resulting; whilst another, who says that she saw no flash, described her case as a sudden numbness, temporary paralysis of the tongue, with a choking sensation of being unable to get her breath, and a pricking of pins and needles at the soles of her feet. In every case affected I found from my inquiries that all were in ground contact with their feet, their bodies being only partially or nearly altogether submerged, as in the position of splashing one another, wading, etc. Two gentlemen of the party, who were at the time actually swimming and thus in no contact with the ground, felt no shock; neither did three others who were sitting on the rocks edging the pool. It transpires, therefore, that only those more or less in the water with earth contact felt this peculiar blow or shock."

Hailstorms were of frequent occurrence in all Provinces, causing a considerable amount of damage to garden and field crops, fruit, etc. These storms were reported on 6th, 7th, 11th, 12th, 14th to 18th, 20th, 24th to 29th, and on 31st. The most destructive was that which passed over Pretoria on the evening of Christmas Day, 25th December, causing damage estimated as in the neighbourhood of £80,000. This storm seems to have originated in the neighbourhood of Bedford Farm (4 miles east-north-east of Johannesburg), and after pursuing a general northerly course died out to the north of Pienaars River. The hail belt was 69 miles long, with a maximum breadth in the neighbourhood of Pretoria of 15 miles. The area of greatest violence seems to have lain in that part of its course, 4 to 6 miles in length, between the Langebergen on the south side of Pretoria and the north side of the Magaliesberg Range. The average rate of travel of this storm was 17 miles per hour. The storm began at 6.23 p.m.

and lasted till 6.35 p.m. It was accompanied at first by comparatively small stones about the size of marbles, but these were soon succeeded by much larger stones. These latter varied considerably in appearance, some being almost spherical in shape and white, as if composed of hard-packed snow; others were very irregular in shape, in some cases resembling jagged pieces of ice; others had the usual concentric layers, with tooth-like projections, and others were apparently composed of a number of smaller stones fused together. The size of the stones seems to have been mostly about 3½ inches long by 3 inches wide, having a circumference of 9½ to 10½ inches and weighing from slightly under 4 to over 5 ounces. The largest stone of which reliable details are available measured 4 by 3½ by 2 inches and weighed 5·1 ounces. There was very little lightning on this occasion, although another thunderstorm which followed soon afterwards, and during which only rain fell, was accompanied by almost continuous lightning, the flashes occurring about twice every second. The damage was confined mainly to the centre and east of the town. Houses with tiled roofs suffered most, the tiles being either smashed to pieces or perforated as if by a rifle shot. The combined weight of the débris and water caused ceilings to give way, rendering houses uninhabitable. Quarter-inch plate-glass, reinforced with 1-inch mesh wire-netting, was either pierced or cracked in a series of concentric circles; corrugated-iron roofs were generally only dented, although in some cases even new 22-gauge galvanized-iron was perforated. A number of other remarkable effects of the storm were recorded. Trees were barked and branches broken off; a cow had one of its horns broken off at the base, and other animals were badly gashed about the body; and canvas hoods of motor-cars were riddled. At least one person was knocked insensible and a lady died as the result of shock. As indicating the intensity of the downpour, it may be mentioned that 0·80 inch of rain was recorded in ten minutes in Pretoria. This was only one of a series of hailstorms that occurred over the same district during that afternoon and evening.

The accumulated rainfall since the beginning of the year was mostly subnormal, generally by 2 to 4 inches in the Transvaal, but varying from 0·81 inch at Nylstroom to 14·07 inches at Ermelo and 14·76 inches at Woodbush. In the Orange Free State the deficits were mostly between 5 and 6 inches, but ranged from 2·75 inches at Boshof to 5·88 inches at Kroonstad. In Natal the shortages were everywhere large, lying between 6·37 inches at Howick and 13·27 inches at Weenen. Over the Cape Province the deficits were mostly between 1 and 3 inches, but varied from 0·08 inch at Port Nolloth to 9·21 inches at Grahamstown. Areas with a surplus rainfall were confined mostly to the more northerly portions of the Union bordering adjoining territories—that is to say, the east, north, and west of the Transvaal, Bechuanaland, the greater part of the northern border, and the plateau of Namaqualand. In addition to these there are a number of small detached areas in the central and south-western parts of the Transvaal; a patch covering the centre and south-west of the Orange Free State extending south-eastwards to the coast, of the south-east Cape, and Kaffraria; also a fairly large area in the south-west Cape, including the more westerly portion of the south coastal area, the Peninsula, the south of the west coastal area, and part of the south-west; also portions of the southern and west-central Karroos. In the Transvaal the excesses were mostly large, lying between 21·03 inches at Pigeonhole (New Agatha) and 5·09 inches at Zeerust. In the Orange Free State the excesses were between 3 and 4 inches, while over the Cape Province the surplus quantities varied considerably, from less than quarter of an inch at Murraysburg to 4 to 7 inches in the south-east and Kaffraria, and 14 to 17 inches in the south-west in the Groot Drakenstein and French Hoek areas. Surplus amounts in the aggregate rainfall for the six months from the 1st July were confined to much more limited areas

than in the case of the twelve months. Thus, in the Transvaal the only area with a supra-normal amount lay in the west, where Zeerust had a total of 2·10 inches higher than the average. In the Cape Province an excess of precipitation was limited to portions of the east of Kaffraria, of the south-east, of the south-west, including part of the Cape Peninsula, and the south of Bechuanaland. In the Transkei and Bechuanaland the excess was between 1 and 2 inches, in the south-east of the Cape between 3 and 4 inches, in the south-west from 4 to 12 inches, falling to a few hundredths of an inch at the Royal Observatory. The shortages over the rest of the country were mostly between 3 and 5 inches, but ranged over the Transvaal from 1·95 inch at Louis Trichardt to 10·16 inches at Woodbush. In the Orange Free State the deficits lay between 1·65 inch at Bethulie and 5·89 inches at Lindley; in Natal between 3·36 inches at Estcourt and 10·28 inches at Maritzburg. In the Cape Province a large proportion of the country had deficits of 1 to 3 inches, increasing to over 3 inches in the more southerly parts, particularly along the south coastal area; also in the north-east and portion of the northern border. In South-West Africa the only stations having totals lower than the average were Swakopmund on the coast and Franzfontein in the north-west of the territory. Elsewhere there were mainly large excesses, 5 inches and upwards, but ranging from 1·25 inch at Gabis in the extreme south to 18·75 inches at Voigtsgrund near the centre of the southern half of the country. During the second six months of the twelve a surplus occurred, chiefly over the southern third of the country and over a limited area to the north of Windhoek. The excess was least 0·34 inch at Okandjose in the northern half and greatest, 1·59 inch, at Aus in the south-west. The shortages lay mostly between 1 and 3 inches, varying from 0·13 inch at Windhoek to 3·92 inches at Tsumeb, almost in the extreme north of the country.

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 inches. In Natal and Basutoland 4 inches; in Kaffraria 3·5 inches; over the Orange Free State and the north-east and south-east of the Cape Province 3 inches; over the Cape northern borders 2 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 inch, constitute 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 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.*

OBSERVERS' NOTES FOR DECEMBER, 1923.

TRANSVAAL.

Amatava (*Potgietersrust*).—Hot and sultry early part of month. Nice soaking rains for all crops during the latter. Rainfall: 4·07 inches on thirteen days.—A. R. Troye.

Barberton.—The rain has been well distributed through the month. The showers have been very local, but, generally speaking, there have been sufficient for farming requirements. A little hail has been reported to have fallen in the district and some damage done to crops on certain farms. Rainfall: 6·04 inches on sixteen days.—Walter Grubb.

Bloemhof.—Drought very severe; grazing very scarce, and stock-owners shifting their cattle to other districts. Wells drying up. River very low this year. Large swarms of locusts in district lately. Rainfall: 0·47 inch on three days.—F. Osborne.

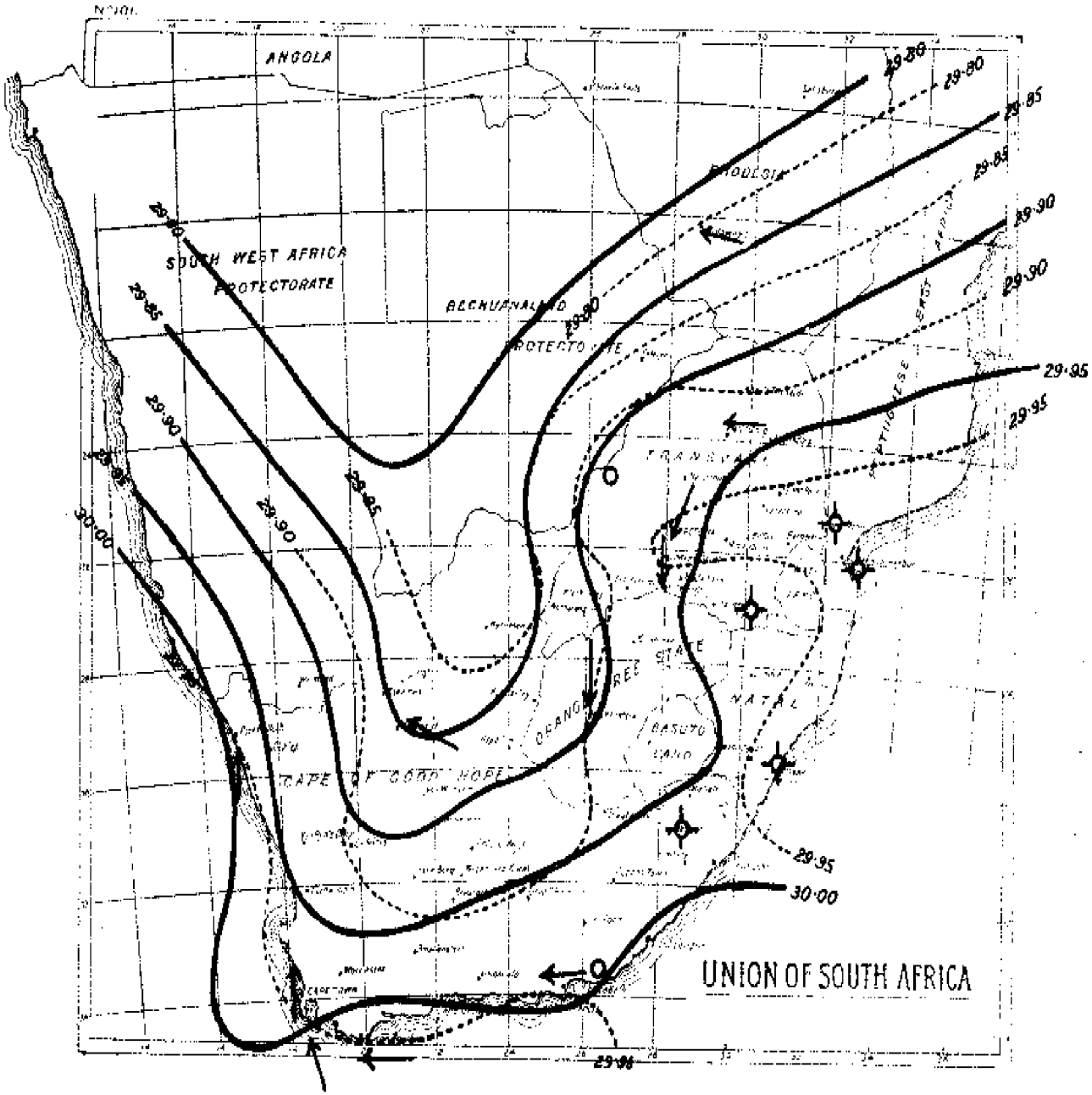
Ermelo.—Month of lower temperatures and rainfall than usual. No maize planted on account of the late season. Rainfall: 3·79 inches on ten days.—Dr. E. B. Theunissen.

Strathmore (*Klarksdorp*).—Dry, hot month; rain much wanted. Rainfall: 1·09 inch on seven days.—Chas. Scott.

Middelburg.—Hot days and cool nights have obtained throughout the month, though in comparison with last year both maximum and minimum temperatures are 2 degrees below the mean of that year. Fair rains fell in the early part of the month, sometimes with hail, and a shower each day for the last thirteen days. Hailstorms have, however, occurred in the district, which have done much damage to crops; in the other parts the crops appear to be coming on satisfactorily. Rainfall: 4·16 inches on twenty days.—Dr. H. A. Spencer.

Pietersburg.—Soft steady rains. Veld and late crops in good state. Rainfall: 4·37 inches on twelve days.—W. J. Frankleyne.

Piet Retief.—28th: good and steady rainfall (1·11 inch) after ten minutes of average hail. Hailstorms reported throughout the month in the district. Rainfall: 3·67 inches on twenty-one days.—J. Werner.



December, 1923. Prevailing Winds and Mean Atmospheric Pressure at 8.30 a.m.
The dotted lines indicate the normal distribution for December, 1923.

Potchefstroom (Experimental Farm).—Dry and hot. Rainfall abnormally low and then only in local thunderstorms. Conditions most unfavourable for crops. 27th: heavy hailstorm at 6·30 p.m.; considerable damage done to crops and fruit. Rainfall: 1·90 inch on eight days.—The Manager.

Jakhalsfontein (Pietersburg).—Light rains at frequent intervals. Dams and rivers still fairly dry. Crops are looking well.—Rev. James C. Palmer.

Carolina.—No hail has fallen in town and surroundings, but in the district some heavy hailstorms have been reported, and many heavy thunderstorms have been experienced with little rain as a rule. Very warm and oppressive weather was experienced during the beginning of the month, but most part of the month was very cool and sometimes even cold and much below the average. Such crops as were rushed in after the first rains are looking very promising indeed. Cattle are in excellent condition, far in advance of previous years. Rainfall: 3·77 inches on seventeen days.—G. Mijnhardt.

Mosdene (Naboomspruit).—The early portion of the month was very dry. Owing to this ploughing and planting had to be discontinued for about ten days; consequently the acreage under crops will be less than otherwise would be the case, though larger than ever before. The growing crops are looking well. Rainfall: 2·63 inches on ten days.—Ernest E. Galpin.

Lichtenburg.—Prospects for the farmers are very bad; cannot start ploughing and sowing on account of the drought. District in very bad condition. The farmers who have sown potatoes, mealies, etc., state that the crops will not grow. Very large swarms of locusts visited Lichtenburg and district, doing a lot of damage and completely discouraging the farmers. The small amount of fruit which was left after the late frost is all diseased and very small. Rainfall: 0·35 inch on five days.—E. Newton.

Gemboksfontein (Middelburg).—Showers have been very local during the month. A heavy hailstorm passed within a few miles of this plantation on the 12th, and did considerable damage to fruit and young forest trees. Rainfall: 5·52 inches on fifteen days.—G. M. van Coller.

Parktown North (Johannesburg).—The weather during December was erratic and unsettled. Cloudy and overcast, threatening rain, ugly skies, but rain passed to central area of city. Drought conditions prevailed and most market gardeners, small holders, and fruit growers practically ruined. The veld being burnt and scorched, as if in winter, grazing being out of the question. Caterpillars ate all the leaves off willow and other trees, and the district is looking somewhat desolate. Local showers amounting to 1·42 inch fell on six days during the month, the heaviest fall being 0·70 inch on the 19th. On Christmas Day a violent thunderstorm passed over in a northerly direction.—G. S. Garnett.

Myrthley (Standerton).—Generally dry during early part of month, in which crops suffered badly. Good rain (0·77 inch) fell on the 19th, which was followed by light showers until the 27th and 28th, when a sharp hailstorm was followed by torrential rain, 0·84 inch. Rainfall: 3·31 inches on eleven days.—J. L. Ellis.

Krugersdorp.—The month has been dry, hot, and most unfavourable from an agricultural point of view. Rarely has the veld been so bare or crops in general so poor at this period of the year, and the outlook is anything but promising. Rainfall: 2·04 inches on eleven days, against an average of 4·60 inches for the past twenty years.—H. Sharp.

West End Plantation (Pretoria).—The hailstorm on the 15th did a fair amount of damage to young trees; it was more severe than the storm on the

16th, but 2 miles east the storm on the 16th was the most severe. During the storm on the 16th the thermometer fell to 45 degrees. We had no hail whatever on the 25th, when they had the severe storm in town. Rainfall: 4·48 inches on nine days.—W. H. Foster.

Melrose (*Bloemhof*).—Veld is in bad condition, owing to the drought. Rainfall: Nil.—C. Combrink.

Bedworth (*Heidelberg*).—All crops dying of drought. Very few crops have been sown and the heat is so great that the effect of the showers is not lasting. Rainfall: 2·50 inches on six days.—B. Wilson.

Slurry (*Marico*).—Numerous large swarms of locusts. Unknown cattle disease; awaiting report on blood smears. Rainfall: 1·04 inch on five days.—J. de Villiers.

Dutoitspruit (*Potchefstroom*).—An awful month with drought and locusts. No crops in sight. Rainfall: 0·61 inch on three days.—J. Ortlepp.

Welverdiend (*Potchefstroom*).—28th: large swarm of flying locusts. Slight damage to mealie crop. Rainfall: 2·07 inches on seven days.—Station Master.

Mullingar (*Potchefstroom*).—28th: swarm of locusts; approximate size, 30 miles by 15 miles; destroyed crops. Rainfall: 0·63 inch on five days.—J. Hamilton.

Zandfontein (*Rustenburg*).—This is one of the driest periods ever experienced in these parts. There is no water and no grass to speak of. Rainfall: 2·50 inches on five days.—R. Boon.

Waaikraal (*Rustenburg*).—No mealies have sprouted yet. Aspect serious. Rainfall: 2·97 inches on seven days.—W. Behrens.

Newlands (*Standerton*).—28th: cyclone in vicinity Kromdraai destroyed windmills, telegraph lines, etc. Rainfall: 5·58 inches on twelve days.—H. E. Gill.

Weltevreden (*Standerton*).—*Drought broken at last. Rainfall: 3·64 inches* on ten days.—D. Lane.

Elandshoek (*Waterberg*).—Rains only sufficient to keep crops and grass from becoming total failure, on account of intense heat between the falls. Rainfall: 2·27 inches on nine days.—Mrs. H. Vickers Strutt.

Willowdene (*Witwatersrand*).—Drought and heat very severe. Summer crops suffering badly. Rainfall: 1·69 inch on seven days.—W. Frost.

Wolmaransstad.—Owing to drought very little ploughing has been done. Big swarms of locusts from Bechuanaland causing great damage to crops and veld. Condition very serious. Up to present large and small stock still in fair condition. Rainfall: 0·76 inch on two days.—R. Kleuver.

Altydmooi (*Zoutpansberg*).—*The stock looking better; veld nice and green.* Ploughing going ahead. Rainfall: 4·28 inches on eleven days.—Mrs. A. L. Gettliffe.

Doornkloof (*Zoutpansberg*).—Cattle fat; veld good. Cotton put in after November rains a failure from drought; second planting good. Other crops excellent. Rainfall: 4·37 inches on ten days.—S. Ralston.

Mahemsvlakte (*Lichtenburg*).—Drought and locusts have destroyed all the crops. Rainfall: 0·82 inch on one day.—S. S. van Rensburg.

Mimosa (*Lichtenburg*).—Very dry and locusts have destroyed the crops and veld. Rainfall: 0·37 inch on three days.—P. Prinsloo.

SWAZILAND.

Matendele (*Swaziland*).—A good planting and germinating month, but still hardly enough rain for deep ploughing. Rainfall: 4·47 inches on seventeen days.—H. S. Parry.

Mbabane.—Nothing unusual to report except that at Mbabane we could do with a little dry weather. Rainfall: 13 inches on twenty-seven days.—R. C. S. Markham.

ORANGE FREE STATE.

Lindley.—Up to the 19th drought conditions prevailed—unprecedentedly protracted. Scorchingly hot, dry winds prevailed. On the 19th 1·10 inch rain fell, and since then, though it has not rained again, atmospheric conditions have improved and the veld is green though short. Ideal conditions for sheep.—Rainfall: 1·67 inch on five days.—J. Collister-Oates.

Holfontein (*Kroonstad*).—Drought conditions continue. Stock in general in very poor condition Mealie crop going off. Owing to the drought not much ploughing has been done. Large swarms of flying locusts are now invading the district and have done a great deal of damage to crops. Rainfall: 0·78 inch on two days.—L. C. McInerney.

Grootkuil Estate (*Winburg*).—Crops eaten by large swarms of flying locusts. Rainfall: 0·34 inch on two days.—V. B. Richards.

Shannon (*Bloemfontein*).—One of the driest Decembers on record. A succession of hot winds dried up everything. No veld at all. Rainfall: 0·28 inch on three days.—J. G. Hatchard.

Kaidoornput (*Bloemfontein*).—Very dry; big stock very poor. Underground water supply getting weak. Rainfall: 0·74 inch on three days.—C. Mulke.

Sterkstroom (*Boshof*).—It is very dry. Sheep are still in good condition, but cattle are thin. Rainfall: 0·44 inch on two days.—J. B. Moolman.

Tembani (*Fauresmith*).—The country is very dry. Riet River standing and all dams dry. Veld cleared by locusts, which have now reached flying stage owing to temporary lack of poison. Rainfall: 0·27 inch on two days.—M. F. Schickerling.

Heilbron.—Crops: From all accounts very little has been done and crops are still very young. Grazing: Grazing on the commonage is in consequence of the low rainfall very scanty, and stock are in low condition. Diseases: Stock diseases have been nil. Locusts: On the 28th a tremendous swarm of locusts (fliers) passed over town in a north-easterly direction and seems to have disappeared entirely. Rainfall: 2·35 inches on nine days.—P. A. du P. Naudé.

Commando Drift (*Hoopstad*).—Drought very severe; loss of cattle. Locusts are seen flying daily and have done a lot of damage. We need rain badly. Rainfall: 0·56 inch on one day.—J. W. Nawn.

L'Esperance (*Ladybrand*).—Appalling drought; veld entirely dried up. Borer in early maize. Impossible to plough or to sow any hay. Rainfall: 1·57 inch on seven days.—C. M. F. Casalis.

Hibernia (*Senekal*).—It is very dry hereabouts. Little maize has been sown and rain is needed for the same. Stock are very thin, but no diseases. Rainfall: 1·52 inch on three days.—D. J. Brouwer.

Bona Fide (*Thaba 'Nchu*).—The country is in a wretched condition and there is very little veld, especially for cattle. Sheep are still in fair condition. Very few mealies are to be seen, and they cannot possibly escape as swarms of flying locusts are to be seen passing every day. Rainfall: 0·45 inch on two days.—R. Morgan.

Woudzicht (*Vrede*).—This month has been exceptionally dry. No ploughing could be done. The prospects for a harvest are very small, as the mealies which are growing will come into seed before it is time. Most farmers have not sufficient grass for stock. Rainfall: 2·03 inches on nine days.—J. N. Köhler.

Prospect (*Vrede*).—Dry conditions continued throughout the month. Here grass is fairly good in the circumstances. Sheep are getting fat and cattle are strong. The rain on the 28th (1·03 inch) has been a godsend. Lands are bare and not much growing. Rainfall: 1·77 inch on eight days.—T. Pitcairn.

Paardekraal (*Wepener*).—Locusts flying every day; veld and crops totally destroyed. Rainfall: 0·15 inch on one day.—J. P. Roux.

Paardekraal (*Winburg*).—Conditions very bad; grass nearly all gone; dams drying up again. Rainfall: 2·07 inches on five days.—G. S. Lowe.

NATAL.

Dundee.—A very pleasant month with one of the hottest days on record—99 degrees on the 5th. Country recovered as far as the veld is concerned, but *ploughing has been difficult and in some cases impossible owing to lack of* soaking rains. Mealie planting very limited. Rainfall: 4·43 inches on twelve days.—West Thorrold.

Ladysmith.—With the exception of a heavy rain on the 19th (2·59 inches), the month has been comparatively dry. Several light showers fell during the month and these have done a lot of good in that they have kept the grass going. Some parts of the district which did not get the heavy rains on the 19th are still exceptionally dry, and ploughing is practically impossible. Stock are picking up and are in a better condition than for some time past. Rainfall: 3·49 inches on nine days.—D. A. R. Leathern.

Maritzburg (*Mental Hospital*).—Growing crops are very retarded owing to the drought. Rainfall: 3·16 inches on eighteen days.—The Staff.

Mid-Illovo.—Rain fell on twenty-three days, totalling 4·70 inches; but ploughing only possible on hard lands after 17th, consequently late ploughing still proceeding and maize crop will be late accordingly and probably short. Very little water in rivers. Veld good and stock in good condition. Total rainfall for 1923: 39·69 inches.—Lt.-Col. J. W. V. Montgomery, C.M.G., D.S.O.

Paddock.—The nice rains on the 17th (1·48 inch), 19th (1·66 inch), and 27th (1 inch) have set crops on a sound footing. Apart from these nice rains we have had several heavy showers, and a great deal of mist and drizzle. Several thunderstorms to the south and south-west and north have passed by, having only noise and no rain. Several days' sun would be welcome. Difficult to get a move on with ploughing owing to shortage of labour. Rainfall: 6·41 inches on twenty days.—G. Victor Merriman.

Greytown.—Although rain, totalling 3·11 inches, fell on seventeen days, conditions are droughty. Rains very local. Much mealie planting has had to be done twice over as cutworm has been very prevalent in places.—Marshall Handley.

Nottingham Road.—Some cold snaps. Many storms had hail in them. Stock of all kind healthy.—Miss E. Smythe.

Paulpietersburg.—Rainfall: 5·32 inches on twenty-one days. Rather below average and made up mostly of local showers until later part of month. Owing to the difficulty of ploughing only about 60 to 70 per cent. of usual quantities of mealies planted. Rivers still very low for the time of year. Total rainfall for 1923: 27·22 inches, of which 13·12 inches fell in January and February.—Dr. Niel Lipscomb.

Essenwood (Estcourt).—27th: heavy rain and hail did considerable damage to crops. Rainfall for month: 2·98 inches on eight days.—T. N. Garland.

Rongpoort (Weenen).—Awful drought: crops a failure and only half of the land ploughed. Too dry to plough the latter half of December. Grass all withered up. Cattle only just filling themselves. Water very low; only dirty pools in streams, which are normally strong at this time. Rainfall: 1·78 inch on eight days.—J. H. Bartholomew.

Sawoti (Umzinto).—Crops and stock doing remarkably well, considering the small amount of rainfall. Rainfall: 4·36 inches on eighteen days.—Archibald & Co.

Glückstadt (Vrijheid).—Hot scorching winds at beginning of month. In spite of a refreshing shower on 5th, ploughing could not be resumed. We had plenty of misty and overcast days. The drought was, at last, broken on the 27th and 28th; 2·52 inches fell on the former day, the hail and floods doing great damage, while on the 28th the storm was accompanied by a steady soaking rain which has enabled ploughing and planting to be resumed at full speed. All crops are late and the cutworm is playing havoc amongst the young mealies. Many fields have been planted twice and even three times without avail. Rainfall for month: 6·96 inches on nineteen days.—F. W. J. Schumann.

CAPE.

Bedford.—Drought and locusts, and the position is becoming serious. Hot days with cold nights. Fruit dropping from trees. Birds devouring any fruit approaching ripeness. The 22nd was the hottest day (104 degrees) for some years. Rainfall: 0·78 inch on eleven days.—Thos. C. Hall.

Graaff-Reinet (Convent).—A warm, dry month; some days very windy. Rainfall: 0·14 inch on three days.—The Mother Superior.

Groot Drakenstein.—Temperature above the average, but no very hot days experienced, the excess being chiefly caused by the warmer nights. Crops forward, fruit ripening from ten to fourteen days earlier than usual. Rainfall: 0·50 inch on five days.—Lionel Baker.

Kenhardt.—The insignificant rainfall in November hatched out a good deal of locusts; these, however, suddenly disappeared again before much damage was done; it is supposed that the fierce hot sun annihilated them. Rainfall: nil.—R. Seydell.

Kokstad.—There was a cold snap (42 degrees) on the 29th. Rainfall: 3·03 inches on thirteen days.—H. D. Coyte.

Murraysburg.—Most changeable weather during month to date (16th), westerly winds prevailing and consequently no rainfall. Large hatchings of locusts since rains of last month, and locust officers and farmers kept busy. Unfortunately supplies of locust poison limited and very irregular. First warm of "fliers" passed over town on the 15th. Pasturage in portion of district good and fair, whilst western portion of district decidedly dry, and farmers beginning to trek.—W. H. Rose-Innes.

Queenstown.—Hot drying northerly winds continued to prevail. Rainfall: 1·06 inch on six days; greatest fall, 0·77 inch on 17th.—J. F. C. Rein.

Stutterheim.—Splendid rains. Rainfall: 6·45 inches on thirteen days.—F. C. Bousfield.

Steenberg's Cove (Malmesbury).—Nothing particular to report. A grain farmer, who has large dealings, reckons that his crop is 5 per cent. above average; but this man is progressive. Rainfall: 0·08 inch on two days.—D. C. Burrell.

Postmasburg (Hay).—Dust and drought. Rainfall: 0·03 inch on one day.—D. Brown.

Aliwal North.—Hot and dry. Rainfall: 0·45 inch on five days.—Alex. Alcock.

Kakamas (Kenhardt).—Locusts were numerous in vicinity, but most swarms have been destroyed by poison and parasite fly. Rainfall: Nil.—N. J. Oosthuizen.

Port Alfred.—Rain during month has been of little value owing to hot dry winds. Veld drying up and gardens suffering. A few showers fell in the district. Rainfall: 2·19 inches on eight days.—W. H. Pascoe.

Elsenburg (Stellenbosch).—The month was noted for hot, dry winds, which did damage by drying up the beneficial rains that had fallen during November and caused lessening of summer crops and grazing. Rainfall: 0·26 inch on four days.—D. C. Crawford.

Nelspoort (Beaufort West).—A dry month. Weather generally calm in the mornings, but would almost daily change to cloud and high winds in the afternoons, especially at or after sunset. Prevailing winds east to south-west. First appearance of "voetganger" locusts on the 4th, travelling south-east to north-west from 4th to 26th. I destroyed or sprayed fifty swarms on the farm. There is still a certain number scattered about on the farm, but the worst seems to be over unless new hatchings take place. Considering the drought and condition of the veld, the stock are in fairly good condition. No losses from infectious stock diseases. Rainfall: 0·09 inch on one day.—W. B. Streak.

Ceres.—Weather generally seasonable, though perhaps a little more windy. Rainfall: 0·40 inch on four days.—A. Heatlie.

Tsolo.—Natives and others are hard at work ploughing. The rain came just in time. Veld improved wonderfully during the month, and the animals (cattle, etc.) have done the same. The two large rains on the 6th (0·66 inch) and 25th (0·96 inch) came down very heavily while they lasted. No cattle diseases in district. Dipping is carried out very strictly by the inspectors. Rainfall: 4·17 inches on ten days.—H. P. Tillard.

Rietfontein (Aliwal North).—Dry month. Prevalence of south-east winds. No ploughing carried on. Crops drying up. Rainfall: 1·20 inch on five days.—A. J. Smith.

Kraaipan (Mafeking).—Locusts are still with us and have arrived at the flying stage. Veld feeding is very poor. The month, generally, has been fine with little wind. Rainfall: 0·92 inch on four days.—P. J. Hart.

Sydney-on-Vaal (Barkly West).—Drought continues. High north-west winds very prevalent. Heavy visitations of locusts in voetganger stage throughout month. Rainfall: 0·60 inch on five days.—J. G. Richards.

Upington.—Rain badly needed. The heat very severe. Stock of all kind healthy. Orange River very low. Rainfall: Nil.—B. Etsebeth.

Louisvale (*Kenhardt*).—No rain during the month. Hot days, but cool nights prevailing. River here is getting very low, and if no rain falls towards the source it will probably cease to run within two months.—Stuart M. Smith.

Tussenbeide (*Caledon*).—Crops, small stock, and all other animals good all over district. Rainfall for month: 0·30 inch on two days.—S. D. J. de Wet.

Moira (*Uitenhage*).—Rain badly needed; recent strong winds have dried everything up. Rainfall: 0·57 inch on five days.—J. H. Champion.

Rooi River (*Uniondale*).—In general, 1923 was a dry year. The rainfall was irregular and water was always scarce for irrigation. The river never ran for a few consecutive days during this year. The farmers have experienced a difficult time. Total rainfall for 1923: 9·83 inches. Rainfall for December: 0·34 inch on one day.—W. G. Schaap, jun.

Hillandale (*Laingsburg*).—The country hereabout is very dry. Rainfall: Nil.—V. A. Young.

Matjeskloof (*Beaufort West*).—Conditions very dry. Prevailing wind south and south-east. Locusts very bad. Rainfall: Nil.—T. de Villiers.

New Bethesda (*Graaff-Reinet*).—Drought really serious. Rainfall: 0·12 inch on one day.—A. G. Erlank.

Chelmsford (*Aberdeen*).—Rainfall: Nil. Destructive winds, locusts, and drought were the order of the day.—F. Hayward.

Knel (*Steynsburg*).—Locusts covering the whole country. Very dry and veld destroyed by locusts. All crops have already been reaped. Locusts did very little damage to crops. Stock in very poor condition. Farmers have already lost sheep and cattle. Water getting very scarce. Rainfall: 0·31 inch on two days.—R. Oosthuizen.

Theefontein (*Hanover*).—Drought extremely serious and stock beginning to die. Two or three swarms of flying locusts observed. Rainfall: Nil.—E. A. Murray.

Ezelsfontein (*De Aar*).—Fountains are giving in and many deeper boreholes, too. Water is getting very scarce. Outlook serious. Stock becoming poor, as the locusts took away what little fodder was left. Locust voetgangers destroyed, but during the month many fliers passed over. Rainfall: Nil.—W. S. Marais.

Fountain Head (*Fort Beaufort*).—Very dry here and drought very serious. Heat very severe, and when a shower comes it does very little good. We want a good soaking rain. Rainfall: 1·18 inch on five days.—C. S. Hockly.

Woburn (*Victoria East*).—Drought still serious. Stock healthy, but poor. Crops bad. Rainfall: 0·79 inch on three days.—H. Smith.

Vineyard (*Albert*).—On 20th a heavy hailstorm occurred; several wheat crops utterly destroyed. Rainfall for month: 1·73 inch on three days.—C. J. Hoar.

Thibet Park (*Queenstown*).—Country very dry and bare. Water very scarce. Rainfall: 1·04 inch on eight days.—W. Frost.

Hoogstede (*Albert*).—During this month most places in the vicinity had more rain than this station, yet nothing effective. Locusts (voetgangers) have destroyed the veld entirely and also many vegetable gardens. Stock, especially cattle, are consequently in poor condition. Rainfall for month: 0·41 inch on two days.—S. G. Griesel.

Kilcullen (Barkly East).—The month was not a very favourable one. Rainfall only 1·32 inch on five days. We also had very severe frosts on the 11th, 12th, and 13th, which have killed nearly all the crops, and as far as vegetable gardens are concerned nothing is left. Stock are in fair condition, and farmers are receiving good prices for their wool. No locusts about.—O. A. Vorster, J.P.

Palmyra (Vryburg).—The month has been very hot and dry. Rainfall: 0·30 inch on two days.—M. G. Brown.

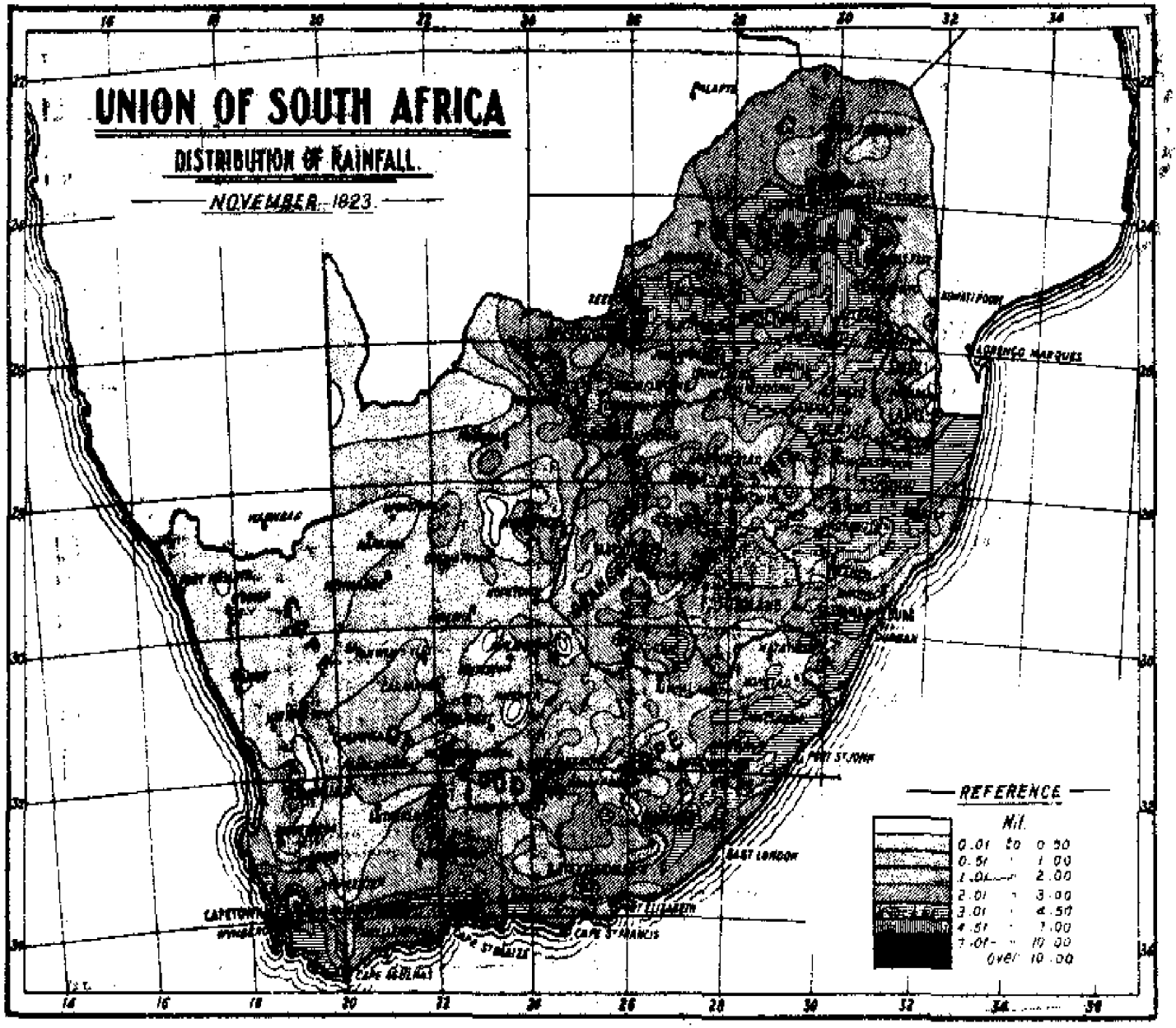
BECHUANALAND.

Dikgatlong Ranch.—The drought cannot be said to be broken yet, the small showers during the month not having penetrated to ploughing depth. From a ranching point of view the year 1923 has not been a good one. The total rainfall of over 17 inches would have been sufficient had it been evenly distributed, which it was not. No locusts have hatched in this district, but several invasions of voetgangers have taken place from the native reserves; these were immediately dealt with and little or no damage was done to the veld.—Paul Jousse.

Mahalapye.—Intense heat. Very dry. Plenty locusts everywhere. Rainfall: 2·05 inches on six days.—Miss M. Giles.

BASUTOLAND.

Mafeteng.—Very hot and dry month; only 0·49 inch of rain on six days. Veld dried up and hardly any grazing. Shortage of water in the camp. Swarms of locusts all around us. Duststorms frequent. Most depressing month generally. Gardening operations hopeless.—F. Hodgson.


UNION OF SOUTH AFRICA
DISTRIBUTION OF RAINFALL.
NOVEMBER 1923.
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
PORT ELIZABETH
CAPE ST FRANCIS
CAPE AGULHAS
CAPE TOWN

AIR TEMPERATURES (SELF-REGISTERING THERMOMETERS IN THERMOMETER-SCREENS), DECEMBER, 1923.

Station.	Observer.	Month—Dec., 1923. Mean Max.	Month—Dec., 1923. 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	82·4	62·1	72·2	72·1	+ 0·1	98·0	5th	56·0	22nd.
Belfast	The Forester	73·6	49·6	61·6	61·2	+ 0·4	82·0	1st, 5th, 6th, and 10th	39·0	9th.
Bloemhof	F. Osborne	91·2	63·0	77·1	73·5	+ 3·6	100·0	27th	51·5	2nd and 3rd.
Ermelo	Dr. E. B. Thennissen.	75·6	52·2	63·9	65·4	− 1·5	87·8	4th	45·0	29th.
Johannesburg (Observatory)	The Staff	77·1	54·7	65·9	64·8	+ 1·1	85·8	10th	46·0	30th.
Klerksdorp (Strathmore)	Chas. Scott	89·3	59·5	74·4	73·4	+ 1·0	97·0	5th	49·0	2nd.
Komatipoort	H. J. Evans	89·8	68·1	79·0	80·6	− 1·6	112·0	1st	61·0	30th.
Louis Trichardt	C. L. Cope	80·9	60·4	70·6	71·9	− 1·3	96·0	11th	48·0	28th and 29th.
Middelburg	Dr. H. A. Spencer	80·0	55·2	67·6	67·4	+ 0·2	90·0	5th and 10th	47·0	30th.
Nylstroom	G. Bakker	83·9	60·5	72·2	72·0	+ 0·2	96·0	11th	50·0	9th.
Pietersburg	W. J. Frankleyne	81·3	58·3	69·8	70·2	− 0·4	94·0	1st and 11th.	52·0	9th.
Piet Retief	J. Werner	76·1	56·3	66·2	67·4	− 1·2	98·4	5th	49·6	30th.
Pigeonhole (New Agatha)	Jno. McCallum	73·9	58·0	66·0	—	—	91·0	1st	52·0	22nd, 23rd, 24th & 25th.
Pilgrims Rest	E. M. Skea	76·9	56·7	66·8	67·3	− 0·5	93·0	5th and 11th.	50·5	22nd.
Potchefstroom (Exp. Farm)	The Manager	88·6	58·2	73·4	70·1	+ 3·3	96·7	5th	47·5	2nd and 3rd.
Pretoria (Meteorological Office)	The Staff	81·1	59·5	70·3	71·2	− 0·9	92·0	10th	49·7	17th.
Rustenburg	A. Streatfield	87·0	59·6	73·3	73·9	− 0·6	97·0	19th	53·0	23rd and 31st.
Standerton	—	—	—	—	66·2	—	—	—	—	—
Zeerust	H. Dietrich	86·4	61·8	74·1	74·7	− 0·6	95·2	6th	51·0	3rd.
Swaziland—										
Mbabane	Swaziland Police	75·4	56·5	66·0	66·4	− 0·4	93·0	1st	50·0	29th.
Orange Free State—										
Bethulie	J. J. Wardhaugh	86·9	55·3	71·1	72·9	− 1·8	95·0	4th	45·0	12th.
Bloemfontein	G. A. Schepers	88·5	58·8	73·6	71·9	+ 1·7	97·5	27th	47·8	2nd.
Harrismith	The Forester	76·3	50·8	63·6	65·4	− 1·8	88·0	5th	42·0	2nd.
Kroonstad	S. R. Northfield	88·1	58·1	73·1	71·6	+ 1·5	96·0	5th	49·3	2nd.
Ladybrand	The Forester	83·3	55·9	69·6	68·2	+ 1·4	90·0	5th	45·0	2nd.
Lindley	J. Collister-Oates	85·4	55·8	70·6	67·6	+ 3·0	94·5	5th	42·5	2nd.
Natal—										
Dundee	West Thorrold	81·3	55·2	68·2	72·0	− 3·8	99·0	5th	50·0	11th, 14th, and 29th.
Durban (Point)	The Port Captain	79·1	67·7	73·4	74·8	− 1·4	99·6	1st	62·6	29th.
Estcourt	The Town Clerk	80·0	56·4	68·2	71·8	− 3·6	98·0	5th	50·0	6th, 11th, and 29th.
Ladysmith	D. A. B. Leathern	86·3	60·8	73·6	77·4	− 3·8	100·0	5th	54·0	29th.
Maritsburg (Mental Hospital)	The Staff	80·1	60·1	70·1	71·8	− 1·7	95·0	9th	54·5	29th.
Stanger	C. C. Foss	82·2	65·0	73·6	75·0	− 1·4	98·0	1st	61·0	12th.
Weenen	The Gaoler	86·8	60·5	73·6	76·5	− 2·9	98·0	5th	50·0	8th.

AIR TEMPERATURES, DECEMBER, 1923—(*continued*).

Station.	Observer.	Month—Dec., 1923. Mean Max.	Month—Dec., 1923. 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	86·0	52·9	69·4	68·3	+ 1·1	93·0	4th	42·5	12th.
Bedford	Thos. C. Hall	81·5	54·3	67·9	68·3	− 0·4	104·0	22nd	42·5	12th.
Capetown (Royal Observatory)	The Staff	78·7	60·8	69·8	67·3	+ 2·5	88·1	20th	50·7	7th.
Carnarvon	A. P. Malherbe	—	—	—	73·5	—	—	—	—	—
Clanwilliam	—	—	—	—	73·2	—	—	—	—	—
East London	The Port Captain	75·9	62·8	69·4	68·5	+ 0·9	83·0	6th	57·0	3rd and 12th.
Graaff-Reinet (Convent)	The Mother Superior	89·1	57·8	73·4	71·8	+ 1·6	103·8	22nd	47·0	12th.
Grahamstown	The Vet. Res. Officer	75·0	53·7	64·4	67·6	− 3·2	100·6	22nd	44·2	30th.
Groot Drakenstein	Lionel Baker	83·8	60·7	72·2	70·4	+ 1·8	94·8	30th	50·0	13th.
Kenhardt	R. Seydell	96·4	64·2	80·3	78·4	+ 1·9	103·0	4th	54·0	2nd and 3rd.
Kimberley	F. W. J. Schmidt	92·1	62·8	77·4	75·7	+ 1·7	100·0	27th	53·0	2nd.
Kingwilliamstown	W. A. Kindness	78·8	57·9	68·4	69·8	− 1·4	98·0	22nd	51·0	12th, 13th, and 14th.
Kokstad	H. D. Coyte	76·4	52·0	64·2	63·2	+ 1·0	91·4	5th	42·0	29th.
Mafeking (Convent)	The Mother Superior	89·1	60·5	74·8	74·7	+ 0·1	96·5	5th	52·2	12th.
Mossel Bay (Cape St. Blaize)	The Lightkeeper	73·3	63·3	68·3	67·5	+ 0·8	77·0	5th, 8th, 24th, 28th, and 31st	56·0	12th.
Murraysburg	W. H. Rose-Innes	—	—	—	69·4	—	—	—	—	—
O'okiep	J. Burrows	85·8	59·3	72·6	71·4	+ 1·2	95·7	15th	50·0	23rd.
Port Elizabeth	The Lightkeeper	74·0	61·5	67·8	67·7	+ 0·1	87·0	6th	56·0	16th.
Port Nolloth	The Lightkeeper	66·5	53·4	60·0	59·0	+ 1·0	89·0	29th	46·0	15th.
Port St. Johns (Cape Hermes)	The Lightkeeper	70·2	65·0	70·6	71·4	− 0·8	81·0	1st and 6th	59·0	23rd.
Queenstown	H. Holley	83·7	53·8	68·8	68·4	+ 0·4	96·0	23rd	43·0	12th.
Somerset East	C. Harris	81·1	54·7	67·9	69·1	− 1·2	101·5	22nd	42·8	12th.
Stutterheim	F. C. Bousfield	77·4	54·6	66·0	65·9	+ 0·1	95·0	22nd	46·3	12th.
Sydney's Hope	Rev. S. Rippon	76·9	55·3	66·1	65·2	+ 0·9	99·5	22nd	46·0	12th.
Uitenhage	H. Inggs	80·1	59·2	69·6	70·2	− 0·6	100·8	22nd	48·0	13th.
Umtata	P. Hackett	79·6	58·1	68·8	69·1	− 0·3	94·8	22nd	53·0	11th.
Vryburg	Chas. Butler	91·7	61·4	76·6	75·3	+ 1·3	100·0	27th	51·0	3rd.
Wynberg (Convent)	The Mother Superior	78·4	60·1	69·2	66·3	+ 2·9	89·5	21st	54·0	8th and 13th.
Basutoland—										
Mafeteng	F. Hodgson	82·6	53·6	68·1	69·6	− 1·5	90·0	27th	44·0	2nd.

RAINFALL, DECEMBER, 1923.

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Transvaal—		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Barberton	W. Grubb	6·04	4·74	+ 1·30	29·71	31·79	− 2·08	10·14	14·02	− 3·88
Belfast	The Forester	4·45	5·83	− 1·38	28·17	32·45	− 4·28	13·44	15·93	− 2·49
Bethal	H. F. Joubert	4·28	5·34	− 1·06	26·07	29·61	− 3·54	9·64	15·61	− 5·97
Bloemhof	F. Osborne	0·47	2·12	− 1·65	13·50	18·36	− 4·86	3·61	6·54	− 2·93
Claremont	—	—	—	—	—	—	—	—	—	—
Ermelo	The Forester	3·75	5·59	− 1·84	17·60	31·67	−14·07	9·53	17·12	− 7·59
Haenertsburg	S.A. Police	7·15	5·79	+ 1·36	46·45	38·37	+ 8·08	11·30	13·99	− 2·69
Heidelberg	W. ter Horst	2·55	4·27	− 1·72	22·48	28·38	− 5·90	8·32	14·03	− 5·71
Johannesburg (Observatory)	The Staff	2·33	4·82	− 2·49	26·47	30·73	− 4·26	9·20	14·38	− 5·18
Klerksdorp (Strathmore)	C. Scott	1·09	3·66	− 2·57	18·20	23·28	− 5·08	3·97	9·80	− 5·83
Komatipoort	H. J. Evans	4·35	3·92	+ 0·43	37·07	27·65	+ 9·42	6·18	9·91	− 3·73
Louis Trichardt	C. L. Cope	6·84	5·35	+ 1·49	43·00	30·10	+12·90	9·96	11·91	− 1·95
Middelburg	Dr. H. A. Spencer	4·16	4·65	− 0·49	26·88	29·00	− 2·12	10·69	14·14	− 3·45
Nylstroom	G. Bakker	3·05	3·94	− 0·89	24·06	24·87	− 0·81	7·05	10·76	− 3·71
Pietersburg	G. Frankelyne	4·37	4·39	− 0·02	19·07	21·28	− 2·21	8·98	9·90	− 0·92
Piet Retief	J. Werner	3·67	5·89	− 2·22	28·12	36·29	− 8·17	10·45	18·04	− 7·59
Pigeonhole (New Agatha)	J. McCallum	10·11	7·66	+ 2·45	68·69	47·66	+21·03	13·11	18·81	− 5·70
Pilgrims Rest	E. M. Skea	6·51	5·79	+ 0·72	50·61	40·09	+10·52	11·84	14·34	− 2·50
Potchefstroom	The Manager	1·90	4·25	− 2·35	19·32	23·66	− 4·34	5·60	11·00	− 5·40
Pretoria (Meteorological Office)	The Staff	5·01	4·62	+ 0·39	27·45	29·39	− 1·94	9·74	13·47	− 3·73
Roodberg	N. H. Munro	4·26	3·63	+ 0·63	23·72	24·83	− 1·11	8·00	10·66	− 2·66
Rustenburg	A. Streatfield	1·44	4·40	− 2·96	25·29	26·44	− 1·15	7·07	11·95	− 4·88
Standerton	—	—	—	—	—	—	—	—	—	—
Wakkerstroom	—	—	—	—	—	—	—	—	—	—
Woodbush	The Forester	10·50	11·15	− 0·56	86·07	71·31	+14·76	15·92	26·08	−10·16
Zeerust	H. Dietrich	4·64	3·53	+ 1·11	28·99	23·90	+ 5·09	11·83	9·73	+ 2·10
Swaziland—										
Mbabane	The Swaziland Police	13·00	8·02	+ 4·98	64·38	53·04	+11·34	20·94	23·51	− 2·57
Orange Free State—										
Bethulie	J. J. Wardhaugh	1·73	2·19	− 0·46	15·66	17·60	− 1·94	4·54	6·19	− 1·65
Bloemfontein	G. A. Schepers	0·20	2·27	− 2·07	25·22	21·68	+ 3·54	4·64	7·79	− 3·15
Boshof	The Postmaster	0·00	2·02	− 2·02	23·36	19·45	+ 3·91	2·75	7·36	− 4·61
Harrismith	The Forester	4·06	4·30	− 0·24	24·10	29·50	− 5·40	10·71	13·98	− 3·27
Kroonstad	S. R. Northfield	0·98	3·19	− 2·21	18·37	24·25	− 5·88	5·84	9·94	− 4·10
Ladybrand	The Forester	1·16	3·23	− 2·07	23·35	27·27	− 3·92	7·52	11·99	− 4·47
Lindley	J. Collister-Oates	1·67	3·69	− 2·02	18·52	24·20	− 5·68	4·77	10·66	− 5·89
Natal—										
Dundee	W. Thorrold	4·43	5·17	− 0·74	22·64	32·09	− 9·45	9·54	14·43	− 4·89
Durban (Point)	The Port Captain	6·08	4·92	+ 1·16	31·88	41·51	− 9·63	13·95	20·72	− 6·77
Estcourt	The Town Clerk	2·20	4·67	− 2·47	22·01	28·91	− 6·90	8·98	12·34	− 3·36
Hlabisa	The Gaoler	8·09	5·99	+ 2·10	—	43·74	—	—	20·92	—
Howick	The Gaoler	6·04	4·55	+ 1·49	26·97	33·34	− 6·37	11·23	15·03	− 3·80

RAINFALL, DECEMBER, 1923—(*continued*).

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		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Ladysmith	D. A. R. Leathern	3·49	4·58	− 1·09	21·44	28·47	− 7·03	8·65	12·25	− 3·60
Maritzburg (Mental Hospital)	The Staff	3·16	5·53	− 2·37	25·09	37·27	− 12·18	6·98	17·26	− 10·28
Stanger	C. C. Foss	5·67	6·11	− 0·44	35·16	42·66	− 7·50	12·79	22·50	− 9·71
Vrijheid	The Gaoler	3·80	5·95	− 2·15	23·85	35·01	− 11·16	12·72	16·77	− 4·05
Weenen	The Gaoler	1·46	3·93	− 2·47	14·07	27·34	− 13·27	7·41	12·10	− 4·69
Cape—										
Aliwal North	A. Alcock	0·45	2·49	− 2·04	18·18	20·36	− 2·18	4·04	7·76	− 3·72
Beaufort West	The Gaoler	0·25	0·85	− 0·60	8·28	9·58	− 1·30	2·77	3·50	− 0·73
Bedford	T. C. Hall	0·78	2·81	− 2·03	23·24	26·58	− 3·34	6·53	11·01	− 4·48
Britstown	The Gaoler	0·00	0·87	− 0·87	8·68	11·45	− 2·77	1·66	3·24	− 1·58
Calvinia	The Gaoler	0·00	0·22	− 0·22	9·24	8·23	+ 1·01	2·80	3·49	− 0·69
Capetown (Royal Observatory)	The Staff	0·21	0·86	− 0·65	27·89	25·54	+ 2·35	12·93	12·89	+ 0·04
Ceres	A. Heathe	0·40	1·32	− 0·92	40·21	41·47	− 1·26	17·94	22·79	− 4·85
Carnarvon	A. P. Malherbe	0·00	0·45	− 0·45	8·35	7·89	+ 0·46	1·65	2·24	− 0·59
Clanwilliam	The Gaoler	0·03	0·17	− 0·14	9·68	8·66	+ 1·02	2·61	4·33	− 1·72
Concordia	F. R. Carstens	0·00	0·21	− 0·21	7·17	6·40	+ 0·77	1·36	2·70	− 1·34
East London	A. Downie	7·91	3·24	+ 4·67	38·99	32·74	+ 6·25	19·76	16·25	+ 3·51
French Hoek (Driefontein)	The Forester	1·14	1·68	− 0·54	96·51	80·04	+ 16·47	50·60	38·48	+ 12·12
Fraserburg	The Gaoler	0·00	0·37	− 0·37	6·02	6·71	− 0·69	1·48	2·00	− 0·52
Grahamstown	Vet. Res. Officer	1·83	2·52	− 0·69	18·82	28·03	− 9·21	8·43	13·80	− 5·37
Garies	The Gaoler	0·00	0·12	− 0·12	4·55	4·98	− 0·43	1·56	2·51	− 0·95
Graaff-Reinet (Convent)	The Mother Superior	0·14	1·30	− 1·16	11·16	13·85	− 2·69	5·35	5·67	− 0·32
Groot Drakenstein	L. Baker	0·60	0·97	− 0·37	50·46	35·59	+ 14·86	23·06	18·58	+ 4·48
Griquatown	The Gaoler	0·00	1·25	− 1·25	9·95	12·90	− 2·95	0·35	3·69	− 3·34
Hanover	The Gaoler	0·10	0·99	− 0·89	11·75	13·20	− 1·45	1·50	4·07	− 2·57
Hopetown	The Gaoler	0·13	1·02	− 0·89	11·44	12·56	− 1·12	1·99	3·76	− 1·77
Kenhardt	B. Seydell	0·00	0·39	− 0·39	9·72	5·76	+ 3·96	0·96	1·53	− 0·57
Kimberley	F. W. J. Schmidt	0·44	1·97	− 1·53	13·35	16·05	− 2·70	2·52	5·73	− 3·21
Knysna	The Gaoler	1·31	2·40	− 1·09	27·10	28·57	− 1·38	11·53	14·91	− 3·38
Kokstad	H. D. Coyte	3·03	4·03	− 1·00	34·20	27·04	+ 7·16	12·92	11·65	+ 1·27
Kingwilliamstown	W. A. Kindness	3·94	2·73	+ 1·21	29·13	25·09	+ 4·04	15·20	11·66	+ 3·54
Kuruman	—	—	2·24	—	—	16·87	—	—	4·93	—
Mafeking (Convent)	The Mother Superior	1·90	3·60	− 1·70	21·12	22·60	− 1·48	7·50	9·26	− 1·67
Mossel Bay (Cape St. Blaize)	The Lightkeeper	0·38	1·36	− 0·98	15·07	17·20	− 2·13	6·37	8·49	− 2·12
Murraysburg	W. H. Rose-Innes	0·00	0·92	− 0·92	11·12	10·89	+ 0·23	2·94	3·57	0·63
O'okiep	J. Burrows	0·00	0·19	− 0·19	7·15	6·97	+ 0·18	1·78	3·30	− 1·52
Phillipstown	The Gaoler	0·00	1·23	− 1·23	8·93	13·45	− 4·52	1·18	4·16	2·98
Piquetberg	The Gaoler	0·66	0·68	− 0·02	21·68	20·84	+ 0·84	8·62	11·43	− 2·81
Port Elizabeth	The Lightkeeper	1·14	1·62	− 0·48	20·69	22·37	− 1·68	8·13	12·12	− 3·99
Port St. Johns (Cape Hermes)	The Lightkeeper	4·90	5·81	− 0·91	48·88	50·01	− 1·13	24·10	24·97	− 0·87
Port Nolloth	The Lightkeeper	0·00	0·07	− 0·07	2·28	2·36	− 0·08	0·88	1·08	− 0·20
Prieska	The Gaoler	0·00	0·75	− 0·75	9·47	9·65	− 0·18	0·93	2·42	− 1·49
Queenstown	H. Holley	1·16	2·95	− 1·79	18·76	22·81	− 4·05	4·11	8·84	− 4·73
Steytlerville	The Gaoler	0·00	0·79	− 0·79	9·97	9·31	+ 0·66	3·09	3·72	− 0·63

RAINFALL, DECEMBER, 1923—(*continued*).

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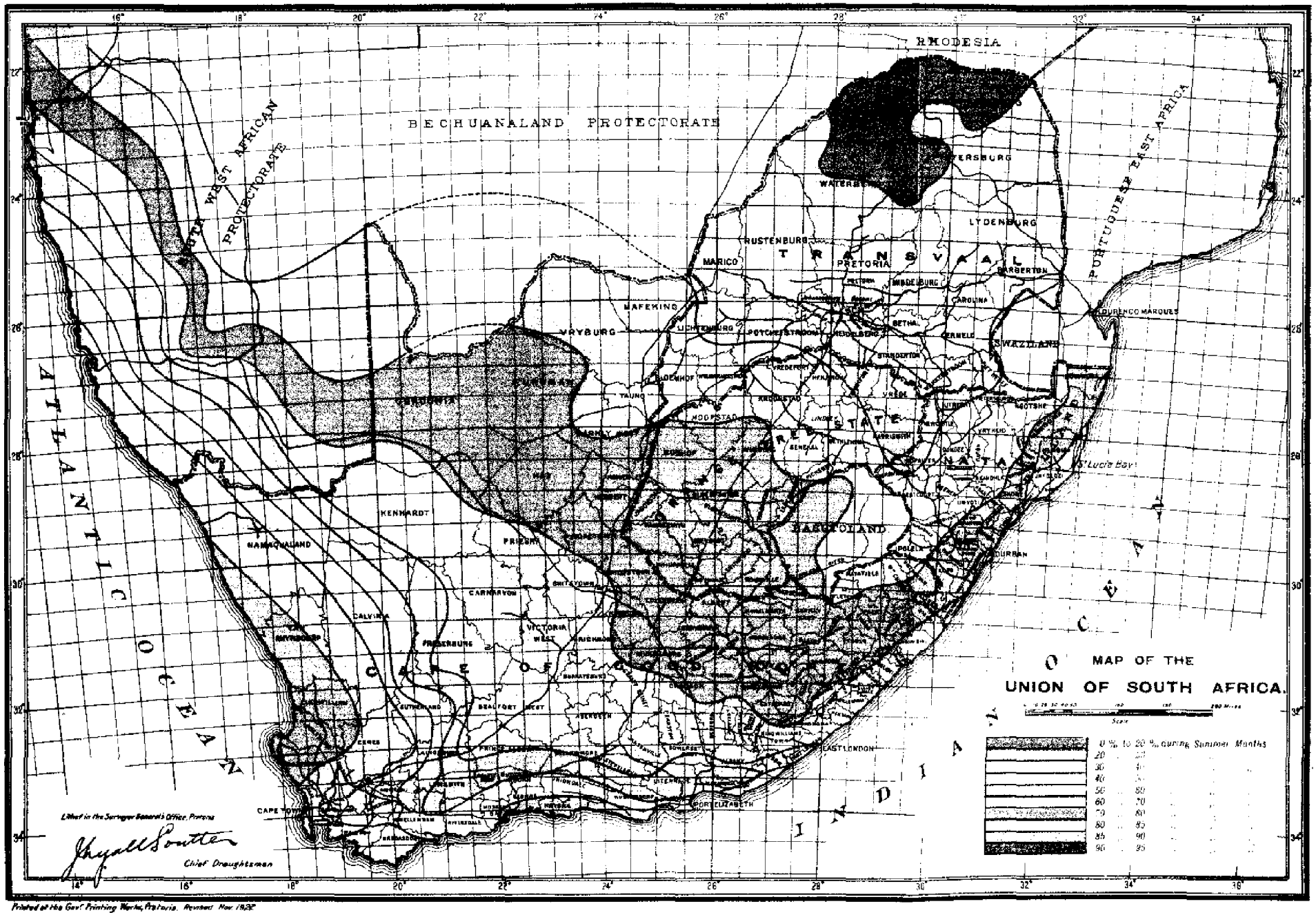
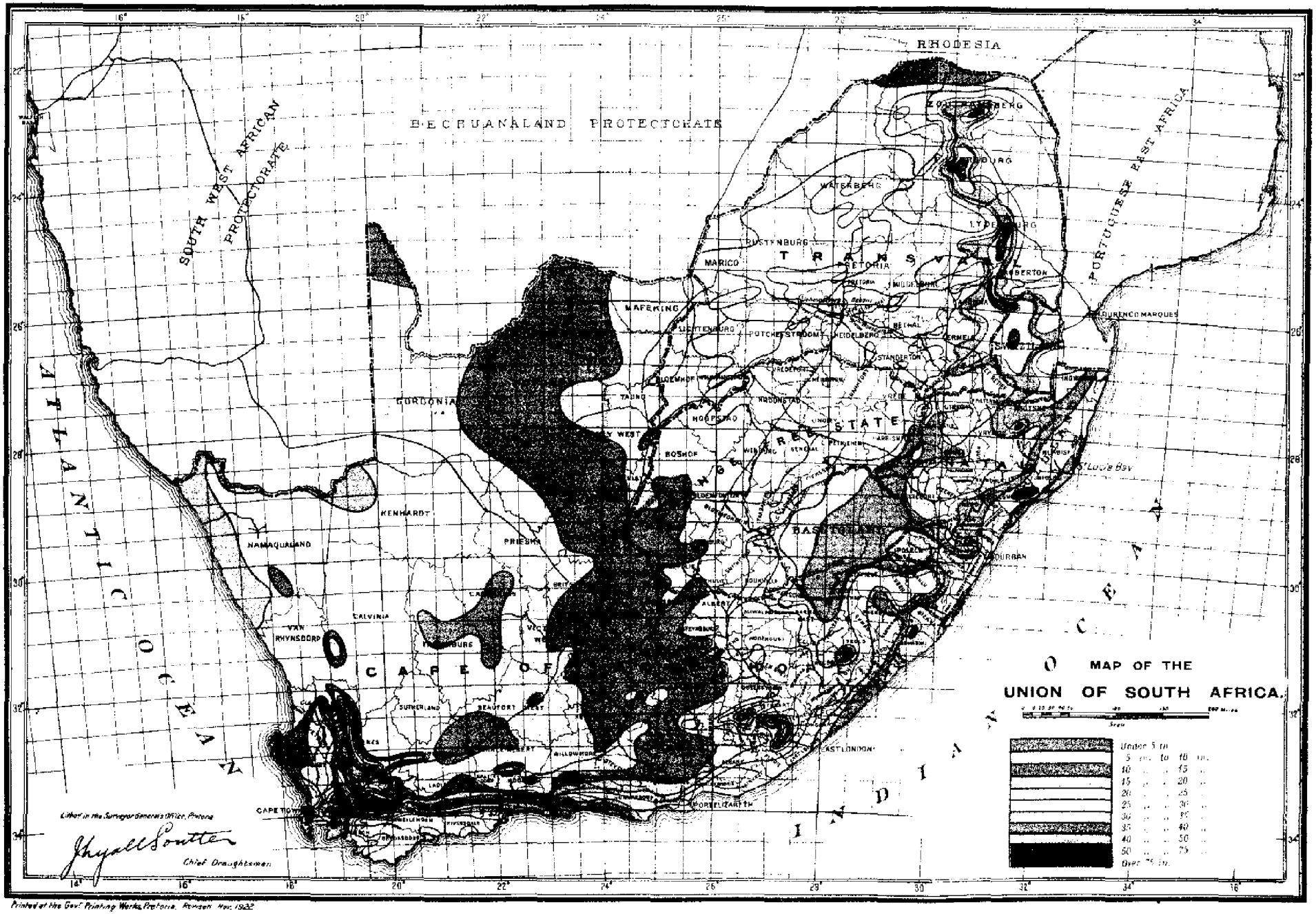
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Sutherland	The Gaoler	0·00	0·39	− 0·39	7·72	9·38	− 1·66	2·88	3·97	1·09
Swellendam	The Gaoler	0·32	2·88	− 2·56	24·37	31·85	− 7·48	9·39	15·60	− 6·21
Sydney's Hope	Rev. S. Rippon	1·23	2·07	− 0·84	17·08	22·57	− 5·49	7·99	10·92	− 2·93
Somerset East	C. Harris	1·10	2·83	− 1·73	19·91	25·47	− 5·56	8·47	11·21	− 2·74
Stutterheim	F. C. Bousfield	6·45	3·74	+ 2·71	43·27	29·83	+13·44	16·38	13·21	+ 3·17
Uitenhage	H. Inggs	1·38	1·29	+ 0·09	18·10	17·24	+ 0·86	8·20	8·44	− 0·24
Umtata	B. Hackett	2·36	3·01	− 0·65	29·51	25·44	+ 4·07	9·95	10·98	− 1·03
Uniondale	The Gaoler	0·27	0·64	− 0·37	10·29	13·31	− 3·02	4·45	6·38	− 1·93
Upington	The Gaoler	0·00	0·72	− 0·72	8·72	7·18	+ 1·54	0·34	1·97	− 1·63
Victoria West	The Gaoler	0·00	0·89	− 0·89	9·80	10·41	− 0·61	1·82	3·18	− 1·36
Vryburg	Chas. Butler	1·09	2·53	− 1·44	23·75	19·13	+ 4·62	7·59	5·90	+ 1·69
Worcester	The Gaoler	0·10	0·39	− 0·29	8·60	12·53	− 3·93	3·79	6·66	− 2·87
Wynberg (Convent)	The Mother Superior	0·39	1·22	− 0·83	48·91	46·16	+ 2·75	24·37	25·84	1·47
Basutoland—										
Maseteng	F. Hodgson	0·49	4·68	− 4·19	31·98	31·69	+ 0·29	5·27	12·33	− 7·06
South-West Africa—										
Aus	E. Marthins	0·00	0·11	− 0·11	6·95	4·19	+ 2·76	2·75	1·16	+ 1·59
Bethanie	Rev. Peter	0·00	0·32	− 0·32	12·03	4·66	+ 7·37	1·40	0·75	+ 0·65
Duesternbrook	I. and R. Matthiessen	0·49	1·24	− 0·75	23·46	13·99	+ 9·47	0·58	2·39	− 1·81
Fraunfontein	H. Janson	0·49	1·31	− 0·82	8·37	9·96	− 1·59	0·69	2·10	− 1·41
Gabis	Rev. P. Rehor	0·00	0·32	− 0·32	5·98	4·73	+ 1·25	1·70	1·28	+ 0·42
Garinais	F. Bertling	0·00	0·48	− 0·48	13·27	5·97	+ 7·30	2·96	1·44	+ 1·52
Gibeon	Rev. Spellmeyer	0·00	3·27	− 3·27	12·57	9·17	+ 3·40	0·62	4·09	− 3·47
Gobabis	Rev. Irle	0·40	2·05	− 1·65	20·69	15·92	+ 4·77	2·49	3·86	− 1·37
Grootfontein	Pitkowski	1·31	4·12	− 2·81	34·76	23·61	+11·15	3·41	6·62	− 3·21
Gr. Witvley	Maass	0·48	1·89	− 1·41	20·10	14·87	+ 5·23	1·31	3·43	− 2·12
Karibes	Cpt. Meyer	0·03	0·29	− 0·26	16·65	7·39	+ 9·26	0·40	1·35	− 0·95
Heirachabis	E. Troka	0·00	0·42	− 0·42	6·19	3·88	+ 2·31	1·75	0·91	+ 0·84
Maltahoehe	E. Just	0·00	0·45	− 0·45	10·79	5·99	+ 4·80	0·60	0·96	− 0·36
Neu-Heusis	Liebig's Extract Co.	0·01	1·56	− 1·55	16·65	14·44	+ 2·21	0·70	2·94	− 2·24
Okahandja	B. Templin	0·29	0·81	− 0·52	23·56	13·56	+10·00	0·60	1·99	− 1·39
Okasisjose	Von Gossler	2·12	0·76	+ 1·36	31·29	15·93	+15·36	2·94	2·60	+ 0·34
Okasúgamango	R. H. A. Schneider	1·96	1·80	+ 0·16	29·63	17·85	+11·78	4·17	5·09	− 0·92
Omaruru	The Postmaster	0·27	1·28	− 1·01	20·71	11·21	+ 9·50	0·54	2·13	− 1·59
Rehoboth	The Postmaster	0·00	0·98	− 0·98	21·57	10·39	+11·18	0·00	2·08	− 2·08
Rietfontein	B. Leist	1·23	3·08	− 1·85	34·30	21·06	+13·24	2·88	6·37	− 3·49
Swakopmund	E. Sievert	0·00	0·11	− 0·11	0·39	0·00	− 0·27	0·01	0·29	− 0·28
Tsumeb	Ing. Schetter	1·76	4·22	− 2·46	29·70	24·23	+ 5·47	3·20	7·12	− 3·92
Usakos	Rev. Diehl	0·00	0·54	− 0·54	8·24	5·38	+ 2·86	0·00	0·99	− 0·99
Voigtsgrund	A. Voigts	0·00	0·60	− 0·60	26·15	7·40	+18·75	1·09	1·29	− 0·20
Waterberg	D. Hahn	1·28	3·03	− 1·75	29·38	20·23	+ 9·15	3·79	5·04	− 1·25
Windhoek	Observatory	1·87	1·64	+ 0·23	29·65	13·30	+16·35	2·78	2·91	− 0·13

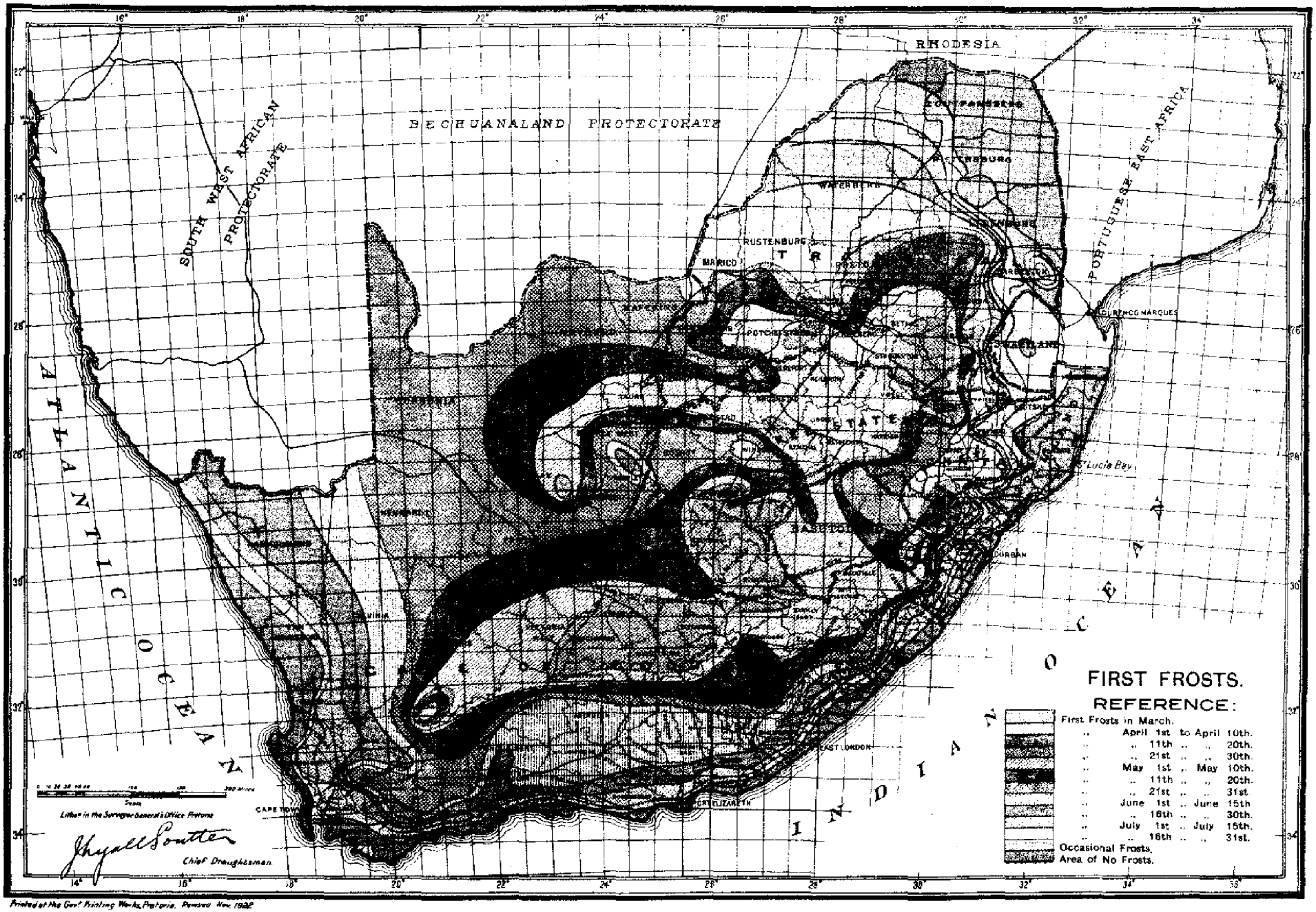
SEASONAL DISTRIBUTION OF RAINFALL.



AVERAGE ANNUAL RAINFALL.



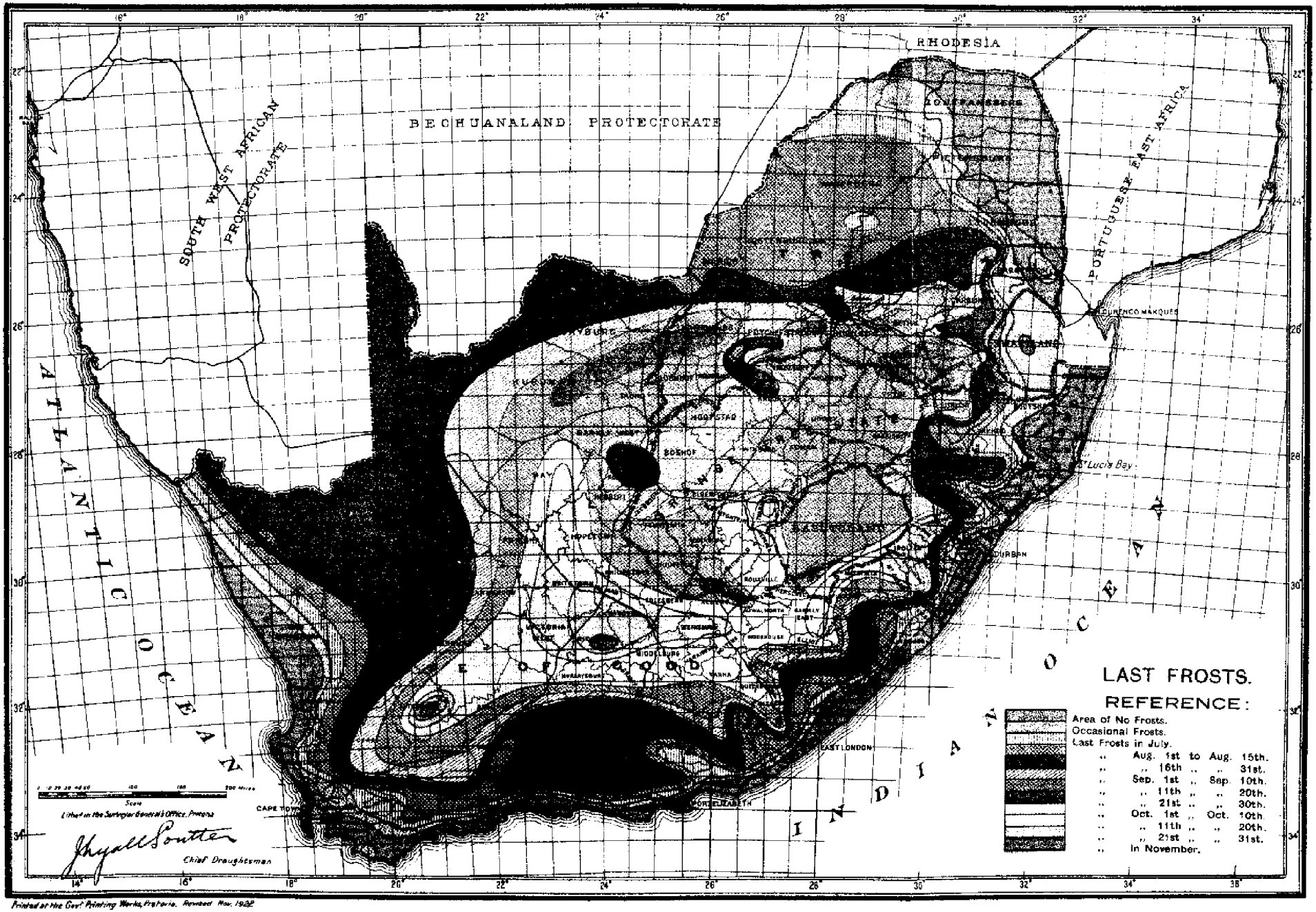
FROST MAP OF THE UNION OF SOUTH AFRICA.



Printed at the Gov't Printing Works, Pretoria. Revised Nov. 1922

NOTE.—The originals of these Frost Maps were drawn and the data compiled by Mr. R. K. Hattersley under the direction of the Chief Meteorologist.

FROST MAP OF THE UNION OF SOUTH AFRICA.



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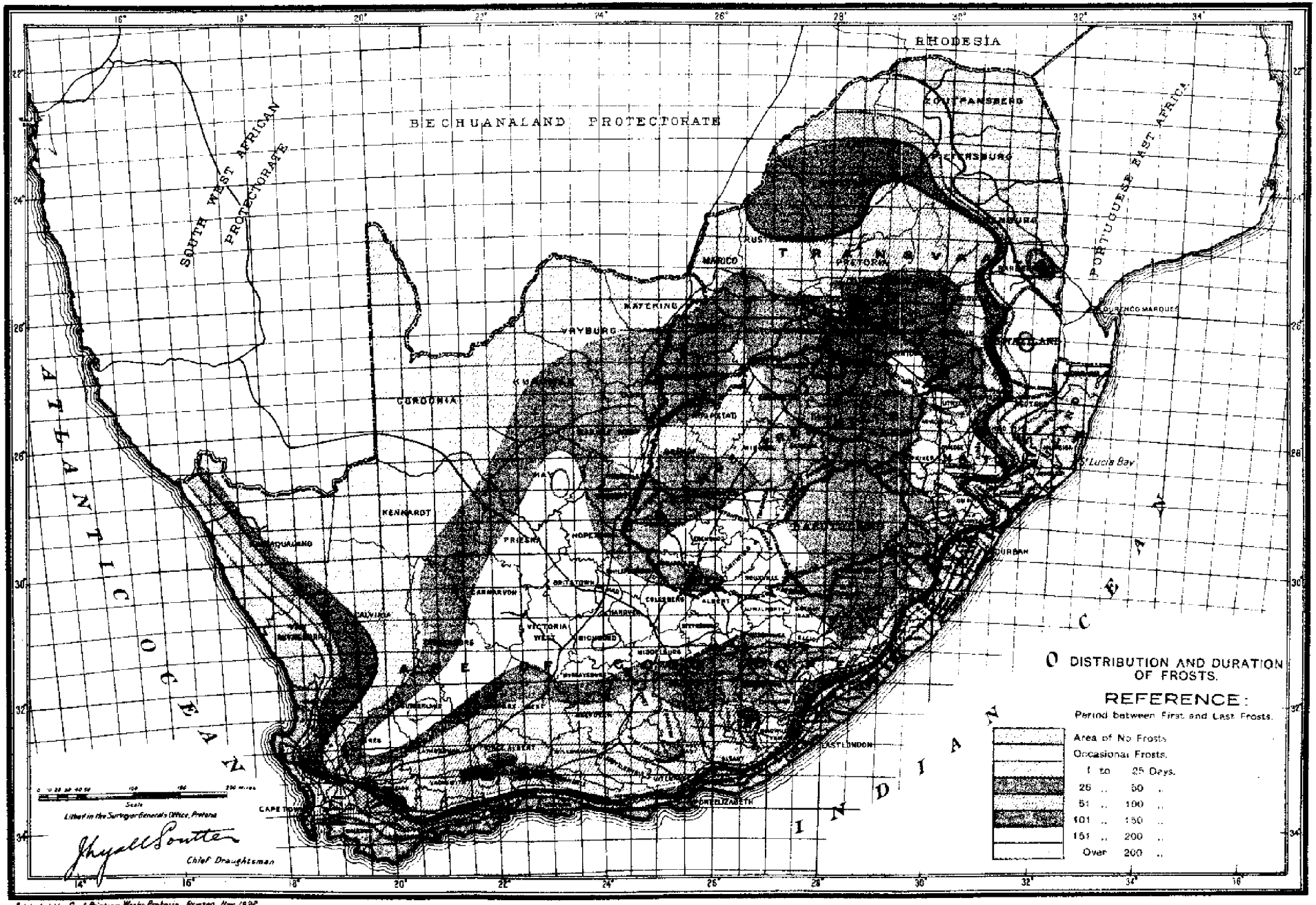
FROST MAP OF THE UNION OF SOUTH AFRICA.



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