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M.O. 353

AIR MINISTRY

METEOROLOGICAL OFFICE

NOTES ON THE
METEOROLOGICAL OBSERVATIONS

MADE IN

BRITISH COLONIES AND PROTECTORATES, ETC.

IN

1930

AND

Summarised in the Annual Reports of Colonial Governments

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TABLE OF CONTENTS

	Page
Gibraltar	4
Cyprus	4
Malta	5
Hong Kong	5
Ceylon	6
Malaya	7
Palestine	8
Gambia	8
Gold Coast	9
Nigeria	9
Sierra Leone	10
Nyasaland	10
Tanganyika	11
Uganda	11
Zanzibar and Pemba Island	12
Basutoland	13
Bechuanaland Protectorate	13
Northern Rhodesia	13
Swaziland	14
Bermuda	14
Bahamas	14
Jamaica	15
Leeward Islands	15
Grenada	16
St. Lucia	16
St. Vincent	17
Barbados	17
Trinidad	17
British Guiana	18
Falkland Islands	18
Mauritius	18
Seychelles	19
Fiji	19
South Georgia	20
Errata	20

NOTES ON THE METEOROLOGICAL OBSERVATIONS MADE IN BRITISH COLONIES AND PROTECTORATES, ETC. IN 1930

And Summarised in the Annual Reports of Colonial Governments

Regular meteorological observations have been made for many years past in the British Colonies and Protectorates at the request of the Home Government and since 1907 summaries of these observations, on a form drawn up in the Meteorological Office, have been included in the Annual Reports of the Colonial Governments. In order to render the valuable material thus accumulated more readily available, the Secretary of State for the Colonies has requested the Colonial Governments to forward reprints of these tables to the Meteorological Office, London, for distribution among the meteorological institutions in the Empire and in foreign countries with which it maintains an exchange of publications. This scheme has now been in operation since 1910 and through it valuable meteorological information has been rendered accessible.

The observations are in most cases taken under the supervision of officers who are engaged in scientific work but who have not all received special training in meteorological work. The procedure adopted in the different Colonies has varied and the tables do not always contain all the information required for full use of the material. A questionnaire requesting further information as to the observations, was therefore prepared in the Meteorological Office and circulated through the Colonial Office to the Governors of the Colonies and Protectorates concerned. From the replies received and from a scrutiny of the printed summaries, and also of the daily observations when available, a compilation of "Notes" was made and issued with the summaries for 1923. Supplementary notes were issued with the summaries for 1924 and 1925; beginning with 1926 the "Notes" have been published annually as an introduction to the collection of reprints. Changes which have been introduced since 1923 are marked by the date of the change in square brackets. For ready reference it is suggested that this introduction may be bound or filed with the meteorological observations for the year 1930.

The "Notes" include a statement as to the hours of observations, the standard of time in use, and a brief reference to the exposure of the instruments. The exposure for thermometers recommended in the *Observer's Handbook* of the Meteorological Office, is in a Stevenson screen, freely exposed to sun and wind and not shaded by trees or buildings. The site prescribed for the exposure of the rain-gauge is a level grass plot, the rim of the gauge being one foot above the ground. The sheltering effect of trees, bushes, buildings, &c., must be avoided and the regulations adopted by the Meteorological Office specify that the distance between the gauge and any object should be at least twice the height of that object. When the site and exposure of the instrument appear to satisfy these conditions they are described as "conventional." Formerly the thermometers at stations of the Meteorological Services of the Governments of India and Ceylon were exposed in wire cages, placed in huts with open sides, freely exposed to wind and sun. That form of exposure was regarded as generally appropriate for tropical conditions and was described in *Hints to Observers in Tropical Africa* issued by the Meteorological Office in 1907. It has been adopted at many tropical stations outside the Indian system. Instances are given in these notes. Experiments in India* and Ceylon† have shown that Stevenson screens, if freely exposed, afford as much protection against solarisation as the other form of exposure, even under tropical conditions, and it is understood that Stevenson screens are being introduced at the Indian stations; they have also been in use during 1930 at all the stations in Ceylon except Hakgala (see page 6). In many tropical countries it is not possible to place the rain-gauge over grass and there is risk of in-splashing of rain-drops during heavy showers. The gauges are therefore placed at greater heights than one foot above the ground. Particulars are given in each instance.

* *Indian Meteorological Memoirs*, 24, Part III, 1922.

† *Colombo, Ceylon J. Sci.* (Sec. E.), 1, 1928, pt. 2, p. 153.

The latitudes, longitudes and heights of the stations are stated when this information is not given in the reprints. Then follows information as to the corrections applied to the readings of the barometer, the method of deducing the mean pressure for the day from the observations at the specified hours,† the hours of setting and reading the self-registering thermometers, the definitions adopted by the observer of "a day with rain," &c., any point being included which throws light on the meanings of the tables and the reliability of the data. Unless otherwise stated the heights of stations are the heights of the barometer cisterns above M.S.L., or if no barometer is in use, the heights above M.S.L. of the sites of the rain-gauges. For some stations, indicated by an asterisk against the name of the station, the daily observations are available in print or in manuscript and it has been possible to examine the published summaries in detail; in this way a number of errata have been discovered which are set out on pp. 20-23. For purposes of reference the years for which observations were first published have been noted for the majority of the stations.

The order in which the various Colonies are arranged is the same as that given in the geographical section of the *International Catalogue of Scientific Literature*, published by the Royal Society. This order has been adopted in the lists of contents of previous sets of summaries.

NOTES ON THE TABLES, 1930.

*Gibraltar

[Observations first published, 1852; interrupted, 1862-1863].

Hours of observation—7h., 13h., 18h., 21h., G.M.T.

The Observatory is situated in the public gardens near the sea front, on the south-west side of the Rock and 102 feet above M.S.L. [1929.]

The exposure of the instruments is "conventional."

The height of the barometer above M.S.L. is 90 feet. [1929.]

Pressure— $\frac{1}{3}$ (7 + 13 + 21h.); readings are reduced to 32°F., lat. 45° and M.S.L.

Temperature—Mean $\frac{1}{3}$ (7 + 13 + 21h.).

Maximum set at 7h. and read at 18h.

Minimum set at 18h. and read at 7h.

The absolute extremes refer, however, to the whole period of 24 hours.

Vapour Pressure and Relative Humidity—Computed from "Hygrometric Tables" published by the Meteorological Office, London, 1924 (M.O. 265). [1926.]

Rainfall—Rim of rain-gauge is 2 feet above a flat roof. [1929.]

Totals refer to the 24 hours beginning at 7h.

Definition of—Day with rain .. 0.1 mm. or more. [1927.]

Day with clear sky .. mean cloud amount (from observations taken 4 times a day) less than 2 tenths.

Day with overcast sky .. mean cloud amount (from observations taken 4 times a day) more than 8 tenths.

Day with gale wind force 8 or more (Beaufort scale).

Wind—An anemometer was erected at Four Corners in August, 1930, the orientation being to true north. Previously wind directions were referred to "magnetic" north.

Cyprus

There are three stations, under the control of the Public Works Dept.

[Nicosia observations first published, 1907].

[Acheritou " " " 1912].

[Limassol " " " 1913].

Hours of observation, 8h. and 14h., zone time, 2 hours fast on G.M.T.

The site and the exposure of the instruments are "conventional" and the instruments are tested, usually once every two years, by an official of the Physical Department, Cairo.

Pressure— $\frac{1}{2}$ (8 + 14h.); readings are reduced to 32°F., lat. 45° and M.S.L.

† E.g. the mean of observations at 7h., 13h. and 21h., is represented by the formula $\frac{1}{3}$ (7 + 13 + 21h.).

Temperature—Mean $\frac{1}{2}$ (max. + min.)

Maximum read and set at 8h., and entered to previous day.

Minimum read and set at 8h., and entered to day of reading.

Vapour Pressure and Relative Humidity—Computed from Glaisher's Hygrometric Tables.

Rainfall—Rim of rain-gauge is 1 foot above the ground.

Totals refer to the 24 hours beginning at 8h.

Definition of—Day with rain .. 0.01 in. or more.

Day with clear sky cloudless sky.

Day with overcast sky .. mean cloud amount more than 5 tenths.

Wind—The wind direction refers to "magnetic" north.

Robinson cup anemometers are in use, but no data of wind force are published. It is stated that no gales are experienced.

Malta

[Observations first published, 1852; interrupted, 1855-1857].

Hours of observation—8h., zone time, one hour fast on G.M.T.

The site and the exposure of the instruments are "conventional."

There has been no change of site.

The observations were taken at the University throughout the year, and not at the station established at the Meteorological Office on April 20, 1928, which supplies data for the British *Monthly Weather Report*.

Pressure—8h. Readings are reduced to 32°F., lat. 45° and M.S.L. [1924].

Temperature—Mean $\frac{1}{2}$ [8h. + $\frac{1}{2}$ (max. + min.)]

Maximum read and set at 8h. [1930.]

Minimum read and set at 8h. [1930.]

Vapour Pressure and Relative Humidity—Computed from "Hygrometric Tables" published by the Meteorological Office, London, 1924. (M.O. 265). [1926].

Rainfall—Rim of rain-gauge is 59 feet above the ground.

Totals refer to the 24 hours beginning at 8h.

Definition of—Day with rain 0.01 in. or more.

Day with clear sky mean cloud amount less than 2 tenths.

Day with overcast sky mean cloud amount more than 8 tenths.

Day with gale day on which the autographic record shows that a force of 8 on Beaufort scale was reached at any time between 0h. and 24h.

Wind—A Robinson cup anemometer and an anemobiograph are in use. The cups are 79 feet above the ground and 8 feet above the roof. The head of the anemobiograph is 15 feet above the roof. The direction is observed to 32 points; the number of entries under N. includes only the winds from N by W., N., and N by E.; similarly the entries under E. include only the winds from E by N., E., and E by S. But under NE. are entered all observations between NNE. and ENE. inclusive (i.e., NNE., NE by N., NE., NE by E. and ENE.); under SE. all observations between ESE. and SSE., &c. The entries under the headings N., E., S. and W. are therefore relatively low and those under NE., SE., SW. and NW. relatively high.

Hong Kong—*Royal Observatory

[Observations first published, 1884].

First order station of the International Classification.

Some elements published for hours of 7h., 13h., 21h., zone time, 8 hours fast on G.M.T.

Pressure—Mean of 24 hourly observations; readings are reduced to 32°F., and lat. 45° at a height of 109 feet above M.S.L.

Temperature—The mean temperature at fixed hours is taken by whirling thermometers.

The daily extremes are taken from the records of a thermograph, and refer to the civil day.

Vapour Pressure and Relative Humidity—Computations based on a formula of the type used for artificially ventilated psychrometers.† This formula has been in use since the beginning of 1928, and the "Notes" for 1928 and 1929 should be amended accordingly.

Rainfall—Rim of rain-gauge is 18 in. above the ground.
Totals refer to the civil day.

Definition of—Day with rain 0.01 in. or more.
Day with clear sky mean cloud amount less than 20 per cent.
Day with overcast sky mean cloud amount more than 80 per cent.

Wind—A Beckley anemometer is in use, with the cups 45 feet above the ground and 13 feet above the roof.

Sunshine—A Campbell-Stokes universal recorder is in use.

Ceylon

Station.	Rain-gauge Ht. of rim.	Years of Observation.	Station.	Rain-gauge Ht. of rim.	Years of Observation.
† Colombo	.. 1 ft. 10 in.	23	Ratnapura	.. 2 ft. 2 in.	62
Puttalam	.. 2 ft. 2 in.	62	Anuradhapura	3 ft. 3 in.	61
Mannar	.. 1 ft. 0½ in.	61	Kurunegala	.. 1 ft. 1 in.	44
Jaffna ..	.. 1 ft. 9 in.	60	Kandy..	.. 1 ft. 6 in.	61
Trincomalee	.. 3 ft. 7 in.	61	Badulla	.. 2 ft. 0 in.	58
Batticaloa	.. 1 ft. 0½ in.	61	Diyatalawa	.. 1 ft. 7 in.	30
Hambantota	.. 1 ft. 9 in.	62	Hakgala	.. 1 ft. 5 in.	47
Gallé ..	.. 2 ft. 2 in.	62	Nuwara Eliya	1 ft. 1 in.	62

Hours of observation 9½h. and 15½h., time of meridian 82½°E., 5½ hours fast on G.M.T.

Pressure—½ (9½ + 15½h.); readings are reduced to 32°F., lat. 45°, and M.S.L.
Only figures from low country stations are included.

Temperature—Large type Stevenson screens are now in use at all the above stations except Hakgala. Most of the thermometer readings in the past have been taken in open sheds, and the averages so obtained have been corrected in the 1930 report to equivalent screen values, by means of comparisons carried on between simultaneous shed and screen readings.

Temperature—Mean ½ (max. + min.).

The average monthly maximum and average monthly minimum temperatures (both dry bulb and wet bulb) are not given separately as such, but the "Average Daily Range" is given (*i.e.*, the difference between the average monthly maximum and minimum), and from this table and the average ½ (max. + min.) values, the average monthly maxima and minima for a number of years can be computed. Offsets from the average monthly mean temperature enable the mean monthly temperatures for the year to be computed. Minimum thermometers are read and set at 9½h. Maximum thermometers are read and set at 15½h., and again at 9½h. The maximum temperature actually booked is the maximum over the six hours 9½h. to 15½h.

Relative Humidity—Computed from tables based on "Tables for the Reduction of Meteorological Observations," published by the Government of India Meteorological Department, 1910. Two sets of relative humidity values are published:—

(1) Monthly averages of mean of 9½h. and 15½h., together with offsets from these averages during the year. These are considered to give a fair indication of humidity conditions during the day-time.

† The formula in use is apparently that known as Pernter's "strong wind" formula, adapted for use with Fahrenheit temperatures and pressures in millibars. See "Hygrometric Tables," published by the London Meteorological Office, M.O. 265, 1931, p. 10.

‡ Data from 1869 for neighbouring station are also published. There is in addition a pluviograph with its rim at 5 ft. 3 in., the catch of which differs very little from that of the standard gauge.

(2) Monthly averages of humidity computed from daily minimum dry and wet temperatures, together with offsets from these averages during the year. These give only approximate humidities, owing to possible lack of synchronisation between dry and wet minima, though the evidence of dry and wet thermographs suggests that temperature and humidity variations are very slight at night.

Rainfall—For heights of rims of rain-gauges above ground see above.

Daily totals refer to the 24 hours beginning with the morning observation.

Self-recording rain-gauges are in use at two of these stations, and at six others.

Definition of—Day with rain 0.01 in. or more.

Wind—Robinson cup anemometers are in use. The heights of the cups above the ground are as follows:—

Colombo	.. 18½ ft.	Batticaloa	.. 35 ft.
Puttalam	.. 14 ft.	Hambantota	11½ ft.
Mannar	.. 13½ ft.	Gallé	.. 12½ ft.
Jaffna	.. 14 ft.	Ratnapura	.. 15 ft.
Trincomalee	14 ft. 9 in.	Diyatalawa	.. 12 ft. 10 in.

above the ground.
This instrument is on the summit of a cliff 100 ft. high.

The heights given are above adjacent ground level. The anemometers at Batticaloa and Gallé are on the ramparts of old forts, and that at Ratnapura is on a crest, which stands out distinctly above the neighbouring ground.

A Dines tube anemometer and an anemobiograph are in use at Colombo.

The data appearing in the annual report of the Ceylon Government include only a part of the data available at Colombo Observatory.

Malaya

The Malayan Meteorological Service now publishes data for the following main stations:—

	Height of rain-gauge above M.S.L.	Rain-gauge Ht. of rim.	First year of observation.
Alor Star, Kedah	.. .. 10 ft.	1 ft.	1930
Kota Bharu, Kelantan	.. .. 19 ft.	1 ft.	1930
Kuala Trengganu	.. .. 105 ft.	1 ft.	1930
Kuala Lipis, Pahang	.. .. 555 ft.	1 ft.	1930
Temerloh	.. .. 165 ft.	1 ft.	1929
Kuala Pahang	.. .. 10 ft.	1 ft.	1929
Bukit Jeram, Selangor	.. .. 196 ft.	1 ft.	1929
Kuala Lumpur (Railway Hill)	.. .. 287 ft.	1 ft.	1928
Malacca	.. .. 149 ft.	1 ft.	1930
Kluang, Johore	.. .. 215 ft.	1 ft.	1929
Mersing	.. .. 187 ft.	1 ft.	1929
Singapore (Mount Faber)	.. .. 296 ft.	1 ft.	1929
Fraser's Hill	.. .. 4,268 ft.	1 ft.	1925
Cameron's Highlands (Tanah Rata)	4,750 ft.	1 ft. 10 in.	1925
Cameron's Highlands (Rhododendron Hill)	5,120 ft.	1 ft.	1925

Hours of observation 9h., 15h., 21h., 105th meridian (E.) time, seven hours fast on G.M.T., except at Cameron's Highlands (Rhododendron Hill) where 9h. and 15h. only. At all stations large type of Stevenson screens are in use. Full details of the observations are given in the Summary.

Data for a number of auxiliary stations are also included.

Palestine

Station.	Rain-gauge Ht. of rim.	First year of Observations.	Station.	Rain-gauge Ht. of rim.	First year of Observations.
Jericho ..	1 metre.	1925	Jerusalem ..	1 metre.	1846§
Jenin ..	1 metre.	1925	Gaza ..	1 metre.	1900||
Haifa ..	1.3 metres.	1897†	Beersheba ..	1 metre.	1925
Tel-Aviv ..	1.2 metres.	1911‡	Acre ..	1 metre.	

Hours of observation 8h., 14h., 20h. at Jericho, Jenin and Acre; 7h., 14h., 21h. at Tel-Aviv; 8h. and 14h. at Haifa; 8h. at Jerusalem, Gaza and Beersheba. Egyptian standard time, 2 hours fast on G.M.T.

The instruments are exposed in standard Egyptian pattern single-louvred screens.

Pressure—readings are reduced to 0°C. and lat. 45° at station level.

Temperature—

Jericho, Jenin and Acre.

Mean ..	..	..	$\frac{1}{4}(8 + 14 + 20h. + \text{min.})$.
Maximum ..	..	..	read and set at 20h. and entered to day of reading.
Minimum ..	..	..	read and set at 8h. and entered to day of reading.

Tel-Aviv.

Mean ..	..	..	$\frac{1}{4}(7 + 14 + 2 \times 21 h.)$.
Maximum ..	..	..	read and set at 21h. and entered to day of reading.
Minimum ..	..	..	read and set at 7h. and entered to day of reading.

Haifa, Jerusalem, Gaza and Beersheba.

Mean ..	..	..	$\frac{1}{2}(\text{max.} + \text{min.})$.
Maximum ..	..	..	read and set at 8h. and entered to previous day.
Minimum ..	..	..	read and set at 8h. and entered to day of reading.

Relative Humidity and Vapour Pressure—Computed from "Jelinek's Psychrometer-Tafeln. Anhang: Hygrometer-Tafeln" by J. M. Pernter. 6th edition. Leipzig, 1911.

Rainfall—For heights of rims of rain-gauges above ground see above.

Totals refer to the 24 hours beginning at 8h.

Gambia—Cape St. Mary

[Observations first published, 1926].

Hour of observation, 9h., time of meridian 16° 40' W., 1 hr. 6 min. 40 sec. slow on G.M.T.

The site and exposure of the instruments are "conventional."

Temperature—

Maximum ..	..	..	read and set at 9h. and entered to previous day.
Minimum ..	..	..	read and set at 9h. and entered to day of reading.

Relative Humidity—Computed from Glaisher's Hygrometric Tables.

Rainfall—Rim of rain-gauge is 1 ft. above the ground.

Totals refer to the 24 hours beginning at 9h.

Definition of—Day with rain .. 0.01 in. or more.

Wind—The velocity is obtained by means of a Robinson cup anemometer, the cups being 10 ft. above the ground.

† Interrupted 1905–24.

‡ Interrupted 1917–22.

§ Interrupted 1849–50 and 1914–24.

|| Interrupted 1905–24.

Gold Coast

[Observations first published, *Accra, 1888; Axim, Tamale and Kumasi, 1914].

Hour of observation, 9h., G.M.T.

At Accra and Kumasi the site and exposure of the instruments are "conventional." At Tamale, the thermometers are exposed in a wire cage under a thatched roof; at Axim in a single louvered screen under a thatched shelter.

Pressure—the values are as read, no corrections having been applied. For corrected (M.S.L.) values at Accra, see p. 20. The barometer at Accra was transferred to a new site in May, 1929.

The heights of the barometer cisterns above M.S.L. are:—Accra, 57.9 ft.; Kumasi, 980 ft.

Temperature—Mean, $\frac{1}{2}(\text{max.} + \text{min.})$.

Maximum and minimum—at Accra, Axim and Tamale the maximum is read and set at 9h. and entered to the previous day; the minimum is read and set at 9h. and entered to day of reading. At Kumasi both maximum and minimum are read and set at 9h., and entered to day of reading.

Relative Humidity—at 9h., computed from Glaisher's Hygrometric Tables.

Rainfall—Height of rim of rain-gauge (h_r) above ground at Kumasi should be 1 ft. 10½ in., and at Tamale 10¼ in.

Totals refer to the 24 hours beginning at 9h.

Definition of—Day with rain—0.01 in. or more.

Day with clear sky—criteria not stated.

Day with overcast sky—criteria not stated.

Wind—At Axim the winds are usually observed to 4 points only.

Nigeria

Hour of observation 9h., local mean time. The following notes give the exposure of the thermometers (A, standard screen; B, modified screen; C, wooden screen under thatched roof or shelter; D, tropical shelter, roof usually thatched, sometimes wood; E, verandah or shaded wall), the heights of the rims of the rain gauges above the ground, and the year for which observations were first published.

Station.	Exposure of thermometer.	Height of rain-gauge.	First Year of Observations.	Station.	Exposure of thermometer.	Height of rain-gauge.	First Year of Observations.
Abeokuta ..	unsatisfactory	in. 15	1905	Kano ..	C	in. 13	1905
Afikpo ..	A	30	1905	Katsina ..	—	—	1923
Asaba ..	D	18	1903	Keffi ..	D	12	1909
Bamenda ..	D	26	1923	*Lagos ..	A	12	1886
Bauchi ..	D	12	1906	Lokoja ..	A	12	1901
Benin City ..	C	24	1903	*Maiduguri ..	D	12	1909
Birnin Kebbi ..	D	12	1909	Makurdi ..	—	—	1926
Brass ..	E	30	1907	Minna ..	D	12	1914
Calabar ..	E	22	1895	Ogoja ..	—	—	1924
Debundscha ..	—	—	1926	Ondo ..	C	9½	1901
Enugu Ngwo ..	C	24	1916	Owerri ..	B	22½	1907
*Hadeija ..	D	9	1918	Port Harcourt	B	14	1915
Ibadan ..	B	16	1901	*Sokoto ..	D	12	1905
Ibi ..	A	12	1909	*†Victoria ..	C with double felt roof	14	1922
Ilorin ..	A	12	1905	Warri ..	A	23	1907
Jos ..	D	22½	1921	Yelwa ..	—	—	1925
*Kaduna ..	A	12	1913	*Yola ..	B	12	1904

† MS. returns available since Feb., 1930.

Pressure.—Lagos—9h.; Kaduna Capital—9h. Prior to 1st September the values published for Kaduna did not include correction to 32°F. For corrected (M.S.L.) values at Kaduna and Lagos see pp. 20 and 21.

Temperature—Mean $\frac{1}{2}$ (max. + min.).

Maximum read and set at 9h., and entered to the previous day.

Minimum read and set at 9h., and entered to day of reading.

Relative Humidity—Computed from "Glaisher's Hygrometric Tables."

At Lagos the relative humidity is the mean of observations at 9h. and 15h. [1927.]

Rainfall—For heights of rims of rain-gauges above ground see above. Totals refer to the 24 hours beginning at 9h.

Definition of—Day with rain 0.01 in. or more.

Sierra Leone

Station.	Rain-gauge Ht. of rim.	First Year of Observations.	Station.	Rain-gauge Ht. of rim.	First Year of Observations.
*Freetown ..	1 ft. 3 in.	1874	Kaiyima ..	No informa- tion.	1927
Batkanu ..	0 ft. 9½ in.	1913			
Bo ..	1 ft. 10 in.	1913	Kissy ..	1 ft.	1913
Bonthe, Sherbro	1 ft.	1913	Makeni ..	1 ft. 6 in.	1923
Daru ..	1 ft. 10 in.	1913	Moiamba ..	1 ft. 4 in.	1913
Hill Station..	2 ft. 6 in.	1916	Njala ..	1 ft.	1926
Kabala ..	1 ft. 10 in.	1913	Pujehun ..	2 ft.	1923

Hours of observation 9h., 17h., Freetown local time, 53 minutes slow on G.M.T.

The heights of the stations (where known) are as follows:—

Freetown (barometer) 224 ft.; rain-gauges:—Batkanu 300 ft., Kissy 350 ft.,

Bo 320 ft., Bonthe, Sherbro 11 ft., Daru 600 ft., Hill Station 650 ft.

The thermometers are exposed in Stevenson screens.

Pressure— $\frac{1}{2}$ (9 + 17h.); readings are reduced to M.S.L. [1924].

Temperature—Mean $\frac{1}{2}$ (9 + 17h.). [1925].

Maximum read and set at 9h., and entered to previous day.

Minimum read and set at 9h., and entered to day of reading.

Vapour Pressure and Relative Humidity—Computed from "Hygrometric Tables" published by the Meteorological Office, London, 1924 (M.O. 265).

Rainfall—For heights of rims of rain-gauges above ground see above.

Totals refer to the 24 hours beginning at 9h.

Definition of—Day with rain 0.01 in. or more [1929], Freetown [1928].

Day with clear sky Day when cloud amount was 0 at either hour of observation [1927]. For Freetown, where criterion is mean less than 2 tenths, see table of corrections, p. 22.

Day with overcast sky Day when cloud amount was 10 at either hour of observation [1927]. For Freetown, where criterion is mean greater than 8 tenths, see table of corrections, p. 22.

Day with gale force 8 or more.

Wind—The winds are observed to 16 points at 9h. and 17h. For Freetown, see table of corrections, p. 22.

Nyasaland—*Zomba

[Observations first published, 1892].

Hours of observation 9h., and 15h. South African mean time, 2 hours fast on G.M.T.

The thermometers are exposed in a Stevenson screen.

Pressure— $\frac{1}{2}$ (9 + 15h.); readings are reduced to 32° F., at station latitude and level.

Temperature—Mean $\frac{1}{2}$ (9 + 15h.).

Maximum read and set at 9h., and entered to previous day.

Minimum read and set at 9h., and entered to day of reading.

Vapour Pressure and Relative Humidity—Computed from "Hygrometric Tables" published by the Meteorological Office, London, 1924 (M.O. 265).

Rainfall—Rim of rain-gauge is 15 in. above the ground.

Totals refer to the 24 hours beginning at 9h.

Definition of—Day with rain—a day with some precipitation, whether measurable or not.

Day with clear sky and overcast sky—The observations of cloud amount made at 9h. and 15h. are classified either as "clear" or as "overcast," but the special definitions of these terms are not given.

Day of gale, day of strong wind—The numbers in these columns are derived from estimates of the wind force on a numerical scale, probably the Beaufort scale.

Tanganyika

Station.	Rain-gauge Ht. of rim.	Observations first published.	Interruptions.
*Dar-es-Salaam ..	1 ft. 8 in.	1893	1913–22.
Mwanza ..	— 10 in.	1894	1896–97; 1900; 1912–22.
Arusha ..	3 ft. 3 in.	1903	1905; 1912–22.
Amani ..	2 ft. 7 in.	1901	1912–23.
Kigoma ..	3 ft. 1½ in.	1927	—
Manyoni ..	3 ft. —	1924	—
Moshi ..	1 ft. 6 in.	1928	—
Kilwa ..	2 ft. 4 in.	1928	—

Hours of observation, 9h. and 14h., Dar-es-Salaam local time, 2hr. 39min. fast on G.M.T., except for Kigoma and Manyoni, 9h. only, and Kilwa, 9h. 30m.

The site and exposure of the instruments at Dar-es-Salaam, Amani, Kigoma, Manyoni, Moshi and Kilwa are "conventional." At Arusha and Mwanza, the thermometers are exposed under thatched shelters.

Temperature—Mean $\frac{1}{2}$ (max. + min.).

Maximum read and set at 9h., and entered to previous day.

Minimum read and set at 9h., and entered to day of reading.

Rainfall—For heights of rims of rain-gauges above ground see above.

Totals refer to the 24 hours beginning at 9h.

Definition of—Day with rain—0.2 mm. or more [1927].

Uganda

[The first years of published observations are shown for convenience under "Temperature."]

Standard of Time adopted is that of longitude 37½° E., 2½ hours fast on G.M.T.

Notes on Exposures:—

Entebbe, Kampala, Serere: in Sudan pattern screens.

Masaka: in a standard screen under a thatched shelter.

Arua, Katera: in a single louvered screen.

Bombo, Fort Portal, Gulu, Mbarara, Ngetta: in cages under thatched shelters.

Mbale: in cage inside Sudan pattern screen.

Masindi, Mubende, Simsa: in cages under verandahs.

Hoima: on wall under thatched verandah.

Kamuli: on a stone pillar under verandah, facing towards house.

Dwoli: under a thatched verandah.

Pressure—Entebbe: $\frac{1}{3}$ (7 + 14 + 21h); readings are reduced to 32° F. and lat. 45° at station level. [1927].

Temperature—The following are the hours at which the maximum and minimum thermometers are set and read and also the first years of published observations :—

	Set	Read	Maximum Entered to previous day	Set	Read	Minimum	First year of Observations
*Entebbe ..	21h.	21h.	—	21h.	7h.	1896	
Arua ..	9h.	9h.	yes	9h.	9h.	1923	
Bombo ..	9h.	9h.	yes	9h.	9h.	1915	
Dwoli ..	8h.	8h.	yes	8h.	8h.	1926	
Fort Portal ..	14h.	14h.	—	14h.	14h.	1901	
Gulu ..	8h.	8h.	yes	8h.	8h.	1911	
Hoima ..	9h.	9h.	yes	9h.	9h.	1909	
Kampala ..	7h.	7h.	yes	7h.	7h.	1907	
Kamuli ..	7h.	7h.	yes	7h.	7h.	1926	
Katera ..	19h.	19h.	—	19h.	19h.	1928	
*Masaka ..	21h.	21h.	—	21h.	21h.	1902	
Masindi ..	8h.	8h.	yes	8h.	8h.	1906	
Mbale ..	7h.	7h.	yes	7h.	7h.	1907	
Mbarara ..	16h.	14h.	—	16h.	14h.	1901	
Mubende ..	7h.	21h.	—	21h.	7h.	1909	
Ngetta ..	7h.	7h.	yes	14h.	7h.	1926	
Serere ..	7h.	7h.	yes	7h.	7h.	1920	
Simsa ..	7h.	7h.	yes	7h.	7h.	1923	

At Entebbe the grass minimum thermometer is set at 21h. and read at 7h. Information about Budo is not available.

Relative Humidity—Computed from "Hygrometric Tables," published by the Meteorological Office, London, 1924 (M.O. 265) [1927].

Rainfall—Totals refer to the 24 hours beginning at 7h., except at Arua, Bombo, Hoima, 9h., Gulu, Masindi, Kitgum, Dwoli, 8h.

Heights of rims of rain-gauges are 1 ft. above ground, except at Dwoli (2 ft. 6 in.).

Definition of—Day with rain .. 0.01 in. or more.
Day with clear sky .. mean cloud amount less than 2 tenths.
Day with overcast sky .. mean cloud amount greater than 8 tenths.

Wind—A Robinson cup anemometer, with cups 15 ft. above the ground, is in use at Entebbe.

Sunshine—A Campbell-Stokes recorder is in use at Entebbe ; it is shaded on the west by a hill subtending an angle of 10°.

Zanzibar and Pemba Island

Zanzibar

[Observations first published, 1891.]

Latitude 6° 10' S. Longitude 39° 14' E. Height of barometer above M.S.L. 50 ft.

Hour of observation 8h., local time, 2hr. 36min. fast on G.M.T.

The thermometers are exposed in a wire cage with a wooden top under a specially erected shelter with a board and tile roof.

Pressure—8h. It is not stated what corrections, if any, have been applied.

Temperature—Maximum .. read and set at 8h., and entered to previous day.
Minimum .. read and set at 8h., and entered to day of reading.

Dew Point and Relative Humidity—Probably computed from the "Tables for the Reduction of Meteorological Observations," published by the Government of India Meteorological Department, 1910.

Rainfall—Rim of rain-gauge is 50 ft. above the ground.

Totals refer to the 24 hours beginning at 8h.

Definition of—Day with rain .. not stated.

Pemba Island

[Observations first published, 1910.]

Latitude 5° 15' S. Longitude 39° 44' E. Height of rain-gauge above M.S.L. 55 ft.

Hour of observation 7h., local time, 2hr. 39min. fast on G.M.T.

The thermometers are exposed in the shade under a verandah.

Temperature—Maximum .. read and set at 7h., and entered to previous day.

Minimum .. read and set at 7h., and entered to day of reading.

Rainfall—Rim of rain-gauge is 3 ft. 8 in. above the ground.

Totals refer to the 24 hours beginning at 7h.

Definition of—Day with rain .. not stated.

Basutoland

[Observations first published, 1922.]

Hour of observation 8½h., South African mean time, two hours fast on G.M.T.

The site and the exposure of the thermometers are "conventional."

Pressure—8½h. In inches as read.

Temperature—In °F. Mean .. ½ (max. + min.).

Maximum .. read and set at 8½h., and entered to previous day.

Minimum .. read and set at 8½h., and entered to day of reading.

Relative Humidity—Computed from tables by R. de C. Ward.†

The values given in the column headed "Tension of Vapour" are the computed temperatures of the dew point in degrees Fahrenheit.

Rainfall—In inches.—Rim of rain-gauge is 4 ft. above the ground.

Totals refer to the 24 hours beginning at 8½h.

Definition of—Day with rain—not stated.

Bechuanaland Protectorate

[Observations first published, 1922.]

Hour of observation 8½h., South African mean time, two hours fast on G.M.T. The site and exposure of the instruments are stated to be conventional.

No information is available as to the observations beyond that given on the sheet.

Northern Rhodesia (July 1928 to June 1929)

[Observations first published, 1906.]

The following particulars refer only to *Livingstone and Fort Jameson ; no information has been received for other stations.

Hours of observation—8h. and 18h. at Livingstone, 8h. at Fort Jameson, South African mean time, 2 hours fast on G.M.T.

The thermometers are exposed under thatched shelters.

Pressure—Readings are corrected to 32°F., at station latitude and level.

Temperature—Mean .. ½ (max. + min.).

Maximum .. read and set at 8h. and entered to previous day.

Minimum .. read and set at 8h. and entered to day of reading.

Relative Humidity—Computed from "Glaisher's Hygrometric Tables," 10th edition, 1910.

Rainfall—Rims of rain-gauges are 4 ft. above the ground.

Totals refer to the 24 hours beginning at 8h.

Definition of—Day with rain .. 0.01 in. or more.

Wind—At Livingstone a cup indicating anemometer is in use, with the cups 26 ft. 6 in. above the ground.

Sunshine—At Livingstone a sunshine recorder of Campbell-Stokes type is in use.

† "Practical Exercises in Elementary Meteorology," Boston, 1899.

Swaziland

[Observations first published, 1922.]

Hour of observation 8½h., time of longitude 30°E., 2 hours fast on G.M.T.

The site and the exposure of the instruments are "conventional" as far as is stated.

Temperature—Mean .. ½ (max. + min.).

Maximum read and set at 8½h., and entered to previous day.

Minimum read and set at 8½h., and entered to day of reading.

Vapour Pressure and Relative Humidity—Computed from the "Smithsonian Physical Tables," 1897.

Rainfall—Rims of rain-gauges are 4 ft. above the ground.

Totals refer to the 24 hours beginning at 8½h.

Definition of—Day with rain 0.005 in. or more.

Day with clear sky .. a day when cloud amount at 8½h. was 0.

Day with overcast sky .. a day when cloud amount at 8½h. was 10.

Day with gale .. no. of observations at 8½h. when wind is force 7 or more on Beaufort scale.

Bermuda

Hours of observation, 8h., 15h., 20h., local time, 4hr. 19min. slow on G.M.T.

The site and exposure of the instruments are "conventional."

Pressure—½ (8 + 20h.); readings are corrected to 32° F. and lat. 45°, at station level.

Temperature—Mean .. ½ (max. + min.).

Maximum read and set at 20h.

Minimum read and set at 8h., and entered to day of reading.

Relative Humidity—½ (8 + 15 + 20h.), computed from the tables supplied by the Meteorological Service of Canada.

Rainfall—Rim of rain-gauge is 1 ft. above the ground.

Totals refer to the 24 hours beginning at 8h.

Definition of—Day with rain a day with some precipitation whether measurable or not.

Day completely overcast .. a day on which the mean amount of cloud from observations at 8h., 15h. and 20h. is greater than 8.

Day with gale a day on which force 8, Beaufort scale, or upwards was recorded at any time.

Wind—A cup anemometer is in use with the cups 50 ft. above the ground.

Bahamas—Nassau

[Observations first published, 1855.]

Hours of observation 7½h. and 15h., 75th meridian time, 5 hours slow on G.M.T.

The site and the exposure of the instruments are "conventional."

Pressure—Readings are reduced to 32° F., lat. 45° and M.S.L.

Temperature—Maximum .. read and set at 7½h., and entered to day of reading.

Minimum .. read and set at 7½h., and entered to day of reading.

The values given under the headings of "Temperature. Max. and Min." refer to mean daily maximum and minimum.

Relative Humidity—Computed from "Psychrometric Tables" by C. F. Marvin, published by the U.S. Weather Bureau, 1915.

Rainfall—Rim of rain-gauge is 1 ft. above the ground.

Totals refer to the 24 hours beginning at 7½h.

Wind—The values given as "Wind Force" are velocities in miles per hour. A Belfort standard U.S. Weather Bureau pattern anemometer is in use. The cups are 20 ft. above the roof of a building which is 15 ft. high.

Jamaica

	*Kingston	Negril Point	Morant Point
Observations first published ..	1881	1895	1881
Standard of time	75th meridian	75th meridian	75th meridian
Slow on G.M.T.	5 hours	5 hours	5 hours
<i>Pressure</i> —			
Readings are reduced to ..	32°F., lat. 45°, M.S.L., and corrected for diurnal range.		
<i>Temperature</i> —Mean	†	†	†
Maximum	read and set at 7h., entered to previous day.	set at 7h. and read at 15h.	set at 7h. and read at 15h.
Minimum	read and set at 15h. (entered to day of reading)	set at 15h. and read at 7h.	set at 15h. and read at 7h.
<i>Vapour Pressure and Relative Humidity</i> †—	"Hygrometric Tables," Meteorological Office, London, 1924 (M.O. 265) [1928].		
<i>Rainfall</i> —			
Rim above ground	51 ft.	6½ ft.	3 ft.
For 24 hours beginning ..	7h.	7h.	7h.
<i>Definition of</i> —			
Day with rain		0.01 in. or more	
Day with gale		40 mi/hr or more	
Day with clear sky		mean cloud amount $\frac{1}{10}$ — $\frac{8}{10}$	
Day with overcast sky ..		mean cloud amount $\frac{8}{10}$ — $\frac{10}{10}$	
<i>Wind</i> —			
Anemometer in use	U.S. Weather Bureau pattern.		
Cups above ground	69 ft.	94 ft.	18 ft.

† The mean temperature is obtained by the following formula devised by the late Maxwell Hall:
 $\frac{1}{4} (7 + 15h + \text{Max.} + \text{Min.}) - 0.5^\circ\text{F.}$

‡ The mean relative humidity is obtained from the readings at 7h. and 15h., corrected to mean of 24 hours by a table of corrections based on an investigation by the late Maxwell Hall.

Leeward Islands

	*Antigua	St. Kitts	Dominica	*Montserrat	Tortola
Years of observation	55	61	32	16	29
Latitude	17° 5' N.	17° 18' N.	15° 30' N.	16° 45' N.	18° 25' N.
Longitude	61° 45' W.	62° 48' W.	61° 20' W.	62° 5' W.	64° 36' W.
Height of barometer above M.S.L.	120.6 ft.	157 ft.	50 ft.	130 ft.	20 ft.
Hours of observation	9h., 15h.	9h., 15h.	9h., 15h.	9h., 15h.	9h.
Standard of time ..	local	local	probably local	local	60th meridian
Slow on G.M.T. ..	4hr. 7min.	4hr. 11min.	4hr. 5min.	4hr. 8min.	4hr.
<i>Pressure</i> —					
	½(9 + 15h.) reduced to 32°F., lat. 45° M.S.L.	½(9 + 15h.) reduced to 32°F., lat. 45° M.S.L.	½(9 + 15h.) reduced to 32°F., station level and lat.	½(9 + 15h.) reduced to 32°F., lat. 45° M.S.L.	9h. reduced to 32°F., lat. 45° M.S.L.
<i>Temperature</i> —					
Mean	½(9 + 15h.)	½(9 + 15h.)	½(9 + 15h.)	½(9 + 15h.)	—
Maximum	read and set at 9h. entered to previous day.	read and set at 9h. entered to previous day.	set at 9h. and read at 15h.	read and set at 9h. and entered to previous day.	read and set at 9h. entered to previous day.
Minimum	read and set at 9h. (entered to day of reading)	read and set at 9h.	set at 15h. and read at 9h.	read and set at 9h.	read and set at 9h.
<i>Rainfall</i> —					
Rim above ground	4 ft.	1 ft.	3 ft. 6 in.	1 ft. [July, 1927]	1 ft. 7 in.
Day with rain	0.01 in. or more.	0.01 in. or more.	Not stated.	0.01 in. or more.	Not stated.
Day with clear sky	criterion indefinite.	criterion indefinite.	—	criterion indefinite.	—
Day with overcast sky	criterion indefinite [1927].	criterion indefinite.	—	criterion indefinite [1924]	—

Totals of rainfall refer to the 24 hours beginning at 9h., except for Antigua, where the totals refer to the 24 hours ending at 9h.

Relative Humidity.—Computed from published tables; basic formula not stated.

Special Notes—

St. Kitts—The site and exposure of the thermometers are “conventional.” The site of the rain-gauge is not stated.

Antigua and Montserrat—The means are based on about 25 observations each month.

Wind—The summary appears to be unreliable chiefly owing to the number of missing observations.

Dominica—The thermometers are exposed in a wire cage suspended in a shed with open sides. The rain-gauge is on Morne Bruce, 400 ft. above M.S.L.

Grenada—*Richmond Hill

[Observations first published, 1891.]

Hours of observation 9h. and 18h., local time, 4hr. 7min. slow on G.M.T.

Site and exposure of the barometer and thermometers “conventional.”

The rain-gauge is 2 ft. 3 in. distant from a wall 1 ft. 2 in. high, which is surmounted by an iron fence 6 ft. high composed of one-inch bars set 8 in. apart.

Pressure—Mean $\frac{1}{2}$ (9 + 18h.); values as read, no corrections have been applied. (See below for attached thermometer.)

The height of the barometer cistern above M.S.L. is 509 ft.

Temperature—The figures under 9 a.m., 6 p.m. and Mean refer to readings of the attached thermometer.

Maximum read and set at 9h., and entered to previous day.

Minimum read and set at 9h., and entered to day of reading.

Vapour Pressure and Relative Humidity—Computed from “Hygrometric Tables” published by the Meteorological Office, London, 1924 (M.O. 265).

Rainfall—Rim of rain-gauge is 1 ft. above the ground. [1927].

Totals refer to the 24 hours beginning at 9h.

Definition of—Day with rain—apparently day with some precipitation, whether measurable or not.

Day with clear sky }
Day with overcast sky } criteria not “conventional.”
Day with gale }

Wind—The wind direction refers to “magnetic” north.

St. Lucia—Castries

[Station moved from Reunion at end of 1927.]

Hours of observation 7h., 12h., 17h., 60th meridian time, 4 hours slow on G.M.T.

Thermometers are in a narrow double-louvred screen, under a light thatched roof.

Temperature—Mean $\frac{1}{3}$ (7 + 12 + 17h.)

Maximum read and set at 17h.

Minimum read and set at 7h., and entered to day of reading.

Rainfall—Rim of rain-gauge is 1 ft. above the ground.

Totals refer to the 24 hours beginning at 7h.

Definition of—Day with rain 0.01 in. or more.

St. Vincent—Agricultural Experiment Station

[Observations first published, 1830; interrupted, 1842–1893.]

Hours of observation 9h. and 15h., local time, 4hr. 5min. slow on G.M.T.

Thermometers are exposed in a single-louvred screen; the rain-gauge is of “Snowdon” pattern.

Pressure—In inches— $\frac{1}{2}$ (9 + 15h.); readings are reduced to 32°F., lat. 45°, and M.S.L.

Temperature—In °F. Mean $\frac{1}{2}$ (9 + 15h.).

Maximum read and set at 9h. and entered to previous day.

Minimum read and set at 9h. and entered to same day.

Vapour Pressure (in inches) and Relative Humidity—Computed from “Glaisher’s Hygrometric Tables.”

Rainfall—In inches. Rim of rain-gauge is 9 in. above the ground.

Totals refer to the 24 hours beginning at 9h.

Definition of—Day with rain 0.01 in. or more.

Day with clear sky mean cloud amount less than 2 tenths.

Day with overcast sky mean cloud amount more than 8 tenths.

Barbados

[Observations first published, 1853; interrupted, 1863–1864.]

Hours of observation: 8h. and 17h., 60th meridian time, 4 hours slow on G.M.T.; pressure and attached thermometer readings at 9h. and 15h.; other observations at 8h. and 17h.; rainfall observations at 6h.

The site and the exposure of the instruments are “conventional.”

Pressure—In inches— $\frac{1}{2}$ (9 + 15h.); readings are reduced to 32°F., lat. 45° and M.S.L.

Temperature—Mean $\frac{1}{2}$ (max. + min.).

Maximum read and set at 17h., and entered to day of reading.

Minimum read and set at 8h. and entered to previous day.

Vapour Pressure (in inches) and Relative Humidity—Computed from “Hints to Meteorological Observers” by W. Marriott, 7th Ed., 1911.

Rainfall—Rim of rain-gauge is 1 ft. above the ground.

Totals refer to the 24 hours beginning at 6h.

Definition of—Day with rain 0.01 in. or more.

Wind—A cup anemometer is in use, with cups 17 ft. above the ground. [July, 1929].

Trinidad—St. Clair, Port of Spain

[Observations first published, 1862.]

Hours of observation 7h. and 15h., 60th meridian time, 4 hours slow on G.M.T.

Site and exposure “conventional.”

Pressure—Mean— $\frac{1}{2}$ (7 + 15h.); readings are corrected to 32°F., and M.S.L. at station latitude.

Temperature—Mean $\frac{1}{2}$ (7 + 15h.)

Maximum read and set at 15h.

Minimum read and set at 15h.

Vapour Pressure and Relative Humidity—Computed from “Hygrometric Tables,” published by the Meteorological Office, London, 1927 (M.O. 265), 2nd edition. [August, 1929.]

Rainfall—Rim of rain-gauge is 1 ft. 2 in. above the ground. [1927].

Totals refer to the 24 hours beginning at 7h.

Definition of—Day with rain 0.01 in. or more.

British Guiana

[Observations first published, 1887.]

The following notes refer to **Georgetown** and **Mazaruni** only.

Hours of observation, 7h., 13h., 18h., local official time, 3hr. 45min. slow on G.M.T.

At Georgetown, the standard thermometer screen is protected from direct sunshine by a shelter. At Mazaruni the site and exposure of the instruments are "conventional."

Pressure—Readings are reduced to 32° F., lat. 45° and M.S.L.

Temperature—Maximum .. read and set at 18h.

Minimum .. set at 18h., and read at 7h.

Vapour Pressure and Relative Humidity—Computed from "Hygrometric Tables," published by the Meteorological Office, London, 1924 (M.O. 265) [1928].

Rainfall—Rims of rain-gauges are 1 ft. above the ground.

Totals refer to the 24 hours beginning at 7h.

Definition of—Day with rain 0.01 in. or more.

Day with clear sky cloud amount less than 2.

Day with overcast sky cloud amount greater than 8.

Evaporation—The amount of evaporation is obtained from the readings of a specially constructed reinforced concrete tank, 6 ft. square.

Wind—Four anemometers are in use at Georgetown, a Lowne's electrical recording and a Robinson cup, with vane or cups 60 ft. above the ground, a Robinson cup with cups 5 ft. above the ground, and a Dines pressure tube anemometer with vane 74 ft. above the ground. At Mazaruni a Robinson cup anemometer is in use, with cups 50 ft. above the ground.

Sunshine—Campbell-Stokes recorders are in use at both stations.

Falkland Islands—*Stanley

[Observations first published, 1904.]

Hour of observation, 9h. local time, 4 hours slow on G.M.T.

The site and the exposure of the instruments are "conventional."

Pressure—The readings printed in the annual report are "as read." For corrected (M.S.L.) values see p. 23.

Height of the barometer above M.S.L., 6 ft.

Temperature—Mean $\frac{1}{2}$ (max. + min.).

Maximum read and set at 9h. and entered to day of reading.

Minimum read and set at 9h., and entered to day of reading.

Rainfall—Rim of rain-gauge is 1 ft. above the ground.

Totals refer to the 24 hours ending at 9h.

Definition of—Day with rain—a day with some precipitation, whether measurable or not. [1926].

Day with clear sky cloud amount 1 tenth or less.

Day with overcast sky cloud amount 9 tenths or more.

Wind—A Robinson cup anemometer is in use, with cups 31 ft. above the ground.

Mauritius—*Royal Alfred Observatory

[Observations first published, 1861.]

The site and the exposure of the instruments are "conventional."

Pressure—Mean of 24 hours; readings are reduced to 32° F., lat. 45°, at station level. Height of barometer cistern above M.S.L., 181 ft.

Temperature—"Mean" is mean of 24 hours.

Maximum and minimum values refer to the civil day 0h. to 24h.

Dew Point, Vapour Pressure and Relative Humidity—The mean temperature of the dew-point, the degree of humidity and the elastic force of vapour are derived from the mean daily temperature of the air and of evaporation, by means of tables based on "Glaisher's Hygrometric Tables," and are not the means of 24-hourly values.

Rainfall—Totals refer to the civil day, 0h. to 24h.

Definition of—Day with rain—0.1 mm. or more.

Evaporation—The amount of evaporation is obtained from the readings of a Negretti and Zambra evaporimeter which consists of a cylindrical brass vessel 8 in. in diameter and 4 in. deep. The amount of water in the vessel is measured at midnight.

Wind—A Robinson cup anemometer is in use.

Sunshine—A Campbell-Stokes recorder is in use.

Seychelles

[Observations first published, 1891.]

Hours of observation 10h. and 16h. local time (10h. 18m. and 16h. 18m. 60th meridian time, 4 hours fast on G.M.T.).

The thermometers are exposed in a Stevenson screen.

The rain-gauge is of an obsolete pattern.

The site is "conventional."

Pressure— $\frac{1}{2}$ (10 + 16h.); readings are reduced to 32° F., lat. 45° and M.S.L. [1928].

Temperature—Mean $\frac{1}{2}$ (10 + 16h.).

Maximum—read and set at 10h. and 16h. and the highest value entered to the day of reading.

Minimum—read and set at 10h. and 16h. and the lowest value entered to the day of reading.

Rainfall—Rim of rain-gauge is 1 ft. 4 in. above the ground.

Totals refer to the 24 hours beginning 10h.

Definition of—Day with rain 0.01 in. or more [1928].

Day with clear sky not stated.

Day with overcast sky cloud amount 9 tenths or more [1928].

Wind—Direction N. includes winds from N. only; NE., from NNE. to ENE. inclusive. Winds from other directions are summarised in an analogous way.

Fiji—*Suva

[Observations first published, 1886.]

Hours of observation 8½h. and 15½h., zone time, 12 hours fast on G.M.T.

The site and the exposure of the instruments are "conventional."

Pressure—Readings are reduced to 32° F., lat. 45° and M.S.L.

Temperature—

Maximum read and set at 8½h. and entered to previous day.

Minimum read and set at 8½h. and entered to day of reading.

Vapour Pressure and Relative Humidity—Computed from "Hygrometric Tables," published by the Meteorological Office, London, 1924 (M.O. 265).

Rainfall—Rim of rain-gauge is 1 ft. above the ground.

Totals refer to the 24 hours beginning at 8½h.

Definition of—Day with rain 0.01 in. or more.

Day with clear sky cloud amount less than 2 tenths.

Day with overcast sky cloud amount greater than 8 tenths. [1926].

Wind—An electric cup anemometer and a Dines pressure-tube anemometer are in use.

Sunshine—A Campbell-Stokes sunshine recorder is in use.

South Georgia—*Cumberland Bay (1928 and 1929)

[Observations first published, 1905.]

Hours of observation 8h., 14h., 20h., local time, 2 hr. 26 min. slow on G.M.T.

Pressure—values in millimetres, reduced to 0° C., at station latitude and level.

They appear to be a good approximation to 24-hr. means. For corrected M.S.L. values, see p. 23. The height of the barometer above M.S.L. is 4 metres.

Temperature—Mean not stated, but appears to be a good approximation to 24-hr. mean.

Maximum read and set at 20h.

Minimum read at 8h., set at 20h.

Both values are entered to the day of reading.

Rainfall—in millimetres.

Totals refer to the 24 hours ending at 20h. The rainfall is measured at every observation hour.

Wind—A Robinson cup anemometer is in use, with cups 7.2 metres (23.6 ft.) above ground.*Sunshine*—A Campbell-Stokes sunshine recorder is in use.**ERRATA, 1930.****Gibraltar***Mean Pressure*—September, 30.040; October, 30.080.*Temperature*—13h., Year, 68.7.*Rainfall*—Total, January, 5.00; March, 1.77; November, 7.26; Year, 36.30.

Maximum in 24 hours, January, 1.52; February, 1.52; March, 1.17; April, 0.74; May, 0.19; June, 2.14; September, 0.04; October, 0.43; November, 3.11; December, 0.78; Year, 3.11.

Number of Days—Fog—September, 1; Year, 7. Hail—May, 1; Year, 4.*Wind*—March, SW. 18; NW. 12; calm, 1; May, N. 1; E. 16; S. 1; SW. 23; W. 33; NW. 11; calm, 2. June, S. 4; NW. 3. July, NE. 7; E. 26; SE. 5; SW. 26. December, N. 1; NE. 3; E. 12; SE. 8; SW. 4; W. 27. Year, N. 23; NE. 38; E. 239; SE. 62; S. 43; SW. 221; NW. 127; calm, 86.**Gold Coast—Accra***Mean Pressure*—values in millibars at M.S.L. are as follows:—

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1011.9	1011.6	1011.6	1011.8	1013.6	1014.4	1015.8	1015.7	1015.1	1013.8	1013.2	1011.8	1013.4

Temperature—Mean, February, 85.1; Year, 82.3. Absolute minimum, March, date, 6th.*Number of Days*—Thunderstorms—March, 2; Year, 4. Clear Sky—January, 14; March, 2; Year, 25.

There were only 19 days' observations in September, excepting pressure and rainfall, of which observations were complete.

Nigeria—Hadeija*Temperature*—9h., May, 91.2; Year, 81.5. Mean, May, 90.5; Year, 81.1.

Absolute minimum, October, 65. Absolute maximum, August, 93.

Relative Humidity—January, 68; Year, 50.9.*Rainfall*—Total, August, 4.44; Year, 14.67.**Kaduna Capital***Mean Pressure*—The corrected values in millibars at M.S.L. are as follows:—

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1017.9	1016.4	1016.0	1015.7	1016.4	1017.1	1017.9	1018.0	1017.7	1017.2	1016.5	1016.4	1016.9

Temperature—9h., February, 76.7; May, 78.5; Year, 76.1. Delete all values of mean, mean minimum, and absolute minimum, for January, February, June, and August to December. Mean, March, 80.5. Mean minimum, March, 66.7. Absolute maximum, September, 96.*Relative Humidity*—February, 62; August, 87; Year, 74.4.*Rainfall*—Total, August, 12.09; Year, 57.57.**Lagos***Mean Pressure*—The corrected values for 9h., in inches at 32° F., lat. 45° and M.S.L. are as follows:—

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
29.849	29.865	29.854	29.855	29.872	29.880	29.908	29.916	29.902	29.881	29.850	29.821	29.871

Temperature—9h., October, 80.1. Mean, January, 80.2; February, 83.7. Mean minimum, January, 73.9; Mean maximum, February, 89.4.*Rainfall*—Maximum, date, July, also 12th; October, 4.78 in. on 2nd.*Number of Days*—Rain, June, 23; Year, 148.**Maiduguri***Temperature*—9h., March, 83.0; December, 78.5; Year, 81.5. Mean minimum, May, 73.7. Mean maximum, October, 96.3; Year, 96.5. Absolute maximum, September, 100.*Rainfall*—Total, May, 142; Year, 8.45.**Sokoto***Temperature*—9h., July, 81.0; Year, 82.2. Mean, July, 81.5; December, 78.8; Year, 83.2. Mean minimum, July, 72.4; Year, 70.3. Mean maximum, April, 105.8; July, 90.6; Year, 96.0.**Victoria***Temperature*—9h., December, 79.6; Year, 78.3. Mean, April, 80.5. Mean maximum, March, 89.1; April, 88.7; Year, 88.4.*Rainfall*—Total, June, 32.79; July, 31.12; August, 48.05; Year, 217.27. Maximum, June, 4.30 on 7th; Year, 8.30 on 21st February.**Yola***Temperature*—9h., March, 86.8; Mean, February, 85.7; March, 89.3; May, 87.3; July, 81.1; Year, 83.3. Mean minimum, March, 75.9; May, 76.6; July, 73.3; Year, 72.3. Mean maximum, February, 100.2; May, 98.0; Year, 94.3.**Sierra Leone—Freetown***Mean Pressure*—February, 1012.0; July, 1015.0.*Temperature*—17h., February, 83.3; July, 78.4; Year, 80.6. Mean minimum, Year, 72.5. Absolute minimum, dates, January, also 25th; February, also 10th. Absolute maximum, dates, July, delete 3rd and 4th; September, also 11th and 16th.*Vapour Pressure*—9h., Year, 28.0.*Relative Humidity*—9h., September, 89.2; Year, 83.2.*Cloud Amount*—17h., October, 6.*Rainfall*—Total, January, trace; May, 9.89; September, 28.30; Year, 114.47. Maximum, March, date, 25th; August, 3.05 on 23rd.*Number of Days*—Rain—July, 25; August, 25; October, 21; Year, 158. Thunderstorms—April, 1; May, 8; November, 13; Year, 60. Gales—August, 2; Year, 6.

The following figures should be substituted for those in the Annual Report for 1930 :—

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
<i>Number of Days—</i>													
Clear Sky	9	8	9	5	1	—	—	—	—	—	3	7	42
Overcast Sky ..	5	1	3	3	11	6	16	17	17	5	2	4	90
<i>Wind—Number of observations from :—</i>													
N.	3	2	2	1	4	—	1	1	2	2	7	5	30
NE.	5	1	1	5	1	4	5	1	10	11	7	9	60
E.	10	4	—	1	—	5	3	1	1	8	10	9	52
SE.	2	—	1	—	—	2	1	—	—	3	1	1	11
S.	1	1	1	2	2	3	5	1	1	4	—	1	22
SW.	11	24	34	26	30	21	27	39	27	22	26	23	310
W.	15	13	14	10	5	9	4	6	5	1	2	2	86
NW.	3	3	5	9	8	2	—	1	3	—	—	4	38
Calm	12	8	4	6	12	14	16	12	11	11	7	8	121

Nyasaland—Zomba

Temperature—9h., March, 71; September, 70. Mean, November, 81. Mean maximum, February, 80.

Vapour Pressure—The columns headed “Tension of Vapour. In.” give the vapour pressure in millibars. 15h., Year, 19.0. Mean, October, 15.3.

Relative Humidity—9h., August, 74; Year, 73. Mean, August, 70.

Earth Temperature—1 foot, 9 h., January, 75; February, 75; March, 73; April, 70; May, 63; June, 59; July, 60; August, 62; September, 68; October, 76; November, 80; December, 80; Year, 70.

Cloud Amount—21h., Year, 7.

Uganda—Entebbe

Temperature—Absolute minimum, September, dates, 4, 12, 29; October, 59.

Vapour Pressure—7h., October, 19.9; Year, 20.0. 14h., March, 19.7. 21h., Jan., 21.1; March, 21.7; May, 21.7; July, 22.3; Year, 21.5.

Relative Humidity—7h., October, 83; Year, 84.

Number of Days—Overcast Sky, September, 5; October, 5.

Wind—February, E. 1; S. 33; June, E. 0. July, S. 21; SW. 4. Year, E. 27; SW. 104.

Evaporation—February, 3.8.

Sunshine—May, 6.8.

Masaka

Temperature—21h., delete value for Year.

Vapour Pressure—14h., July, 20.2. 21h., June, 20.4; July, 19.5; Year, delete.

Relative Humidity—7h., May, 81; Year, 83. 21h., Year, delete.

Northern Rhodesia—Livingstone (July 1929 to June 1930, at 8h. only)

Pressure—December, 26.792.

Temperature—Mean maximum, November, 96.0. Mean minimum, September, 66.1; April, 60.7. Mean monthly temperature, September, 80.3. Absolute minimum, July, 37; August, 39.5; April, 46.

Earth Temperature—1 ft., June, 66.8. 4 ft., February, 85.9.

Cloud Amount—April, 4.9.

Wind—Table 5, 5th column, the values are of mean force at 8h.; June, 0.9. Table 6, 8h., August, NE. 0; Year, NE. 22.

Sunshine—Table 7, per day, August, 10.67; November, 7.27; January, 6.72; Mean, 8.61.

Jamaica—Kingston

Columns headed “Tension of Vapour” are apparently Dew Points.

Morant Point

Heading “Tension of Vapour” should presumably be “Dew Point”.

Negril Point

Heading “Tension of Vapour” should presumably be “Dew Point”. Footnote—the reduction of pressure should be stated as to Mean Sea Level.

Leeward Islands—Antigua

Rainfall—Total, July, 2.67; Year, 30.33. Maximum, Year, 1.82.

Montserrat

Rainfall—Maximum, date, December, 30th.

Grenada—Richmond Hill

Mean Pressure—January, 29.500; June, 29.513; July, 29.515; October, 29.516; December, 29.502; Year, 29.518.

Temperature—9h., January, 79; March, 79; April, 80; May, 80; September, 80; November, 80; Year, 78.5. 18h., January, 80; March, 81; May, 82; August, 82; November, 82; December, 81; Year, 81. Mean, May, 81; August, 81; September, 81; November, 81; December, 80; Year, 80. Mean minimum, February, 73; April, 73; June, 73; July, 74; August, 74; September, 74; October, 74; December, 73. Mean maximum, February, 87; March, 88; May, 88; October, 87; December, 87; Year, 87. Absolute minimum, May, date, also 21st; November, 71. Absolute maximum, January, date, 8th; November, date, also 8th; December, 89 on 6th; Year, 90.

Cloud Amount—9h., April, 4.

Rainfall—Total, August, 1.50; Year, 4.51. Maximum, January, 0.61 on 20th; April, 0.37 on 14th; June, 1.08 on 10th and 16th; December, 0.86 on 15th.

Falkland Islands—Stanley

Mean Pressure—

Values at M.S.L. :—

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
995.3	1006.1	994.9	1006.1	1008.5	996.8	1001.4	1009.5	1006.6	1003.5	1004.5	1000.1	1002.8

Temperature—Maximum, April, dates, 11th, 14th, 16th.

Rainfall—Total, March, 3.73; Year, 24.64. Greatest Fall, June, 0.52 on 17th. Date, April, 16th.

Number of Days Rain—March, 24; June, 21; July, 24; August, 21; September, 18; November, 12; Year, 234. *Snow or Sleet*—June, 20; July, 25; Year, 51. *Clear Sky*—January, 3; February, 4; May, 0; June, 1; July, 1; October, 1; December, 3; Year, 24. *Overcast Sky*—October, 13; November, 8; Year, 168.

Wind—Force 4-7, January, 22; February, 18; March, 21; April, 18; May, 14; August, 20; Year, 238. Mean Force, April, 4.0; June, 3.8; August, 4.3.

South Georgia—Cumberland Bay

Pressure—Values of $\frac{1}{3}(8 + 14 + 20)$ converted to mb. and reduced to M.S.L. :—

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
991.3	991.7	991.1	989.1	997.5	987.4	992.8	997.6	1000.4	994.1
Nov.	Dec.	Year.							
995.3	996.2	993.7							

Temperature—Maximum, January, 17.4; February, 13.4; March, 19.1; July, 5.3 on 10th; September, 11.6; October, 10.2; November, 14.3; December, 14.0 on 12th. Minimum, January, -1.0 on 5th and 25th; February, -3.1 on 23rd; March, -1.6 on 16th and 24th; April, -5.4; May, -6.6; June, -11.2; July, -10.0; August, -13.2; September, -8.7; October, -10.3 on 12th; November, -5.6; December, -2.1 on 27th.

Rainfall—Total, February, 138.0; June, 146.2; Year, 1493.4. Greatest fall, February, 8.96.

Number of Days—Rain—(It is not known what definition of a day of rain is in use).

