

FOR OFFICIAL USE.

M.O. 343.

AIR MINISTRY

METEOROLOGICAL OFFICE

NOTES ON THE
METEOROLOGICAL OBSERVATIONS

MADE IN

BRITISH COLONIES AND PROTECTORATES, ETC.

IN

1929

AND

Summarised in the Annual Reports of Colonial Governments

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TABLE OF CONTENTS

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TABLE OF CONTENTS

	Page
Gibraltar	4
Cyprus	4
Malta	5
Hong Kong	5
Ceylon	6
Malaya	7
Straits Settlements	7
Palestine	8
Gambia	9
Gold Coast	9
Nigeria	9
Sierra Leone	10
Nyasaland	11
Tanganyika	11
Uganda	12
Zanzibar and Pemba Island	13
Basutoland	13
Bechuanaland Protectorate	13
Northern Rhodesia	14
Swaziland	14
British Honduras	14
Bermuda	15
Bahamas	15
Jamaica	16
Leeward Islands	16
Grenada	17
St. Lucia	17
St. Vincent	18
Barbados	18
Trinidad	18
British Guiana	19
Falkland Islands	19
Mauritius	19
Seychelles	20
Fiji	20
South Georgia (1928 and 1929)	21
Errata	21

NOTES ON THE METEOROLOGICAL OBSERVATIONS MADE IN BRITISH COLONIES AND PROTECTORATES, ETC. IN 1929

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 1929.

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 1929 at the stations in Ceylon (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. 21-25. 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, 1929.

*Gibraltar

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

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

The Observatory was situated in an obsolete bastion of the fortifications on the sea front, S.W. side of the Rock and 50 feet above M.S.L. In May, 1929, the Observatory was moved to a new site in the public gardens near the sea front, on the south-west side of the Rock and 102 feet above M.S.L. The exposure of the instruments is "conventional."

The height of the barometer above M.S.L. was 53 feet until May 29, 90 feet afterwards.

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 was 2 feet above a sloping roof, until May 29, 2 feet above a flat roof afterwards.

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—The wind direction refers 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 .. It is not stated how the adopted mean temperature is obtained.

Maximum set at 8h. and read at 19h.

Minimum set at 19h. and read at 8h.

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—Computed from "Tables for the Reduction of Meteorological Observations," published by the Government of India Meteorological Department, 1910.

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. 6 in.	22	Ratnapura ..	2 ft. 2 in.	61
Puttalam ..	2 ft. 2 in.	61	Anuradhapura ..	3 ft. 3 in.	60
Mannar ..	1 ft. 0½ in.	60	Kurunegala ..	1 ft. 1 in.	43
Jaffna ..	1 ft. 9 in.	59	Kandy ..	1 ft. 6 in.	60
Trincomalee ..	3 ft. 7 in.	60	Badulla ..	2 ft. 0 in.	57
Batticaloa ..	1 ft. 0½ in.	60	Diyatalawa ..	2 ft. 0 in.	29
Hambantota ..	1 ft. 9 in.	61	Hakgala ..	1 ft. 5 in.	46
Gallé ..	2 ft. 2 in.	61	Nuwara Eliya ..	1 ft. 1 in.	61

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 1929 report to equivalent screen values, by means of comparisons carried on between simultaneous shed and screen readings. In some cases, e.g., Colombo and Mannar, these comparisons have been made for three years and have now been discontinued. In others the correction rests on a shorter period and may be modified in the 1930 report when more comparisons are available. This applies particularly to Anuradhapura, Hambantota and Kurunegala, where the screens were only taken into use early in 1929, but it is unlikely that any further alterations will exceed ½° F.

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 temperatures 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.

† 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 the times of minima seldom differ by much.

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

Totals refer to the 24 hours beginning at 9½h.

Self-recording gauges are in use at 8 stations.

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. above general level;
Puttalam ..	14 ft.		20 ft. above the ram-
Mannar ..	13½ ft.		parts, which are them-
Jaffna ..	14 ft.		selves 15 ft. high.
Trincomalee ..	14 ft. 9 in.	Hambantota ..	11½ ft.
	above the ground.	Gallé ..	12½ ft.
	This instrument is on	Ratnapura ..	15 ft.
	the summit of a cliff	Diyatalawa ..	12 ft. 10 in.
	100 ft. high.		

Five Dines tube anemometers and two anemobiographs are in use.

Malaya†

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

	Height.‡	Rain-gauge Ht. of rim.
Temerloh, Pahang ..	165 ft.	1 ft.
Kuala Pahang ..	10 ft.	1 ft.
Bukit Jeram, Selangor ..	196 ft.	1 ft.
Kuala Lumpur, Selangor ..	287 ft.	1 ft.
Kluang, Johore ..	215 ft.	1 ft.
Mersing, Johore ..	187 ft.	1 ft.
Singapore, Mount Faber ..	296 ft.	1 ft.
Fraser's Hill ..	4,268 ft.	1 ft.
Cameron's Highlands (Tanah Rata) ..	4,750 ft.	1 ft. 10 in.
Cameron's Highlands (Rhododendron Hill)	5,120 ft.	1 ft.

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.

Straits Settlements

Station.	Lat.	Long.	Height of Barometer above M.S.L.	Standard of Time.	First year of Observa- tion.
Singapore ..	1° 18' N.	103° 51' E.	36 feet	105th meridian, 7 hr. 1841 fast on G.M.T.	
Malacca (Durian Daun).	2° 13' N.	102° 14' E.	23 feet	Local time, 6 hr. 49 1880 min. fast on G.M.T.	
Labuan ..	5° 15' N.	115° 15' E.	55½ feet	Local time, 7 hr. 41 1890¶ min. fast on G.M.T.	
Penang ..	5° 34' N.	100° 20' E.	16½ feet	Local time, 6 hr. 41 1880 min. fast on G.M.T.	

Hours of observation 9h., 15h., 21h.

† The statement in the issue of these "Notes for 1928," p. 6, that values of relative humidity were computed from ½ (max. + min.) dry bulb and ½ (max. + min.) wet bulb is incorrect. In 1928 the tables were as described above; in previous years a table gave the means of the humidities from the maxima of the dry and wet bulbs and the humidities from the minima of the dry and wet bulbs.

‡ The publication of the Federated Malay States which included data for Taiping, Seremban and Raub has been discontinued.

§ Site of rain-gauge above M.S.L.

|| Interrupted 1846-1868. ¶ Interrupted 1896-1910.

The instruments are exposed in a screen with single-louvred walls and a double top at Singapore, and in cages beneath thatched shelters at Penang and Malacca. No information is given regarding the exposure at Labuan.

Pressure— $\frac{1}{3}$ (9 + 15 + 21h.); readings are reduced to 32°F., lat. 45° at station level.

Temperature—The following are the hours at which the maximum and minimum thermometers are set and read :—

Station	Set	Maximum		Minimum	
		Read	Entered to previous day	Set	Read
Singapore ..	21h.	21h.	—	21h.	21h.
Malacca ..	9h.	15h.	—	9h.	9h.
Penang ..	9h.	9h.	yes	9h.	9h.
Labuan ..	9h.	9h.	not stated	9h.	9h.

Rainfall—Heights of rims of rain-gauges above ground are :—

Singapore 12 in., Malacca 16 in., Penang 10 in., Labuan 18 in.
Totals refer to the 24 hours beginning at 9h.

Definition of—Day with rain—Singapore 0.2 mm. or more. Malacca 0.5 mm. or more. Penang—the raindays are entered under “overcast days”. Labuan—not stated.

Day with clear sky and overcast sky—The criteria are not as stated at Penang.

Wind—At Singapore the wind observations refer to “magnetic” north; at Penang and Malacca to true north. Information is not available for Labuan.

Sunshine—A Campbell-Stokes recorder is in use at Singapore.

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. + 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 × 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 .. $\frac{1}{2}$ (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.

† Interrupted 1905–24.

‡ Interrupted 1917–22.

§ Interrupted 1849–50 and 1914–24.

|| Interrupted 1905–24.

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.

Vapour Pressure and Relative Humidity—Computed from Glaisher’s Hygrometric Tables. The values of vapour pressure (“Elastic Force of Vapour”) are in inches of mercury.

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.

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 louvred 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. 21. 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, 52.6 ft. until May 13, 57.9 ft. after May 21; Kumasi, 980 ft.

Temperature—Mean, $\frac{1}{2}$ (max. + 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	15 in.	1905	Kano ..	A	12 in.	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

Pressure—Lagos—9h.; Kaduna Capital—9h.; for corrected (M.S.L.) values see pp. 21–22.

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-	1927
Batkanu ..	0 ft. 9½ in.	1913	tion.		
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 32° F., lat. 45° and M.S.L. [1924]. For Freetown, see p. 22.

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.

† Lagos—instruments moved to new site on June 25, 1929.

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. 23.

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. 23.

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. 23.

Nyasaland—*Zomba

[Observations first published, 1892].

Hours of observation 9h., and 15h. South African mean time, 2hr. fast on G.M.T. (Changed from 9h. and 21h. on January 1, 1929.)

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 observations of the bending of eucalyptus trees in the wind and not from estimates of the wind force on a numerical 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 $37\frac{1}{2}^{\circ}$ E., $2\frac{1}{2}$ 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 : $\frac{1}{2}$ (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 $6^{\circ} 10' S.$ Longitude $39^{\circ} 14' E.$ 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 $5^{\circ} 15' S.$ Longitude $39^{\circ} 44' E.$ 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 $8\frac{1}{2}$ h., South African mean time, two hours fast on G.M.T.

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

Pressure— $8\frac{1}{2}$ h. In inches as read.

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

Maximum .. read and set at $8\frac{1}{2}$ h., and entered to previous day.

Minimum .. read and set at $8\frac{1}{2}$ h., 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 $8\frac{1}{2}$ h.

Definition of—Day with rain—not stated.

Bechuanaland Protectorate

[Observations first published, 1922.]

Hour of observation $8\frac{1}{2}$ h., 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.

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

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 site and exposure of the instruments are "conventional" at Livingstone. At Fort Jameson the thermometers are exposed under a thatched shelter.

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

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.

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.

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 .. $\frac{1}{2}$ (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.

British Honduras—*Belize

Hours of observation, 6h. and 18h., June to November; 6h., January to May and December. Standard of Time, 90th meridian, 6 hours slow on G.M.T.

Pressure—The extreme readings at the hours of observation are given, reduced to 32°F., lat 45°, and M.S.L.

Temperature—Maximum .. read and set at 6h. and entered to day of reading (all months).

From June to November the maximum appears to be read and set also at 18h., and entered to day of reading, the highest of the two readings (6h. and 18h.) being taken as the maximum.

Minimum .. read and set at 6h. and entered to day of reading.

The values given are the highest and lowest temperatures of each month.

Relative Humidity—Computed from Smithsonian Meteorological and Physical Tables, 1906 edn.

Rainfall—The height of the rim of the rain gauge above the ground is 34 in.

For June to November the totals refer to the 24 hours ending 18h.; for December to May, to the 24 hours beginning 6h.

Definition of—Day with rain .. not specified, but appears to be a day with some precipitation whether measurable or not.

Wind—A cup anemometer with cups 45.7 feet above ground is in use.

***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— $\frac{1}{2}$ (8 + 20h.); readings were reduced to 32°F., at station latitude and a height of 151 ft. above M.S.L., until August 28, 1929. Starting with the 15h. reading on August 28, 1929, the height is 125 ft.; starting with the 15h. reading on September 4, 1929, correction to lat. 45° is also applied.

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

Maximum read and set at 20h.

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

Relative Humidity— $\frac{1}{2}$ (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.

Sunshine—A Campbell-Stokes recorder is in use.

Bahamas—Nassau

[Observations first published, 1855.]

Lat. 25° 5' N. Long. 77° 20' W. Height of the barometer cistern above M.S.L. 31.4 ft. The instruments were moved to the Wireless Telegraph Station on August 3rd, 1927.

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 pre- vious day.	set at 7h. and read at 15h.	set at 7h. and read at 15h.
Minimum (entered to day of reading)	read and set at 15h.	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	0.01 in. or more	0.01 in. or more
Day with gale	40 mi/hr or more	40 mi/hr or more	40 mi/hr or more
<i>Wind—</i>			
Anemometer in use	U.S. Weather Bureau pattern. 69 ft.	U.S. Weather Bureau pattern. 94 ft.	U.S. Weather Bureau pattern. 18 ft.
Cups above ground			

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

Leeward Islands

	*Antigua	St. Kitts	Dominica	*Montserrat	Tortola
Years of observation	54	60	31	15	28
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.
Pressure—					
	$\frac{1}{2}(9 + 15h.)$ reduced to 32°F., lat. 45° M.S.L.	$\frac{1}{2}(9 + 15h.)$ reduced to 32°F., lat. 45° M.S.L.	$\frac{1}{2}(9 + 15h.)$ reduced to 32°F., station level and lat.	$\frac{1}{2}(9 + 15h.)$ reduced to 32°F., lat. 45° M.S.L.	9h. reduced to 32°F., lat. 45° M.S.L.
Temperature—					
Mean	$\frac{1}{2}(9 + 15h.)$	$\frac{1}{2}(9 + 15h.)$	$\frac{1}{2}(9 + 15h.)$	$\frac{1}{2}(9 + 15h.)$ [1927]	—
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 (entered to day of reading)	read and set at 9h.	read and set at 9h.	set at 15h. and read at 9h.	read and set at 9h.	read and set at 9h.
Rainfall—					
Rim above ground.	4 ft.	1 ft.	3 ft. 6 in.	1ft. [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 over- cast sky.	criterion indefinite [1927].	criterion indefinite.	—	criterion indefinite [1924]	—

Totals of rainfall refer to the 24 hours beginning at 9h., except for Antigua from January to August, 1929, when the totals refer to the 24 hours ending at 9h.

Relative Humidity—Computed from "Hints to Meteorological Observers" by W. Marriott.

Special Notes—

St. Kitts—Until the beginning of March 1927, the screen containing the thermometers was 10½ ft. to the west of the laboratory, 20 ft. high, when it was moved to a "conventional" site. 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.

Antigua—The thermometers were destroyed by the hurricane of 1928. Temperature readings were not resumed until May 6, 1929.

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

Day with gale } criteria not "conventional."

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.]

Latitude 13° 8' N. Longitude 59° 36' W.

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 at 17h. each day and at 8h. on the following day, the lower reading being taken as the minimum temperature of the day on which the 17h. reading is made.

Vapour Pressure (in inches), Relative Humidity and Dew Point—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 9 ft. above the ground.

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 (in inches) 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, 3hr. 51min. 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. [1924].

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; N.E., from N.N.E. to E.N.E. 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—A Dines electric cup anemometer is in use. A Dines pressure-tube anemometer was brought into use on January 29, 1928.

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. 25. 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, 1929.

Gibraltar

Mean Pressure—January, 30.182.

Temperature—Mean minimum, August, 69.5; October, 60.7.

Rainfall—Total, January, 0.57; February, 4.66; April, 1.55; Year, 19.50. Maximum, February, date, 9; September, 0.82.

Wind—April, SW. 31; NW. 3. August, N. 0; E. 35. December, E. 14; SE. 9; S. 1; SW. 13; W. 32. Year, N. 18; SE. 101; S. 11; SW. 191; W. 219; NW. 118.

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
1927 ..	1012.4	1011.4	1011.2	1011.3	1012.4	1013.7	1015.2	1015.2	1013.9	1012.9	1011.5	1011.4	1012.7
1928 ..	1011.0	1012.2	1011.2	1011.4	1012.8	1013.5	1015.9	1016.1	1014.5	1013.5	1011.7	1011.3	1012.9
1929 ..	1010.9	1010.6	1010.5	1011.1	1012.7	1014.5	1016.0	1015.6	1014.7	1013.3	1011.6	1011.5	1012.7

Temperature—Mean, August, 74.1. Mean maximum, December, 90.1. Mean minimum, August, 70.1; October, 75.3; November, 77.4. Absolute maximum, October, dates, 14, 31. Absolute minimum, October, date, 20.

Cloud Amount—Mean, October, 5.4.

Nigeria—Hadeija

No records are available for April.

Temperature—9h., September, 81.5; December, 68.9. Mean, January, delete; March, 82.7; April, 90.2; May, delete; November, 76.1; December, 67.1. Mean minimum, January, delete; May, delete. Mean maximum, January, 85.0; March, 102.2; December, 82.5. Absolute minimum, January, delete; May, delete.

Relative Humidity—December, 39.

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
1018.1	1016.9	1015.7	1015.2	1015.4	1017.0	1017.2	1017.5	1017.2	1016.7	1016.9	1018.3	1016.8

Temperature—9h., December, 69·3. Mean, delete values for January, April, May, August, September, October, November, December, Year; February, 77·9. Mean minimum, February, 63·3. Mean minimum and absolute minimum, delete values for January, April, May, August, September, October, November, December, Year. Mean maximum, February, 92·6; September, 84·8; Year, 88·1.

Lagos

Mean Pressure—The corrected values 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
29·922	29·893	29·903	29·920	29·931	29·959	29·965	29·959	29·940	29·898	29·848	29·891	29·919

Temperature—9h., June, 77·2. Mean, May, 81·0; October, 79·7. Mean maximum, May, 86·0; Year, 85·7.

Relative Humidity—January, 77; February, 79; March, 80; April, 81; May, 83; June, 88; August, 83; September, 83; October, 84; November, 83; December, 79; Year, 82.

Rainfall—Total, May, 10·78; Year, 85·82. Maximum fall, date, April, also 15; June, 26; August, also 22; Year, June, 26.

Maiduguri

Temperature—Mean, January, 72·5. Mean minimum, January, 55·7; November, 64·3; Year, 68·2. Mean maximum, January, 89·3. Absolute minimum, September, 70. Absolute maximum, July, 98.

Relative Humidity—June, 80; Year, 64·4.

Sokoto

Temperature—9h., October, 85·4. Mean, February, 81·5; November, 82·4; Year, 83·2. Mean minimum, February, 64·3; March, 72·2; July, 72·4; Year, 69·6. Mean maximum, November, 98·4; Year, 95·8.

Yola

Temperature—9h., August, 76·5; Year, delete. Mean, February, 85·1; March, 89·7; August, 78·9; December, 77·0; Year, delete. Mean Minimum, February, 71·7; August, 71·3; December, 63·1; Year, delete. Mean maximum, February, 98·4; March, 103·1; August, 86·4; Year, delete. Absolute minimum, February, 65; March, 68; August, 68. Absolute maximum, Year, delete.

Relative Humidity—Delete mean for year.

Rainfall—Delete total, maximum, date, and number of days, for Year. Maximum fall, date, November, 1.

Sierra Leone—Freetown

Mean Pressure—Values in inches at 32° F., lat. 45° and M.S.L. :—

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
—	29·861	29·858	29·857	29·861	29·924	29·954	29·956	29·934	29·931	29·890	29·880

Temperature—9h., February, 82; March, 82. Mean, February, 82·5; March, 82·5; June, 78·5; November, 81·0; Year, 80·1. Mean maximum, June, 84. Mean minimum, January, 73; May, 74; Year, delete. Absolute maximum, June, 87 on several dates. Absolute minimum, May, June, July, delete.

Vapour Pressure—9h., February, 27·9. 17h., December, 27·5. Mean, February, 27·4.

Number of Days—*Rain*—August, 26; December, 2; Year, 164. *Thunderstorms*—October, 2; November, 3; December, 1; Year, 6.

The following figures should be substituted for those in the Annual Report for 1929 :—

—	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
<i>Number of Days</i> —													
Clear Sky	22	18	16	10	8	1	1	—	—	1	3	12	92
Overcast Sky ..	2	2	4	1	—	3	9	4	3	1	4	2	35
<i>Wind</i> —Number of observations from :—													
N.	2	—	4	—	1	2	1	—	1	3	4	1	19
NE.	11	17	16	14	16	14	4	2	6	8	8	19	135
E.	1	4	8	12	—	1	—	—	1	2	4	12	45
SE.	2	6	5	2	9	1	1	2	—	—	—	1	31
S.	1	3	1	1	1	—	2	1	—	1	3	2	16
SW.	—	5	—	2	8	17	33	36	32	19	15	12	179
W.	1	1	—	—	1	3	2	—	—	3	3	3	17
NW.	1	—	—	—	—	1	—	—	1	—	1	2	6
Calm	43	20	28	29	26	21	19	21	19	26	22	10	284

Nyasaland—Zomba

Pressure—June, 26·897; August, 26·911.

Temperature—15h., June, 71. Mean minimum, March, 64.

Vapour Pressure—The values are in millibars.

Earth Temperature—1 foot, 9h., January, 75; February, 74; March, 74; April, 73; May, 65; June, 62; July, 62; August, 62; September, 72; October, 79; November, 82; December, 76; Year, 71.

Cloud Amount—9h., Year, 5. Mean, August, 5; October, 3.

Rainfall—Maximum, date, August, 7; October, 31.

Tanganyika—Dar-es-Salaam

Temperature—14h., June, 27·5. Mean, January, 28·7. Mean maximum, January, 31·8.

Rainfall—Maximum, date, April, 19.

Uganda—Entebbe

Temperature—14h., October, 77·6; Mean maximum, February, 82·5; October, 80·8. Absolute maximum, July, dates, 4, 10, 17.

Vapour Pressure—7h., May, 20·5; June, 19·2. 14h., February, 19·5; March, 20·2; June, 20·5; October, 19·6; Year, 19·7. 21h., March, 22·0; June, 20·8.

Relative Humidity—14h., September, 60.

Cloud Amount—7h., November, 7·6. 14h., April, 7·2.

Number of Days—Clear Sky—May 1; August, 2; Year, 8. Overcast sky—August, 5; December, 8; Year, 56.

Wind—March, E. 1; SE. 6. December, N. 12; NW. 4. Year, N. 103; E. 27; SE. 87; NW. 46.

Northern Rhodesia—Livingstone (July 1928 to June 1929, at 8h. only)

Pressure—October, 26·848; February, 26·779.

Temperature—Mean wet bulb, March, 57·7; June, 50·0. Mean maximum, September, 94·3. Mean minimum, April, 57·3. Mean monthly temperature, July, 59·5. Absolute minimum, April, 49·4.

Relative Humidity—November, 51; December, 70; February, 78; March, 82; April, 63; June, 62; Year, extreme, 82.

Ground Minimum Temperature—October, 57·7; January, 61·8; Year, mean, 51·9.

Earth Temperature—1 ft., March, 78.0; April, 80.4.

Table 6, col. 5, heading should be 8 a.m.

Table 8, Per Day, August, 10.88.

Jamaica—Kingston

Columns headed "Tension of Vapour" are apparently Dew Points. It is not known how the mean relative humidity is determined. No information is available regarding the criteria used for days of clear and overcast sky.

Temperature—Absolute maximum, July, 93.3.

Dew Point—7h., May, 68.

Cloud Amount—7h., December, 2.8; mean, 4.2. 15h., December, 5.1.

Rainfall—Maximum, July, 0.43; August, 2.42; September, 1.08; October, 1.03; November, 1.00. Date, July, 29; August, 18; September, 2; October, 9; November, 3.

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—Maximum, October, 2.10; December, 0.52. Date, October, 28; December, 14.

Number of Days—Rain—March, 12; September, 9; Year, 184.

Montserrat

Rainfall—Total, January, 4.82; May, 4.58; August, 9.84; October, 6.36; Year, 71.87. Maximum, date, May, 21; June, 12. From January to August rainfall measurements were not made on all days and the numbers of raindays in that period should be deleted; similarly the data of maximum falls during January, February, April and August should be deleted.

Grenada—Richmond Hill

Mean Pressure—April, 29.525; May, 29.517; June, 29.529; September, 29.493; October, 29.497.

Temperature—9h., April, 79; May, 78; June, 79; July, 80; October, 80. 18h., January, 77; February, 77; March, 78; April, 79; May, 79; June, 80; August, 80; September, 80; October, 81; Year, 79. Mean, February, 77; March, 77; April, 79; May, 79; June, 79; July, 80; November, 81; December, 81. Mean minimum, February, 71; April, 74; June, 74; July, 74; August, 74; November, 75; Year, 73. Mean maximum, March, 85; May, 86; June, 86; September, 87; October, 88; November, 88; Year, 86. Absolute maximum, date, January, also 29; October, also 15.

Relative Humidity—9h., March, 79; July, 78; Mean, March, 78; July, 76.

Cloud Amount—9h., February, 2; March, 4; June, 5; September, 7; December, 3; Mean, 4. 18h., Mean, 5. Mean, February, 2; June, 5; September, 6; December, 3.

Rainfall—February, 2.55; May, 8.56; June, 12.94; July, 5.95; August, 8.22; November, 9.75; Year, 82.06. Maximum, May, 0.80; July, 0.86; November, 1.89; Year, 4.20. Date, March, 22; May, 20; July, 29; November, 6.

Number of Days—Rain—March, 9; May, 24; July, 23; August, 24; September, 18; October, 16; Year, 223.

Barbados

Pressure—Heading should read "Barometric Pressure, reduced to 32° F., lat. 45° and M.S.L."

Falkland Islands—Stanley

Pressure—Mean :—

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
998.7	998.0	997.6	998.9	1006.3	1000.2	1000.2	1002.2	999.3	1002.4	998.2	993.9	999.7

Lowest, February, date, 1.

Temperature—Mean, February, 48.7; May, 39.1; August, 38.7. Maximum September, date, also 24 and 26. Minimum, May, 20. Date, March, also 1; May, 31; September, also 9 and 10.

Rainfall—Total, February, 2.60; April, 3.05; August, 2.01; September, 2.08; Year, 33.62. Greatest fall, February, date, 18.

Number of Days—Rain—September, 20; Year, 221. *Clear Sky*—March, 3; April, 6; August, 5; September, 2; Year, 36. *Overcast*—March, 11; September, 15; October, 7; December, 9; Year, 136.

Wind—Force 4-7, January, 13; February, 17; April, 21; May, 13; June, 13; July, 19; August, 15; September, 20; October, 24; November, 17; December, 22; Year, 215. Direction, January, SE. 1; SSE. 0; S. 3; SW. 6; WSW. 0; NW. 3; NNW. 1. February, NE. 1; WNW. 1. April, N. 1; NE. 1. June, W. 12; calm, 2. August, NW. 6; calm 2. September, ESE. 1; NNW. 1. December, SSE. 0; S. 5. Year, N. 12; NE. 14; ESE. 3; SE. 12; SSE. 9; S. 23; SW. 49; WSW. 32; W. 102; WNW. 30; NW. 38.

Mean force, January, 3.3; February, 4.4; April, 4.4; May, 3.5; June, 3.6; September, 4.5; October, 4.6.

Fiji—Suva

Rainfall—Most in 24 hours, January, 4.31.

South Georgia—Cumberland Bay

No records are available for March and April, 1928.

Mean Pressure—The values in mm. reduced to 0° C., lat. 45° and M.S.L. are as follows :—

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1928 ..	742.4	744.2	—	—	741.3	750.7	750.6	749.2	748.6	750.8	744.3	743.6	—
1929 ..	747.5	742.9	746.3	745.7	748.7	742.2	746.1	746.0	747.2	750.9	750.0	743.4	746.4

1928.

Temperature—Maximum, December, 14.3; date, 5. Minimum, February, -1.8; date, 18; November, -2.7; date, 19.

Rainfall—Total, August, 147.7; December, 55.1. Greatest fall—the figures apparently refer to the greatest amount measured at any one observation hour, and not to the greatest amount in a 24-hour period.

Number of Days—Rain, etc.—January, 20; February, 18; May, 20; June, 11; July, 13; August, 17; September, 19; October, 15; November, 17; December, 17.

Cloud Amount—May, 8.0; July, 7.6; August, 7.5; November, 8.4.

1929.

Temperature—Mean, April, 2.35. Minimum, May, -5.7; date, 29.

Barbados

Pressure—Reading should read "Barometric Pressure reduced to 32°F. lat. 45° and M.S.L."

Island—Stanley

Pressure—Mean

Year	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	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