

# THE COLOMBO OBSERVATORY.

1932

## REPORT OF THE ACTING SUPERINTENDENT OF THE OBSERVATORY.



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### ADMINISTRATION.

*Staff.*—On February 18 at the expiration of Mr. A. J. Bamford's leave preparatory to retirement, Mr. H. Jameson was confirmed as Superintendent and Mr. D. T. E. Dassanayake as Assistant Astronomer. On the same date, Mr. D. J. Jayasinghe, Junior Technical Assistant, was promoted to the grade of Senior Technical Assistant.

On August 11 Mr. Jameson proceeded on vacation leave and I took charge as Acting Superintendent, Mr. A. P. Kandasamy, Senior Technical Assistant, acting as Assistant Astronomer and Mr. R. D. Kreltszheim, Junior Technical Assistant, acting as Senior Technical Assistant.

Mr. Kreltszheim was on leave from June 29 to August 13, during which time, by arrangement with the Director-General of Observatories, India, he visited various observatories under the Indian Meteorological Department and studied their methods.

The vacancy in the Junior Technical Assistant grade created by the promotion of Mr. Jayasinghe has been left unfilled. Instead, two Third Grade Surveyors, Messrs. A. B. Piyadasa and G. de S. Karunatilleke, have been temporarily attached to the Observatory, the former from July 11 and the latter from August 15, and have been engaged almost entirely on upper-air observations and their reductions.

The year saw the retirement of the two most senior members of the clerical staff, Messrs. F. A. P. P. Pullenayegum and J. W. F. Ohlmus. Mr. Pullenayegum, who combined the duties of Chief Clerk and Chief Meteorological Observer, retired in May after 36 years' service in the Department, of which the last 24 years were spent at the Observatory. At his retirement, the post of Chief Meteorological Observer at the Observatory was definitely abolished, while his place as Chief Clerk was taken by Mr. H. R. Henson. Mr. Ohlmus retired in September with a service of 26 years to his credit, the last 15 years having been spent at the Observatory, and was succeeded by Mr. L. M. de Mel.

*Buildings.*—There were no extensions made to the buildings during the year.

### TIME WORK.

The astronomical activities of the Observatory were mainly limited to time work.

The use of the Cooke micrometer transit (4-inch object glass) and Borrel chronograph was considerably restricted during the year, and the clocks were rated by regular observations of the Bordeaux and Rugby vernier time signals.

Both the sidereal clocks, Fournier 70 and 72, continued to maintain satisfactory rates. The cord of 70 broke on the evening of June 30 and the clock was out of action till July 15, when it was set going again with a new cord.

The mean-time clocks, Cooke and Dent No. 45082, worked continuously without incident. The Cooke clock was used chiefly for sending out the wireless time signals and the Dent clock for the time ball work. For this purpose they are adjusted daily by solenoids, after comparison with the sidereals.

The Synchronome master clocks continued to be in use for calibrating the seismograph, and for dials in various parts of the building.

*Time Ball and Synchronization.*—The time ball at the Flagstaff Station was dropped at 09.00 Ceylon Standard Time (0330 G.M.T.) on all days, inclusive of Sundays and public holidays.

There were 360 successful signals out of a possible 366. One failure was caused by the officer on duty inadvertently omitting to send the signal, three due to trouble on the line, while the remaining two resulted from faults at the Flagstaff Station end.

The working of the time ball involves co-operation between four departments, Survey (Observatory), Telegraph, Harbour Engineer's and Master Attendant's, and my thanks are due to those officers of the other departments concerned who have co-operated in this work.

Synchronizing signals were sent daily to the Central Telegraph Office, whence a further distribution of time signals was made throughout the Island. These were sent from the Observatory at 07.55 and 15.55 on ordinary week days, at 07.55 only on public holidays that are not



post office holidays, and at 08.54 on Sundays and post office holidays. Since July 9, however, only the signal at 07.55 was sent on Saturdays. A test measurement was in all cases made immediately after the setting signal, and this enabled the Observatory staff to verify that the setting signal had done its work satisfactorily, and if necessary to report any defect by telephone. Details of this test signal were given in the 1930 report.

The clock in the lighthouse at the corner of Chatham street and Queen street was synchronized daily at 09.00, its relay being in series with the time ball circuit. At certain hours the strike of this clock is included in the broadcasting programme as a time signal.

The broadcast of these strikes at noon is checked daily at the Observatory, and the error noted. The great majority of these checks gave errors of less than 5 seconds. The clock stopped on three occasions during the year. On one occasion the stoppage was evidently due to the omission to send the time ball signal, on another it was due to a mechanical fault in the clock, while on the last the cause was probably electrical.

*Issue of Wireless Time Signals.*—These were sent out twice daily, in the old International or "Onogo" Code, from the Welikada Wireless Station. The morning signal is from 12.27—11.30, Ceylon Standard Time (0557—0600, G.M.T.), on 130 kc/s (2300 metres), C.W., and the evening one from 22.27—22.30 (1657—1700, G.M.T.) on 500 kc/s (600 metres), I.C.W. There is no curtailment on Sundays or public holidays.

In the case of a failure or erroneous signal, the words "time signal failed" are sent out in Morse immediately afterwards.

Details of the apparatus and procedure are given in the 1930 report.

In 1932 there were 724 successful signals out of a possible 732. Two failures were caused by faulty release of the drum, two due to trouble on the line, and two others to faults developing in the apparatus at the Wireless Station during the signal; on one occasion the power failed, while on the other, the cause of the failure could not be definitely determined.

As in the case of the time ball work, the wireless signals involve close co-operation with the Telegraph Department, and I am glad to take this opportunity of expressing my thanks to all concerned for the way in which they have been maintained.

#### METEOROLOGICAL EQUIPMENT AND WORK.

The 16 main climatological stations and the 3 new stations established for aeronautical meteorology, that were in action in 1931, were maintained during the year.

At the 16 main climatological stations, observations were taken daily at 9½ hours and 15½ hours. In addition, observations were taken at 8 hours at Colombo and Nuwara Eliya and at 8 hours and 17 hours at Trincomalee and Hambantota for transmission to India. At the request of the Indian Meteorological Department, arrangements were made for sending 8 hours' and 17 hours' observations from Batticaloa as well, commencing from October 15. The 17 hours' observations are used, in conjunction with values derived from the Colombo autograms, in preparing the evening wireless weather report for issue from Colombo.

Mention may also be made of the climatological stations maintained by the Rubber Research Institute at Culloden, Neboda, and by the Tea Research Institute at St. Coomb's, Talawakele, and of that started in January at the Nettle Grub Laboratory, Passara—a sub-station of the Tea Research Institute.

The records from these stations are sent regularly to the Observatory. A pluviograph is maintained at Labugama Reservoir by the Colombo Municipality, while the Observatory maintains another at Watawala, and a recording anemometer at Haputale, in addition to some pluviographs and recording anemometers at the main stations. There is a Robinson Anemometer at the Little Basses Lighthouse, which is maintained and read twice daily by the Lighthouse Service.

The chief changes in outstation observers during the year were at Jaffna and Batticaloa, where on account of the closing down of the Survey Offices at the end of June, new arrangements had to be made. At present the observers at Jaffna are drawn from the Public Works Department and at Batticaloa from the Kachcheri staff.

The pin diagrams and other systems of checking at Colombo were continued without any marked change in methods.

One clerk of the Survey Department, another from Puttalam Kachcheri, two members of the Master Attendant's Department and one lighthouse-keeper were given a course of training in meteorological work at the Observatory.

*Wireless Weather Reports.*—The chief daily weather report and forecast was prepared each morning in time to be broadcast *en clair* at noon. It subsequently appeared in the "Post Office Daily List" and in the local newspapers.

The chief material for this report was provided by the morning telegrams from 14 climatological outstations, the observations at Colombo, including the morning pilot balloon flight, and such ships' messages as were available. Other sources of information were the telegram from Pamban, and the figures from stations in Ceylon that are not fully equipped climatological stations, but from which the morning measurement of rainfall is wired. These stations now number 21.

Weather reports, prepared avowedly with a view to shipping, were sent out in Morse immediately after the time signals at 11½ hours and 22½ hours. These messages deal with the immediate neighbourhood of Ceylon in more detail than can be expected in the Indian Messages, which avowedly have to summarize the outstanding features over big areas. By kind permission of the Director-General of Observatories, copies of the Indian messages are received at Colombo, and use is made of any relevant parts but the main sources of information for the reports from Colombo are the Ceylon readings (both surface and upper air) and wireless messages received direct from ships.

Mention was made in last year's report of the issue of a Fleet Synoptic Message from Matara Naval Wireless Station, daily at 13½ hours on a wave-length of 150 kc/s (2000 metres). From April 11, this was sent out in two parts—the first part, consisting primarily of the land



stations Colombo, Hambantota, Trincomalee, Nuwara Eliya, and the Indian Station Pamban and such ships' telegrams as were available, being broadcast at 11 hours, and the second part, consisting of ships' telegrams received later, a summary of the morning pilot balloon flight at Colombo, and a weather inference and forecast, being broadcast at 13½ hours. On Sundays and post office holidays, however, only one Message was sent out at 11 hours.

The number of ships from which weather telegrams were received during the year was 379, which is a definite increase over the number for the preceding year (323). I am glad to take this opportunity of expressing my thanks to the various Captains and other officers concerned.

The greatest number of telegrams received from any one vessel was 82 from H.M.S. Investigator. The s.s. Margha sent 69, and others from which over 40 were received were H.M.S. Cumberland, the s.s. Badarpur, Mooltan, Masimpur, Jalapalaka, Aungban, Bendigo, Tuscania, Oronsay, and Otranto.

The total number of ships' telegrams received was 3,786, an increase of nearly 70 per cent. over the number for last year.

Individual acknowledgments have been sent in all cases, but not all these have reached the addressee—some have been returned after redirection had failed to keep up with the movements of the ship.

*Rain Gauges and Volunteer Observers.*—Rainfall figures appear in this report from 400 stations. These include the stations that report daily, at which the observers receive an allowance, but the great majority of them are maintained voluntarily, and I am glad to take this opportunity of thanking all who have co-operated in this work.

The new stations started during the year include four under the Irrigation Department (Kahapatwilagama, Kayinattawa, Kehellandewewa, and Tammennawa), one under the Department of Agriculture (Tamblagam), one at Hanwella Resthouse, one at Palatupana Lewaya, and one at Hiripitiya Goat Farm (Major C. L. de Zilva). Through the courtesy of the Superintendent, Mr. E. Gordon Brooke, rainfall figures from Hanwella Group Estate have been made available, and are published for the first time in this report.

Four stations have been discontinued, Balangoda Experimental Station, Esnaphyle Estate, Mullaittivu, and Uyilankulam, but all of them were in action during the first part of the year, and their figures are included up to the date of their discontinuation.

While it is not possible to mention all the voluntary helpers individually, I wish to put in a special word of thanks to some of those who have done a great deal more than supply monthly summaries of their daily rainfall figures. Among these should be mentioned—Mr. R. G. Coombe (Poonagalla) for his weekly barograms and special messages on unusual conditions; Mr. E. E. Megget (Detenagalla), Mr. Ross Wyllie (Oakwell), Mr. A. Pearson (Horakele) for sunshine charts; Mr. A. C. Tutein-Nolthenius (West Haputale) for anemometer figures and charts; Mr. C. K. Groves (Hope) for anemometer figures; Mr. E. H. Mellor (Norton Bridge and Donnybrooke) and Mr. C. Erskine (Ben Hope) for telegrams and post cards concerning heavy rain; Mr. G. Huntley (Vincit), Mr. J. A. Mudge (Theydon Bois), Mr. V. C. Baker (Keenagaha-ella), and Mr. G. P. Kelly (Nilloomally) for interesting climatological notes.

The number of daily reporting rain-gauge stations stood at 15 at the beginning of the year and included three estate gauges, of which mention was made in previous reports. This was increased to 20 at the beginning of May by the inclusion of five more estate gauges at Campion, Dunedin, Eheliyagoda, Maliboda, and Yataderiya, and was again increased to 21 at the beginning of June by the establishment of a new gauge at Hanwella Resthouse. All these additional stations are in the catchment of the Kelani river, and it was felt that their inclusion would provide very useful information during times of flood threat. In this connection I must express my indebtedness to the various Superintendents concerned, for their ready co-operation, namely, Mr. H. A. McLaren (Geekiyanakanda), Messrs. S. B. Dias and R. C. H. Ellis (St. Martin's Group), Messrs. W. S. Roper and Rawdon Payne (Panilkande), Mr. J. L. Innes-Lillingston and Captain O. C. Hare (Campion), Mr. J. A. Tate (Dunedin), Mr. W. Carver (Eheliyagoda), Mr. Neville Rolfe (Maliboda), and Mr. H. C. Rowbotham (Yataderiya).

*Co-operation with Indian Meteorological Department.*—Telegrams from Colombo and Nuwara Eliya are sent to India at 8 A.M. and from Trincomalee, Hambantota, and Batticaloa at 8 A.M. and 5 P.M. as a matter of daily routine, while extra storm warning telegrams are also sent from the four coast stations at various times, when asked for by the Indian Meteorological Department. The numbers of storm-warning telegrams sent in 1932 to Poona were:—Colombo, 40; Trincomalee, 19; Hambantota, 26; and to Calcutta:—Colombo, 28; Trincomalee, 55; Hambantota, 44; Batticaloa, 35.

The results of the morning pilot balloon flight were telegraphed to Poona throughout the year, and to Calcutta at certain seasons. In addition, afternoon flights were wired when required, and telegrams were also sent whenever the general appearance of the morning synoptic chart showed anything worthy of such treatment.

The weather messages received from shipping were also forwarded to India, by wire if required, or if anything unusual was noted in them.

By the courtesy of the Director-General of Observatories, India, copies of all broadcasts sent by him to the Navy Wireless Station at Matara were also delivered to the Colombo Observatory. In addition copies of the daily morning telegram from Pamban were also sent here and proved of considerable value, owing to the way in which during the north-east monsoon strong wind often blows down the Gulf of Mannar, and so produces distinctly rougher weather between Colombo and Cape Comorin than is indicated by the shore readings at Colombo alone.

*Upper-Air Work.*—Rubber pilot balloons were in use throughout the year, the tail method of observation being used. The balloons showed a marked improvement in quality over those received in the previous year and, with the exception of one packet, were very satisfactory.

The experiment of sending out each monthly consignment of balloons from England in two parts, half by ordinary post and half by special stowage (in cold storage aboard ship), and comparing their behaviour afterwards was continued till June. These further tests confirmed the suggestion in last year's report, that the method of transit has no marked effect on the subsequent behaviour of the balloons.



The total number of flights was 51, or 68 less than last year. During the first eight months in the year, owing to shortage of staff, flights were more or less restricted to one a day except on international days when two were sent up. With the arrival of the two Surveyors, the normal procedure of two flights a day was carried out from about the middle of August.

It was the practice in previous years to offer a small reward during the south-west monsoon for the return of balloon tails by the finder. This was not done, however, during the present year, as it was felt that sufficient information is already available.

The total number of flights in which the balloon was followed to a height of at least 5 kilometres was only 29. Of these 7 were followed to a height of at least 7 kilometres and only 2 to at least 10 kilometres. The highest observed altitude during the year was 11.3 kilometres in November. Nearly all the high flights were confined to the first three months, only one flight reaching a height of 7 kilometres during the rest of the year. On the whole, the observations of this year's observations were rather disappointing compared with those of the previous year, and are shown diagrammatically in plate VIII.

*Vertical Temperature Gradient.*—The four thermographs at the Welikada Wireless Station have been in continuous operation throughout the year, except from February 15 to March 15, when owing to damage to the screen at half-mast, no records were available from that height.

*Seasonal Correlation.*—Indications as to the strength of the monsoon this year were somewhat at variance and no definite forecast was made. February temperatures have often shown appreciable correlation, low temperatures in that month being frequently associated with a deficient monsoon rainfall. Temperatures in February this year were distinctly below normal, and pointed to a weak monsoon. On the other hand, thunderstorm activity in March and April were below the average, a condition usually followed by an excess monsoon rainfall. On the whole, the evidence was rather contradictory and afforded no clear indication of the deficient monsoon, that actually occurred (see plate IV.).

### PUBLICATIONS.

The present report is on the same lines as its predecessors, and gives among other information rainfall figures from 400 stations. The latter part of it includes the tables that also appear in the Ceylon Blue Book. The chief change this year is the exclusion of the current year's figures from the averages. In the case of temperatures and sunshine, however, where shorter series of observations are available, averages have been brought up to the end of 1932 by the inclusion of figures for this year.

Routine publications have been similar to those of last year, and included daily reports in the "Post Office Daily List" and newspapers, and monthly summaries in the *Government Gazette* and *Tropical Agriculturist*.

It must be remembered that a good many observations are made here which are not published in the report and Blue Book, owing to exigencies of space and the expense of printing. Among these may be mentioned measurements of amount of cloud, surface and underground temperatures, evaporation, &c. Information on these points can be obtained on application to the Observatory.

Other publications include.—"An example of the use of Percentiles in Climatology" and "Heavy rain at Colombo on May 10, 1932" by Mr. Jameson, in the *Meteorological Magazine*; "The liability to drought at Colombo" by Mr. Jameson, in the *Quarterly Journal of the Royal Meteorological Society*. Mr. Jameson also read a paper on "The Expectancy of Heavy Rainfall in Ceylon" at the annual meeting of the Engineering Association in August.

As in previous years, publications have been received from a number of observatories and other organizations. While their receipt has been acknowledged individually by letter, I am glad to take this opportunity of thanking the donors collectively.

### SEISMOGRAPH.

The Milne Shaw seismograph was in use throughout the year. The boom point was changed on November 3 and again the next day, but otherwise only minor adjustments were needed. There were a few stoppages on account of trouble with the clocks, particularly between April 1 to 6, but none of these were protracted.

The coupling was maintained as before at the 250 magnification throughout, and measurements of period, damping ratio, and sensitivity were made about once a month.

The free period showed a tendency to decrease slightly from its normal value of 12 seconds, but with occasional adjustment it remained throughout the year in that neighbourhood.

Measurements of damping ratio varied from 1 in 16 to 1 in 28. It was occasionally adjusted to a mean value of 1 in 20.

The sensitivity was usually of the order of 60 mm. per second of arc, the extreme values during the year being 48 and 66.

The list below, of 69 earthquakes, is restricted to definite shocks, and contains no reference to a large number of small traces that were also recorded. The regular diurnal movement of the pillar is still a definite feature of the records.

All times are in Greenwich Mean Time.

No.	Date 1932.	P			S			L			Maximum.			End.		Amplitude.	Remarks.
		H	M	S	H	M	S	H	M	S	H	M	S	H	M	MM	
1621..	5	..02	15	33..	—	..	—	..03	22	09..	04	26	..	0.4..			—
1622..	9	..10	32	53..	10	41	56..	10	47	26M	10	51	39..	13	04½..	1.7..	—
																1.1..	—
1623..	13	..16	41	32..	—	..	—	..17	14	20..	17	44	..	0.4..			—
1624..	24	..03	57	20..	04	07	50..	04	32	44..	04	38	50..	06	31½..	0.9..	—
1625..	29	..13	53	01..	14	02	39..	14	26	09..	14	31	57..	17	44	..	1.5..
1626..	30	..03	16	37..	—	..	—	Not pronounced			05	17½.		<0.4..			—



No.	Date 1932.	P			S			L			Maximum.			End. Amplitude.		Remarks.	
		H	M	S	H	M	S	H	M	S	H	M	S	H	M		MM
February																	
1627..	3	..06	34	08..	—	..	—	..	..07	38	40..	09	17½	..	0.5..	—	
1628..	12	..01	03	14..	01	07	33..	01	09	04..	..01	11	03..	03	13	4.0..	—
1629..	14-15	..23	19	38..	23	24	16..	23	25	06..	..23	29	28..	01	04½	3.9..	—
1630..	16	..14	13	29..	—	..	—	..	..14	52	07..	15	26½	..	0.6..	—	
1631..	21	..12	48	39..	—	..	—	..	Between	..14	12½	..	About	1.5	The trace is lost between 13h 29m 59s and 13h 30m 29s this interval being the Hour time mark of 30 seconds duration.	—	
									13	29	59						
									and								
									13	30	31						
1632..	23	..00	29	20..	—	..	—	..	..00	54	00..	02	29	..	2.1..	—	
March																	
1633..	4-5	..23	31	03..	23	33	00..	23	35	13..	..23	35	47..	00	03	2.4..	—
1634..	8	..18	26	40..	—	..	—	..	..19	00	40..	19	32½	..	0.4..	—	
1635..	10	..05	55	20..	—	..	—	..	..06	17	40..	07	07½	..	0.4..	—	
1636..	14-15	..23	02	39..	—	..	—	..	..00	16	27..	01	00	..	0.4..	—	
1637..	18	..05	22	51..	05	26	46..	05	27	51..	..05	29	37..	06	49	2.8..	—
1638..	19	..11	10	38..	11	19	20..	11	32	58..	..11	40	43..	12	16	0.6..	—
1639..	26	..00	16	35..	00	26	40..	00	46	25..	..00	53	08..	02	50	4.5..	—
1640..	26	..07	12	20..	—	..	—	..	..07	16	02..	07	17	15..	08	02½	2.9..
1641..	26	..10	01	14..	10	12	35..	10	27	49..	..10	32	31..	12	16	2.9..	—
1642..	27	..08	52	57..	08	57	29..	09	06	59..	..09	08	34..	09	32	0.8..	—
1643..	28	..00	40	53..	00	45	03..	00	49	33..	..01	51	13..	02	50½	3.2..	—
April																	
1644..	3	..21	12	20..	—	..	—	..	..21	36	30..	21	57½	..	0.5..	—	
1645..	18	..11	28	39..	—	..	—	..	..11	40	35..	11	59½	..	0.7..	—	
1646..	22	..05	03	38..	05	08	10..	05	11	55..	..05	17	30..	05	55½	0.5..	—
May																	
1647..	14	..13	19	31..	13	25	44..	13	34	19..	..13	35	29..	16	54½	82.0..	—
1648..	21	..10	29	55..	Elusive	..11	24	40..	11	43	25..	12	27½	..	1.9..	—	
1649..	26-27	eP16	22	30..	16	32	28..	16	47	28..	..17	03	06..	19	18	2.2..	—
		iP16	26	54													
1650..	28	..02	34	28..	02	38	18..	02	42	13..	..02	48	30..	03	34	0.6..	—
June																	
1651..	3	..10	56	55..	Elusive	..11	49	20..	12	12	50..	14	46½	..	81.0..	—	
1652..	10	..20	30	15..	20	36	22..	20	44	38..	..20	46	05..	21	11½	0.4..	—
1653..	11	..08	43	45..	—	..	—	..	..08	52	38..	09	19½	..	0.7..	—	
1654..	13	..21	06	57..	—	..	—	..	..21	23	07..	22	00½	..	0.8..	—	
1655..	16	..01	22	50..	01	27	52..	01	33	48..	..01	37	08..	03	15	1.6..	—
1656..	18	..10	32	26..	Elusive	..11	35	52..	11	50	42..	13	40½	..	33.0..	—	
1657..	18	..17	42	49	—	..	—	..	..17	45	06..	18	09½	..	0.5..	P masked in microseisms, probably earlier.	
1658..	22	..13	19	50..	Elusive	..14	05	20..	14	23	50..	15	21½	..	2.2..	—	
July																	
1659..	5	..10	58	06..	11	02	36..	11	06	08..	..11	12	41..	11	52½	0.8..	—
1660..	7	..17	02	09..	—	..	—	..	..17	45	39..	18	24½	..	0.5..	—	
1661..	12	..20	31	35..	—	..	—	..	..20	52	25..	21	22	..	0.7..	—	
1662..	16	eP21	06	32..	21	11	29..	21	15	52..	..21	16	07..	22	21	1.1..	—
		iP21	07	01													
1663..	25	..09	32	38..	—	..	—	..	..10	50	28..	11	50	..	1.5..	P masked in microseisms, hence uncertain.	
August																	
1664..	2	..04	35	29..	04	40	39..	04	49	26..	..04	55	07..	—	..	0.5..	—
1665..	12	..03	57	56..	—	..	—	..	..04	26	55..	05	06	..	0.5..	P is masked in microseisms, hence uncertain.	
1666..	14	..04	44	42..	04	48	49..	04	52	39..	..04	53	00..	—	..	9.7..	End lost in microseisms.
1667..	21	..04	33	40..	—	..	—	..	..04	41	38..	05	22	..	1.0..	—	
September																	
1668..	3	..12	18	19..	—	..	—	..	..12	43	52..	13	02	..	0.5..	—	
1669..	9	..13	45	39..	13	55	01..	14	09	03..	..14	12	26..	14	56	1.3..	—
1670..	11	..14	30	09..	—	..	—	..	..14	36	54..	14	50	..	1.0..	—	
1671..	15	..11	21	03..	—	..	—	..	..11	41	18..	12	25½	..	1.1..	—	
1672..	15	..14	12	58..	14	26	13..	14	42	36..	..14	54	15..	16	28	2.5..	—
1673..	20	..15	46	57..	—	..	—	..	..15	54	04..	16	32	..	1.0..	—	
1674..	23	..14	32	12..	14	40	20..	14	50	33..	..14	58	35..	15	59	0.9..	—
1675..	26	..19	30	48..	19	41	08..	19	56	53..	..19	59	25..	21	29½	3.0..	—
1676..	27	..18	47	34..	—	..	—	..	..18	54	03..	19	21½	..	0.6..	—	
1677..	29	..04	07	32..	—	..	—	..	..04	45	52..	—	..	..	0.5..	—	
1678..	29	..17	58	02..	—	..	—	..	..18	35	58..	—	..	..	0.5..	—	
October																	
1679..	2	eP03	36	55..	Elusive	..04	20	29..	04	33	27..	05	10	..	1.0..	—	
		iP03	41	44													
1680..	16	..12	18	20..	—	..	—	..	..13	16	13..	13	58	..	1.0..	—	
1681..	29	..11	20	30..	11	26	05..	11	29	34..	..11	30	40..	12	17½	2.5..	—
1682..	30	..21	11	29..	—	..	—	..	..21	55	07..	22	25	..	0.8..	—	
November																	
1683..	9	..18	35	13..	18	39	12..	18	42	10..	..18	43	35..	19	08	0.7..	—



No.	Date 1932. December	P H M S	S H M S	L H M S	Maximum. H M S	End. H M	Amplitude. MM	Remarks.
1684..	4	..08 19 01..	08 25 19..	08 35 19M <sub>1</sub>	08 37 19..	10 14 $\frac{1}{2}$ ..	7.5..	—
1685..	4	..10 40 44..	10 46 57..	10 53 33..	10 58 54..	11 25 $\frac{1}{2}$ ..	7.5..	—
1686..	7	..16 42 03..	— ..	— ..	..18 00 21..	18 34 $\frac{1}{2}$ ..	0.9..	—
1687..	11	..04 29 17..	— ..	— ..	Not pronounced	05 18 $\frac{1}{2}$ ..	1.2..	—
1688..	21	..06 32 49..	Elusive	..07 10 47..	07 21 42..	08 51 ..	0.9..	—
1689..	31	..02 40 50..	02 48 43..	02 55 04..	03 04 $\frac{1}{2}$ ..	03 38 ..	2.5..	—

M is only approximate  
trace is indistinct



International  
Seismological  
Centre

#### WEATHER SUMMARY, 1932.

*January.*—The rainfall was markedly below normal over the whole Island. No rain was reported from practically all the stations in an area that can be described roughly as the Colombo-Avissawella-Kurunegala-Chilaw quadrilateral, while another rainless area was the eastern part of the Southern Province. St. Martin's (Lower) with 20.23 inches recorded the highest total for the month.

*February.*—The rainfall was in excess over the greater part of the Island, the chief exceptions being the Northern Province, the northern part of the Eastern Province, and the southern part of the Southern Province. Rainfall averages are low in February, and even with this excess only a few stations reported as much as 10 inches for the month. Several stations in the Jaffna Peninsula reported no rain at all.

*March.*—The rainfall during this month was generally below normal. Though an appreciable number of stations, in all parts of the Island, showed slight excess, very few were more than 2 inches above their average, and none as much as 5 inches above. The rain was chiefly due to local thunderstorms, and most of it fell during the later half of the month.

*April.*—For a few days about the middle of the month, a definite barometric gradient from the south-west set in, and for several days caused weather conditions that simulated those of the early south-west monsoon. During the rest of the month, however, weak gradients and local afternoon or evening thunderstorms were the rule. Excesses and deficits of rainfall were somewhat irregularly distributed throughout the Island.

*May.*—The rainfall was generally above normal, particularly on the western slopes of the hills, where many stations showed excesses of 10 inches or more above their long-period averages. The greatest excess reported was 18.34 inches at Rasagalla, while the greatest monthly totals were 44.92 inches at Theydon Bois and 37.20 inches at Watawala. The only appreciable areas reporting deficits were those contained between the eastern slopes of the main hill-country and the east coast, south of Batticaloa.

The greatest daily fall during the month was 10.43 inches at Colombo Observatory, a record for that station. The greater part of this rain fell on the morning of the 10th, and was remarkably intense, 9 $\frac{1}{2}$  inches being recorded in 3 $\frac{1}{2}$  hours. This rain-storm, however, appeared to have been confined to a comparatively small area, as neighbouring gauges registered considerably smaller falls.

*June.*—The rainfall this month was below normal over almost the whole Island, deficits being greatest in the south-west. Many stations in the north and a few along the east coast reported no rain at all during the month.

In the lee of the hills, local thunderstorms were common during the last few days of the month, conditions distinctly unusual for this season of the year. Pilot-balloon observations at Colombo showed that the monsoon wind currents at heights of a few thousand feet above the ground had weakened considerably about then, and it is quite likely that this weakening had allowed greater scope for the development of local circulations on the other side of the Island.

*July.*—The rainfall was again below average nearly everywhere, particularly in the south-west of the Island, where usually the July totals are high. Nearly every station in this area reported deficits of at least two inches, and quite a number were between 5 and 10 inches below their averages.

Several stations in the north and east of the Island reported no rain at all during the month.

*August.*—The rainfall of August, on the other hand, was well above average over the greater part of the Island, this being particularly so in the low-country between Colombo and Matara, where excesses of 10 to 20 inches were the rule. Hiniduma, with a rainfall of over 33 inches above its average, was easily the most outstanding case, while quite a number of stations in the Island had broken their previous records for August.

The distribution of rainfall during the month was rather striking in the way the rain had concentrated into the second half of the month. During the first fortnight, there was a moderately steep south-westerly gradient, a partial collapse of which about the middle of the month resulted in conditions usually associated with the inter-monsoon period.

*September.*—The rainfall this month was below average over by far the greater part of the Island, deficits being most marked in a comparatively small area, extending westward from the central hills, where several stations were between 5 and 10 inches below their average for the month, and a few more than 10 inches in deficit.

A number of stations in the north and north-west of the Island reported no rain at all.

*October.*—The rainfall was nearly everywhere above average, excesses being most marked on the western face of the central hills and along the west and east coasts of the Island. Kitulgala with 46.15 inches recorded at once the highest total for the month and the largest offset, namely, 24 inches above average. Other stations that had over 35 inches for the month were Padupola and Maliboda, while quite a number of stations in the same part of the Island recorded between 30 and 35 inches during the month.



The only stations that were over 5 inches in deficit formed a group in the Southern Province, a little north of Matara, while small deficits were recorded at about a score of stations generally distributed on the eastern and southern slopes of the hill ranges and in the south of the Island.

*November.*—The rainfall of November was again above average over the greater part of the Island. It was particularly heavy in the north, where several stations recorded excesses of over 15 inches for the month and more than one station over 20 inches.

The Island came under the influence of two depressions that formed in the Bay of Bengal during the month. Neither of these actually crossed the Island, but they both developed into fairly severe cyclonic storms and came near enough to it to exert considerable influence over the weather.

Thunderstorm activity too was fairly pronounced.

*December.*—The rainfall of December, on the other hand, was nearly everywhere below average, deficits being most marked in the eastern half of the Island, particularly on the eastern slopes of the central hills, where several stations were more than 10 inches in deficit and two stations, St. Martin's and Hendon, as much as 25 inches and 17 inches respectively below average.

The highest total of 17·54 inches for the month was recorded at Kanakarayenkulam. The only other stations that had over 15 inches for the month were St. Martin's, Hendon, and Iddumekelle in the Central Province, Keenakelle in the Uva Province, and New Tirrukovil in the Batticaloa District.

*Year.*—With the exception of the north and the western low-country, rainfall totals for the year were below average practically throughout the Island.

D. T. E. DASSANAYAKE, B.Sc., F.R.Met.S.,  
Acting Superintendent.

Colombo, March 29, 1933.



Return of Rainfall in Ceylon during 1932, and the Means during different Periods up to 1931.

Station and Abbreviation used on Maps.	Height above mean Sea Level.	Year.	Jan.		Feb.		March.		April.		May.		June.		July.		August.		Sept.		Oct.		Nov.		Dec.		Total for the Year		Greatest Quantity registered in any 24 hours.			
			Inches.		Inches.		Inches.		Inches.		Inches.		Inches.		Inches.		Inches.		Inches.		Inches.		Inches.		Inches.		Inches.		Days.		Inches.	
			Days.		Days.		Days.		Days.		Days.		Days.		Days.		Days.		Days.		Days.		Days.		Days.		Days.		Days.		Days.	
Alagalla (Al.)	..	1932 (means during 21 years ..)	0.23	2	6.52	8	3.12	5	13.08	19	12.14	23	3.16	10	4.42	16	6.43	17	3.77	12	29.60	25	20.75	21	5.11	9	108.33	167	7.50	Oct. 24 to 25		
Allai Tank	..	1932 (means during 56 years ..)	6.02	9	2.02	2	6.00	7	9.50	12	9.38	10	11.37	17	7.43	12	6.01	10	8.07	11	15.69	16	12.76	15	9.17	10	103.42	130	9.82	June 24 to 25, 1911		
Alutnuwara	..	1932 (means during 32 years ..)	3.31	6	1.59	5	1.46	4	0.16	2	3.11	7	2.92	3	1.94	1	5.41	13	1.19	2	17.48	22	10.01	16	11.44	19	60.02	100	4.02	Oct. 24 to 25		
Ambalantota	..	1932 (means during 10 years ..)	8.92	9	2.48	3	2.27	3	2.02	4	2.93	4	1.33	1	1.75	2	4.16	4	4.45	5	8.97	11	15.75	15	18.10	15	73.13	77	9.11	Nov. 17 to 18, 1906		
Ambanpitiya (Am.)	..	1932 (means during 60 years ..)	4.29	4	7.40	7	7.70	6	2.95	6	2.30	3	1.82	3	0.00	0	3.20	7	0.35	1	8.64	11	10.44	12	5.65	12	54.74	72	2.70	Nov. 23 to 24		
Ambepussa (Amb.)	..	1932 (means during 4 years ..)	15.79	14	5.18	7	5.15	7	5.18	9	2.85	5	0.56	2	1.17	2	1.94	3	2.86	5	11.78	15	14.04	16	16.78	17	83.28	103	9.92	Jan. 17 to 18, 1913		
Amparai Tank	..	1932 (means during 56 years ..)	0.00	0	1.17	3	0.90	6	6.04	13	5.44	19	0.71	4	0.59	2	7.56	15	4.41	15	5.13	9	5.39	14	1.72	4	39.06	104	2.01	Oct. 7 to 8		
Andankulam Tank, Trincomalee	..	1932 (means during 41 years ..)	3.92	6	1.35	3	4.44	7	3.66	6	4.22	7	3.09	9	2.11	5	1.20	6	3.38	8	4.48	9	8.42	13	5.83	9	46.11	87	5.27	Nov. 4 to 5, 1929		
Angoda Lunatic Asylum	..	1932 (means during 2 years ..)	0.26	3	4.22	6	8.45	13	11.77	20	14.84	26	4.73	24	4.72	19	10.74	22	9.72	21	18.60	28	12.99	21	2.46	8	103.50	211	2.93	Oct. 7 to 8		
Annfield Estate, Dikoya (An.)	..	1932 (means during 44 years ..)	3.49	6	2.61	4	6.81	10	10.79	15	10.71	15	12.88	20	8.23	17	6.70	16	8.58	16	17.46	21	13.78	17	7.27	11	109.33	168	16.65	Aug. 7 to 8, 1886		
Anningkanda Estate, Deniyaya	..	1932 (means during 54 years ..)	0.13	1	4.08	6	3.17	8	10.90	19	14.17	24	3.00	21	3.33	17	16.40	24	6.44	17	21.84	31	12.64	26	3.08	9	99.18	203	5.48	Oct. 7 to 8		
Anuradhapura	..	1932 (means during 8-9 years ..)	6.97	9	2.48	5	7.01	8	15.17	19	11.77	18	10.33	24	7.18	19	5.66	17	6.36	19	18.47	22	15.79	23	6.02	12	113.20	193	5.87	May 6 to 7, 1930		
{ Survey Office Experiment Station	..	1932 (means during 56 years ..)	1.83	12	8.05	7	5.64	7	1.42	2	2.97	8	2.46	2	1.53	1	5.13	11	0.84	4	14.51	23	7.35	19	8.58	16	60.31	112	3.08	Mar. 25 to 26		
	..	1932 (means during 41 years ..)	14.50	12	4.79	5	3.41	5	3.21	6	3.87	5	2.08	3	1.87	3	2.87	5	4.16	6	8.63	12	12.50	14	17.87	15	79.77	92	19.20	Dec. 7 to 8, 1881		
	..	1932 (means during 2 years ..)	4.10	9	0.95	3	1.83	5	0.91	3	3.31	10	0.65	3	0.27	1	6.33	9	0.97	3	16.08	21	14.01	18	13.16	19	62.57	104	4.53	Dec. 6 to 7		
{ Survey Office Experiment Station	..	1932 (means during 2 years ..)	8.69	10	1.89	3	1.72	3	1.90	4	2.55	3	0.83	1	1.94	3	3.24	5	3.73	6	7.52	11	15.26	16	15.60	15	64.88	80	13.30	Nov. 18 to 19, 1904		
	..	1932 (means during 4 years ..)	0.00	0	4.37	5	3.10	5	7.84	11	24.16	20	1.06	8	2.11	9	18.93	19	3.94	12	22.24	26	17.04	22	4.30	7	109.09	144	7.02	May 13 to 14		
	..	1932 (means during 44 years ..)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	May 3 to 4, 1931	
{ Survey Office Experiment Station	..	1932 (means during 44 years ..)	0.04	1	3.63	8	4.77	12	6.68	16	17.90	27	9.01	28	13.81	24	5.92	26	5.99	16	12.28	28	9.75	25	2.57	11	92.35	222	2.73	April 10 to 11		
	..	1932 (means during 54 years ..)	4.01	10	2.20	6	6.30	12	9.37	18	8.90	17	16.34	25	15.04	26	11.63	23	10.76	21	12.60	22	9.71	18	6.11	13	112.95	210	8.79	Oct. 4 to 5, 1913		
	..	1932 (means during 54 years ..)	1.58	6	13.37	16	7.06	20	12.12	18	20.76	27	6.91	24	4.01	18	11.22	24	8.86	18	6.71	24	21.48	27	8.72	18	122.80	240	5.17	Nov. 13 to 24		
{ Survey Office Experiment Station	..	1932 (means during 54 years ..)	8.94	14	7.24	10	10.81	16	12.82	18	12.62	18	13.24	22	9.03	18	7.96	17	10.87	17	15.99	21	17.53	21	13.66	19	140.70	211	7.98	Oct. 27 to 28, 1906		
	..	1932 (means during 62 years ..)	1.14	9	5.06	4	1.51	6	10.19	18	10.82	16	0.00	0	0.20	6	6.85	16	0.06	2	13.25	22	10.72	20	5.59	20	65.39	139	6.33	May 14 to 15		
	..	1932 (means during 62 years ..)	4.02	9	1.53	4	2.94	7	6.82	13	3.45	7	1.24	4	1.27	3	1.66	4	3.16	6	9.66	16	10.70	18	8.67	16	55.11	105	9.32	May 20 to 21, 1891		
{ Survey Office Experiment Station	..	1932 (means during 8-9 years ..)	1.17	8	5.06	3	3.86	7	8.94	18	7.73	14	0.00	0	0.10	2	6.43	12	0.09	2	14.14	19	8.28	14	4.50	11	60.30	110	4.10	Feb. 13 to 14		
	..	1932 (means during 8-9 years ..)	6.77	9	1.32	3	4.74	7	5.75	10	4.18	6	0.17	1	0.95	1	0.82	2	5.13	5	8.38	12	11.03	15	8.48	11	57.72	82	7.56	Dec. 27 to 28, 1928		
	..	1932 (means during 8-9 years ..)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	