This condition caused persistent rains in the provinces of Cautin, Valdivia, Llanquihue and Chiloe.

In Argentina, heavy rains and electrical storms occurred in the northern and central parts during the 9th, 10th, and 11th.

In Bolivia, very heavy rains took place during the 14th, 15th, and 16th. These rains extended into the southwest, causing severe floods in the Chilean provinces of Tarapaca and Antofagasta. The Rio Loa rose to extraordinary stages, doing severe damage to various towns and nitrate factories.

On the 16th an important barometric depression appeared from the west approaching South America off the central region of Chile. On the 17th, a pronounced fall of pressure took place in the Islands of Juan Fernandez, and on the 18th the depression began to affect the continent. On the 19th there were scattered rains between Valparaiso and Valdivia. On the 20th, the depression continued its southward progress, and abundant rains occurred between the provinces of Cautin and Magellanes.

In Argentina, during the 19th and 20th, a great depression existed in the northern region, and caused violent wind storms with lightning and thunder, rain, and hailstones of large size.

During the later days of the month a notable rise of pressure took place in southern Chile, resulting in the establishment of an anticyclonic center in the latitude of Chiloe, and the return of atmospheric conditions to normal.

March.—The outstanding meteorological feature was the frequency of disturbances in the southern region of the continent.

During the first days of the month pressure was high over northern Argentina and Uruguay. At this time light rains fell in the southern part of the province of Buenos Aires and in the territory of Rio Negro; electrical storms, with hail, occurred in central La Pampa on the 3d.

From the 4th to the 6th an area of high pressure formed in the region of Chiloe. On the 7th a V-shaped depression was accompanied by electrical storms, rain, and hail in Chilean provinces from Colchagua to Malleco.

A depression appeared in the south off Cabo Raper on the 10th; it caused rains over the whole southern region on the 11th and 12th.

A moderately heavy snow fell in Magellanes on the 15th.

During the following days an anticyclone formed in the south and this condition remained until the 26th; during this period a maximum pressure of 770 mm. (30.32 inches) was recorded at Puerto Madryn on the Atlantic coast.

Scattered rains fell in Argentina on the 24th and again from the 28th to the 30th.

A depression from the west appeared off central Chile on the 27th; on the next day it affected conditions in the south, bringing violent electrical storms, with rain and hail, in the provinces from Bio-Bio to Chiloe. During the following days it moved away toward the south, its path passing near the South Shetland and South Orkney islands into the antarctic glacial sea.

On the whole the month of March was more rainy than normal in southern Chile. In Argentina and Urguay rains were frequent and in Bolivia and the high regions of Peru they were rather abundant.

BIBLIOGRAPHY

C. FITZHUGH TALMAN, Meteorologist in Charge of Library

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies;

Brooks, Charles F.
Some striking displays of coronas and iridescent clouds. 12 p. 28½ cm. [Typewritten.]

Dole, Eleazer J.
Studies on the effects of air temperature and relative humidity on the transpiration of Pinus strobus. Burlington. 1924. 39 p. illus. plates. 23 cm. (Univ. of Vt. & State agric. coll. Vt. agric. exper. sta. Bull. 238, July, 1924.)

Fergusson, S. P.
Methods for measuring humidity. p. 119–121. 24 cm. (Repr.: Journ. optic. soc. Amer. & review of sci. instrum. v. 10, no. 1, Jan., 1925.)

Frisch, K.
Merejää vaatlused 1923/24 talvel Eestis. n. p. n. d. 16 p. illus. 27 cm. (Beobachtungen des Meereises im Winter 1923/24 in Eesti.) (Tartu Ülikooli Eesti veekogude uurimise komisjoni väljaanne No. 1.)

[Le Breton, T. A.]
Dirección meteorológica. [Buenos Aires. 1924.] p. 89–93. plates (part fold.). 27 cm. (Min. agric. de la nación, República Argentina. Memoria correspondiente al ejercicio de 1923.)

New York Edison Co.
Weather chart, showing a comparison of clear and cloudy weather during 1921, 1922, and 1923, possibly offering an explanation for any variation in lighting bills. n. p. n. d. 1 sheet. illus. 21½ cm.
"Weather man as a lamplighter." n. p. n. d. [2 p.] fig. 20½ cm. [Repr.: Ferguson service, April, 1924.]

Peek, F. W., jr.
Lightning and other transients on transmission. 13 p. illus. 30½ cm. [Amer. inst. elec. engin., Journ. v. 43, Aug., 1924.]

[Shaw, William Napier.]
Kalendar for 1925 ... London. 1925. unp. 15½ cm.

RECENT PAPERS BEARING ON METEOROLOGY

The following titles have been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers and other communications bearing on meteorology and cognate branches of science. This is not a complete index of all the journals from which it has been compiled. It shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau.

Académie Roumaine. Bulletin de la section scientifique. Bucarest. 3 année. no. 5–6. 1925.
Donici (Donitch), M. N. Semaine internationale des nuages du 24 au 30 septembre à l'Observatoire d'Astronomie Physique sis parc de Dubosarii Vechi. p. 28–35.

American meteorological society. Bulletin. Worcester, Mass. v. 6. March, 1925.
Bavendick, F. J. A dry snowfall. p. 43.
Brooks, Charles F., & Tripp, Frances V. Phenology: Responses of life to the advance of the seasons. p. 47–48.

Annalen der Hydrographie und maritimen Meteorologie. Berlin. 52. Jahrgang. Dezember 1924.
Jakobi, N. Photographische Methode zur Untersuchung der Konvektionsströme. p. 281–285.
Seilkopf, Heinrich. Die meteorologische Beratung der Überführungsfahrt des Luftschiffes LZ 126 durch die Deutsche Seewarte. p. 285–289.

Annalen der Physik. Leipzig. Bd. 75, no. 22. 1924.
Müller, Aloys. Über die Form des blauen Himmels. p. 653–656.

Archives des sciences physiques et naturelles. Genève. v. 7. Janvier-février 1925.
de Perrot, Samuel. Contribution à l'étude du vent de la Maloja. p. 56–61. [Abstract.]
Gockel, A. Quelques problèmes d'électricité atmosphérique résolubles par des observations au col de la Jungfrau. p. 52–53. [Abstract.]

Archives des sciences physiques et naturelles—Continued.
Goetz, F.-W. Sur la clarté locale (Ortshelligkeit) du ciel en lumière ultra-violette. p. 49–52. [Abstract.]
Huber, P.-B. Résultats d'écoute et influence des conditions atmosphériques en t. s. f. p. 63–64. [Abstract.]
Mörikofer, W. Nouvelles observations concernant la théorie du vent de la Maloja. p. 54–56. [Abstract.]

Association of American geographers. Annals. Albany. v. 15. March, 1925.
Davis, W. M. A climatic classification of oceanic islands. p. 35. [Abstract.]
McAdie, Alexander. Special maps for charting storm movements. p. 41. [Abstract.]
Visher, S. S. The rainfall régime as a great handicap to tropical development, with special mention of Australia. p. 46–47. [Abstract.]

Astronomie. Paris. 38. an. Décembre 1924.
Salet, Pierre. Variation de la constante solaire et de la température moyenne de la terre. p. 504–506.

Beiträge zur Physik der freien Atmosphäre. München. 12. Bd. H. 1. 1925.
Bartels, J. Bemerkungen zu den Arbeiten des Herrn Dr. Baur (St. Blasien) über mehrjährige Perioden in der Witterung. p. 17–25.
Baur, Franz. Die 3- bis 3½-jährige periodische Luftdruckschwankung in der freien Atmosphäre. p. 11–16.
Baur, Franz. Ueber mehrjährige Witterungsperioden und die Anwendung der Periodogrammanalysis zu ihrer Aufdeckung. p. 26–32.
Ritter, F. Springungen für Forschungszwecke. p. 1–10.
Rittich, P. A. Die Verteilung des Windes in den unteren Schichten der Atmosphäre bis 1000 Meter über einer konvexen (Ontolowo) und einer konkaven (Pavlovsk) Oberfläche. p. 56–61.)

France. Académie des sciences. Comptes rendus. Paris. t. 180. 1925.
Guilbert, Gabriel. Sur les causes de destruction rapide des cyclones. p. 850–852. (16 mars.)
Hubert, Henry. Sur la quasi-permanence du dessin des courbes météorologiques en Afrique Occidentale. p. 945–947. (23 mars.)

Geografiska annaler. Stockholm. Årg. 6. H. 3–4. 1924.
Ahlmann, H. W: son. Le niveau de glaciation comme fonction de l'accumulation d'humidité sous forme solide. p. 223–272.
Dobrowolski, A. B. Mouvement de l'air et de l'eau sur des accidents du sol. p. 300–367.
Wiese, W. Polareis und atmosphärische Schwankungen. p. 273–299.

Géographie. Paris. t. 42. Décembre 1924.
Rouch, J. L'influence de la lune sur le temps: opinions modernes. p. 673–676.

Geophysikalisches Institut der Universität Liepzig. Band 3. Heft 2. 1924.
Bergeron, T., & Swoboda, G. Wellen und Wirbel an einer quasistationären Grenzfläche über Europa. 172 p.

Hemel en dampkring. Den Haag. 22 jaarg. December 1924.
Pinkhof, M. De halo van Ommen. p. 361–363.

Időjárás. Budapest. v. 29. Január-február 1925.
Vladár, Andreas. Berechnung der Windgeschwindigkeit des Tornados von Bia am 13. Juni 1924. p. 29–30.

India. Meteorological department. Memoirs. Calcutta.
Normand, C. W. B. Wet bulb temperatures and the thermodynamics of the air. (v. 23, pt. 1. 1921.)
Walker, Gilbert T. Correlation in seasonal variations of weather. VII. The local distribution of monsoon rainfall. (v. 23, pt. 2. 1922.)

Japanese journal of astronomy and geophysics. Transactions and abstracts. v. 2. no. 4. 1925.
Fujiwhara, Sakuhei. Fourth report on vortical motion: the function of steering line. p. (23). [Abstract.]
Hirata, Tokutarô. Note on the measurement of the evaporation of water. p. (24)–(25). [Abstract.]
Kikuti, Tunetake. On the cumuli clouds which appeared on the days of the great earthquake and fire. p. (25). [Abstract.]
Kobayasi, Tatuo. On the mechanism of cyclones and anticyclones. p. (23)–(24). [Abstract.]
Matukawa, Tetumi. Frozen rain drops at Sapporo. p. (25). [Abstract.]
Matukawa, Tetumi. On the observation of earth temperature in winter. p. (22). [Abstract.]
Misawa, Katue. On the glaze storm of 22 and 23 Jan., 1923 in Nagano Prefecture. p. (25). [Abstract.]
Morita, Heizi, & Isii, Tuneo. On the relation of barometric gradient and the velocity of north wind at 14h, central standard time at Kumagaya. p. (24). [Abstract.]
Ogura, Sinkiti. Effect of atmospheric pressure on sea-level in the western part of the North Pacific Ocean. p. 209–231.

Japanese journal of astronomy and geophysics—Continued.
Ogura, Sinkiti. Effect of atmospheric pressure on sea-level in the western part of the North Pacific Ocean. p. (26)–(27). [Abstract.]
Sasaki, Kôiti. The density of snow as affected by temperature and humidity of air. p. (26). [Abstract.]
Sekiguchi, Rikichi, & Taguti, Katutosi. On the prevailing winds at various heights, lower than 3,000 m. over Kôbe, as determined by pilot balloon observations. p. (22)–(23). [Abstract.]
Sekine, Yukio. Summary of pilot balloon observations at Tokorozawa. p. (23). [Abstract.]
Takata meteorological observatory. Snowfall mixed with some soil-like substance. p. (26). [Abstract.]
Tsuji, Yoshiwo. On the formation and structure of rime. p. (26). [Abstract.]
Watanabe, Masayuki. On the coldest and warmest seasons. p. (22). [Abstract.]

Journal of scientific instruments. London. v. 2. January, 1925.
Beck, Conrad. Apparatus to photograph the whole sky. p. 135–139.

Matériaux pour l'étude des calamités. Genève. Année. 1 Octobre-décembre 1924.
Visher, Stephen S. Tropical hurricanes as calamities. p. 195–217.

Mentor. New York. v. 13. May, 1925.
Hausman, Leon Augustus. The mystery of the will-o'-the-wisp. p. 58.

Meteorological magazine. London. v. 59. 1925.
Biddecombe, C. H., *and others.* The fog of December 10th–11th, 1924. p. 277–284. (Jan.)
Brunt, D. Convective circulations in the atmosphere. p. 1–5. (Feb.)
M., P. I. Keswick diary of the eighteenth century. p. 20–21. (Feb.)

Meteorologische Zeitschrift. Braunschweig. Band 41. 1924.
Ficker, H. von, & Schmauss, A. Bemerkung zu der Mitteilung O. Myrbachs "Was versteht man unter einer Depression?" p. 363–364. (Nov.)
Groissmayr, Fritz. Asymmetrie der Temperaturextreme. p. 367–370.
Groissmayr, Fritz. Thermische Charakteristika alpiner Klimascheiden. p. 366. (Nov.)
Hoelper, Otto. Strahlungsmessungen im Algäu. p. 346–352. (Nov.)
Johannson, O. V. Vereinfachungen der Korrelationsberechnungen nebst einigen Anwendungen. p. 358–361. (Nov.)
Myrbach, Otto. Was versteht man unter einer "Depression"? p. 361–363. (Nov.)
Peppler, W. Ein weiterer Beitrag zur Kenntnis der Schichtdicken der Wolken. p. 364–366. (Nov.)
Süring, R. Strahlungsklimatische Untersuchungen in Agra (Tessin). p. 325–346. (Nov.)
Tichanowsky, J. J. Polarisation des Himmelslichtes und Sonnenhöhe. p. 352–357. (Nov.)
Kreitmeyer, Eduard. Einige graphische Darstellungen auf Grund neuerer physikalischer Werte. p. 380–388. (Dez.)
Witkiewitsch, W. J. Untersuchung von Schalenkrenz-Anemometern mit geneigter Achse. p. 390–391. (Dez.)

Nature. London. v. 115. April 11, 1925.
Bauer, Louis A. Further evidence regarding the correlation between solar activity and atmospheric electricity. p. 537–549.
Reynolds, William C. The positive electrical drift in the air. p. 531.

Optical society of America. Journal. Rochester, N. Y. v. 10. March, 1925.
Covert, Roy N. Meteorological instruments and apparatus employed by the United States Weather Bureau. p. 299–425.

Petermanns Mitteilungen. Gotha. 71. Jahrgang. 1925.
Perlewitz, Paul. Lufthülle, Luftfahrt und Geographie. p. 7–9. (1/2. H.)
Schrepfer, Hans. Die Kontinentalität des deutschen Klimas. p. 49–51. (3/4. H.)
Thorade, Hermann. Die Erzeugung von Meeresströmungen durch den Wind. p. 67–68. (3/4. H.)

Philosophical magazine. London. v. 49. March, 1925.
Wahlin, H. B. The mobility of the positive ions in air. p. 566–570.

Physikalische Zeitschrift. Leipzig. 26. Jahrgang, no. 1. 1925.
Benndorf, Hans. Über das Grundproblem luftelektrischer Forschung. p. 81–91.
Hoffmann, G. Registrierbeobachtungen der Höhenstrahlung im Meeresniveau. p. 40–43.

Pontificia accademia romana dei nuovi Lincei. Atti. Roma. Anno 76. Sess. IVa–VIIa. 18 marzo–17 giugno, 1923.
Martinelli, G. I cicloni al nord e al nord-est Europa e le depressioni sull' Italia. p. 205–219.

Pontificia accademia romana dei nuovi Lincei—Continued.
Negro, Carlo. A proposito di certe discussioni in elettricità atmosferica. p. 178–184.
Popular astronomy. Northfield, Minn. v. 33. April, 1925.
Bassett, Preston R. Shadow bands and searchlights. p. 232–236.
Watts, Harvey M. Shadow bands during the period of greatest obscuration—partial eclipse of the sun, Philadelphia, January 24, 1925. p. 236–240.
Popular weather quarterly. Tunbridge Wells. v. 3. April, 1925.
Allison, J. Reginald. Does wireless affect our weather? p. 15–17.
Science. New York. v. 61. April 3, 1925.
MacDougal, D. T. Tree trunks, growth and reversible variations in circumference. p. 370–372.
Scientific monthly. New York. v. 20. May, 1925.
Antevs, Ernst. Glacial climatic conditions. p. 464–465.
Coleman, A. P. The spacing of ice ages and early pre-Cambrian climates. p. 473–475.
Humphreys, W. J. Some factors of climatic control. p. 449–459.
Stanton, Timothy W. Evidence of invertebrates on the question of climatic zones during Mesozoic time. p. 459–463.
Visher, Stephen Sargent. The solar-cyclonic hypothesis and the glacial period. p. 475–478.
White, David. Upper Paleozoic climate as indicated by fossil plants. p. 465–473.
Tycos-Rochester. Rochester, N. Y. v. 15. April, 1925.
Daly, G. H. Forecasting weather by wireless. p. 64–65.
Flora, S. D. Weather forecasts for millions. p. 54–56.
Laskowski, B. R. Ball lightning. p. 66–67.
Laskowski, B. R. An unusual fog movement. p. 61.
Laskowski, B. R. Weather forcasts for marcel waves. p. 52.
Luckiesh, M. The mountains of fairyland. p. 45–47.
Many kinds of rainbow. p. 69.
Radio and the weather. p. 58–59; 62–63.
Wetter. Berlin. 41. Jahgang. November/Dezember 1924.
Arendt, Th. Ueber Windregistrierungen in Potsdam und Köthen. p. 179–184.
Malsch, W. Die Schneeverhältnisse in Baden. p. 185–187.
Peppler, W. Die Bedingungen grosser lufttrockenheit im Hochschwarzwald. p. 176–179.
Polis, P. Verteilung der Spät-und Frühfröste in der Rheinprovinz und in den angrenzenden Gebietsteilen von Hessen-Nassau und Westfalen. p. 161–167.
Prochnow, Oskar. Wetterwarnung oder Wetterbeobachtung durch Vögel? p. 187–188.
Stäger, U. Beiträge zur Theorie der Gewitterelektrizität. p. 167–170.
Topolansky, Moriz. Mittelwerte und Einzelwerte in der Klimatologie. p. 188–190.
Wussow, G. Die starken Augustregen 1924 in Norddeutschland. p. 170–173.

SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING MARCH, 1925

By HERBERT H. KIMBALL, In Charge, Solar Radiation Investigations

For a description of instruments and exposures, and an account of the method of obtaining and reducing the measurements, the reader is referred to the REVIEW for January, 1924, **52**: 42 and January, 1925, **53**: 29.

From Table 1 it is seen that solar radiation intensities averaged somewhat above normal values for March at Washington and Lincoln, and somewhat below at Madison. A noon reading of 1.55 gram-calories per min. per cm² at Lincoln on the 14th almost equals the previous March maximum at that station of 1.56. A note on the original record reads "The high wind with snow yesterday [March 13] seems to have cleared the air to an exceptional degree."

Table 2 shows that the total solar and sky radiation received on a horizontal surface averaged below normal at Lincoln and slightly above normal at Washington and Madison.

At Washington skylight polarization measurements made on five days give a mean of 56 per cent, with a maximum of 65 per cent on the 19th. These are close to normal values for March at Washington. At Madison, measurements made on six days give a mean of 56 per cent with a maximum of 63 per cent on the 26th. These are slightly below normal values for March at Madison.

TABLE 1.—*Solar radiation intensities during March, 1925*

[Gram-calories per minute per square centimeter of normal surface]

Washington, D. C.

Date	8 a.m.	Sun's zenith distance 78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Mar. 3	1.32		0.64	0.89	1.14	1.43					1.12
6	4.75			0.84	1.06		1.05	0.95	0.76	0.64	3.81
12	4.95	0.68	0.79	0.97	1.23	1.57	1.33	1.14	1.02		3.45
16	3.00		0.62	0.82	1.02						2.36
19	12.24						1.15	0.96			8.18
20	3.81		0.88	1.04	1.18						4.57
21	5.79	0.54	0.71	0.89	1.09						5.36
23	3.00	0.88	1.02	1.14	1.31	1.50	1.32	1.01	0.92	0.72	2.87
Means		0.70	0.77	0.94	1.15		1.21	1.02	0.90	(0.68)	
Departures		−0.01	−0.03	±0.00	±0.00		+0.09	+0.09	+0.10	±0.00	

TABLE 1.—*Solar radiation intensities during March, 1925*—Contd.

Madison, Wisconsin

Date	8 a.m.	Sun's zenith distance 78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Mar. 2	0.53					1.57	1.30				0.81
10	5.16				1.21						4.17
12	2.16		0.83	0.95	1.20	1.41	1.05				3.45
23	3.99						0.68				5.79
24	6.76						1.33	1.18			5.16
26	5.16			0.95	1.07						6.27
28	3.00		1.10	1.21	1.37	1.55					3.15
30	3.81						1.20				4.75
31	3.30			1.17	1.37		1.17				2.87
Means			(0.96)	1.07	1.24		1.12	(1.18)			
Departures			−0.07	−0.11	−0.08		−0.18	+0.01			

Lincoln, Nebraska

Mar. 2	1.12		1.14								1.37
5	4.75	0.70	0.80	0.99	1.17	1.42					6.27
14	1.32		1.04	1.19	1.42	1.70	1.37	1.00			1.60
18	3.30					1.52	1.25	1.07	0.89	0.76	3.81
19	3.99	0.94	1.06	1.20	1.40	1.64	1.39	1.19	1.04	0.92	2.49
21	3.00		1.04	1.17	1.33	1.50					3.00
24	5.16					1.46	1.25	1.06	0.90	0.76	5.36
25	4.57		1.01	1.12	1.28	1.48	1.28	1.10	0.95	0.82	4.37
26	3.30		0.79	0.99	1.25		1.13	0.95	0.80		2.87
27	2.62	1.01	1.12	1.24	1.41	1.56	1.34	1.14	1.02	0.90	1.96
30	3.00		1.07	1.17	1.36	1.57					2.49
Means		0.88	1.01	1.13	1.33		1.29	1.07	0.95	0.83	
Departures		±0.00	+0.07	+0.04	+0.04		+0.02	±0.00	±0.00	+0.04	

* Extrapolated.

TABLE 2.—*Solar and sky radiation received on a horizontal surface*

[Gram-calories per square centimeter of horizontal surface]

Week beginning—	Average daily radiation: Washington	Madison	Lincoln	Chicago	New York	Average daily departure from normal: Washington	Madison	Lincoln
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal*	*cal.*	*cal.*
Feb. 26	361	293	310	208	252	+80	+11	−31
Mar. 5	304	229	325	148	242	−2	−77	−39
12	295	298	332	184	265	−42	−26	−60
19	459	355	457	255	366	+101	+13	+45
26	243	445	427	331	180	−132	+86	−1
Excess or deficiency since first of year on Apr. 1, 1925						−1,099	−1,785	−1,302