

Pressure at sea level, a. m. and p. m.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
<b>ALASKA—continued.</b>												
<b>Sitka:</b>												
a. m. ....	9.80	9.86	9.90	9.94	9.99	0.03	0.04	9.98	9.84	9.77	9.71	9.78
p. m. ....	9.77	9.84	9.87	9.91	9.97	0.01	0.05	0.01	9.87	9.78	9.68	9.74
<b>Tanana:</b>												
a. m. ....	0.08	0.06	0.05	9.99	9.95	9.92	9.88	9.83	9.80	9.73	9.62	9.94
p. m. ....	0.07	0.06	0.02	9.97	9.92	9.87	9.83	9.77	9.75	9.70	9.81	9.93
<b>Valdez:</b>												
a. m. ....	9.78	9.83	9.84	9.89	9.96	0.00	0.03	9.94	9.81	9.69	9.63	9.66
p. m. ....	9.77	9.82	9.82	9.86	9.93	9.97	0.00	9.93	9.79	9.68	9.62	9.65
<b>PACIFIC OCEAN.<sup>2</sup></b>												
<b>Honolulu, Hawaii:</b>												
a. m. ....	0.01	0.06	0.05	0.07	0.06	0.05	0.03	0.02	0.00	0.01	0.03	0.02
p. m. ....	9.99	9.04	0.04	0.06	0.04	0.03	0.01	0.00	9.99	0.00	0.02	0.00
<b>Midway Island:</b>												
a. m. ....	0.00	0.03	0.08	0.10	0.09	0.07	0.08	0.09	0.07	0.05	0.07	0.04

Pressure at sea level, 7 a. m. and 7 p. m., 75th meridian time.

Stations.	June.	July.	August.	Septem-ber.	October.	Novem-ber.
<b>WEST INDIES.<sup>2</sup></b>						
<b>Basseferre:</b>						
7 a. m. ....	0.00	0.03	9.99	9.95	9.93	9.95
7 p. m. ....	9.98	0.01	9.97	9.94	9.91	9.93
<b>Bridgetown:</b>						
7 a. m. ....	9.99	0.00	9.98	9.95	9.94	9.93
7 p. m. ....	9.96	9.98	9.95	9.92	9.90	9.91
<b>Camaguey:</b>						
7 a. m. ....	9.96	0.01	0.00	9.96	9.92	9.98
7 p. m. ....	9.96	0.00	9.99	9.95	9.91	9.97
<b>Curacao:</b>						
7 a. m. ....	9.89	9.92	9.90	9.86	9.86	9.86
7 p. m. ....	9.86	9.87	9.85	9.80	9.80	9.83
<b>Guantanamo:</b>						
7 a. m. ....	0.97	0.01	9.99	9.93	9.92	9.95
7 p. m. ....	9.94	9.97	9.95	9.90	9.90	9.92
<b>Habana:</b>						
7 a. m. ....	9.99	0.03	9.99	9.95	9.94	0.03
7 p. m. ....	9.98	0.02	9.98	9.94	9.93	0.01
<b>Kingston:</b>						
7 a. m. ....	9.93	9.97	9.95	9.91	9.89	9.92
7 p. m. ....	9.92	9.94	9.92	9.88	9.86	9.90

<sup>2</sup> See footnote for Alaska.

Pressure at sea level, 7 a. m. and 7 p. m., 75th meridian time—Con.

Stations.	June.	July.	August.	Septem-ber.	October.	Novem-ber.
<b>WEST INDIES—contd.</b>						
<b>Port-au-Prince:</b>						
7 a. m. ....	9.97	0.00	9.99	9.94	9.92	9.95
7 p. m. ....	9.94	9.97	9.94	9.89	9.87	9.90
<b>Port Castries:</b>						
7 a. m. ....	9.98	9.99	9.97	9.93	9.90	9.90
7 p. m. ....	9.96	9.97	9.95	9.91	9.88	9.88
<b>Port of Spain:</b>						
7 a. m. ....	9.95	9.98	9.96	9.94	9.92	9.91
7 p. m. ....	9.89	9.91	9.88	9.86	9.84	9.84
<b>Puerto Plata:</b>						
7 a. m. ....	0.01	0.05	0.04	9.95	9.96	9.98
7 p. m. ....	9.98	0.01	0.00	9.92	9.90	9.93
<b>Roseau:</b>						
7 a. m. ....	9.99	0.01	9.98	9.95	9.93	9.93
7 p. m. ....	9.96	9.98	9.95	9.91	9.89	9.89
<b>St. Thomas:</b>						
7 a. m. ....	0.02	0.04	0.01	9.95	9.94	9.95
7 p. m. ....	0.01	0.04	0.00	9.93	9.93	9.95
<b>San Juan:</b>						
7 a. m. ....	0.03	0.05	0.02	9.97	9.95	9.96
7 p. m. ....	0.02	0.03	0.00	9.95	9.92	9.93
<b>Santiago de Cuba:</b>						
7 a. m. ....	9.94	9.98	9.96	9.94	9.89	9.94
7 p. m. ....	9.93	9.97	9.95	9.92	9.88	9.92
<b>Santo Domingo:</b>						
7 a. m. ....	0.00	0.03	0.01	9.95	9.95	9.98
7 p. m. ....	9.96	9.99	9.97	9.91	9.90	9.92
<b>Swan Island:</b>						
7 a. m. ....	9.87	9.92	9.91	9.88	9.87	9.90
7 p. m. ....	9.85	9.91	9.89	9.85	9.84	9.87
<b>Turks Island:</b>						
7 a. m. ....	0.03	0.07	0.04	9.98	9.95	9.99
7 p. m. ....	0.01	0.06	0.02	9.96	9.93	9.97
<b>CENTRAL AMERICA.<sup>2</sup></b>						
<b>Belize:</b>						
7 a. m. ....	9.90	9.95	9.93	9.90	9.88	9.95
7 p. m. ....	9.88	9.92	9.90	9.86	9.85	9.92
<b>Bluefields:</b>						
7 a. m. ....	9.87	9.89	9.89	9.88	9.87	9.90
7 p. m. ....	9.82	9.86	9.85	9.82	9.79	9.82
<b>PANAMA CANAL ZONE.<sup>2</sup></b>						
<b>Balboa Heights:</b>						
7 a. m. ....	9.85	9.85	9.86	9.86	9.86	9.86
7 p. m. ....	9.82	9.82	9.82	9.82	9.83	9.82
<b>Colon:</b>						
7 a. m. ....	9.85	9.87	9.86	9.86	9.86	9.86
7 p. m. ....	9.83	9.84	9.84	9.83	9.83	9.83

<sup>2</sup> See footnote for Alaska.

NOTES, ABSTRACTS, AND REVIEWS.

Otto Klotz, LL., D. D. Sc., 1852-1923.

The news of the death of Otto Klotz, Director of the Dominion Observatory, on December 28, 1923, as announced by the Department of the Interior, Ottawa, on January 10, 1924, is received with great regret by officials of the United States Weather Bureau, many of whom were personally acquainted with him. He was held in high esteem because of his many contributions to the sciences of astronomy, geodesy, and seismology.

WEATHER BUREAU STAFF MEETINGS.

Regular meetings of the staff of the Central Office of the Weather Bureau have been held during the autumn and winter of 1923-24 as nearly as possible at two-week intervals. This plan of staff meetings has been tried before in the Weather Bureau with indifferent success, presumably because the programs were not properly supervised. The present plan, however, has been very successful and much interest has been shown throughout

the year, giving every indication that a continuance of the plan will be welcomed.

The meetings, which are limited in length to one hour, have been held at 11 a. m., on first and third Wednesdays of each month, and will continue through May, there being no meetings during the summer. The Chief of the Weather Bureau presides at the meetings, or, in case of his absence, the Assistant Chief. The program committee consists of Dr. W. J. Humphreys, chairman, Prof. A. J. Henry, Dr. H. H. Kimball, and Prof. C. F. Talman. The secretary is C. LeRoy Meisinger. The discussions are restricted to matters of general scientific interest, whether current meteorological literature of importance, researches conducted within the Bureau, or projects of a scientific character upon which the opinion of the staff is desired. It is the desire to make these meetings of general helpfulness to field officials of the Weather Bureau through the discussion of matters that these officials may wish to bring to the attention of the Central Office group, or upon which the opinion of this group is desired. It is understood, of course, that such opinions are not final and conclusive.

The following is a list of the discussions that have been held:

NOVEMBER 13, 1923.

- C. L. Mitchell: Aeronological aids in forecasting the unusual movement of the Atlantic coast storm of October 23, 1923.  
 A. J. Henry: Variations in the levels of the central African lakes Victoria and Albert.<sup>1</sup> (Based on *Geophysical Memoirs*, No. 20, by C. E. P. Brooks.)  
 H. H. Kimball: On the variations of the sun's visible features associated with variations of solar radiation. (Based on paper of same title in *Proceedings of the National Academy of Sciences*, October, 1923, by C. G. Abbot.)

NOVEMBER 21, 1923.

- W. J. Humphreys: Recent studies of the composition of the upper air.  
 C. LeRoy Meisinger: The mechanism of cyclones and anti-cyclones.<sup>2</sup> (Based on paper of same title in *Quarterly Journal of the Royal Meteorological Society*, July, 1923, by T. Kobayasi.)  
 F. G. Tingley: Further discussion of a proposed method of extrapolation of weather data, with a possible application to long-range forecasting.

DECEMBER 5, 1923.

- A. J. Henry: Pacific Lows and weather forecasting on the Pacific coast.

DECEMBER 19, 1923.

- I. F. Hand: Investigation of the dust content of the atmosphere.<sup>3</sup>  
 S. P. Fergusson: Cloud systems. (Based on a memoir by Ph. Schreschewsky and Ph. Wehrlé of the Office National Météorologique de France.)

JANUARY 9, 1924.

- O. L. Fassig (visiting official from San Juan, P. R.): Pilot-balloon work in Porto Rico.<sup>4</sup>

JANUARY 23, 1924.

- C. F. Talman: An inspection of the Weather Bureau Library.

FEBRUARY 13, 1924.

- E. W. Woolard: On the kinematics of an ideal cyclone.<sup>5</sup> (Based on a report of V. H. Ryd entitled "Travelling Cyclones," *Publikationer fra det Danske Meteorologiske Institut*, Meddeleser Nr. 5, Copenhagen, 1923.)

FEBRUARY 20, 1924.

- C. LeRoy Meisinger: The balloon project and what we hope to accomplish.<sup>6</sup>  
 H. W. Clough: A short cycle in terrestrial weather and its relation to solar data.<sup>7</sup>

A later issue of the REVIEW will contain programs for the remainder of the season.—C. L. M.

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### V. H. RYD ON TRAVELLING CYCLONES.<sup>3</sup>

By EDGAR W. WOOLARD.

[Weather Bureau, Washington, D. C., Feb. 13, 1924.]

In our efforts to explain natural phenomena and to construct comprehensive quantitative theories whereby what we have observed in the past is accurately described and what we shall observe in the future may be satisfactorily predicted, we are much handicapped by the extreme complexity of the actual conditions as found in Nature. In order that a problem may be han-

dled at all by methods now available, it is almost always necessary to make "simplifying assumptions," i. e., to replace the intractable natural reality by a conceptual ideal; and it is to the latter that our subsequent discussion always applies. These assumptions are of such a character that the conditions subjected to theoretical investigation, while different from what we must assume to actually exist in Nature, are in general not so different that the results have no value as an indication of what may be conceived to happen in the natural reality.

It is sometimes necessary, however, to proceed by successive approximation, particularly at the start of an attack upon an especially complex problem. If an attempt be made to deal with *all* the complications of the natural reality, simultaneously and at the very beginning, no progress whatever may be possible; but by constructing successive workable ideals, each departing less and less from the natural reality, and noting carefully to what extent each suffices as a representation of what is observed actually to occur, a complete and satisfactory theory may eventually be worked out.

In Dynamical Meteorology not only are the problems involved extraordinarily complex, but we are at present handicapped by a lack of adequate observational data upon which to base the initial conceptual ideal, and whereby to check our resulting theories. However, the major features of actual phenomena are coming to be more and more satisfactorily represented in the theories of successive investigators. V. H. Ryd, of the Danish Meteorological Institute, to whom we owe a recent noteworthy attack on the problem of the circulation of the air in a cyclone, the source of the energy necessary for its maintenance, and the disposal of the rising air, states that "No theory of atmospheric mechanism can be proved directly, but the proof can be established gradually in an indirect manner. As a rule, the abundant explanations of meteorological phenomena from earlier days are based upon qualitative considerations only, but it might be difficult to set forth a theory so absurd that it could not be 'proved' in this manner. What can be done, and what ought to be done, is the making of *numerical computations by which it can be seen if the theory set forth is a probable one*. But, beyond this, the proof must rest with comparison with what is found in nature."

"If all the cases agree to a satisfactory degree, where such comparisons can be made, the theory must be taken as a true one for the present, and then without any hesitation we shall use conclusions drawn also where no comparison with facts can take place. On the contrary, when the theory disagrees with nature, it will depend on the special circumstances what is to be done. If the disagreement concerns the *foundation* itself, the theory must be considered as a *false one*, and it will be necessary to *abandon* it. On the other hand, if the disagreement concerns certain conclusions drawn from the theory, a new investigation can be made, and perhaps the result will be satisfactory when, for example, new circumstances are taken into consideration." Ryd deduces a theory of the pressure distributions and wind velocities at different levels in the cyclone, of the vertical circulation of the air at these levels, etc., and combines them into a description of the circulation of the air and the general mechanism of a travelling cyclone, illustrating and supporting his theory by a complete, worked out numerical example.<sup>2</sup>

<sup>2</sup> Ryd, V. H.: *Travelling Cyclones. Publikationer fra det Danske Meteorologiske Institut, Meddeleser Nr. 5. Copenhagen, 1923.*

<sup>1</sup> Discussion to appear in later REVIEW.

<sup>2</sup> This REVIEW, p. 37-38.

<sup>3</sup> To be discussed in a later REVIEW.

<sup>4</sup> This REVIEW, p. 22-23.

<sup>5</sup> This REVIEW, p. 36-37.

<sup>6</sup> This REVIEW, p. 27-29.

<sup>7</sup> This REVIEW, p. 38-39.

<sup>8</sup> Presented before the Weather Bureau Staff at its meeting of Feb. 13, 1924.