

## NOTES AND ABSTRACTS

## WILLIAM HENRY DINES, 1855-1927

[Condensed from the *Meteorological Magazine*, January, 1928]

The readers of this magazine will have heard with regret of the death of W. H. Dines, which occurred on Christmas Eve at the Old Observatory, Benson, and will desire to express their sympathy with Mrs. Dines and with her two sons who are our colleagues on the staff of the office.

Interest in meteorology may almost be said to be hereditary in the Dines family, for Mr. Dines's father was the inventor of the dew-point hygrometer, which still goes by his name and is described in most text books on physics. \* \* \*

Mr. W. H. Dines was born in 1855. He served an apprenticeship as a railway engineer, and then proceeded to Corpus Christi College, Cambridge, where he read mathematics and graduated as a Wrangler in 1881. From that time onward he devoted himself to meteorology but did not hold an official position. He was in the true and best sense of the word an amateur, never seeking to enhance his personal reputation, still less to secure financial advantages for himself, but he has left an indelible impress on the progress of the science. Of an exceedingly reticent and retiring nature, he was essentially an individual worker, yet a great deal of his work was done in cooperation with others. His early work on wind pressure was in cooperation with the Wind Pressure Committee of the Royal Meteorological Society. It gave us the pressure-tube anemometer, which made it possible to measure transient gusts of wind, an indispensable preliminary to the development of our modern ideas of turbulence.

Dines had reached middle life when the observational study of the upper air came into its own. \* \* \* The Joint Upper-Air Committee of the British Association and the Royal Meteorological Society, which was responsible for inaugurating such work as could be undertaken here, was fortunate in securing Dines as its active worker. The early work was carried out with kites at Mr. Dines's house at Oxshott, or from a steam vessel off Crinan on the west coast of Scotland. He exhibited an almost uncanny facility in devising at a minimum of cost, apparatus which worked and achieved results which he had set out to obtain. \* \* \* The investigation of the higher regions of the atmosphere by means of sounding balloons was included in a [later] program. Here Dines struck an entirely original line in the design of the meteorograph which he used. To economize weight he dispensed with the clock, which was used by all other workers in the field, and contented himself with obtaining a pressure-temperature record of the ascent on a scale so small that the curve had to be tabulated with the help of a reading microscope. \* \* \*

In his later years he was impelled to the study of radiation, and here again we find him active both as a designer of instruments and as observer and student. It is gratifying to note that despite his failing health he was able to maintain his scientific interests almost up to the end, for it is only a few months since he contributed, with the cooperation of his son, L. H. G. Dines, a paper to the *Memoirs of the Royal Meteorological Society* on "Mean values of radiation from various parts of the sky at Benson." Mr. Dines was elected a Fellow of the Royal Meteorological Society in 1905, and was awarded the Symon's gold medal of the Royal Meteorological Society in 1914.—*R. G. K. Lempfert.*

GENERAL JADWIN REPORTS ON FLOOD-PROTECTION SYSTEM FOR MISSISSIPPI RIVER<sup>1</sup>

Flood-protection works costing \$296,400,000 for the Mississippi Valley are recommended in the long-awaited report of Maj. Gen. Edgar Jadwin, Chief of Engineers, United States Army, just transmitted to Congress by the President with his indorsement. The recommendations represent a thoroughgoing revision of the present Mississippi River Commission's project as well as of the system under which work has been carried on heretofore. Depending on levees only is for the first time abandoned, and declared to be incapable of providing for the maximum predicted flood. The essentials recommended are:

## THE PROJECT IN OUTLINE

(1) The present levee system is retained as the basis of the new project, but the levees are to be raised somewhat and at some points are to be set back. To prevent failure from causes other than overtopping and bank caving the levee section is to be enlarged. The maximum section, generally, will be river slope 1 on 4, crown 12 feet wide, and landside slope about 1 on 6.

(2) Three large overflow channels or flood ways outside the levee lines are to be provided, all on the west side of the river, located as shown on the map, Figure 3.

(3) Just above New Orleans a controlled spillway into Lake Pontchartrain is to be built.

(4) Backwater ponding in the lower ends of, the principal flood basins is utilized for further relief, these backwater areas being submerged only in occasional floods from once in 3 years to once in 15 years.

(5) Bank revetment on a large scale (to cost \$115,000,000) is provided for channel stabilization.

(6) A complete topographic map of the valley is to be prepared as a preliminary, and the estimates included a figure of \$1,000,000 for this work.

As to the administrative system which should be set up for carrying out this great project, General Jadwin recommends that the local authorities be required to meet part of the construction cost—\$37,440,000 out of the total figure stated above—and in addition all costs of right of way and incidental damages, while the United States Government should pay the rest. Direction of the work by the Mississippi River Commission is to be improved by placing the commission under the direction of the Chief of Engineers.

In connection with these specific recommendations, the report discusses various alternative solutions that have been proposed and finds against them. In particular it states that reservoirs would not be capable of dealing with the flood problem at any reasonable cost.

No details on the determination of maximum probable flood are given in the report, nor is levee construction discussed except to say that the earth levee is the best type for the purpose. The plans and estimates do not include the tributaries except for a short distance above their mouths; the subject of tributaries is still under study.

At the outset the report declares that the past plans of the Mississippi River Commission have been proved unsuccessful:

<sup>1</sup> Reprinted from *Engineering News-Record* of December 15, 1927.

The plan heretofore pursued has been the construction of levees high enough and strong enough to confine all of the flood waters within the river channels. The levees that have been constructed are not sufficiently high for such floods as are now predicted. \* \* \* Insufficient room was left in the river for the passage of the unprecedented volume of flood water. The levees must be strengthened, but a halt must be called on further material increase in their heights and the consequent threat to the inhabitants of the areas they are built to protect.

Man must not try to restrict the Mississippi River too much in extreme flood. The river will break any plan which does this.

The plan recommended provides the requisite space for the passage of floods, and levees of adequate strength to withstand them. \* \* \*

#### NEW THREE-CUP ANEMOMETER

The new three-cup anemometer has been furnished to each first-order station in continental United States. These instruments were put into use as station anemometers beginning with January 1, 1928.

This anemometer runs so close to the true velocity of the wind that errors in the anemometer itself are smaller in magnitude than errors from other sources, such as those due to exposure, variability in velocity during the time period chosen, the mechanical condition of the anemometer, and limitations in making and interpreting the record. Hence, the indicated values from the new instrument will be recorded, reported, and published without correction. A brief description of the instrument is published in the MONTHLY WEATHER REVIEW for April, 1924, pages 216-218.

At evaporation stations where, because of the location of the anemometer near the ground, the velocities are so low as to be practically the same from either the four-cup or the three-cup instrument, the four-cup instrument will be continued.

#### HOW SUNSPOTS ACT AS REFRIGERATORS<sup>1</sup>

[Reprinted from the Literary Digest, January 21, 1928, p. 36]

It seems to be the fashion to blame sunspots for the weather. It is true that the researches of Abbot and his coworkers appear to indicate that the sun gives off a slightly greater amount of heat when spots are most numerous, but the observations are delicate and the reality of the phenomenon may still be questioned by some. Other attempts to correlate the spots with rainfall have led to conflicting results and, though men have seriously tried to figure a relation between sunspots and the trend of stocks, the price of wheat, famines, etc., it should be obvious that if so direct an effect as rainfall is uncertain, secondary effects would be even less connected. It is not impossible that the yearly average rainfall of the entire earth may some day be found dependent upon the frequency of sunspots, but as to local conditions, the possibility of predicting the weather from the spot configurations, we are more than skeptical—frankly unbelieving.

#### SNOW AND A COLD WAVE IN EUROPE DECEMBER 18-23, 1927

Coincidentally with the occurrence of a cold wave in Europe on the dates above mentioned, there was an exceptionally large depression of the barometer over the North Atlantic, apparently extending from Newfoundland to Portugal, or it may be that a greater number of meteorological reports would have shown the presence of a series of great barometric depressions in tandem; in any event, the contrast between the pressure over the ocean and the land was unusually great.

It is a rather common experience to find in the Pacific Ocean a great barometric depression coincidentally with the presence of a great anticyclone over continental United States. During the period above mentioned there was a fairly intense cyclone centered over the Gulf of Alaska, but high pressure over the continent prevented its advance inland. The weather in the

United States during the cold wave in Europe changed but little, high pressure dominating throughout the period.—A. J. H.

#### THE INFLUENCE OF FORESTS ON RAINFALL AND RUN-OFF<sup>1</sup>

C. E. P. BROOKS, D. Sc.

[Reprinted from Meteorological Magazine, December, 1927]

Of the water vapor which is condensed as rainfall over the land, about two-thirds is provided by evaporation over the oceans, and the remaining third by evaporation and transpiration over the land. The latter contribution is made up of the evaporation of rainfall intercepted by foliage, evaporation from the soil, and transpiration, and estimates are made of these three factors for forests, crop or grass land, and bare soil. The figures are expressed as percentages of an average rainfall of 30 inches a year; for forests they give interception, 15; evaporation from soil, 7; transpiration, 25; total, 47 per cent. For crops evaporation from soil, 17; transpiration, 37; total, 54 per cent. For bare soil, evaporation, 30 per cent. Thus, the replacement of forests by crops would tend to increase the supply of moisture to the air, and, therefore, the general rainfall slightly; replacement by bare soil would decrease the general rainfall slightly. The changes in the run-off are likely to be more noticeable; replacement of forests by crops would decrease the run-off by 15 per cent, and make it less regular; replacement by bare soil would increase the run-off, but would make it highly irregular. A forest 30 feet high may be considered as adding about 30 feet to the effective height of the ground, and this should increase the local orographical rainfall by 1 or 2 per cent. Data obtained in various localities were examined in detail. At Mauritius, deforestation has resulted in a decrease by 2 or 3 per cent, while in Sweden, Germany, and India the rainfall at forest stations is about 1 per cent greater than that at neighboring stations in the open, after making allowance for differences of exposure. The question of fog and dew was also examined, and it was found that under average conditions their total effect is slight.

#### METEOROLOGICAL SUMMARY FOR SOUTHERN SOUTH AMERICA, NOVEMBER, 1927

By J. BUSTOS NAVARRETE, Director

[Observatorio del Salto, Santiago, Chile]

Atmospheric circulation showed but little activity in November. In the central region the weather was very variable, with much cloudiness and morning fog on the coast. Rains were infrequent in the south; the storms developed, as usual, in the region from Valdivia to Chiloe and at times extended as far as Concepción and Maule.

The most important anticyclones, accompanied by fair weather in the south, strong south winds on the coast between Chiloe and Arauco, and general fall in temperature, were those of the 1st-3d, 6th-13th, and 19th-25th. The second of these developed in the region of Juan Fernandez, moved toward Chiloe, and then recurved toward the Atlantic coast over Neuquen, Bahia Blanca, and Buenos Aires.

Small depressions were frequent on the coasts of the middle region and the Province of Coquimbo; important depressions accompanied by strong winds and rain crossed the southern region between the 4th and 6th and about the 11th.

<sup>1</sup> The Literary Digest of Jan. 21, 1928, quoting from Dr. Donald H. Menzel, of Lick Observatory, in one of the leaflets of the Astronomical Society of the Pacific, remarks upon the very great contrast in temperature between the temperature of the photosphere and that of the spot itself, viz, about 2,000 deg. (absolute) lower. The excerpt which we print below will doubtless be of interest to our readers.—Editor.

<sup>1</sup> The full article of which the following is an abstract will doubtless appear in a forthcoming number of the Quarterly Journal of the Royal Meteorological Society, 49 Cromwell Road, London, S.W. 7.