

eastern half of the United States lies about 300 meters (roughly a thousand feet) above sea-level, and the western half of the country projects into the atmosphere to an altitude of many thousands of feet. Hence, if there were no other objection to the use of sea-level, it could at least be partially disqualified by the fact that it lies, from a few feet to over a mile and a half, below every official barometer of the Weather Bureau.

But there are other difficulties of a more practical nature. For instance, one of the terms in the hypsometric formula, or barometric reduction formula, is the mean temperature of the air column between the observer and the reduction level. In the case of reduction to sea-level there is, for the most part, a column of soil and rock instead of the column required by the formula. Nevertheless, the temperature argument employed in the reduction tables is *the mean of the current surface temperature and the temperature 12 hours earlier*. There is no physical reason why this temperature value should be used, for it does not represent the mean temperature of an air column at all. It is merely an arbitrary method of getting a temperature value, which, fortunately, where the imaginary air column is not too long, happens to suffice. But, in the Plateau region, where the reduction distance is great, the temperature argument may lead to a quite erroneous sea-level distribution of pressure. If the temperatures are lowered abnormally in the immediate vicinity of the ground by a snow-cover, or if the mean temperature during a twelve-hour period is raised abnormally by the occurrence of a chinook the "sea-level" pressure may be raised or lowered by several tenths of an inch in extreme cases, where, in reality, there has been no actual change in the reading of the station barometer. Thus, one or two stations which are experiencing a chinook may produce on the morning weather map a LOW with considerable horizontal gradients extending toward its center from all directions. It is true that under such conditions, the wind direction will not conform to the pressure distribution, but this is an unsafe criterion because of the marked influence of local topography upon wind direction in mountainous regions. Similarly, the intense cold near the surface at two or three stations may considerably raise the reduced pressure and give an erroneous impression of the strength of a HIGH.

The Plateau region of the United States lies in a position of great strategical importance from the viewpoint of the forecaster, for it is not until cyclones and anticyclones have moved into the region of the West and Northwest, where stations are maintained, that much of a definite nature can be surmised as to their probable movement. Thus, the Plateau region, above all others, should have the best method of reduction, but, at present, it is the least reliable.

What is to be the remedy? How are we to banish the barometric bogies which haunt our weather maps? It is not a new problem: the weakness of the present method was recognized by Bigelow when he was instituting it over twenty years ago. But these twenty years have offered no substitute that will be certain to solve the difficulty. A symposium on pressure reduction at the Toronto meeting would, therefore, be a matter of great and timely importance.—
C. LeRoy Meisinger.

U. S. WEATHER BUREAU TO OPERATE UNDER LIMITED APPROPRIATIONS.

The Act making appropriations for the Department of Agriculture for the Fiscal Year ending June 30, 1922, which includes provisions for the Weather Bureau, has finally passed the Congress.

It provides an appropriation next year for the Weather Bureau of \$1,886,570, which is an increase of \$10,000 over the appropriation for the current fiscal year. \$9,000 of this increase provides "for investigations, observations, and reports, forecasts, warnings, and advices for the protection of horticultural interests from frost damage," and the additional amount is for an increase of official traveling expenses, in part.

This increase of \$9,000 is a favorable action on the request contained in the estimates of the Weather Bureau to this Congress, for the extension of the fruit-frost service. As the value of the fruit crop has increased, its protection from frost by heating has become more extensively practiced, and the demands on the Weather Bureau for frost forecasts and specialized advice exceed its ability to meet them under present appropriations.

The Weather Bureau strongly urged in its estimates before Congress an increased appropriation of \$200,000 for its aerological work, and it was a source of considerable regret that this item was not finally approved, although an increase of one-half this amount was passed by the Senate but later failed of agreement by the conferees on the part of the House and Senate. The main object of this project is to take observations in the upper air, which will be used in connection with observations taken at surface stations, for the purpose of adding to existing knowledge of the physics and dynamics of the air, and especially to furnish aviators with accurate information as to the weather conditions in the upper air and with forecasts which will aid them in flights or else to avoid flights under hazardous conditions. Forecasts are now being made for various flying zones, but the number of stations at which upper-air observations are being made are quite inadequate to represent sufficiently the territory to be covered. The Weather Bureau is the only Federal agency which collects and disseminates information of this character, which is indispensable to Army, Navy, post-office, and civilian flyers. Aerial navigation now creates a great demand which can be met only by increased appropriations and extension of the present service.

It is noted that the Congress, in its urgent necessity for economy, has not made any material increases in appropriations for the Weather Bureau, which will thereby be under the necessity of suspending maps and other details of work at a considerable number of its stations. It is simply a question of man-power on the one hand and the purchasing power of the stationary appropriations of the Bureau on the other. The remedy is—sufficient appropriations to pay adequate salaries to attract men possessing the qualifications that are necessary for the most efficient conduct of the work. Furthermore, paper, supplies, etc., required in the issue of weather maps in the conduct of Weather Bureau work must be paid for at much higher prices than formerly; also, rents, which are required to be paid at nearly 100 stations throughout the country, are now increasing at a rapid rate. Many leases for such quarters, made several years ago, are now expiring, and must be renewed at increased rates, which makes the aggregate rental charge materially larger.

Notwithstanding such matters, appropriations for the Weather Bureau have remained practically constant. The Bureau is earnestly and successfully striving to maintain the service in the most efficient manner possible, but obviously, under the conditions cited, curtailments and restrictions are unavoidable, if the great service being rendered to the public, for the protection of life and property through its forecasts, is to be safeguarded and maintained with the highest efficiency.

This country can't afford to let its weather bureau run down. It is too valuable, too necessary. Congress should by all means look into this situation and remedy it without unnecessary delay.—*Calumet (Mich.) News, Feb. 4, 1921.*

NOTES.

Give science its share.—Refreshing among the requests for appropriations for commercial and warlike purposes was the plea made recently before a congressional committee by Charles Greely Abbot, of the Smithsonian Institution, for "six miles of mountain road, a wireless telephone and a water reservoir to be dug out of solid rock," so that his work of scientific observation at the summit of a mountain in Arizona may be carried on a little more easily. . . . [The observations are of solar radiation for computation of the solar constant. The station, which was opened last October, is in the Harqua Hala Mts., Ariz.—one of the least cloudy spots in the United States.]—*Greenville (S. C.) News, Jan. 20, 1921.*

The winter-killing of plants.—Many plants, observes a writer in the Scientific American, are killed to the ground in winter although the root-stocks which are protected by the soil live and are ready to send forth shoots again the spring. If it were simply the action of the cold that killed the plant the roots would certainly be destroyed for the ground surrounding them is frozen solid. There is good reason for believing that it is not so much the cold as the excessive loss of moisture that really destroys the vegetable tissue. The upper part of the plant is subjected to a continuous evaporation and this loss of moisture cannot be made good because the roots are in solidly frozen ground. . . .—*The Pathfinder (Washington, D. C.), Jan. 1, 1921.*

Wintering snipe and rainfall.—Mr. J. T. Nichols reports having seen, for the first time in winter, a Wilson's snipe on Long Island on Dec. 28, 1919 and Jan. 17, 1920. Referring to the Christmas bird censuses published annually in *Bird Lore* he found that at least one snipe was seen on Long Island at Christmas time in 6 of the 15 reports, 1905–1919. Studying the weather records of the months preceding each of these 6 cases, Mr. Nichols found that mildness of weather could not explain the presence of snipe, for some of the winters (cf. that of 1919–1920) were unusually cold.

"It seems that heavy precipitation in August or October (which are, by the way, the critical months of its southward movement there) is most favorable for the snipe's lingering on Long Island into the winter."—*Abstr. from Forest and Stream, May, 1920, p. 251.*

Weather reports by wireless.—Government weather reports will be sent out by wireless from the radio station at the Omaha air mail field beginning to-morrow, making it possible for farmers in eastern Iowa and western Nebraska to get them from 12 to 18 hours sooner than at present. . . .—*Washington (D. C.) Post, Feb. 13, 1921.*

That the wireless telephone and telegraph weather reports sent out from Madison at 12:30 daily are heard in Texas, Kansas, New Jersey, and on the Canadian Border is indicated by letters received at the wireless experimental station of the physics department of the University of Wisconsin. . . . The tubes used for the transmission of reports by wireless telephone were made by Prof. E. M. Terry, who directs the service. . . .—*The Press Bulletin, Madison, Wis., Jan. 19, 1921.*

Daily weather reports are to be sent to farmers in all parts of the state by wireless from the Kansas Agricultural college. The farmer receiving the message, either over his own wireless equipment or by 'phone from the nearest station, knows what his immediate course of action should be, whether conditions will be favorable for plowing or planting or harvesting.

Accurate daily weather prediction will mean a good deal to most farmers, especially those remote from ordinary sources of news. But that is only one of the possibilities which lie in wireless service for the farms. By one more medium, more marvelous than telephone or telegraph, the farmer advances from lonely isolation to daily contact with his fellow men.—*Moline [Ill.] Daily Dispatch, March 10, 1921.*

Brick pavement explodes.—The brick pavement over a 10-mile section of road near Seattle has "exploded" no less than 12 times in the past few years. A short