

or the other that I would like if possible to show them that this is impossible."

The experiments above referred to belong to the agricultural experiment stations and not to the Weather Bureau, since the latter can only make observations on meteorological phenomena. The atmosphere is too large to permit of making experiments, properly so called, with it. The acting director of the office of experiment stations states that he "knows of no experiments bearing directly upon the question of the effect of the moon upon vegetation."

We have to do with a belief that has come down to us from prehistoric times, one that began before accurate observations were recorded, and that may have originated like the myths of mythology, like the practise of "medicine men" and "fakirs," like the Arabian Nights, or the tales of ghosts and banshees. The general growth of a myth is well illustrated in Fiske's *Myths and Myth Makers*.

We quote from a few of the proverbs relating to the influence of the moon upon vegetation, as handed down to us through folk-lore. In some communities these sayings still have an influence in the agricultural industries notwithstanding their apparent absurdity:

Go plant the bean when the moon is light,  
And you will find that this is right;  
Plant the potatoes when the moon is dark,  
And to this line you will hark;  
But if you vary from this rule,  
You will find you are a fool;  
If you follow this rule to the end  
You will always have money to spend.

*Dunwoody, Weather Proverbs, p. 59.*

Plant garden beans when the sign is in the scale they will hang full.—*Tusser, Five Hundred Points of Husbandry.*

Sow peason and beans in the wane of the moone,  
Who soweth them sooner, he soweth too soone;  
That they with the planet may rest and rise,  
And flourish with bearing most plentiful wise.

*Werenfels, Dissertation upon Superstition  
(transl. Lond., 1748), p. 6.*

He (the farmer) will not commit his seed to the earth when the soil, but when the moon, requires it. He will have his hair cut when the moon is either in Leo, that his locks may stare like a lion's shag, or in Aries, that they may curl like a ram's horn. Whatever he would have to grow, he sets about it when she is on her increase, but what he would have made less, he chooses her wane.—*Werenfels, Dissertation upon Superstition (transl. Lond., 1748), p. 6.*

Seeds of all kinds should always be sown during the moon's increase, that is, between the time of new and full moon. Destroy weeds, dig, harrow, plow, and hoe from the full until the new, that is, during the moon's decrease. As the moon increases in light, the most suitable sign for germination has next been selected. The best spring signs are undoubtedly Taurus, Cancer, and Libra; the moon must therefore be in one of these, and it is also best that one of these be rising on the eastern horizon. Cancer and Libra are preferred to Taurus.—*Walter H. Smith, in Vennor's Almanac, 1884, p. 29.*

Here are three different sayings as to the phase of the moon during which to plant:

1, a bright moon for beans and a dark moon for potatoes; 2, an increasing moon for whatever we would have to grow well; 3, a waning moon for peas and beans. To add to our confusion, Mr. Smith, who is an advocate of the increasing moon theory, also tells us that we must wait until the moon is in a favorable sign of the zodiac, with another favorable sign rising in the east. He kindly came to the assistance of those who can not make the computations and selected, for the year 1884, the days and hours on which they might plant their seed. There were two favorable days in April, five in May, and three in June, and about three favorable hours on each day.

In spite of the fact that there are therefore only one or two full working days in a whole month when the moon and the signs are favorable for planting, our American farmers wisely busy themselves with seed sowing when the soil (not when the moon) allows it, and in good time they gather in

the crop. Evidently the American farmers, as a class, doubt the influence of the moon, but do believe in the soil, temperature, rainfall, manure, and laborious cultivation.—*H. H. K.*

#### PUBLICATIONS OF THE UNITED STATES WEATHER BUREAU.

In a letter dated Vienna, April 30, 1901, Prof. Julius Hann suggests that it would be desirable if European meteorologists could be more easily informed as to what bulletins the Weather Bureau has published.

Since the organization of the Weather Bureau on a civilian basis under the Department of Agriculture on July 1, 1891, the bulletins have been designated by letters of the alphabet when in quarto form, and by numbers when in octavo form. The latest publications under these classifications are Bulletins H and No. 29, respectively. Since January, 1895, all the publications have been numbered chronologically in addition to their special serial designations; the latest publication, the current number of the MONTHLY WEATHER REVIEW, has the chronological number 246.

Dr. W. F. R. Phillips, in charge of the Weather Bureau Library, has prepared the following list of the bulletins and other more important publications of the Weather Bureau, exclusive of author's separates and periodic publications. It probably includes all of interest to scientists and the public generally. Hereafter a list of recent publications will appear monthly in the pages of the REVIEW.

Most of these publications may be purchased for a nominal sum, but they are generally intended for free distribution among the meteorologists and scientific libraries of this and other countries. Those marked with a star (\*) are now out of print, but occasionally a copy is returned to the Bureau. Applications for publications should be addressed to "The Chief of the U. S. Weather Bureau."

#### LIST OF THE MORE IMPORTANT BULLETINS, AND OTHER PUBLICATIONS OF THE UNITED STATES WEATHER BUREAU.

- Bulletin A. Summary of international meteorological observations. H. H. C. Dunwoody. (19 by 24 in.) 20 pp. 61 charts. 1893.
- \* Bulletin B. Surface currents of the Great Lakes, 1892-1894, inclusive. M. W. Harrington. (19 by 24 in.) 14 pp. 6 charts. 1894.
- Bulletin C. Rainfall and snow of the United States. M. W. Harrington. 4to. 80 pp. Atlas (19 by 24 in). 23 charts. 1894.
- Bulletin D. Rainfall of the United States. A. J. Henry. 4to. 58 pp. 11 charts. 1897.
- Bulletin E. Floods in the Mississippi River. Park Morrill. 4to. 77 pp. 59 plates. 1897.
- Bulletin F. Report on the kite observations of 1898. H. C. Frankenfield. 4to. 71 pp. 6 plates. 4 charts. 1899.
- Bulletin G. Atmospheric radiation. F. W. Very. 4to. 130 pp. 1900.
- Bulletin H. West Indian hurricanes. E. B. Garriott. 4to. 69 pp. 7 charts. 1900.
- \* Bulletin No. 1. Climate of Death Valley, Cal. M. W. Harrington. 8vo. 50 pp. 1892.
- \* Bulletin No. 2. New method for discussion of magnetic observations. F. H. Bigelow. 8vo. 41 pp. 1892.
- \* Bulletin No. 3. Relations of soil to climate. E. W. Hilgard. 8vo. 59 pp. 1892.
- \* Bulletin No. 4. Soils and soil moisture and crop distribution. Milton Whitney. 8vo. 90 pp. 1892.
- \* Bulletin No. 5. Fluctuations and movements of ground water at Whitewater, Wis. Franklin H. King. 8vo. 75 pp. 1892.

- \* Bulletin No. 6. Diurnal variation of barometric pressure. Frank N. Cole. 8vo. 32 pp. 1892.
- \* Bulletin No. 7. Report of first annual meeting of the American Association of State Weather Services. 8vo. 49 pp. 1893.
- \* Bulletin No. 8. Climatology of the cotton plant. P. H. Mell. 8vo. 68 pp. 1893.
- \* Bulletin No. 9. Forecasting of thunderstorms during the summer of 1892. N. B. Conger. 8vo. 54 pp. 1893.
- \* Bulletin No. 10. Climate of Chicago. H. A. Hazen. 8vo. 137 pp. 1893.
- Bulletin No. 11. Report of International Meteorological Congress, Chicago, 1893. 8vo. Part I.\* 206 pp. Plates X. 1894. Part II.\* 377 pp. Plates XV. 1895. Part III. 188 pp. Plates XVIII. 1896. Part IV. *In press.* O. L. Fassig, Secretary.
- \* Bulletin No. 12. Condensation of atmospheric moisture. Carl Barus. 8vo. 104 pp. 1894.
- \* Bulletin No. 13. Temperatures injurious to food products in storage and transportation. H. E. Williams. 8vo. 20 pp. 1894.
- Bulletin No. 14. Report of third annual meeting of the American Association of State Weather Services. 8vo. 31 pp. 1894.
- \* Bulletin No. 15. Protection from lightning. A. G. McAdie. 8vo. 26 pp. 1895.
- Bulletin No. 16. Determination of aqueous vapor by means of spectrum. L. E. Jewell. 8vo. 12 pp. 1895.
- \* Bulletin No. 17. Weather Bureau work in connection with rivers of the United States. Willis L. Moore. 8vo. 106 pp. 1896.
- \* Bulletin No. 18. Report of fourth annual meeting of the American Association State Weather Services. 8vo. 55 pp. 1895.
- Bulletin No. 19. Relative humidity of southern New England. A. J. Henry. 8vo. 23 pp. 1897.
- \* Bulletin No. 20. Storms, storm tracks, and weather forecasting. F. H. Bigelow. 8vo. 87 pp. 1896.
- \* Bulletin No. 21. Solar and terrestrial magnetism in relation to meteorology. F. H. Bigelow. 8vo. 176 pp. 1897.
- Bulletin No. 22. Climate of Cuba; also weather of Manila. W. F. R. Phillips. 8vo. 23 pp. 1898.
- Bulletin No. 23. Frost: when to expect it and how to lessen injury from. W. H. Hammon. 8vo. 37 pp. 1898.
- \* Bulletin No. 24. Convention of Weather Bureau officials, Omaha, Nebr., 1898. James Berry, Secretary. 8vo. 184 pp. 1899.
- Bulletin No. 25. Weather forecasting; historical, practical, and theoretical. Willis L. Moore. 8vo. 16 pp. 1899.
- Bulletin No. 26. Lightning and the electricity of the air. A. G. McAdie and A. J. Henry. 8vo. 74 pp. 1 chart. 3 plates. 1899.
- \* Bulletin No. 27. The probable state of the sky along the path of total eclipse of the sun, May 28, 1900. Observations of 1899. F. H. Bigelow. 8vo. 23 pp. 4 charts. 1899.
- Bulletin No. 28. The climate of San Francisco, Cal. A. G. McAdie. 8vo. 30 pp. 1899.
- \* Bulletin No. 29. Frost fighting. A. G. McAdie. 8vo. 15 pp. 2 maps. 9 plates. 1900.
- \* Special report on the transfer of the Weather Bureau to the Department of Agriculture. M. W. Harrington. 8vo. 26 pp. 1891.
- \* Weather and wreck charts of the Great Lakes 1886-1893. M. W. Harrington. (1 sheet of atlas entitled Report, etc.)
- \* Rainfall laws. Dr. G. Hinrichs. 8vo. 94 pp. 6 plates. 1893.
- \* Certain climatic conditions of the Dakotas. (Senate Ex. Doc. No. 157.) J. P. Finley. 8vo. 206 pp. Charts XCV. 1893.
- \* Daily river stages. Principal rivers of the United States. Part IV. 1891-1893. Thomas Russell. 8vo. lxxiv, 439 pp. Charts XII. 1894.
- \* Protection from lightning. A. G. McAdie. 8vo. 20 pp. 11 plates. 1894.
- \* Wrecks on the Great Lakes from December 17, 1885, to November, 1893. M. W. Harrington. 8vo. 22 pp. 1894. (Reprint).
- \* Protection of food products from heat and cold during transportation. M. W. Harrington. 8vo. 7 pp. 1894.
- Precipitation in Nebraska and South Dakota. (Senate Mis. Doc. No. 113.) A. J. Henry. 8vo. 33 pp. 1894.
- \* Weather Bureau Kite. C. F. Marvin. 8vo. 5 pp. Plate. 1895. (Reprint, M. W. R.)
- The Marvin Seismograph. C. F. Marvin. 8vo. 6 pp. 1895. (Reprint, M. W. R.)
- Constants and units used in meteorology. Cleveland Abbe. 8vo. 6 pp. 1896. (Extract, M. W. R.)
- Cloud observations and an improved nephoscope. C. F. Marvin. 8vo. 12 pp. 1896. (Reprint, M. W. R.)
- Sunstroke weather of August, 1896. 4to. 4 pp. W. F. R. Phillips. (Extract, M. W. R.)
- \* International meteorological symbols. (Weather Bureau Circular of information.) M. W. Harrington. 8vo. 5 pp. 1894.
- \* Atmospheric circulation in tropical cyclones. H. B. Boyer. 8vo. 17 pp. 17 plates. 1896.
- \* W. B. No. 63. Studies of weather types and storms. No. 1. Types of storms in January. E. B. Garriott. 4 pp. Charts. 1895.
- \* W. B. No. 81. Statistics of State Weather Services. O. L. Fassig. 8vo. 12 pp. 1896. (Reprint, M. W. R.)
- W. B. No. 85. Departures from normal temperatures and rainfall, with crop yields in Nebraska. H. H. C. Dunwoody. 8vo. 30 pp. Charts. 1896.
- \* W. B. No. 86. Injury from frosts and methods of protection. 8vo. 12 pp. Charts. 1896.
- \* W. B. No. 92. Studies of weather types and storms. Part II. Weather Bureau officials. 4to. 24 pp. 38 plates. 1896.
- \* W. B. No. 102. St. Louis, Mo., tornado of May 27, 1896. H. C. Frankenfield and A. J. Henry. 8vo. 6 pp. Charts. 1896. (Reprint, M. W. R.)
- W. B. No. 104. Responses to questions at the International Meteorological Conference, Paris, 1896. Willis L. Moore. 8vo. 29 pp. 1896.
- W. B. No. 109. Sunshine recorders. Circular G, Instrument Division. C. F. Marvin. 8vo. 18 pp. 1896.
- \* W. B. No. 110. Kite experiments at the Weather Bureau. C. F. Marvin. 8vo. 115 pp. 21 plates. 1896. (Reprint, M. W. R.)
- W. B. No. 112. Daily river stages. Principal rivers of the United States. Part V, 1893-1895. Park Morrill. 4to. 555 pp. 1896.
- W. B. No. 122. Monograph on the mechanics and equilibrium of kites. C. F. Marvin. 71 pp. 1897. (Reprint, M. W. R.)
- \* W. B. No. 124. Standard system of coordinates for magnetic and meteorological observations. F. H. Bigelow. 8vo. 7 pp. 1897. (Reprint, M. W. R.)
- \* W. B. No. 125. Wind barometer table. E. B. Garriott. 8vo. 5 pp. Charts. 1897. (Reprint, M. W. R.)
- \* W. B. No. 126. Clothing and temperature. W. F. R. Phillips. 8vo. 6 pp. 1897. (Reprint, M. W. R.)
- W. B. No. 130. Equations of hydrodynamics and forms applicable to the problems in meteorology. Joseph Cottier. 4to. 8 pp. 1897. (Reprint, M. W. R.)
- W. B. No. 138. United States daily atmospheric survey. Willis L. Moore. 8vo. 6 pp. 1897.

- W. B. No. 140. Forests and rainfall. H. A. Hazen. Svo. 2 pp. 1897. (Reprint, M. W. R.)
- \* W. B. No. 142. The probable state of the sky along the path of total eclipse of the sun, May 28, 1900. F. H. Bigelow. Svo. 7 pp. 1 chart. 1897. (Reprint, M. W. R.)
- \* W. B. No. 145. Highest kite ascension at Blue Hill. S. P. Fergusson. Svo. 4 pp. 1897. (Reprint, M. W. R.)
- W. B. No. 148. An improved sunshine recorder. D. T. Marving. Svo. 15 pp. 1897. (Reprint, M. W. R.)
- W. B. No. 149. A winter barograph curve from the South Pacific Ocean. R. de C. Ward. Svo. 8 pp. 1897. (Reprint, M. W. R.)
- W. B. No. 159. Wrecks and casualties on the Great Lakes, 1895, 1896, and 1897. Norman B. Conger. Svo. 20 pp. 3 charts. 1898.
- W. B. No. 162. Normal annual sunshine and snowfall. A. J. Henry. 4to. 5 pp. 1898.
- W. B. No. 166. Instructions for aerial observers. Circular K, Instrument Division. C. F. Marvin. Svo. 33 pp. 1898.
- W. B. No. 168. Cyclonic circulation and the translatory movement of West Indian hurricanes. Rev. Benito Vifias, S. J. Svo. 34 pp. 1898.
- W. B. No. 171. Moisture tables. C. F. Marvin. Svo. 9 pp. 1898. (Reprint, M. W. R.)
- \* W. B. No. 179. The probable state of the sky along the path of total eclipse of the sun, May 28, 1900. F. H. Bigelow. Svo. 8 pp. 1898. (Reprint, M. W. R.)
- W. B. No. 180. Aneroid barometers. C. F. Marvin. Svo. 6 pp. 1898. (Reprint, M. W. R.)
- \* W. B. No. 188. Climate and crop report, Alaska section. H. L. Ball. Svo. 7 pp. 1899. (Reprint, M. W. R.)
- W. B. No. 193. Measurement of precipitation. Circular E, Instrument Division. C. F. Marvin. Svo. 28 pp. 1899.
- \* W. B. No. 194. Hydrology of the Lake Minnetonka watershed. S. W. Corley. Svo. 10 pp. 1899. (Reprint, M. W. R.)
- W. B. No. 199. Property loss by lightning, 1898. A. J. Henry and A. G. McAdie. Svo. 16 pp. 1899. (Extract from Bulletin No. 26.)
- W. B. No. 201. Climatology of the Isthmus of Panama. H. L. Abbot. Svo. 19 pp. 1899. (Reprint, M. W. R.)
- W. B. No. 202. An advance in measuring and photographing sounds. B. F. Sharp. Svo. 18 pp. 1899. (Reprint, M. W. R.)
- \* W. B. No. 203. Variations in lake levels and atmospheric precipitation. A. J. Henry. Svo. 8 pp. 1899. (Reprint, M. W. R.)
- W. B. No. 223. Anemometer tests. C. F. Marvin. Svo. 18 pp. 1900. (Reprint, M. W. R.)
- W. B. No. 227. Daily river stages. Principal rivers of the United States. Part VI, 1896-1899. Weather Bureau. 4to. 446 pp. 1900.
- W. B. No. 228. Tables of daily precipitation for 1893-1895, inclusive. (Completed only to "P.") Weather Bureau. Svo. 256 pp. 1900.
- W. B. No. 231. Report of the Chief of the Weather Bureau. 1900. Svo. 15 pp.
- W. B. No. 233. Anemometry. Circular D, Instrument Division. C. F. Marvin. Svo. 67 pp. 1900.
- W. B. No. 235. Psychrometric tables. C. F. Marvin. Svo. 84 pp. 1900.
- W. B. No. 237. Meteorological chart of the Great Lakes for season of 1900. A. J. Henry and N. B. Conger. 4to. 23 pp. 1901.
- W. B. No. 241. Barometers and measurement of atmospheric pressure. Circular F, Instrument Division. C. F. Marvin. Svo. 94 pp. 1901.

## WIND AND TEMPERATURE.

A correspondent has proposed the following question :

Given, a close fence 12 or 14 feet high running from the northeast to the southwest, or directly athwart a blizzard from the northwest, a thermometer being on each side of the fence about 5 feet from the ground. If the thermometer on the north side indicates 15° above zero what will the instrument on the lee side show?

I know from practical experience the great and appreciable difference in the two sides to animal life but have no knowledge of the effect these two positions of the thermometer have upon the mercury. Will you kindly tell me? If, as some claim, there is very little, then why should a man exposed on the north side freeze to death, while on the south side he would survive without much injury? In one case the cold cuts to the marrow, in the other by buttoning up one's coat only a chilly sensation is experienced. Is not vegetable life in this particular affected much the same as animal life, or in other words would not a tender tree on each side of this high fence fare much the same as two men, one on each side of it?

There is no appreciable difference between the temperature of the air on the windward and leeward sides of a fence, or of any other form of windbreak. Animals seek shelter from the wind for the reason that it conveys away the heat of their bodies much faster than does the quiet air, since the covering provided for their protection by nature is not impervious to strong winds. For the same reason, a man will perish in a high wind with a temperature that would cause him little discomfort in a calm, since in the presence of a strong wind his clothing is incapable of retaining his bodily heat.

The lowest temperatures and those that produce frosts and destruction to vegetation usually occur after the wind has died down, and are due to excessive radiation of heat from the ground and from the plants into space. Under these conditions the plants are sometimes colder than the air itself, so that a fence could be of no possible use to the plants; in fact it is well known that under these circumstances a wind brings warm air to prevent frost.

When a cold wave is coming on, the plants are, of course, cooled by the cold air that is continually passing by them, and if this cold air can be held back and the warm air retained the plants will be protected; but a fence on the windward side of the field would hardly effect this, since cold air has a tendency to descend to the ground and warm air to rise. A covering of some sort is therefore the only means of retaining the desired heat, and the same covering will also prevent the lowering of the temperature by radiation.

It is for these reasons that the Weather Bureau in its publications has always advocated screens, smudges, etc., as a protection against frost.

## REDUCTION TO STANDARD GRAVITY AT MEXICAN STATIONS.

In order to correct the barometer for the variations in gravity we have to consider the fact that not only does the force of gravity, combined with the centrifugal force due to the diurnal rotation of the earth, vary with the latitude of the station, but there is also a small variation depending on the altitude of the station above sea level and the mass of the mountain or plateau on which the station rests. Some account of this problem has been given in the MONTHLY WEATHER REVIEW for December, 1896, p. 463, July, 1898, p. 314, and December, 1898, p. 550, at least in so far as concerns the United States. In Mexico the problem of the reduction to standard gravity is one of special importance, since great differences of altitude occur at stations very close together. As all Mexican stations, so far as they are mentioned in the accompanying table, use mercurial barometers, the corrections have therefore been computed by Señor Pastrana according