

of beginning and ending of rainfall, and the temperature and pressure of the air. With one or two exceptions, the stations that are not at present so equipped are of slight importance or, in general, have all the instruments necessary for the satisfactory performance of their work. One hundred and fifty-nine steel towers, with the improved auxiliary equipment for the display of storm warnings, are now installed at as many stations distributed over the shores of the Great Lakes and the Atlantic and Pacific seacoasts. At 77 of these stations high-power electric lanterns are used, and at the others improved oil lights.

AN HONEST LONG-RANGE FORECASTER.

In the MONTHLY WEATHER REVIEW for July, 1904, page 322, under the title "Fake Forecasts," we have expressed our remonstrance against the publication of long-range weather forecasts that pander to the desire of the managing editor of a newspaper for sensational headlines, irrespective of reliability or public welfare. No principles known to conservative, reliable meteorologists warrant the publication of long-range forecasts of the details of local weather. We were very sorry to include in our list of offenders the name of one who has published some good contributions to meteorology; one who has been a close student of the weather map, but who was unwittingly drawn into an attempt to make long-range predictions on a very slender basis and at a very great risk to the good name of science. "Science" is a term that can only be properly applied to facts, observations, principles, and conclusions that are recognized by the world of scholars as acceptable to all because well-founded and generally unchallenged. No one man's hypotheses, deductions, generalizations, discoveries, or theories form a part of the body of "science" until they have been fully published and have stood the test of public discussion. The scientific literature of the past two hundred years, and even of the past fifty years embraces hundreds and thousands of papers that have long since lost whatever importance they once had; in fact both societies and journals are on their guard against publishing that which is useless, to say nothing of being absurd and injurious. Science is conservative, not sensational. Those who publish their ideas first in newspapers, as though afraid to stand the racket of a quiz by their colleagues in the established societies or journals of science, are liable to deceive themselves, mislead the public, and finally come to grief themselves. But we are pleased to find that our friend had committed only the error of an enthusiastic but honest man, and we take great pleasure in publishing the following letter, in which he sets himself right before his fellow citizens and colleagues.—C. A.

NORTHFIELD, MASS., November 11, 1904.

EDITOR MONTHLY WEATHER REVIEW.

DEAR SIR: It has been brought to my attention that in a recent number of the MONTHLY WEATHER REVIEW I am classed among long-range forecasters who work "against all recognized principles of meteorology." As nothing could be further from the truth, and as I have done no work of a forecasting nature for many months, I should like to correct such a view, for I am diametrically opposed to all such humbuggery, and utterly fail to comprehend where such an opinion had its inception. The only long-range forecaster who ever made regular predictions, whose work seemed to me to have an iota of common sense in it, was your old servant Dunn, [Mr. E. B. Dunn of the Weather Bureau office in New York, not Mr. Lawrence Dunne of Alabama] and I have never looked into his work enough to overcome my prejudices against it on general principles. My own experiments abundantly satisfied me, first, that long-range work as a steady plan of procedure was inoperative, and, second, impracticable unless mixed with guesswork, i. e., lying. You are welcome to use enough of this letter to right the error as regards myself, and, it may be, reaffirm your position, provided that you correctly state my ideas. While I have been requested to give a statement of my position through the columns of widely circulated neutral mediums, I would much prefer to convince those with whom I have long labored through the official organ which has done me an injustice, though by means of some unknown source of misconception, I have no doubt.

Having corrected, as above, the false impressions that seem to have been created, I will, as briefly as consistent, give the results of my investigations of practical long-range forecasting, which will, I think, reiterate your own private and expressed convictions. I will first state that I wrote the Chief of Bureau in the year 1903 asking if there was no way

in which a practical weather worker who had recently passed the age limit, but who had previously passed the meteorological examination by a good number of points, could enter the service, as by reexamination. I received a curt if not a courteous negative. [The Chief of Bureau can not change the rulings of the Secretary of Agriculture or of the Civil Service Commission.] Having the wish to do something of benefit to the community in the field to which I was most particularly adapted, I started a weather forecast business and found, among other things:

First. That the public wants long-range forecasts regularly, and
Second. That it is impossible to make any such with sufficient correctness. I doubt if a Weather Bureau official who has ever made one short-range forecast privately thinks it impossible to make a single long-range forecast. Even the MONTHLY WEATHER REVIEW occasionally hints at the backward extension of great atmospheric changes, lasting perhaps a week—just as the giving away of a dam would slant the level of the water with increasing velocity, beginning at the dam.

Third. The editor of one daily paper carefully studied my three-day forecasts, admitted they were as correct as could be expected for two days, and then wanted them to cover more time as thoroughly. I should recommend that such newspapers try to have Congress appropriate half as much more if they want three-day forecasts, and, still more if they want a few hours' notice given of "tornadoes." People who think it doesn't take money to save money by weather predictions must be ignorant enough to support goose-bone and other theories, including astrology, moonshine, and bombs.

Fourth. The editor of a second daily paper studied my work most carefully and has been writing me ever since to recommence it.

Fifth. Various other editors either wanted me to furnish such stuff very cheaply or else to make exciting predictions, or with impossible regularity, which would necessitate lying. I would not do anything of the kind, and naturally object strenuously to being classed among those who sacrifice honor for profit.

Sixth. The people generally throughout the region covered by the last "cold winter" expect another colder than the average. Here is a whole people making a long-range prediction. Can all the people fool themselves some of the time? Or could a specialist not make such a prediction?

Seventh. As the result of my work, leading reputable papers, etc., began having their own "three-day predictions." Where these have been justified they have been continued. If I proved my three-day predictions were as good or better than 83 per cent correct, why should the Civil Service rules absolutely exclude a man of thirty-five years from his country's service in his chosen and peculiar profession?

Eighth. That the Weather Bureau gets the credit for all such paid for work, where the furnisher does not get part pay in advertising. Thus, if the incog. work is good the Bureau is helped, and if bad, to use the A B C argument, the people relish it or they wouldn't support the paper in using it. When it is not incog., if it is good, it is a reflection on the Bureau for not having such men in its employ, and if bad it should carry its own condemnation. However, in my case, I furnished my own name for the editors to do as they saw fit with, and that leads me to remark:

Ninth. As the Weather Bureau is like the Government "of, for and by the people," can there be harm in discreet persons using it not only privately but publicly if honorably giving it due credit in their work? Wherever I have been the Weather Bureau officials have been helped, (and so the general service,) more than I, by the value of my work. Sensational predictions are almost never justified, though the Minnesota type of a West Indian tornado should have been heralded several hours in advance, if that would not have resulted in more deaths from fright than it would have prevented.

Tenth. An editor in Duluth, Minn., said that all weather predictions were injurious to his paper; if you predict fair the advertisers would have advertised any way, and if you predict rain they wouldn't advertise at all. That argument is about as old as the age of man.

Eleventh. I obtained the most peculiar assortment of ideas from editors from Chicago to St. Louis and Winnipeg, including all sorts of forecasting "from stocks to eternity." Confining myself strictly to weather, it seems that the people "as a whole" have got to be educated "up" to "long-range forecasts" before they can be satisfied with what few they can "gamble on," and the various newspapers who used these generally "kicked" if they couldn't dig out at least a terrible hailstorm or blizzard every time.

Twelfth. I established the great principle that the appearance of a cool wave within the field of observation is the surest sign of all weather changes in that field that short-range predictions can foretell. If I made that fact emphatically understood by those sufficiently conversant the result of my labor is a success.

So as I reluctantly abandoned trying daily long-range newspaper forecasts for that part of North America, preferring honor to money, I would deeply appreciate the favor if you can conveniently set me right again with your readers.

Sincerely,

ALTON D. ELMER.

METEOROLOGICAL COURSE AT WILLIAMS COLLEGE.

In response to an inquiry by the Editor we learn that Prof. Willis I. Milham, Director of the Field Memorial Observatory

of Williams College, maintains an excellent course in meteorology.¹

This course occupies the first half year of each annual session. It is based on Davis's Elementary Meteorology, but much outside material is given in the form of lectures. In order to systematize the work, a syllabus covering both textbook and lectures is closely followed, but in this the order of topics is rearranged from the work by Davis to suit the needs of Professor Milham's classes.

Additional practical laboratory work is also imposed, consisting in the use of apparatus for observations, work on meteorological statistics, essays or short theses on special subjects, and work with the weather map in making forecasts. The following is the first page of the list of problems relating to statistics:

Monthly extremes of temperature for March, April, and May at Williamstown, Mass.

Monthly extremes of temperature for July, August, January, and February at Springfield, Mass.

Ice days at Amherst, Mass.

Normal absolute yearly range of pressure at Amherst, Mass.

Difference in temperature between Amherst and Williamstown, Mass.

Freezing days at Amherst, Mass.

Constancy of mean annual temperature at Amherst, Mass.

Extremes of temperature for January and July at Albany, N. Y., as compared with those at Williamstown, Mass.

Monthly extremes of temperature for July, August, January, and February at New Haven, Conn.

Monthly extremes of temperature for December, January, and February at Williamstown, Mass.

Extremes of temperature for July and January at New York, N. Y., as compared with those at Williamstown, Mass.

Difference in temperature between Albany, N. Y., and Williamstown, Mass.

Monthly extremes of temperature for July, August, January, and February at Minneapolis, Minn.

Difference between mean monthly temperatures computed from hourly observations and $\frac{1}{2}$ (max. + min.) at Amherst, Mass.

Annual barometric variation at Amherst, Mass.

Monthly extremes of temperature for July, August, January, and February at New York, N. Y.

Monthly extremes of temperature for June, July and August at Williamstown, Mass.

Monthly extremes of temperature for September, October, and November at Williamstown, Mass.

The following list contains some of the special topics on which essays must be written by the students.

| | |
|-----------------------|-----------------------------------|
| Lightning. | Maximum and minimum thermometers. |
| Waterspouts. | Ocean and lake temperatures. |
| Blizzards. | Tornadoes. |
| Artificial rain. | Weather proverbs. |
| Foehn and chinook. | Sunspots and rainfall. |
| Sunset colors. | Snow line. |
| Thermometer shelters. | River stages. |

During the current winter the students and various voluntary observers will carry out a special investigation into the distribution of abnormal low temperatures in neighboring valleys and the vertical temperature gradient during still clear nights.—C. A.

WEATHER BUREAU STATION AT CHARLES CITY, IOWA.

By CLARENCE J. ROOT, Assistant Observer.

A new Weather Bureau station was opened at Charles City, Floyd County, Iowa, on November 1, 1904. The longitude of Charles City is 92° 38' W., latitude 43° 04' N., and elevation

¹It was at Williams College that the eminent meteorologist, Prof. John Henry Coffin, was professor of natural philosophy, 1839-1843, and here he established our first mountain observatory for meteorological work, i. e., that on Mount Greylock, where continuous self-registering instruments were maintained for two years. "Coffin's Winds of the Northern Hemisphere," Smithsonian, 1851, is still one of the great storehouses of data relative to both the upper and lower clouds and the winds. The elaborate work, "Winds of the Globe," 1873, was quite an epoch in American meteorology. Professor Coffin was born in Northampton, Mass., 1806, September 6, and died in Easton, Pa., 1873, February 6. He was a graduate of Amherst College, and, after leaving Williams College held the position of professor of mathematics and astronomy in Lafayette College at Easton, Pa., until his death, when his son, Selden J. Coffin, succeeded him.

1015 feet above mean sea level. The city is situated in the valley of the Cedar River and is partially surrounded by hills ranging in height from 50 to 68 feet above street level. The station is located one block from the river. It is furnished with a full instrumental equipment, the wind instruments and electrical sunshine recorder being mounted on a 50-foot steel tower, in the base of which the thermometer shelter is suspended. The rain gages have a ground exposure in the yard. Two observations will be taken daily and the usual records kept.

METEOROLOGY IN NEW SOUTH WALES, AUSTRALIA.

Two important steps looking to a higher appreciation of meteorology have lately been taken in Australia. The first relates to the introduction of the so-called nature study in the public schools. In February last the Department of Public Instruction issued a syllabus of instruction to guide the course pursued by the teachers in schools under that department. This gives suggestions and instructions as to methods of teaching in the different grades from the kindergarten to the seventh class, or children of the age of fourteen or fifteen. Throughout this course the observation of nature is inculcated. Thus, in the lowest or first class the beginners receive a series of lessons on plant and animal life, and cultivate plants and flowers in the ground or in pots, observing the various stages of development. They use sand trays for modeling representations of the geographical features; they observe the appearances of the sky. In the second class the same course is pursued, but is applied to more difficult subjects. The observation of sky phenomena is continued and the effects of seasonal changes are observed. In the third class "Observing and recording simple meteorological phenomena and seasonal changes, with lessons based on these observations." In the fourth class we read "Physical features associated with the chief towns, with climatic conditions and commercial products; lessons on climate and atmospheric phenomena." In the fifth class "A course of experimental lessons in some branch of elementary science; lessons bearing on agricultural pursuits, with such scientific principles as will enable the pupil to understand the reasons, etc.

The whole course is adapted to direct the attention of the youth toward the studies and sciences that have a practical application in everyday life.

The second important meteorological feature is a so-called new departure, namely, the publication of a daily weather chart in the Daily Telegraph, which is the principal newspaper of the colony. We are indebted to Hon. Andrew Noble for copies of the Daily Telegraph of October 12, 13, and 14, containing the very first charts with isobars and winds. Such charts will undoubtedly educate the people to a condition of intelligence that ought to render impossible a repetition of the numerous rain-making schemes and other evidences of deplorable ignorance that were manifested during the recent terrible and disastrous drought. We quote the following from the Daily Telegraph of October 12.

The inclusion of meteorology in the new public schools syllabus has directed special attention to consideration of weather conditions. Correspondents, including a number of public school teachers, have applied to the Daily Telegraph for amplified daily information on this subject and the meteorological branch of the Sydney Observatory also has been requested to furnish details of the weather conditions and atmospheric pressures, the information upon which the weather forecasts are made.

The Daily Telegraph has arranged to publish daily a chart showing the principal features of weather conditions, including the high and low pressure isobars. Where possible the rainfall area will be indicated, and conditions on the coast will also be given.

This chart will be prepared from information supplied by Mr. H. A. Hunt, the acting meteorologist of this state. The publication of isobaric charts will enable students with their local knowledge of physical surroundings to anticipate in detail their probable weather more completely than is possible at the central office, where precise knowledge of local