

the pace of the race is gaining, but the goal is not and never will be in sight.

Since the time of Newton our knowledge of the phenomena of nature has wonderfully increased, but man asks, perhaps more earnestly now than in his days, What is the ultimate reality behind the reality of the perceptions? Are they only the pebbles of the beach with which we have been playing? Does not the ocean of ultimate reality and truth lie beyond?

METEOROLOGICAL NOTES.

FOR many years the United States government has assiduously gathered up the meteorological conditions from many stations scattered far and wide over the surface of our great continent, and having collated the facts sent in to the central office, has deduced therefrom certain forecasts known as probabilities. These forecasts are made out twice per day, and then telegraphed broadcast over the country, to be disseminated among the people as widely as possible for the benefit of their commerce, their agriculture, their shipping, and even their lives. For many years I have been on the "volunteer" roster of the United States Weather Service, and as such have been the recipient of weather telegrams once per day. For several years I went to the trouble and expense to supply the usual flags, and faithfully made the proper display of them (at Fayette, Mo.).

In 1889 I saw in the *St. Louis Republic* a brief notice of a "whistle code" in use at Seymour, Ind., and I determined to introduce the whistle in place of the flags, and for the following considerations: (1) The flags could not be seen to any advantage beyond one mile; (2) in foggy weather or during snow-storms the flags could not be seen at all; (3) the whistle could be heard in any kind of weather and to distances reaching from six to eight miles in all directions, and by using a more powerful whistle the distance could be made greater still.

Accordingly I sent to Indiana and obtained the code in vogue there. It was a combination of short and long blasts, the "shorts" sometimes preceding and in other cases following the "longs." I concluded it would be more systematic to have the longs refer to the weather and come first, and the shorts refer to temperature and come last. The chief advantage in having shorts come last was that any one hearing a prolonged blast of the whistle might be sure that no short ones had preceded and been lost. I therefore adopted the following plan. Shorts refer to the temperature, one short meaning colder (the column in the thermometer gets shorter with cold), and two shorts meaning warmer. Longs refer to the weather, one long meaning fair (clear, or cloudy without precipitation), two longs meaning rain or snow. This much being decided upon, it is easy to blow "fair and warmer," or "snow and colder," or "fair and warmer followed by rain," — in the last the shorts come in the middle to separate the one long (fair) and the two long (rain), — or any other combination necessary. For the announcement of cold waves, three longs; and for frosts in the frosty seasons or for severe storms in summer, four longs, were used at Seymour, Ind., and the same were adopted in my code. In September, 1889, the first signal was blown, being preceded by four short blasts as a warning that the "weather" was about to be blown. From that date to this the people for miles around have been daily warned of the probabilities for the succeeding twenty-four hours, and they have shown much interest in the matter, being willing

to put up at the mill, if necessary, a more powerful whistle than the one now employed.

One of our merchants had the code printed on his advertising cards, and they may be seen tacked up in stores or homes, or in the hands of citizens near and far. Many people soon commit the code to memory and have no need for the key. Persons have reported hearing the whistle at the distance of ten miles; but, as a rule, it is not regularly heard beyond five or six miles.

During the summer of 1890 I tried to get some of our railroads to adopt the code, and whistle the weather at intervals of five or six miles as the trains sped through the country. One road replied that they had too much whistling to do already, there were so many crossings along the way. But I still do not see why the weather whistle could not be used instead of the customary two longs and two shorts usually blown at crossings.

In the chief signal officer's report for 1890, p. 235, I am credited with the introduction of the whistle code now in use in many places in the State. In recent circulars sent out by Chief Harrington, I see that the code has been still further modified, the three longs being used to indicate "local rains," and three shorts meaning a "cold wave." As a cold wave comes rather under the head of temperature, it is doubtless more appropriate to include it among the shorts.

I have written thus at length about the whistle code because I think it should be widely introduced, entailing no expense for flags to be whipped out by the wind, and reaching more people than flags can. Moreover, by having the dispatch blown at the same hour every day, it becomes a time signal by which the people can set their clocks and watches. The noon hour is a good one where the morning forecasts can be delivered before twelve o'clock.

For several years, by the courtesy of the government, I was permitted to use a set of maximum and minimum thermometers. But they entailed the necessity of observation and adjustment every day, and this duty bound the observer to be at home or to intrust the instruments to other hands, or to break the continuity of his record. So last May one year ago I purchased a Draper self-recording thermometer, regulated it by comparisons with the standard instruments for several weeks, and then gave up these standard instruments.

For twelve months I replaced the charts week by week, and filed away the "red-lined" ones, with dates, etc., properly filled in the blanks therefor. On the first of July of this year (1891) I began to put those charts through again, using purple ink instead of red in the pen. Comparison of temperatures for 1890 and 1891, day by day, hour by hour, is both easy and interesting. I think I shall change the ink to green, or some other color, and use again another year. It is certainly a great comfort to wind up the clock, put in another chart, refill the pen, once per week (say Monday morning), and then go about one's business or on a journey, perhaps, and to know that there is to be no break in the record though away for days at a time. I would not like to go back to the old method again.

T. BERRY SMITH.

NOTES AND NEWS.

THE Brooklyn Institute announces a series of "Institute Extension Courses," consisting of lectures on astronomy, by Mr. Garrett P. Serviss, president of the department of astronomy. The first course will be on the solar system, embracing "The Sun, Its Distance, Size, Motions, and Gravity;" "The Sun, Its Nature