and movements of clouds has only been satisfactorily developed within the past ten years, although it was undoubtedly suggested and tried as early as 1857. The study of lightning, by means of photography began, we believe, with the work of Dr. H. Kayser, of Berlin, in 1884, and von Hænsel in 1883.

In studying the distribution of polarized light over the sky it may be practicable to so arrange the apparatus that the relative amount of polarization may be deduced by photographed records, so as to give a general view of the condition of a large portion of the sky. The record of the amount of sunshine and cloudiness by the so-called Jordan sunshine recorder is well known, although this is strictly speaking a blue print rather than a photographic process. A photograph of the distorted disc of the sun near the horizon, if one could be taken, would be a record of the irregularities of atmospheric refraction, and, therefore, of the density of superposed layers of air.

Photographs of snow crystals, frost work, sections of hailstones, views of waterspouts and tornadoes, halos, rainbows, and glories are not rare. Even the waves of compression in the atmosphere attending a bullet or an explosion, or any wave of sound, as also the streams of mixed warm and cold air flowing around an obstacle have been photographed.

Those meteorologists who take a personal interest in all these applications of photography will appreciate the efforts that are being made by the Royal Photographic Society of London to extend the scope of its annual exhibitions to every branch of photography and its applications. Those who have interesting photographs or photographic apparatus that they wish to exhibit should communicate directly with Mr. John A. Hodges, Honorary Secretary, No. 66 Russell Square, London, W. C. The exhibition will be opened on October 1 and medals will be awarded.

The exhibition will be arranged in five sections, of which the last is entitled Scientific Photography and Photography in its Technical Applications. Under this head, the circular reads as follows:

This section will comprise examples of work shown for its technical qualities and apparatus used in photographic investigations: The various processes of color photography; the photographic reproduction of paintings, drawings, maps; photographs by artificial light; photography applied to industrial and educational purposes, astronomy, spectroscopy, geology, meteorology, microscopy, medicine, surgery, and the Röntgen rays; surveying and engineering; zoology and botany; telephotography, new processes, enlargements; photography applied to military purposes, recording instruments, etc.; negatives, transparencies, stereoscopic prints and slides; lantern slides, and general work.

Exhibits may be excluded unless the points of special technical or scientific interest are distinctly stated.

Medals will be placed at the disposal of the judges, but noncompetitive work will be admitted.

There seems to be a small charge to each exhibitor for the wall space occupied by him.

A NEW METEOROLOGICAL JOURNAL.

By a letter from Mr. A. J. Monné, of Nykerk, we learn that with the cooperation of Mr. Chr. A. C. Nell he proposes to publish a journal for meteorology in the Dutch language. The meteorology of the ocean has, as is well known, been diligently studied by the Dutch navigators, and forms the principal part of the work of the meteorological institute of the Netherlands, founded by Buys-Ballot, and now conducted by Prof. Dr. M. Snellen of the University of Utrecht. Moreover, the islands of the Dutch West Indies and East Indies are so near to the West Indies and Philippines, respectively, that our interest in their meteorology has lately become greatly quickened. We doubt not that the Dutch journal will have much interest for many American readers.

CLIMATIC DIVISIONS OF MISSOURI.

In the annual summary of the Missouri section, for 1899, Mr. A. E. Hackett, Section Director, adds a general review of the climate of Missouri. He divides the State into five physiographic divisions, and attributes to each of them the following normal temperatures and rainfall for the respective seasons:

Divisions.	Normal mean temperatures.				Normal average precipitation.			
	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
	°	°	°	°	*Ins.*	*Ins.*	*Ins.*	*Ins.*
Northwest plateau	51.8	74.5	53.6	27.7	10.74	13.62	7.32	4.65
Northeast plain	53.5	75.3	55.1	30.6	11.58	11.87	8.45	6.51
Southwest lowlands	54.3	75.7	56.1	31.9	12.44	12.59	7.79	6.42
Ozark plateau	55.1	74.8	56.2	34.7	14.00	12.75	8.89	8.09
Southeast lowlands	58.0	76.7	58.3	37.3	14.52	11.86	9.90	10.57
State	54.5	75.3	55.9	32.4	12.65	12.44	8.47	7.25

THE EFFECTS OF DIMINISHED PRESSURE ON COOKING.

In the January report of the New Mexico section Mr. R. M. Hardinge quotes the following from a cook book issued by the ladies' guild at Albuquerque, N. Mex. The whole article seems to give results of actual experience and careful observation on a subject which is now attracting great attention at the hands of experimental stations that are doing for the kitchen that which has already been done for the farms and the workshops. Some of the hypothetical explanations given by Mrs. C. L. Herrick, to whom this article is due, may not stand the test of further scientific investigation, but the whole subject is eminently worthy the attention of the chemists.

It is a matter of common observation among housekeepers in New Mexico that recipes and practices found reliable elsewhere fail to achieve the expected results on the Plateau.

Some of us have endured many trying experiences in adapting our cooking to our environment, and it is to aid friends to a more easy accomplishment of these household tasks that these lines are written.

One of the difficulties has been with our cake mixing and baking. It took me a long time to discover that the use of the same number of eggs I had been accustomed to in a lower altitude caused my cakes to be a failure. I now use half as many as my eastern recipes call for, adding two tablespoons of milk or water for each egg left out. The reason for this is that the albumen of the egg, when added to the batter, forms a tenacious coating, which helps it to retain the gases that tend to escape by virtue of their expansion. The albumen is much heavier than the gases engendered by the raising agent, and when the atmospheric pressure is heavier, as in lower altitudes, it is impossible for these gases to escape so rapidly, and there is time for the batter to be thoroughly aerated before hardening.

Here the heat of our ovens is longer in penetrating, the atmospheric pressure is diminished, and the gases tend to escape before the heat is sufficient to harden. This escape of the gases prevents the aeration of so large a quantity of the albumen, and the superfluous amount serves but to toughen the cake. It is necessary to apply the heat quickly and evenly in order to coagulate the albumen and prevent the collapse or "falling" of the cake.

Less shortening and less sugar can be used here, because of their weight and, also, because both melt in the process of baking, and in this way dilute the batter and make it easier for the gases to escape. To counteract this, more flour must be used, the proteids of which form a glutinous consistency which prevents the escape of the gases.

It has been found more satisfactory to add the raising agent after all other mixing is done and just as the batter is ready to place in pans for the oven. This prevents the escape of the gases before reaching the oven, which is sure to occur if the raising agent is sifted through the flour and added gradually, as we were accustomed to mix ingredients in a lower altitude, for effervescence begins as soon as the raising agent is moistened.

I have been much more successful in using one teaspoonful of soda with two teaspoons of cream of tartar as a raising agent when a teaspoon of baking powder is called for, without, however, being able to determine the reason.

We are all familiar with the varying temperature of boiling water

according to altitude, and know that it is not possible for water to get hot enough to cook an egg on the summit of a high mountain. In fact, this temperature of boiling water is a helpful guide in determining elevations of mountains, and is often so used. This helps us to understand why it is that articles of food whose cooking depends upon heat applied through the medium of water requires a longer time for cooking in Albuquerque, where the temperature of boiling water is 202° F., than the same food would require at sea level, where the temperature of boiling water is 212° F. The vapor of water contained in cooking food will also afford heat more slowly.

The extreme dryness of the atmosphere of the Plateau has a marked hardening influence upon many food substances, so that our farinaceous foods, such as beans, corn, etc., require to be left much longer in water before cooking in order that they may be softened.

We believe that the Weather Bureau observers on Pikes Peak were never able to boil their dried beans so as to make them palatable. As regards the action of baking soda and of egg batter, it may be that the barometric pressure or the elastic resistance of the air (not its weight) determines to what extent the disengaged carbonic acid gas shall expand and aerate the dough.

SUDDEN TEMPERATURE CHANGES IN MONTANA.

In the MONTHLY WEATHER REVIEW for March, we give on page 115 the remarks of Mr. C. W. Ling concerning the sudden changes of temperature on March 7 and 8, at Havre, Mont., followed by some remarks by the Editor. Further contributions on this subject have been received from which we quote as follows.

In the March report of the Montana section, Mr. E. J. Glass, gives the following quotation from the records of the observer at Kipp:

An interesting meteorological phenomenon was observed here at 10:25 a. m., March 8. A strong chinook wind was blowing from the southwest, temperature, 40°. For an hour previous a characteristic cold wave cloud had been visible in the north, drifting rapidly eastward, and at the same time spreading slowly toward the south. Suddenly a huge mass of white fog-like cloud appeared in the southeast, moving at a low altitude in a northwesterly direction with great rapidity. At 10:50 a. m., when the latter covered about one-third of the sky, the wind veered to north, and the meeting of the three currents of air, one warm and moist, the second a typical dry chinook, and the third frigid in the extreme, caused an instantaneous precipitation of frost, amounting to 0.5 of an inch, and a fall in temperature from 40° to 9° in less than two minutes, while the sun was shining brightly. At 2:15 p. m. the wind had backed to southwest and the temperature had risen to 39°. Chinook winds at Ovando and Yale. Ice in creeks broken up in the vicinity of Wibaux. Farmers in western Montana are seeding. Plowing is being done over the State where the ground is free from snow.

By comparing the above record with the observations at Havre, Mont., and those at Helena, which are respectively 150 miles east and southeast, the Editor is led to believe that it should be possible, with the assistance of our voluntary observers, to elaborate a complete system by which to foresee the approach of cold waves and chinooks, or any other sudden changes of temperature within 200 miles of the main Divide of the Rocky Mountains. Such a system can apparently derive but little help from observations on the high plateau west of the main Divide, including the western portion of Montana and the whole of Idaho, until we have solved the problem of reducing pressures at elevated stations to a common upper level.

In continuation of this subject Mr. C. W. Ling again writes from Havre under date of May 14, as follows:

In regard to the sudden changes of temperature on March 7 and 8, and other similar changes in temperature that occur here, I beg to state that I believe they are due entirely to the conditions assumed by the atmospheric pressure, two lows or two low pressure areas of different energy and both bounded on the north by the same high would cause these alternate currents of warm and cold air. Any low moving eastward and causing an indraught of air from the Plateau region southwest of Havre produces dynamic heating, giving Havre a sudden rise in temperature and southwest winds.

No foehn process occurs here with a south or southeast wind. The second low moving eastward allows the influence of the high to be felt, in which the temperature falls suddenly. If the movement of the lows is slow, the alternating changes in temperature caused by the chinook and cold wave conditions will occur in this vicinity.

The accumulation of cold air in valleys or lowlands that is felt often in driving over a hilly country, especially on a still night, no wind prevailing, could hardiy be applied as the cause of the sudden changes in temperature in this neighborhood even if this cold air was put in motion, for the changes occur here when a fresh to brisk wind prevails.

As a further contribution to this study Prof. A. J. Henry submits the accompanying copies of the continuous barograph and thermograph records at Havre, fig. 3, and at Williston, fig. 4, and says:

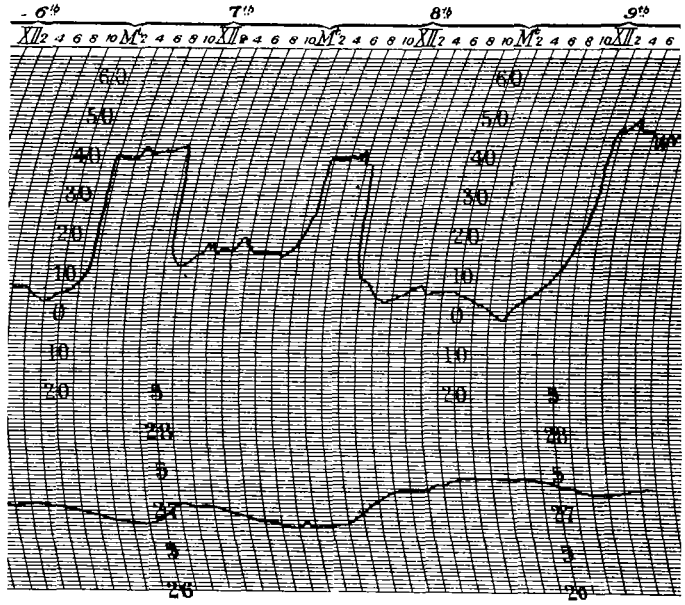

FIG. 3.—HAVRE.

The sequence of events was about as follows: On the night of March 6 a low area was approaching Montana from the north Pacific coast. At the p. m. observation Havre and other stations to the northward and northeastward were well within the region of northeasterly winds. In the southwestern and southern portions of Montana the winds were from a southerly quarter. The dividing line between the opposing wind systems must have extended diagonally across the State in a northwesterly-southeasterly direction.

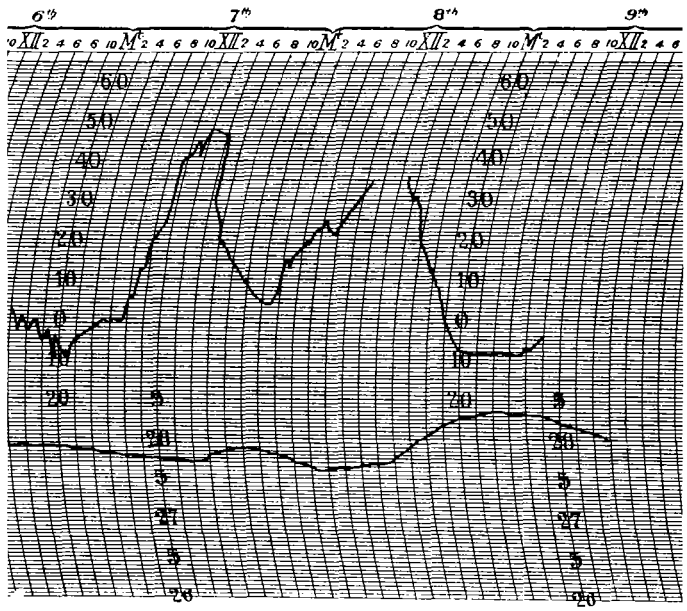

FIG. 4.—WILLISTON.

At Havre the temperature began to rise slowly at 10 p. m. of the 6th,