UNITED STATES DEPARTMENT OF AGRICULTURE
WEATHER BUREAU
Climatological Division WASHINGTON

November 11, 1933.

Miss Ida M. Tarbell,
120 East 19th Street,
New York, N. Y.

Dear Miss Tarbell:

Receipt is acknowledged of your letter dated the 6th instant inquiring as to whether this Bureau has ever compiled a history of the weather of the United States through the 19th Century, with particular reference to the weather in southern Indiana in the summer, fall and winter of 1816, and the date of the winter of the deep snow in Illinois, whether it was the winter of 1829 and 1830 or 1830 and 1831.

With regard to the weather in southern Indiana during the summer, fall and winter of 1816, we have no record of any observations in the locality mentioned during that period, however, the year 1816 is usually referred to as a year without a summer. This applied particularly to the more northeastern parts of the country where, as you have doubtless heard, the temperatures were frequently unusually low, and frost, ice, and snow were observed in practically all the months of the summer, particularly in New England. Descriptions of this particular summer have appeared in many of the histories of the older States of the Union, but your attention is invited to the "Climatology of the United States", by Lorin Blodget, published by J. B. Lippincott & Company, of Philadelphia, 1857, pages 146 and 147.

Concerning the occurrence of the heavy snowfall about 1830 in Illinois, we are sending you photographic copies of pages 7 and 8 of a paper on the Climate of Illinois, by Mr. M. L. Fuller, of this Bureau, which is a reprint from the "Transactions of the Illinois State Historical Society for 1912". This is the only information we have with regard to the snowfall in question.

Respectfully,

P. C. Day

P. C. Day,
Meteorologist in Charge of Division.

(Inclosures.)

Digital Image, 2009. The Ida M. Tarbell Collection, 1890-1944, Allegheny College Pelletier Library

of population and consequent nearness of observers. The tornado that visited St. Louis, Mo. in 1896 was one of the most destructive on record and did much damage in Illinois. But a tornado that visited southeastern Illinois and southern Indiana June 18, 1815, must have been as vigorous as any of recent years. The damage to people and property was necessarily very little owing to lack of settlements, but through White County, Ill., the storm left a path of broken and twisted forest a mile in width.

A little hail probably occurs on an average of one to three times a year at most Illinois stations, but damaging hail is rare. Peoria had a hail storm in May, 1858, in which it is said hundreds of stones as large as hen's eggs fell on the space of an ordinary city lot. A large two-story hotel, where the Mayer Hotel now stands, had all its windows broken on the north and west, some of them in spite of closed shutters outside. So much glass could not be replaced without a shipment by boat from Pittsburg, Penn., and the windows waited from May till November for the glass.

Turning now to some of the special features mentioned in early accounts: The many permanent ponds of water and the usual saturated condition of a large part of the prairie surface in those days, were not necessarily due to heavier rainfall but are abundantly accounted for by the difference in drainage conditions. Then the rather firm prairie sod held the water longer on its surface; the considerable growth of grass prevented its running off as rapidly; and when it did reach the depressions or ponds there were only the natural water courses to carry it away. Today the cultivated soil absorbs more of the rain and permits its more rapid downward movement into the subsoil; every depression in almost every field is either ditched or tiled, the natural water courses are improved and kept cleared, and the grading of the country roads affords a regular system of drains only a mile apart in each direction. The same amount of rain and snow falling upon the same topography would today find its way mostly into the soil except from the heavier rains; and the surplus, reaching the depressions, would be led more quickly into the principal streams and wend its way to the ocean. Tillage and improved drainage are sufficient to account for the greater dryness of the landscape in Illinois in recent years. Similar explanation applies to many of the shrinking brooklets and dried up springs in other sections of the country.

Among the distinctively weather features of early days probably the one that has received most attention is the "deep snow" of the winter of 1830-31, which has been well described by Eleanor Atkinson in a paper read before this society. The local history of that storm at Peoria is much the same as in other portions of central Illinois. According to the account of Mr. A. Moffat, given by Drown in his Record and Historical View of Peoria, a snowstorm began December 29, 1830 which was so severe that Mr. Moffat lost his way in going to his home three miles distant, and only found it again by blundering into a line of timber along which he could make his way homeward. The snow fell that day and night to the depth of about two and a half feet. One week later, January 5, 1831, another storm followed that was almost equally severe, so that after settling the snow lay nearly four

feet deep on the prairies, it is said, with *much deeper drifts* in the timber and ravines. Following these storms the weather appears to have been continuously cold so that any melting that occurred was balanced by later snowfall and the original depth maintained practically up to the end of February. This great depth of snow caused some interesting situations. Mr. Moffat states that it was two or three weeks before some of the settlers could break roads sufficiently to get away from home. Others state that hardship from lack of food and fuel was narrowly averted in some localities. Wild animals found life equally difficult. At first, when the snow was soft, the wolves were badly handicapped and it is said the farmers on horseback could run them down. But after a crust had formed on the snow the wolf was lord of creation, for he could run while the deer and buffalo could not. The deer, buffalo and elk could not get through the snow to forage on grass, nor could they get about to browse on shrubs and twigs of trees; and many deer and buffalo were killed by starvation and wolves, and the elk were practically exterminated.

The Indians in the vicinity of Peoria also had their troubles. Four feet of soft snow makes rather poor walking. None of the braves had any snow shoes nor knew how to make or use them. An aged squaw saved the day. She had been brought up in Canada and was the only person in the tribe who could show how to make snow shoes or how to navigate them.

Allowing for the exaggeration that usually creeps into stories of the long ago the snow of that winter seems to have been heavier than any that has occurred in Illinois since. There were, however, Indian traditions of a similar winter thirty to fifty years earlier. The natural query now is whether eighty years immunity since 1831 means a change in our climate, or whether a similar winter may come again.

It will be recalled that the essential features of that winter were two unusually heavy snows in succession, followed by continued cold weather. All these elements still occur. Any one familiar with the movements of our general storms knows that successive storms occasionally follow similar paths. Also that winter storms that cross the middle Mississippi valley sometimes give very heavy snows along their northern side. Eighteen to 25 inches of snow fell in portions of southern Indiana and southwest Ohio in a single storm in February, 1911. And in March, 1912, 25 inches fell at Kansas City in about twenty-four hours. All that is needed for a recurrence of the winter of 1830-31 is the mere coincidence of two successive snow storms like that of 1912 at Kansas City, followed by temperature somewhat like that in our winter of 1912. And there is no apparent reason either in the records of weather or in the laws of storms for believing that such a winter may not come again sometime to central Illinois and give us a repetition of the "deep snow" of 1831.

Another notable incident of early days was a remarkably sudden fall in temperature, that has been well described by Judge Cunningham. A mild thawing winter morning was followed by a sudden shift of the wind and a temperature drop so rapid and pronounced that people caught away from home were frozen to death before they could reach shelter. Ducks and geese were frozen fast in the mud, rain dripping from the bridle