river nearly six hundred feet in height. This would form slackwater in the Ohio all the way up to Pittsburg, submerging the site of that city to the depth of two hundred and fifty or three hundred feet, and setting the water back far into the valleys of the Alleghany and Monongahela Rivers.

In the extensive gravel-deposits of Ohio, south of the glacial line, no paleolithic implements have as yet been found; but they may be confidently looked for. When they are found, the investigations of Professor Wright and his associates will have important bearings in determining their age; for, in many respects, Ohio affords unrivalled opportunities for determining the amount of erosion which has taken place since the ice of the glacial period withdrew. So far, the evidence points to a later date for the glacial period than that which is advocated by some. The erosion which has taken place since the glacial period is surprisingly small. The streams running over the glaciated surface occupy very shallow valleys. In those rivers whose course was changed by glacial action so as to produce waterfalls the gorges are never more than a few miles long. The period cannot have been extremely long, or these streams would have done more work.

THE WEATHER IN FEBRUARY, 1883.

DESTRUCTIVE floods on the Ohio and tributary waters occurred from Cincinnati and Louisville southward. The water rose higher than ever previously recorded, and property was destroyed estimated as worth $30,000,000. Warnings were issued by the signal-office ten to fifteen days in advance; and merchants had ample time, in most instances, to save their property. The following table exhibits some of the principal facts: —

STATION.	Date water reached the danger-line.	Highest water above danger.		Date water left the danger-line.	Estimated loss.
		Am't.	Date.		
		Feet.			
Pittsburg, Penn.	5	4.8	5	9	$50,000
Marietta, O.	–	–	13	–	50,000
Maysville, Ky.	–	–	12	–	–
Cincinnati, O.	8	16.3	15	22	1,500,000
Lawrenceburg, Ind.	–	–	14	–	–
Vevay, Ind.	–	–	15	–	–
Jeffersonville, Ind.	–	–	16	–	100,000
Louisville, Ky.	8	20.4	16	25	367,000
New Albany, Ind.	9	–	–	–	1,000,000
Shawneetown, Ill.	–	–	–	–	250,000
Cairo, Ill	13	12.2	26	Above at end of month.	–
Memphis, Tenn.	21	Still	rising	28	–
Vicksburg, Miss.	24	"	"	28	–

The last column contains losses only so far as reported. The injuries due to sweeping away of homes, to imperilled health and comfort, and to business delayed, cannot be estimated, but are known to have been very extensive. A very full report is given in the Monthly weather-review of the signal-service.

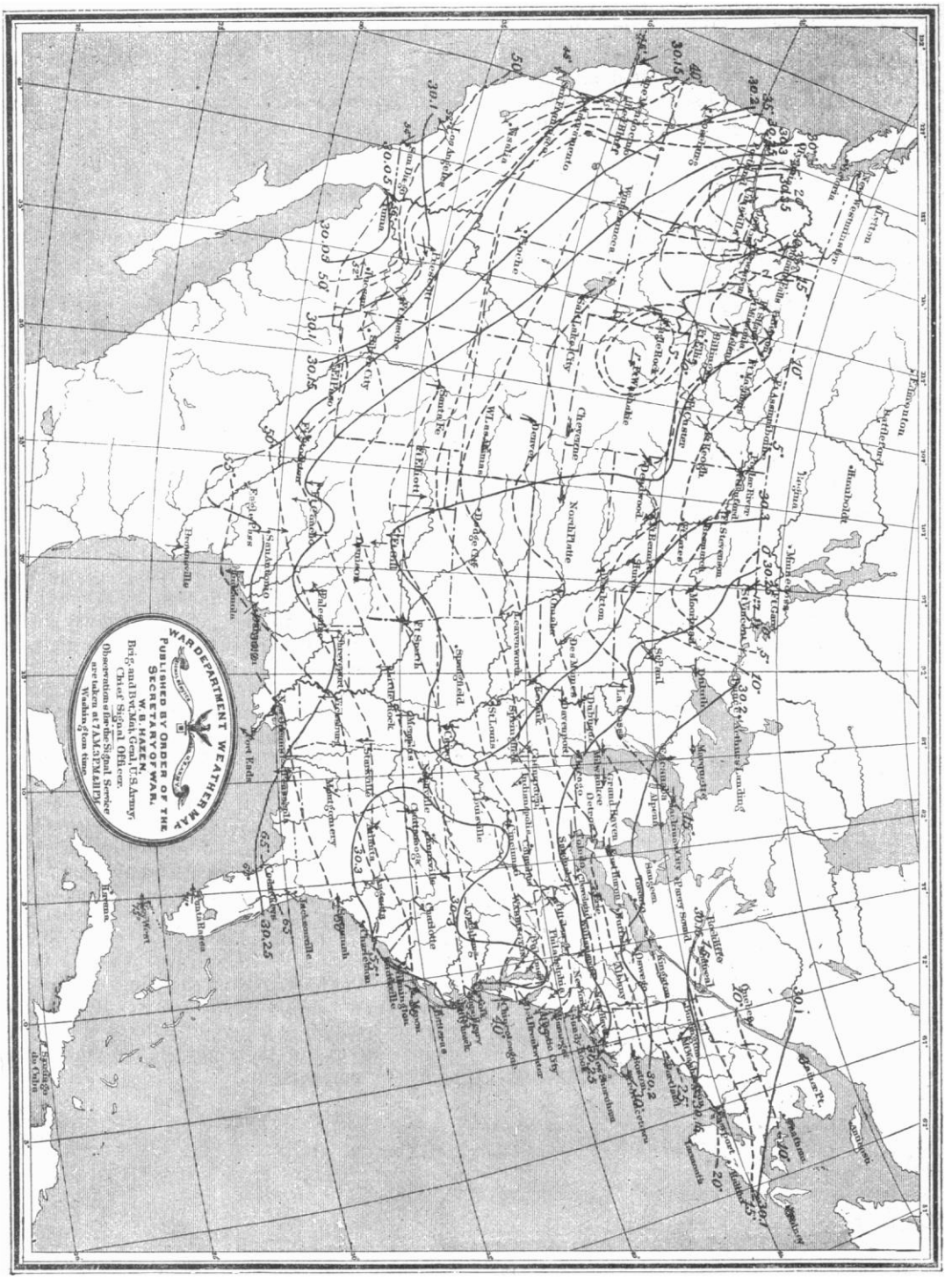
The month has been colder than the mean for the region west of the Mississippi River. The mean temperature was from 8° to 16° below the normal on the Rocky-mountain plateau; it was slightly below the normal in the north, east of the Mississippi; and above the normal in the south. In the whole country east of the Rocky Mountains the temperature was 0.5° below the normal. The lowest temperature reported was −57°, at Fort Washakie, Wyoming. The rainfall of the Pacific during the winter has not been sufficient to assure a medium wheat-crop in that region. The deficiency was over 4 inches in central California and Oregon in February, and there were larger deficiencies during the previous winter months. This important crop, therefore, depends largely upon the spring rains, which in this region are usually very light. On the other hand, there has been a large excess of rain in the lower lake-region and Ohio valley, the excess in the latter region being 3.86 inches.

Ice dangerous to navigation is slowly drifting south to latitude 43°, between longitudes 45° and 48° W.

The chart on the next page shows the mean distribution of air-pressure and temperature, with the prevailing wind-directions in the United States and Canada. This chart shows very high pressure over nearly the whole country, it being from .1 to .2 of an inch above the mean, except in Florida and southern California. The areas of low pressure traced to the Atlantic have all passed over the St. Lawrence valley, and in no case has the centre of any depression passed to the south of the Ohio valley or middle states.

The total number of storms that have been traced in the United States during each February since 1877 is given below. The mean velocity of the storms, as published in the annual reports of the chief signal-officer, are added for comparison.

Year.	No. of storms.	Mean velocity, miles per hour.
1877	11	26.5
1878	8	27.8
1879	6	33.3
1880	14	39.6
1881	9	43.8
1882	11	42.5
1883	10	36.4
Mean	9.9	35.7



MONTHLY MEAN ISOBARS, ISOTHERMS, AND WIND-DIRECTIONS, FEBRUARY, 1883. REPRINTED IN REDUCED FORM BY PERMISSION OF THE CHIEF SIGNAL-OFFICER.

Ten storm-tracks were traced across the ocean. Of these, a very severe one was felt in the north Atlantic from Feb. 4th to 7th. The winds were of unusual severity, and pressures as low as 28.1 inches were reported by several steamers. This storm, however, was exceeded in extent and severity by most violent gales from the 12th to the 16th, when pressures below 28 inches were recorded.

The total movement of the air on Mount Washington (as indicated by a specially devised Robinson's anemometer) was 32,404 miles, there being 1,825 miles on the 17th. Winds over 100 miles per hour were reported on the 1st, 17th, 26th, and 27th.

Ninety-two cautionary signals were displayed during the month; of which 75, or 81.5%, were justified by winds of at least 25 miles per hour within 100 miles of the station.

The most extensive auroral display was that of the 24th, which was observed on the New-England coast, and from the upper Mississippi to Washington Territory. Auroras are also reported on the 1st, 4th, 5th, 13th, 25th, 27th, and 28th. Prof. D. P. Todd of Amherst reports sunspots most numerous on the 12th and 13th, and least on the 23d and 24th. Unusual earthquake-shocks were experienced on the 4th in Illinois, Michigan, New Hampshire, and Maine. It would seem, that, at the same time, shocks were felt in Agram (Hungary) and Madrid (Spain), as cabled to the New-York Herald. On the 27th another notable shock was felt in Connecticut, Rhode Island, and Massachusetts.

THE LAW OF NUCLEAR DISPLACEMENT, AND ITS SIGNIFICANCE IN EMBRYOLOGY.

DURING his investigations upon the development of fishes, mollusks, and arthropods, the writer's attention has been drawn to the physiological relations of the food-yelk, and the germinal matter of the ova of these forms. A more thorough study of the relations of the two principal materials of the ova of various forms has led him to the conclusion that there is a general law which largely, if not entirely, determines the mode of cleavage apparent in various embryological types. Approximations towards a general statement of the law have been made by Von Baer, Haeckel, Balfour, Whitman, and Mark. My only object is to present what I believe to be some new evidence, and to extend the scope of what appears to be an important generalization.

There are only two clearly marked types of ova. These are, first, the holoblastic or evenly segmenting, and, secondly, the meroblastic or unevenly segmenting. The so-called centrolecithal type is found almost altogether amongst the arthropods, and seems to be in a great measure characteristic of them; but, upon close examination and comparison, I believe it will be found that this mode of segmentation is not so widely different from that met with in the ordinary meroblastic ovum. Whatever may be the opinion with regard to the claims for the recognition of two or three types of segmentation, there can be but two forms of ova discriminated in the animal kingdom; viz., those with, and those without, a food-yelk. Those without food-yelk may be called *homoplastic;* that is, they are composed of but one kind of plasma, all of which is germinal. The first segmentation-nucleus is central in position after fertilization, so that the first cleavage divides the ovum into two equal segmentation-spheres. The result of further segmentation is to divide the total germinal mass into tolerably even-sized spheres. The other type, opposed to the foregoing, may be called the *heteroplastic*, by which it is intended to signify that two or more proteids may enter into the composition of the egg, besides oils in the form of drops. At the time of maturation and impregnation the nucleus is displaced from its original central position to a remarkable extent; in fact, it may be so displaced, as compared with its position in very young eggs, as to appear as if it were altogether superficial or parietal; as in the large ova of fishes, reptiles, and birds. This parietal position of the first segmentation-nucleus is not its original one, as an investigation of the developing ovules in the ovaries of these forms will show; but, even long before the first segmentation-nucleus is formed by the fusion of the male and female pronuclei, we actually find, that in some cases the germinative vesicle has migrated from the centre of the ovum, towards the periphery, without having suffered any marked change in size.

To what cause is this permanent displacement of the egg-nucleus due? We find it to occur only in those ova in which we may detect two sorts of plasma, or in those with germinal matter to which a second or passive quantity of matter has been added during the intra-ovarian growth of the egg. The added material may be in the form of a clearly defined yelk, or it may make its presence manifest only after the beginning of segmentation, by aggregating at one pole or centrally as a less homogeneous, more granular mass than the portion directly involved in the process of segmentation. The