

surface, up to an altitude of several hundred meters, and again reached -4° at the altitude of 3,000 meters. At the highest altitude of 6,000 meters there was registered -25.6 , and during the rapid fall of the balloon, the so-called inversion of temperature was again shown in the lower strata. The balloon, which at first moved rather rapidly toward the northwest, must have met rather high up a feeble current of air blowing from the north, which again carried it toward the south and allowed it to fall gently on the highest trees of the Grünwald. The fact that it descended during the nighttime, that is to say about 3h. 50m. a. m., was the reason why it remained for one and a quarter days undiscovered. It was first seen on Sunday morning by Herr Jochens as he was walking out, who perceiving that it would be impossible to get the balloon down without technical assistance, took the trouble to personally notify the officers of the balloon corps. With much labor and not without serious danger to life, a captain of that corps was able on Monday to bring the balloon in fragments down from its airy location, in fact a portion of the material, together with the network, was left in the tree. But the meteorological apparatus was brought to the earth uninjured, so that the reward of 50 marks, promised for the rescue of the balloon, could properly be paid to the energetic balloon corps.

The military balloon "Bussard," of 1,300 cubic meters capacity, and which by the assistance of the commander of the balloon corps, who had so often helped us in our scientific ascensions of the past years, was filled with 1,000 cubic meters of hydrogen and ascended a few minutes before the "Cirrus," also moved, at first, rapidly toward the northwest but after it had attained its position of equilibrium at an altitude of about 1,500 meters, it gradually swerved towards the north-northwest, which direction it maintained during the remainder of the rather slow voyage. Here, also, the increase of temperature with ascent in the lower strata, as registered by "Cirrus," was observed with perfect clearness; the temperature rose from -4° to $+1^{\circ}$ C. and only regained the first value at an altitude of 3,000 meters. During the nighttime the balloon remained at an altitude of less than 2,000 meters, but after sunrise it began to ascend steadily. As the aeronauts saw that they were approaching the coast of the Baltic they decided that in case the coast should be reached before noon and a wind should blow stronger from the south, they would attempt to pass over the Baltic and land either in Denmark or its neighborhood. Unfortunately the wind at their altitude did not increase to the necessary extent, as it usually does, so that at 2h. 21m. p. m., therefore, after a voyage of eleven and a half hours they sorrowfully descended at Volkshagen, south of Ribnitz in Mecklenburg, 206 kilometers north-northwest of Berlin. In the descent, since the surface wind blew with unexpected force, the balloon dragged for a little but no serious injury occurred thereby; the temperature -24.4° was observed at an altitude of 5,650 meters.

If now we review the results so far as known of these associated international experiments, we have the following: Of the four simultaneous ascents of unmanned registration balloons, the French attained the greatest height, about 15,000 meters, and the lowest temperature, -63° C.; next to this comes the Strasburg balloon with about 8,000 meters altitude and -30° C. temperature. Both of these were perfectly new balloons and considerably larger than ours, which ascended to 6,000 meters and recorded a temperature of -25.6° . The Russian balloon, probably also an old military balloon, attained only 1,500 meters. Of the four manned balloons, that of our own balloon corps, ascended the highest, viz, to about 5,700 meters and found a temperature of -24.4° C. The Russian balloon, which ascended in St. Petersburg, attained about 5,000 meters, where -27° or -24° was observed; the Munich balloon attained 3,400 meters; as to the two balloons that ascended at Warsaw, the maximum height is not known. Of further interest is the direction taken by each balloon and the corresponding mean wind velocities. The St. Petersburg balloon was carried by a north-northeast wind at an average velocity of 9 meters per second. The Warsaw balloon had a north-northwest wind. The Berlin military balloon had an exactly opposite south-southwest wind with a velocity of 5 meters

per seconds. The Munich balloon had a direct west wind of 8 meters per second; similarly the Strasburg balloon had a west wind, but the Paris balloon had a southwest wind of 12 meters per second.

TEMPERATURES OF NOVEMBER AND DECEMBER, 1896.

By Prof. H. A. HAZEN (dated January 25, 1897).

There was a remarkable reversal of temperature conditions in the United States in December as compared with November. As shown in the November WEATHER REVIEW, page 414, the coldest November in twenty-seven years was experienced in Montana, while the warmest of seventy-five years was noted in Philadelphia. During December, Havre, Helena, and Miles City each showed a temperature 12° above normal. This has been exceeded but once at Havre (Assiniboine), it has been equaled but once at Miles City, and at Helena temperature was the highest since observations of the weather service began. On the Atlantic Coast the great heat of November gave way to temperatures far below the normal: New York, -3.7° ; Augusta, -4.1° .

It is interesting to inquire whether the cold area of the west was gradually transferred to the east or whether we must look for some other explanation of these anomalous conditions. The weekly temperatures have been charted for the whole country, and these charts do not show any progression of a cold area from west to east. On turning to the tracks of low and high areas in the two months we find a remarkable similarity in their general tendency, with the single exception that there was quite a long period of high pressure in the middle Plateau Region and two highs very slowly moved from the middle Pacific in December which had no counterpart in November. If we turn to the two charts of mean pressure in the two months, we find the following very significant changes: The high pressure, 30.35, to the north of Montana in November moved to the middle Plateau Region (30.32 at Idaho Falls and 30.31 at Salt Lake City). The high pressure off the Carolina coast in November moved to east Tennessee and west Carolina. This distribution of pressure in the West caused southerly and southwesterly winds in Montana, with corresponding high temperature in that region.

The high area over the Atlantic in November carried warm southerly and ocean winds, but in December the center of the subpermanent high pressure was wholly over the land, and the clear skies permitted intense radiation of heat from the earth's surface. It should be noted that the temperature in the middle Plateau was 1.7° above normal at Salt Lake City and 4.6° at Idaho Falls. In the latter case it seems probable that the radiation effect was much diminished by the proximity of a series of storms traveling from the moist and warm Pacific Coast to the north of Montana. It is not possible to account fully for all the temperatures noted, and we must look to moisture and other conditions at several thousand feet above the earth for a more complete elucidation of such anomalies.

NOTES BY THE EDITOR.

SIR ISAAC NEWTON AND HIS KITES.

Mr. Oliver L. Fassig, formerly Librarian in the Weather Bureau, who has taken a year's leave of absence without pay in order to study meteorology and physics in Germany, calls our attention to the fact that perhaps the remark by Professor Marvin in the April REVIEW, page 115, "Sir Isaac Newton is said to have taught the boys how to fly their kites," does not do full justice to that eminent man.

Our knowledge of Sir Isaac's experiments with kites is based upon two paragraphs in Brewster's Life of Sir Isaac Newton,

published in Edinburgh in 1855. On page 11 of Vol. I, Brewster, apparently on the authority of Dr. Stukely's manuscript, which is still preserved among the "Portsmouth manuscripts," says:

With this view he introduced the flying of paper kites, and he is said to have investigated their best forms and proportions, as well as the number and position of the points to which the string should be attached. He constructed also lanterns of crumpled paper, in which he placed a candle, to light him to school in the dark winter mornings; and in dark nights he tied them to the tails of his kites in order to terrify the country people, who took them for comets.