

on the evening of May 21. Owing to unfavorable conditions aloft, the race was a slow one and the distances covered were disappointing. The winning balloon, of which Mr. Ralph H. Upson, of New York City, was pilot, landed at Peters Creek, Va., about 50 miles due west from Danville, Va., and approximately 420 miles from Birmingham, nearly 35 hours after starting. The other eight balloons landed in Central Tennessee, at distances about 200 miles from Birmingham.

The Weather Bureau furnished meteorological information and advice to the contestants, in addition to pilot balloon observations from seven Signal Corps, four naval, and eight Weather Bureau stations.

The following notes are from the report of Mr. Clarence G. Andrus, of the Due West, S. C., aerological station, who was meteorological observer aboard the winning balloon and aide to Mr. Upson:

The first night was spent at an average sea-level altitude of 2,100 feet, and travel was made in a north-northwesterly direction. During the following day varied and changeable winds were encountered, rain squalls were observed in many directions, and the distance covered was not great and chiefly in an eastward direction. The first half of the following night found the balloon moving fairly rapidly northeastward through the southeastern part of Kentucky, and then the southwestern part of West Virginia at moderate speed. The balloon was describing a large arc whose center would be over the South Atlantic States, and during the latter part of the night, in West Virginia, the course of the balloon was toward the east, and later became southeast. As distance from Birmingham was not being increased, nor did it seem possible to locate a favorable wind to bear the balloon away from the starting point, and ballast was running somewhat low, it was decided to land.

This race was of particular interest to the Weather Bureau. Light winds made it necessary for the pilots to seek levels where the currents were most favorable. The fact that Mr. Upson with his wide experience as pilot, aided by Mr. Andrus with his knowledge of meteorological conditions in the free air gathered in the course of his Weather Bureau work, was the winner in the race by a considerable margin, seems to indicate clearly the advantages to be derived by applying a knowledge of meteorological conditions.--*W. B. Top. and Pers.*, June, 1921.

EXPERIENCES IN KITE FLYING.

A kite break-away that shows some of the experiences that occasionally fall to the lot of aerological men occurred at Broken Arrow, Okla., 10 o'clock a.m., January 15, 1921. The steel wire, which is used as a line, was defective and broke at a pull of 200 pounds, releasing 3 kites and 4700 meters wire. They traveled about 4 kilometers east-southeast from the station when some coal miners seeing the wire dragging past, fastened it to a machine nearby. The wire carried a considerable electrical potential at the time, but these men were prevented from getting a shock because the end of the wire was on the ground.

Station men arrived in a few minutes, clamped the wire fast and grounded it.

In the afternoon the pull on the wire was still high, and it was necessary to run the wire down toward the kites. Three men with a pulley followed the wire across fields while another brought the truck around to the road. The pulley was then fastened to the truck and the kites were gradually lowered by driving down the road. The first kite was landed and 3 kilometers wire was on the ground when the wire broke again, releasing the other two kites and 1700 meters wire.

We started immediately to follow them, but the roads were so muddy that we were soon left behind. The kites rose and fell as the end of the wire caught temporarily on a tree or fence and broke loose again. After traveling 10 miles we came to a place where the kites were caught in the edge of a large forest in the Verdigris River bottoms. The end of the wire was tied around a small branch in the top of a 75-foot tree.

As it was nearly dark and there was a strong probability that if the tree were cut, the wire would break loose again and the kites go farther into the forest, it was decided to return home. We had not gone far when we discovered that the gasoline was nearly gone, but after a search of the countryside sufficient fuel for the return trip was found.

Monday morning we returned to the scene; one kite was seen flying just below the clouds some distance within the forest. Foreseeing the possibility of having to fell some trees, we borrowed an ax and a cross-cut saw and started into the wood. The ground was covered in places with 3 or 4 inches standing water, and the only landmark was a creek which we followed. The kite was high and the visibility poor so that we could not tell whether the kite was flying toward or away from us. After traveling about 2 kilometers into the forest a faint singing of the wire was heard, and eventually it was sighted 100 meters in the air. Some distance away it was caught in the tops of several tall trees. Two large oak trees were then cut and the wire was brought within reach.

Noon came, and we were getting hungry. We returned to the truck and fortunately found a farmer who took us home to dinner. After dinner the kite was lowered by wrapping the wire around the stumps of two saplings cut off for the purpose 4 feet above the ground. When the kite was within 500 meters it began to fall and came down in a small tree from which it was recovered undamaged. It was the head kite; the secondary had come down during a lull Sunday night and became detached from the wire, allowing the head kite to rise again. The secondary was found several days later not far from the place where the kites originally caught at the edge of the forest.

This is the longest continuous flight ever made here. Although the wind had veered through 270 degrees and fallen to rather low velocities at times, the kites remained in the air about 52 hours. Other kites have gone farther, as on April 8, 1919, when 5 kites broke away and landed 6 hours later in Kansas, 160 miles northwest of the station. On this date a strong northerly surface wind veered into a strong southerly wind at 3 kilometers altitude. Thus the upper and lower kites continued to pull against each other throughout this remarkable flight.

Although kites at this station have collapsed or broken away on numerous occasions, no material damage has ever befallen the delicate meteorograph which is carried in the head kite. This is partly the result of the way the instrument is tied in the kite, which acts as a spring for the instrument when the kite suffers any sudden jolt.—*J. A. Reihle.*

INDEPENDENT NATIONAL WEATHER BUREAU FORMED IN BRAZIL.

After a hard struggle against adverse factors and a serious crisis which benumbed the Brazilian Government and commerce, Dr. J. de Sampaio Ferraz at last obtained a decree creating an independent Weather Bureau for Brazil, and had the honor to be appointed its first director. He is now striving to ob-