gust of wind of about 25 miles an hour struck the balloon forcing it down into another tree, at which time the rip cord became entangled in the branches of this tree, pulling it loose from the basket. This forced me to land at once and ended the race so far as this balloon was concerned.

The following is taken from McCullough's log:

Forced to ground by being caught in two thunderstorms while over Coraopolis, Pa., one from the northeast and one from the southeast. Terrific winds which drove the balloon almost due west and requiring a rip landing at Frankfurt Springs, Pa.

Some of the meteorological conditions encountered by Lieutenant Lawrence's balloon were described by Lieutenant Reichelderfer aid, as follows:

July 5, 11.20 a. m. Altitude, 13,400 feet. Temperature, 45° F. Cu. rising to the west, north, and east. Mist is forming on a level some hundred feet below the balloon. Our course is east. Humidity is high enough to condense breath. A rainbow appeared on the mist around the balloon shadow.

2.30 p. m. Altitude, 14,500 feet. Course east. Cu. Nb. closing in to the north, east, and south.

2.35 p. m. Altitude, 14,300 feet. Below us at about 9,000 feet is a thick Cumulus mist. Sky: 5/10 Cu. and 4/10 Cu. Nb. Thunderstorms in all directions.

4.05 p. m. Passing through Cu. We are valving almost continuously. Balloon rising at rate of 600 to 800 feet per minute. We are in a rising current and our gas is expanding rapidly because of higher temperature. The balloon is rising rapidly through the edge of the Cu. Nb. and is passing through the cloud very rapidly.

4.10 p. m. Emerged from [2] top of Cu. at about 14,000 feet. We were valving almost continuously. The sun was shining brightly. Balloon rose rapidly to 16,500 feet. We held this altitude for several minutes. Towering Cu. all around us. Some below us. Cu. Nb. were on all sides and growing rapidly. We valved for a minute or two. Balloon rose to 17,000 feet. Statiscope gave indication that we were about to descend. Valved more. Balloon rose 200 feet higher. Valved continuously for three or four minutes, both hanging to valve cord. Balloon descended 100 or 200 feet. Stopped valving. Ascent began again. Valved one or two minutes. Rose to 17,600 feet. Continued valving. Rose 200 feet higher, where the balloon remained for a short time. Valved one or two minutes. Rose to 18,000 feet. The Cu. Nb. were growing all around us and thunder was frequent. Other Cu. tops were 2,000 or 3,000 feet below us. Valved several times for one or two minute periods. The statiscope at times indicated descent. This never continued for more than 50 or 75 feet, when ascent began again. Rose by degrees to 18,500 feet. We remained between 18,500 and 18,000 feet for 30 minutes or more. The flotation bags burst one after another with loud reports. We valved for two or three minute periods (as long as the two of us could hang on to the valve cord) six to ten times. Cu. tops were all around us. There was frequent thunder. There were some Cu. tops below us some 3,000 or 4,000 feet. Finally, after many minutes of valving, descent began slowly. Reached top of clouds at about 14,000 feet. Descended rapidly through clouds for several thousand feet at rate of 1,000 or 1,200 feet per minute. Began expending ballast including the helium bottle. Came out of base of clouds at about 7,000 feet. Mountains were all around, a town or two, and a railroad. There were occasional cleared fields and a great deal of woodland. Descended rapidly to 500 feet. Dumped over ballast as balloon neared ground. Drag rope touched as balloon descended to within a few feet of the trees. The drag rope caught in the trees. We looked for a landing place. The surface wind was light westerly (?) We finally loosened the drag rope and headed for a small field. Farmers were gathering. We called to them to hold us. We landed easily at 5.55 p. m. with two bags of ballast. A shower began just before we landed. We valved down, then ripped.

[2] The nearly continuous valving as recited in this paragraph seems to be conclusive evidence that the balloon was in a strong ascending current in which the air was rising en masse rather than in discontinuous shreds as has sometimes been suggested.—EDITOR.

The table below gives the names of pilots and aids, the distance traversed, and time in the air of each contestant. The list is arranged in the order of the distance covered.

Pilot.	Aid	Landed (nearest town).	Distance.	Time in air.
			Miles.	*H. m.*
(1) Lieut. R. S. Olmstead, U. S. Army.	Lieut. J. W. Shoptaw, U. S. Army.	Marilla, N. Y.....	449.5	28 15
(2) Lieut. J. B. Lawrence, U. S. Navy.	Lieut. F. W. Reichelderfer, U. S. Navy.	Glen Campbell, Pa.	398.1	25 42
(3) H. E. Honeywell, civilian.	P. J. McCullough, civilian.	Brockton, N. Y....	397.2	28 11
(4) Capt. L. T. Miller, U. S. Army.	Lieut. C. M. Brown, U. S. Army.	Ford City, Pa.....	370.0	23 31
(5) Capt. C. E. McCullough, Officers' Reserve Corps.	Lieut. C. R. Bond, U. S. Army.	Frankfurt Springs, Pa.	312	20 4
(6) Lieut. F. B. Culbert, U. S. Navy.	Lieut. T. D. Guinn, U. S. Navy.	Alliance, Ohio....	284	20 6
(7) Lieut. J. B. Jordan, U. S. Army.	Lieut. M. F. Moyer, U. S. Army.	Macedonia, Ohio..	272	(?)
(8) Lieut. Commander J. P. Norlleet, U. S. Navy.	Lieut. J. B. Anderson, U. S. Navy.	Mount Eaton, Ohio.	250	18 28
(9) J. A. Boettner, civilian.	J. M. Yolton, civilian..	Fremont, Ohio....	199	16 10
(10) R. F. Donaldson, civilian.	P. A. Erlach, civilian.	Bryan, Ohio.....	157	(?)
(11) R. H. Upson, civilian.	C. G. Andrus, Weather Bureau.	Wapakoneta, Ohio	118	(?)
(12) W. T. Van Orman, civilian.	H. V. Thadden, civilian.	Hartford City, Ind.	68	5 40
(13) Warren Rasor, civilian.	Lieut. R. Emerson, U. S. Naval Reserve Force.	Atlanta, Ind.....	30	2 50

LIGHTNING FATALITY.

By ERIC R. MILLER, Meteorologist.

[Weather Bureau Office, Madison, Wis., June 27, 1923.]

On Monday, June 18, 1923, two instructors in the University of Wisconsin, W. E. Armentrout and M. L. MacQueen, were struck by lightning while crossing an open lot used by the university for the storage of coal. Armentrout was instantly killed, but MacQueen is now recovering, and I have obtained the following information from him:

He was conscious throughout the period of the electrical discharge and realized that he was being struck by lightning. He says that the pain of the spasmodic contractions of his muscles was terrible, but the noise and heat of the flash were nearly as bad. He speaks also of a sensation of terrible pressure on his head.

The current entered his body at his left shoulder, which is seared over an area of about 4 inches. The muscles of his legs near the ankles were wrenched by the spasmodic contractions and were swelled so that his leg at that point was about twice the normal size when I saw him. He was paralyzed from the waist down for a few hours after the flash.

Armentrout, who was killed, was also burned on his left shoulder and arm, and a small patch of hair was burned from his head. MacQueen, who fell beside Armentrout, says that he tried to rouse Armentrout and noticed that as he did so Armentrout turned blue. Doctors tell me that this cyanosis indicated that Armentrout's heart had stopped, probably as a result of severe tetanus due to the passage of electricity through the muscle of the heart.

The place where these men was struck is a very low place, and ground water is not far below the surface. Three holes remain to show where the lightning entered the ground. That iron has little directive effect on lightning is shown by the fact that a railroad rail lay about 10 feet away, the track of a railway switch about 30 feet away, a crane 100 feet away, and wire fences and the buildings of the Forest Products Laboratory about 150 feet away. The cloud, which came from the southwest, had passed over houses, trees, and an iron smokestack within a few hundred yards.