THE AVIATION MEETING AT RHEIMS.

The first real aviation meeting held anywhere in the world took place last week near the city of Rheims, France. The Betheny plain, which is several miles in length and a mile or more in width, was the scene of a triumph of aeroplanes such as even the most enthusiastic aeronauts did not believe possible. Not only were all records broken, but new ones were set up which are far in advance of the supposed state of the art at the present time.

Altogether there were thirty-eight aeroplanes entered in the various contests and races, for which $40,000 in cash prizes were offered. The machines which made flights were divided about equally between the monoplane and the biplane types, although the latter type was rather more in favor. Of the machines of this type, five were Wright biplanes, five biplanes of the Voisin cellular type with a tail, and three of the Farman type with a tail but without vertical partitions between the main planes. The Curtiss biplane represented America.

The monoplane type of flying machine was represented by three Antoinette machines, two Bleriot, and three Pelterie.

The course over which all the contests took place was a rectangular one, the total distance around it being 10 kilometers (6.21 miles). The judges' and timekeepers' stand was in the middle of one of the short sides, just opposite the grand stand. A row of aeroplane sheds was placed at one end of the grand stand.

The first day of the meeting, Sunday, August 22nd, was given up to trials of the machines entered in the International Cup Race for the Bennett trophy. On account of the seventeen entries, elimination trials were required in order to select three contestants to represent France in the race.

As there had been rain the preceding day and also early Sunday morning, and as the wind still continued to blow at the rate of about 12 miles an hour, the weather conditions were not propitious for the first flights. Soon after 10 A. M. Monsieur Maurice Guffroy attempted to get off the ground with his red-winged "R.E.P." (Pelterie) monoplane, but on account of the sodden condition of the earth, he was unable to rise in the air. M. Paul Tissandier was the next to make an attempt. He had a Wright biplane, and as this starts from a rail, he had a distinct advantage over M. Guffroy. It was with considerable difficulty, however, that everything was put in readiness about the starting apparatus in the fifteen minutes allowed for making a start. Then, too, he had trouble with his motor. Finally, however, he got away just as the time was up. The machine rose and made a two-minute flight, during which all the skill of the aviator was required to keep it right side up. At length it was caught by a stronger gust than usual, which caused it to make a dive. M. Tissandier stopped the engine and glided to earth. Thus was eliminated the second entrant for the International Cup Race.

M. Hubert Latham was the next one to attempt a flight with his powerful Antoinette monoplane. He rose in the air readily, but when once aloft the strong wind gusts caused his machine to pitch and roll in an alarming manner. After covering about a kilometer he quickly descended, landing safely. In a second trial later on, M. Latham qualified by making two rounds of the course (20 kilometers or 12.4 miles) in 18 minutes and 33 seconds. No sooner had M. Latham descended than M. Louis Bleriot rose in the air in his No. 22 monoplane fitted with a 45-horse-power Anzani motor. But even this skillful aviator had difficulty in keeping his monoplane on an even keel in the wind which was blowing. He covered the course once, and was making his second round when a sudden gust drove his machine earthward and damaged the tail in alighting. He had covered sufficient distance to be appointed one of France's representatives in the International Race.

Capt. Ferber, who flies under the pseudonym of De Rue, made a short flight with his Voisin biplane. He came very near running into a barricade opposite the grand stand. M. Lefebvre, with a Wright machine, succeeded in starting during a calm moment. He made a round of the course in 8 minutes and 8 1-5 seconds; and although he was obliged to descend during the second round, and after covering but 16 kilometers (10 miles) on account of the wind, he was appointed as the third representative in the cup race. M. Tissandier afterward made two rounds in 19 minutes and 26 seconds, and was appointed as a reserve pilot. M. Latham, on the "Antoinette II.," made two rounds in 19 minutes and 44 1-5 seconds. M. Paulhan made two rounds with his Voisin biplane in 21 minutes and 4-5 second, and M. Sommer in 23:32. Thus, although six reserve pilots were allowed, only three—Tissandier, Paulhan, and Sommer—were appointed.

As the weather cleared in the afternoon, and the wind ceased entirely, ideal conditions prevailed toward the end of the day, with the result that almost all the aviators brought out their machines and made flights toward evening. At 6 o'clock no less than five aeroplanes were flying simultaneously around the course, and the sight was one never to be forgotten. M. Lefebvre on his Wright machine performed the most daring feats; besides describing circles and figure eights, he would rush at the grand stand, and then quickly turn to the left and avoid it. M. Paul Tissandier and Count de Lambert made excellent exhibition flights upon their Wright aeroplanes. The latter at one time flew past M. Bunau-Varilla on his Voisin biplane, going below him and thus reversing Mr. Curtiss's maneuver of the day before, when he passed above M. Latham when flying at right angles to him.

The results of the first day's attempt to cover one and three circuits of the course (10 and 30 kilometers, or 6.21 and 18.63 miles) in the speed tests, were as follows:

	3 Rounds.	1 Round.
Tissandier (Wright biplane)	28:59 1/5	9:26 1/5
Count de Lambert (Wright biplane)	29:02	9:33 2/5
Lefebvre (Wright biplane)	29:02 1/5	8:58 1/5
Latham (Antoinette monoplane)		9:47 4/5
Paulhan (Voisin biplane)		10:50
Bunau-Varilla (Voisin biplane)		13:30 1/5
Sommer (Farman biplane)		11:24 2/5
Cockburn (Farman biplane)		11:44

The following day, Monday, Mr. Glenn H. Curtiss covered one round of the course in 8 minutes and 35 3/5 seconds. He succeeded in lowering this to 8 minutes and 11 3/5 seconds on Wednesday, although he was not able to equal M. Bleriot's record of 8 minutes and 4 2/5 seconds (46.15 miles an hour), made Tuesday by this aviator with a new monoplane fitted with an 80-horse-power motor. The third day of the meeting was notable on account of a visit paid by the French president, M. Fallieres, who inspected all the machines and showed great interest. The first flight this day was made by Bunau-Varilla, who flew in a breeze of 15 miles an hour, which caused his Voisin biplane to rock dangerously. He made one circuit of the course. Next M. Paulhan made a flight, rising first to a height of about 100 feet and afterward to between 300 and 500 feet. On the back stretch he raced a train for some distance, overtaking and passing it. Despite the strong wind, which caused the machine to pitch and lurch, he made the first round in 12 minutes and 13 seconds. After completing three rounds of the course, he made a sudden descent and a wide curve, but righted his machine when near the ground, and passed the grand stand on a level keel, making a couple of wide circles in front of it before he alighted. As an exhibition of daring his flight in the 15-mile wind at such a great height stands unprecedented. The time of his three rounds was 38 minutes and 12 2/5 seconds. M. Paulhan's performance indicated that he might yet do greater things, and it was only the next day that he succeeded in breaking all endurance records. On Wednesday, August 25th, he remained in the air 2 hours, 43 minutes, 24 4/5 seconds. He covered a distance of 134 kilometers (83¼ miles). After several other aviators had made short flights, M. Paulhan started about 4 P. M. in a wind of about 6 miles an hour, and circled the course continuously, notwithstanding that the wind blew at times as high as 24 miles an hour. While the speed of the machine was only about 30 miles an hour, it was remarkable for the ease with which it flew in the wind and for the steady running of the motor. This motor is the Gnome revolving-cylinder 50-horse-power engine, consisting of seven cylinders which spin around a fixed crank. The propeller is attached to the cylinders, which revolve in a vertical plane, the motor being placed in the rear of the lower plane.

M. Paulhan had already made several lengthy and excellent flights with his biplane, but that on the 25th ultimo is by far the longest, exceeding Wilbur Wright's 2-hour and 20-minute record by 23 minutes. The first round of the course was made in 12 minutes and 16 seconds. During the sixth round the wind increased to such an extent that M. Paulhan was blown inside the course, and in order to turn the pole at one corner, he was obliged to describe a complete circle. After alighting, when his gasoline gave out, at 7:30, he had the tank refilled, and then flew from the point where he came to earth across to the grand stand. He received an ovation from the spectators. M. Paulhan's flight was for the Grand Prix de la Champagne, the prize for which is $10,000 to the winner.

Another aviator to make his appearance on Wednesday was M. Rougier, who had a Voisin biplane. He made the first flight of the day, but his motor gave out, and he came to earth shortly after crossing the starting line. After two unsuccessful attempts, M. Latham flew once around the course at a great height with his "Antoinette XIII." at the same time that M. Paulhan was flying. He only succeeded in making one round, owing to motor troubles, and the wind at a high elevation appeared to bother him as much as it did Paulhan, who was flying lower down. M. Henri Fournier, in a Voisin machine, was another novice to attempt a flight. After getting three-quarters around the course, he was dashed to the ground by the strong wind, and escaped with a broken nose, although his machine was demolished. M. Latham also made a round at a great height with his No. 29 Antoinette monoplane. M. Lefebvre was the only Wright pilot to attempt a flight. He soon came to earth, owing to the breaking of the gasoline feed pipe. M. Delagrange made a short flight on a small Bleriot monoplane, and M. Bunau-Varilla made a good flight on his Voisin biplane. M. Latham's best performance this day was three rounds of the course. Between 6:30 and 7 P. M. eight or nine machines were quickly brought out, and attempts were made to better the 10-kilometer speed record. The Curtiss biplane was the last to start, which it did when no less than five aeroplanes were traveling around the course. The aviator took the first turn rather wide. He was obliged to fly above one machine, and he ran out of his course somewhat in order to avoid a collision with M. Sommer on his Farman biplane. He reduced his time to 8 minutes and 11 3/5 seconds in this flight. Short flights were made by M. Legagneux on Capt. Ferber's biplane, M. Rougier and Bunau-Varilla on their Voisin biplanes; M. Sommer on a Farman biplane, and M. Delagrange on the Bleriot monoplane. M. Bunau-Varilla rose to a height of more than 300 feet.

The record for speed and distance was made on August 26th by M. Latham with his No. 29 Antoinette monoplane. The weather conditions were favorable at the start, but during the course of the flight M. Latham encountered heavy wind and a rain storm. He nevertheless kept the machine flying until the fuel gave out. He succeeded in making over fifteen rounds of the course in 2 hours, 18 minutes, and 9 3/5 seconds. The total distance covered was 154.375 kilometers (95.88 miles). The average speed was therefore 41.63 miles per hour. The fastest round was made in 8 minutes and 20 3/5 seconds, at an average speed of 44.65 miles an hour. This record surpassed that made the day before by M. Paulhan, since the machine flew a considerably greater distance in less time, while it also demonstrated its stability in a wind of about 24 miles an hour, and its capability of traveling through rain. The flight was a complete vindication of the Antoinette motor which, it will be remembered, failed Latham twice when he attempted to cross the English Channel. This motor is of the V-type, having eight water-cooled cylinders. It is one of the lightest motors ever constructed per horse-power. Besides making this record flight in the P. M. Latham flew 70 kilometers (43.5 miles) in the A. M. with the "Antoinette XIII." Count de Lambert flew 116 kilometers (72 miles) late in the P. M. also, so that the long flights on Thursday totaled over 212 miles. M. Bleriot met with an accident on Thursday. In order to avoid alighting upon some dragoons who were traveling across the field on horseback, he steered his machine into a fence, breaking the propeller and damaging the monoplane considerably. He was making a flight with M. Delagrange as passenger when the accident occurred. M. Rougier also alighted upon some spectators, but fortunately they were not seriously injured.

Latham's distance record of Thursday was a record of only a day, for on Friday, August 27th, Henri Farman surpassed it decidedly with his modified Voisin-type biplane now known as the Farman machine. The sixth day of the meeting was the last one in which the Prix de la Champagne could be competed for, and everyone took it for granted that Latham's record of 95 miles in 2:18 would remain unbeaten. About 4:30 P. M. Latham brought out the "Antoinette XIII." monoplane and started on another long flight. Some ten minutes later MM. Farman and Sommer started out quite unexpectedly upon Farman biplanes, and a real race at once began. At the end of Latham's second round, he passed high above Sommer and Farman, who were flying close to the ground at about the same level and only 50 feet apart, Sommer leading. The two biplanes made the last turn of the course only a second apart, and then Farman passed Sommer in front of the grand stand, while the latter's machine dropped and touched the ground just as it crossed the line. Sommer accordingly circled around the timer's box and crossed the line once more, according to the rules, which maneuver placed him far in the rear. Both biplanes flew at an average height of from 6 to 12 feet only, while Latham maintained an elevation of from 250 to 300 feet. His machine was considerably faster than the other two, and he lapped both of them several times. Latham covered 50 kilometers (31.05 miles) in 44:23 against Farman's 51:21. Eighty and 100 kilometers (49.71 and 62.14 miles) were covered by Latham in 1:11:20 1/5 and 1:29:20 2/5 respectively; but finally, after making 110 kilometers (68.35 miles) in 1:38:5 1/5, his fuel gave out and the monoplane glided to earth. After Latham ceased flying, Farman kept steadily on. Sommer stopped after making three rounds because of motor trouble. He afterward started again, but too late to make a record before the closing of the lists at 7:30. Shortly before 5 P. M. M. Tissandier started on his No. 4 Wright machine and made 11 circuits in 1:46:52 2/5. At about the same time, Bunau-Varilla made several circuits on his Voisin biplane, and Delagrange and Bleriot came out

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ing a run of twenty-four hours, when handling material at the speeds as specified in the contract, no part of the motor will rise in temperature more than 70 deg. C. above the surrounding air. All electrical equipment is designed for a direct current of 220 volts. The grab bucket has a cubical capacity of 100 cubic feet of limestone, and the scoop bucket of 132 cubic feet. Both buckets are especially designed for working in limestone. The grab bucket has an over-all width of about 7 feet 6 inches and an over-all length when open of 17 feet 6 inches. The capacity of the machine is 200 tons per hour. The hoisting speed is 250 to 275 feet per minute; the racking speed 900 feet per minute; and the whole bridge travels at the rate of 100 to 150 feet per minute.

MEASURING A RIVER'S FLOW.

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the velocity recorded at a number of different depths in each strip. By the vertical integration method the meter is moved at a slow uniform speed from the surface of the stream to the bottom and back again.

For convenience of reference and comparison the results obtained are plotted in the form of a curve on a chart.

Another illustration shows the Great Falls of the Missouri River in Montana. A gaging station at the point from which the photograph is taken was established by the Geological Survey in July, 1902.

The river is favorable at this point for water-power development and shows the kind of stream, apart from navigable rivers, measured and reported upon by the Survey. In this way the Survey constantly brings to the attention of the investing and developing public many previously unnoticed but valuable water-power sites.

We are indebted to the director of the U. S. Geological Survey for the use of the accompanying illustrations.

THE AVIATION MEETING AT RHEIMS.

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with their Bleriot monoplanes. Both Bleriot and Curtiss tried to lower their speed records for one circuit of the course, and the latter succeeded in making 2 seconds better time than before. His time of 8:09 1/5 corresponds to almost 45.7 miles an hour. Bleriot made the circuit in 8:08 2/5, which was 4 seconds slower than formerly.

At the end of 2 hours, 22 minutes, and 51 seconds, Farman had flown 140 kilometers (86.99 miles) and beaten Paulhan's record. It was getting dark rapidly and the spectators could only see the machine as it passed before the grand stand. Ten minutes and 19 seconds later he completed his fifteenth round, and less than five minutes later he had beaten Latham's record. One hundred and sixty kilometers (99.4 miles) were covered in 2:43:35 2/5, and 180 kilometers (111.88 miles) in 3 hours, 4 minutes, 55 2/5 seconds. As it was now 7:30, the nineteenth round afterward made by Farman was not counted in the official figures. He actually covered over 190 kilometers (118.06 miles) and remained in the air all told about 3¼ hours. As he finished in front of the grand stand a searchlight was thrown upon him. He was pulled from his machine and carried upon the shoulders of his friends, receiving a decided ovation. Thus, for the second time, he has won a $10,000 cash prize, the first instance being when he flew 1 kilometer in a closed circuit on January 13th, 1908. It is possible that he will try again to win this sum by making the 140-mile flight from New York to Albany. In the flight for the Grand Prix, he carried enough fuel to fly 3½ hours.

The other prizes awarded in the Grand Prix de la Champagne distance race were as follows:

Second, $5,000, won by Hubert Latham on his Antoinette monoplane. Distance, 154.5 kilometers (96 miles).

Third, $2,000, won by M. Paulhan with his Voisin biplane. Distance, 131 kilometers (81.4 miles).

Fourth, $1,000, won by Count de Lambert with his Wright biplane. Distance, 116 kilometers (72.1 miles).

Fifth, $1,000, won by Paul M. Tissandier. Distance, 111 kilometers (68.97 miles).

Sixth, $1,000, won by M. Roger Sommer with a Farman biplane. Distance, 60 kilometers (37.3 miles).

The distances covered by the other competitors were: 50 kilometers (31.1 miles) by M. Delagrange, with a Bleriot monoplane; 40 kilometers (24.9 miles) covered by M. Bleriot with one of his monoplanes; 30 kilometers (18.64 miles) covered by Mr. Curtiss with his biplane; and 21 kilometers (13.04 miles) covered by M. Lefebvre with his Wright machine.

This first aviation meeting has demonstrated beyond a doubt that the real flying machine is here. That aeroplane races will soon supersede the dangerous automobile races, there can be no question. We expect in our next issue to give full details of the successful machines at Rheims and their motors, as well as further particulars of the flights which were accomplished.

Tire cover and fastening therefor, G. W. Brown 931,674
Tire inner tube, pneumatic, H. K. Raymond 931,648
Tire plug, pneumatic, J. Glanz 931,056
Tire upsetter, J. H. Macdonald 931,325
Tires for wheels, manufacturing elastic, T. L. Carbone 931,563
Tires, making casings for pneumatic vehicle, J. ●. King 931,207
Tobacco cutter, rotary, W. A. Hagemeyer .. 931,295
Toe calk machine, D. G. Wyman 931,364
Tongs, A. G. Kjellerstedt 931,317
Toothpick machine cutter, H. A. Dorr 931,044
Top, T. N. Reed 931,187
Toy, S. H. Rogers 931,221
Toy air gun, S. T. Allen 931,553
Toy motor, electric, H. C. Grant 931,417
Toy, moving picture, E. W. Davis 931,184
Toy, musical, ●. Einicke 931,286
Toy musical instrument, S. R. Divine 931,578
Track, carrier, W. & J. F. Mitchell 931,455
Track laying machine, J. H. White 931,166
Track rail support, J. W. Kemmerle 931,206
Track sanding device, E. A. Longmire 931,444
Train lighting system, D. C. Jackson 931,613
Tray adjustable support, aseptic, C. F. Booth 931,378
Tripod, tilting top, J. C. Fyfe 931,692
Trolley and support therefor, S. S. Goldman 931,292
Trolley clamp, E. E. Rose 931,345
Trolley clamp, T. Varney 931,357
Trolley clamp, H. P. Davis 931,390, 931,391
Trolley conductor clamp, C. Aalborg 931,368
Trolley conductor hanger, H. P. Davis 931,503
Trolley hanger, T. Varney 931,353, 931,356, 931,358
Trolley hanger, H. P. Davis 931,392
Trolley hanger, G. B. Dusinberre 931,397, 931,398, 931,400
Trolley hanger and clamp, C. Aalborg 931,366
Trolley harp, T. A. Gannoe 931,592
Trolley wire hanger, Heimbecker & ●rum .. 931,301
Trough and glass support for glazed structures, combined, J. A. ●lsson 931,638
Truck, H. C. Grant 931,413, 931,414
T-slot bar, G. H. Vining 931,164
Tube and bar mill conveyer, North & Harrison 931,545
Tube drawing device, W. T. Adams 931,551
Tube making machine, G. A. Lutz 931,134
Tube mill tube trough, J. S. Worth 931,544
Turbine, elastic fluid, B. Ljungstrom 931,323
Typewriter, G. W. Downing 931,689
Typewriting machine, W. F. Helmond 931,303
Typewriting machine, J. J. Cooper 931,680
Typewriting machine, J. C. Doane 931,688
Umbrella, folding, P. L. Page 931,079
Umbrella lock, R. E. Adams 931,550
Undergarment, R. M. Sidey 931,151
Upholstering attachment, H. G. Westmore .. 931,106
Upholstering machine, I. Karpen 931,313
Urinal ventilator, A. J. Cheney 931,268
Valve, F. C. Smith 931,155
Valve, L. Schutte 931,228
Valve, C. Wainwright 931,532
Valve, flush, E. Nanfeldt 931,465
Valve for gas main joggle, L. Shaw 931,506
Valve, gas regulating, C. C. Armstrong 931,668
Valve gear, air, E. A. Rix 931,650
Valve, lavatory supply, W. A. Speakman .. 931,512
Valve, triple, W. V. Turner 931,238
Valve, triple, J. W. Cloud 931,271
Vapor electric apparatus system, F. Conrad. 931,114
Vapor generator, R. W. Zierlein 931,664
Vapor rectifiers, system of distribution for, F. Conrad 931,115
Vault, burial, W. E. Haworth 931,299
Vehicle, D. H. James 931,614
Vehicle automatic brake, F. D. Kaser 931,430
Vehicle brake, automatic, G. R. Kelly 931,621
Vehicle foot board, J. Hage 931,601
Vehicle shock absorber, F. N. Rosenstengel. 931,653
Vehicle wheel, B. C. Oblinger 931,214
Vehicle wheel, C. L. Shaw 931,505
Vehicle wheel, T. B. Jeffery 931,615
Veil clasp, B. Honsowetz 931,308
Ventilator. See Draft ventilator.
Ventilator, F. G. Andrews 931,667
Violin chin rest, G. Beisheim 931,251
Wagon brake, W. L. Roper 931,491
Washing compound and making same, clothes, J. H. Schlueter 931,498
Well drilling apparatus, H. B. Walker 931,101
Whalebone stretching and straightening machine, O. Holzhauer 931,204
Wheelbarrow, R. T. Todd 931,096
Wheelwright's tool, F. M. Sturgis 931,160
Whip, H. Flesch 931,047
Whip socket, J. H. Larson 931,437
Windmill regulator, M. S. Newcomer 931,140
Window or shutter operating mechanism, E. Van Noorden 931,239
Window screen, D. M. Henry 931,421
Wire bender, J. S. Pratt 931,480
Wires and cables, hanger and clamp for, C. Aalborg 931,367
Wrapping machine, A. M. Price 931,646
Wrench, F. Smith 931,510
Wrench, J. J. Parsons 931,640
Writing machine, E. R. Hess 931,305
X-ray apparatus, E. W. Caldwell 931,034

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1863, will be furnished from this office for 10 cents, provided the name and number of the patent desired and the date be given. Address Munn & Co., 361 Broadway, New York.

Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list. For terms and further particulars address Munn & Co., 361 Broadway, New York.