

THE BRITISH ARMY AEROPLANE.

After carrying on a series of experiments last September and October, the aeroplane designed by Capt. S. F. Cody, of the British Aeronautical Corps, was remodeled and has lately been given some further trials.

As first designed, this machine was similar to the present aeroplane. The dimensions of the planes were 40 feet long by $7\frac{1}{2}$ feet wide, and they were spaced 8 feet apart. Movable wing tips were arranged at the ends of the lower planes, the horizontal rudder being placed in front and the triangular vertical rudder at the rear. There was also a small triangular vertical surface above the main plane at the center. The flights made by this machine were 304 feet on September 29, 200 feet at 10 feet elevation on October 14, and 1,200 feet at 30 feet elevation in 27 seconds on October 16. In the last flight the machine tipped to one side and was smashed when it struck the ground.

The planes of the new machine are about one-third longer than those of the old one, and the total weight of the machine is some 1,500 pounds. The same 50-horse-power 8-cylinder Antoinette motor is used. It is placed at the front of the lower plane in the center, and drives two peculiar propellers located each about 4 feet on either side of it at the front edge, by means of chains. The movable wing tips have been placed beside the horizontal rudder, so that they are practically extensions of it. One of these turns upward and the other downward when the steering column is swung from one side to the other, while a forward and backward motion of the steering column turns the horizontal rudder. The vertical rudder is placed at the rear as before, and is worked by turning the steering wheel. The 3-gallon gasoline tank is placed above the motor, and the radiator is located vertically behind the aviator's seat, which is back of the motor. The motor is mounted upon a substantial chassis and strong springs are interposed between this chassis and the axles of the running gear for the purpose of absorbing the shock when the machine strikes the ground.

The most notable feature of this aeroplane is found in the two propellers. These are of a peculiar type similar to that described in the SUPPLEMENT of December 19, 1908, by Mr. Sidney H. Hollands. The peculiar feature is that the blades are broader at their base than at their ends, the width at the base being 24 inches, and the width at the outer end being but 5 inches. The length of the blades is about 3 feet. They are made of aluminium and are curved somewhat like a sugar scoop. Each one is mounted on a strong piece of steel tubing. Mr. Cody, as well as Mr. Hollands, both claim to have found that a blade of this shape gives better results than the usual form of blade, which is narrower at the base than at the tip. It is only in this respect that Mr. Hollands' propeller resembles that used by Mr. Cody on the British army aeroplane. In a letter to English "Aeronautics" Mr. Hollands describes his propeller (with which he claims to have obtained a thrust of 26 pounds per horse-power) as having two "narrow-tipped blades of a special conchoidal (or irregular crescent-shape) cross-section, set to pitch-angles of maximum efficiency. These angles, together with the other foregoing essential features, were all separately determined by a long

and careful series of comparative experiments. The blades have a twist, and the pitch is 0.7 of the diameter. It is most efficient at high speeds (the driving torque being relatively very small), and the essential features of the design lend themselves to strength and rigidity. It is constructed wholly of high-grade steel, and the 2 meters diameter type weighs 13 pounds, with a factor of safety of six, at 1,200 revolutions per minute." Mr. Hollands claims that his pro-

pellor is superior to those used on the army aeroplane and that it was designed some years before the propellers of Mr. Cody. According to a cable report, the first test of the remodeled aeroplane occurred on the 20th instant. Two short flights were made by Capt. Cody successfully, but the third one was terminated, after the machine had traveled some 300 feet at a height of about 20 feet from the ground, by the buckling of the hori-



Three-quarter front view of the aeroplane.

The movable tips at each end of the horizontal rudder, the motor and propellers, the three-wheeled chassis with buffer wheel in front, are all visible in this photograph.

zonal rudder, and the aeroplane fell heavily and was badly wrecked.

The Meeting of the Society of Automobile Engineers.

On Tuesday of last week the Society of Automobile Engineers held a meeting at the Automobile Club of America in the morning, and in the building of the United Engineering Societies in the afternoon. The opportunity was taken to make some tests upon the dynamometer of the Automobile Club. A Fiat machine was first tested, and at a speed of 40 miles an hour, 20-horse-power was developed at the rear wheels. The Benz racer, which obtained second place at the Grand Prix race at Savannah, was next tested, and on the second speed it attained a road speed of 65 miles an hour with the development of 100 horse-power. During this test the drawbar pull rose as high as 750 pounds. When it is remembered that the machine is fitted with four speeds, it can be seen that when traveling 90 miles an hour this machine must develop well over 100 horse-power.

At the afternoon session of the Society several papers were read upon "Autogenous Welding," "Standardizing Motor Bearings," "The Economics of Weight Reduction," and "A New Type of Indicator for Gasoline Engines."

A \$500 Prize for a Simple Explanation of the Fourth Dimension.

A friend of the SCIENTIFIC AMERICAN, who desires to remain unknown, has paid into the hands of the publishers the sum of \$500, which is to be awarded as a

3. Each essay must be typewritten and identified with a pseudonym. The essay must be enclosed in a plain sealed envelope, bearing only the pseudonym. With the essay should be sent a second plain sealed envelope, also labeled with the pseudonym, and containing the name and address of the competitor. Both these envelopes should be sent to "Fourth Dimension Editor, SCIENTIFIC AMERICAN, 361 Broadway, New York, N. Y."

4. All essays must be in the office of the SCIENTIFIC AMERICAN by April 1, 1909.

5. The Editor of the SCIENTIFIC AMERICAN will retain the small sealed envelope containing the address of the competitor and forward the essays to the Judges, who will select the prize-winning essay.

6. As soon as the Judges have agreed upon the winning essay, they will notify the Editor, who will open the envelope bearing the proper pseudonym and containing the competitor's true name. The competitor will be notified by the Editor that he has won the prize, and his essay will be published in the SCIENTIFIC AMERICAN.

7. The Editor reserves the right to publish in the columns of the SCIENTIFIC AMERICAN or the SCIENTIFIC AMERICAN SUPPLEMENT three or four of the more meritorious essays, which in the opinion of the judges are worthy of honorable mention.

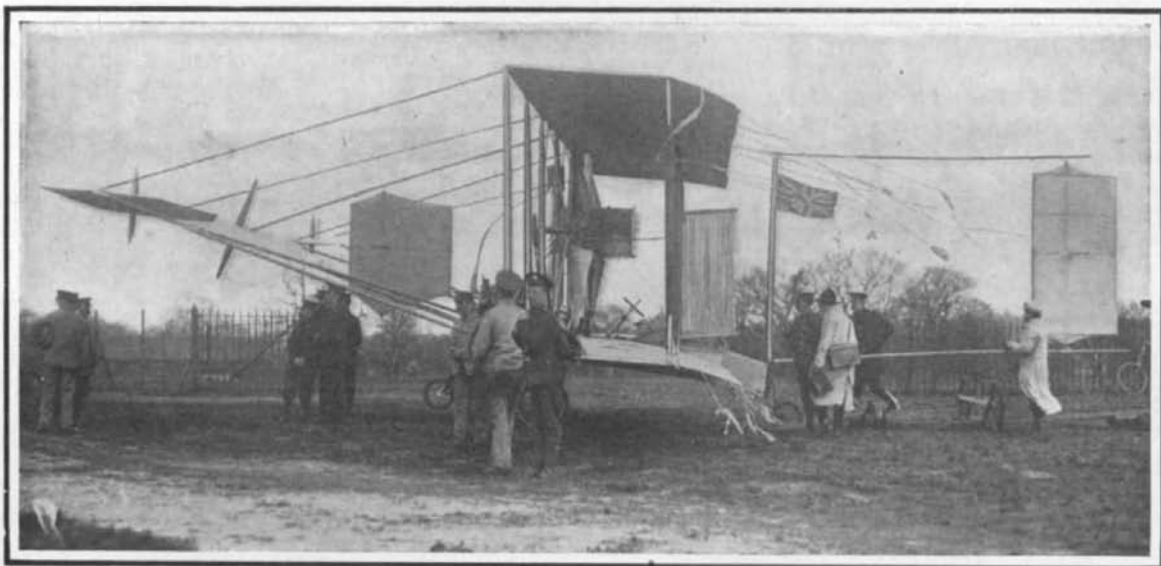
Prof. Henry B. Manning, of Brown University, and Prof. S. A. Mitchell, of Columbia University, will be the judges.

AERONAUTICAL NOTES.

Wilbur Wright has gone to Pau, in the south of France, where he has been joined by his brother Orville. These two famous aviators expect to spend some time at Pau making flights and conducting experiments. The French company that is selling their machines already has orders for thirty-three in hand.

Glenn H. Curtiss, our only other famous aviator and the first winner of the SCIENTIFIC AMERICAN Trophy, has left for Dr. Bell's home near Baddeck, Nova Scotia, where he will aid the other members of the Aerial Experiment Association in conducting experiments with Dr. Bell's tetrahedral-cell aeroplane (which is to be fitted with a motor and propellers) and also in making further flights with the "Silver Dart." This fourth aeroplane of the A. E. A. has been fitted with runners so that, like the first one, it can be started on the ice. Before starting on his trip, Mr. Curtiss has completed the drawings for a new 4-cylinder, water-cooled aeronautic motor of about 25 horse-power and not more than 100 pounds weight. The first engine of this type will be built at once.

The sheds of the Aeronautic Society at Morris Park now contain two new aeroplanes which are being worked upon daily. These are the 450-pound machine of Frederick Schneider and an aeroplane of nearly double this weight that is being built by W. R. Kimball. Both machines are of the Wright type and both have novel features. The former has a pivoted horizontal surface in the rear above the vertical rudder in addition to the usual front horizontal rudder. An Adams-Farwell revolving-cylinder motor of 36 rated horse-power and but 98 pounds weight drives two 68-inch propellers in opposite directions. A third propeller can be used in the center between the other two if this is found desirable. There are three control wheels for operating the various rudders. Mr. Kimball's machine has a row of eight 4-foot propellers placed between the planes and extending nearly their entire width. These propellers are driven by a wire rope in the same manner as on this experimenter's helicopter, and the same 50-horse-power, two-cycle motor that was used on this machine is to furnish the motive power. This is the first application of multiple propellers—i. e., of more than two or three—to an aeroplane, and it will be interesting to see how this method of propulsion (which is claimed to be more efficient) works out in actual practice.



End view of the British army aeroplane.

Note the vertical rudders in the front and rear, the propellers and motor at the front edge, and the vertical gasoline tank and radiator between the planes at the center and toward the rear. The flag and streamers show the direction of the wind.

THE NEW AEROPLANE OF THE BRITISH ARMY AERONAUTIC CORPS.

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prize for the best popular explanation of the Fourth Dimension, the object being to set forth in an essay the meaning of the term so that the ordinary lay reader can understand it.

Competitors for the prize must comply with the following conditions:

1. No essay must be longer than 2,500 words.
2. The essays must be written as simply, lucidly, and non-technically as possible.