For each value of the angle of trail (β) as defined by the table there is a corresponding definite relationship between the area (A), speed (V), and load (W), carrying capacity of the aerofoil. This relationship serves to establish the load table (Table III) in which can be found the weight per square foot supported at different velocities between 5 and 80 ft. per sec. It is interesting to apply this table—prepared long before any machines had flown—to the Farman flyer of the present day. The velocity of that machine is about 70 ft. per sec., and the aspect ratio 5, which with a skin-friction co-efficient of ·01 would give about 3 lbs. per sq. ft. lift, a figure which is sufficiently close to the real value demonstrated by experiments.

The model of Table I has frequently been referred to in the text: its thrust horse-power is deducted from the component of gravity in gliding. It approached earth at 2·5 ft. per sec., and as 1 h.p. (550 ft.-lbs.-secs.) could maintain that upward velocity in (550 ÷ 2·5 = 220) lbs., therefore the model in horizontal flight, which is equivalent to an upward velocity of 2·5 ft.-secs., requires power at the rate of 1 h.p. per 220 lbs. weight. The flight velocity resulting from this is, by experiment, 17 ft. per sec., and as when gliding the fall is 2·5 ft. per sec., it follows that the natural gliding angle of the model is $\frac{2\cdot5}{17} = \frac{1}{6\cdot8} =$ 14·8 per cent., which, as has already been explained, constitutes a measure of the total resistance.

In the case of the Wright and Voisin machines, the flight velocities, and the weights and the engine powers, are known experimentally. The thrust h.p. developed by the propellers is deduced from the motor h.p. by allowing for the losses in transmission, and, in consequence, the load supported per thrust h.p. is greater than the equivalent for engine h.p. This value of lift has a corresponding value for rate of fall, for just as with the model a lift of 220 lbs. per. h.p. represented a fall of 550 ÷ 220 = 2·5 ft. per sec., so in the case of the Wright flyer does a lift of 76 lbs. per h.p. represent a natural gliding fall of 550 ÷ 76 = 7·23 ft. per sec., which, compounded with a flight velocity of 58 ft. per sec., indicates a natural gliding angle of 1 in 8, or 12½ per cent., which once again is a measure of the flight resistance.

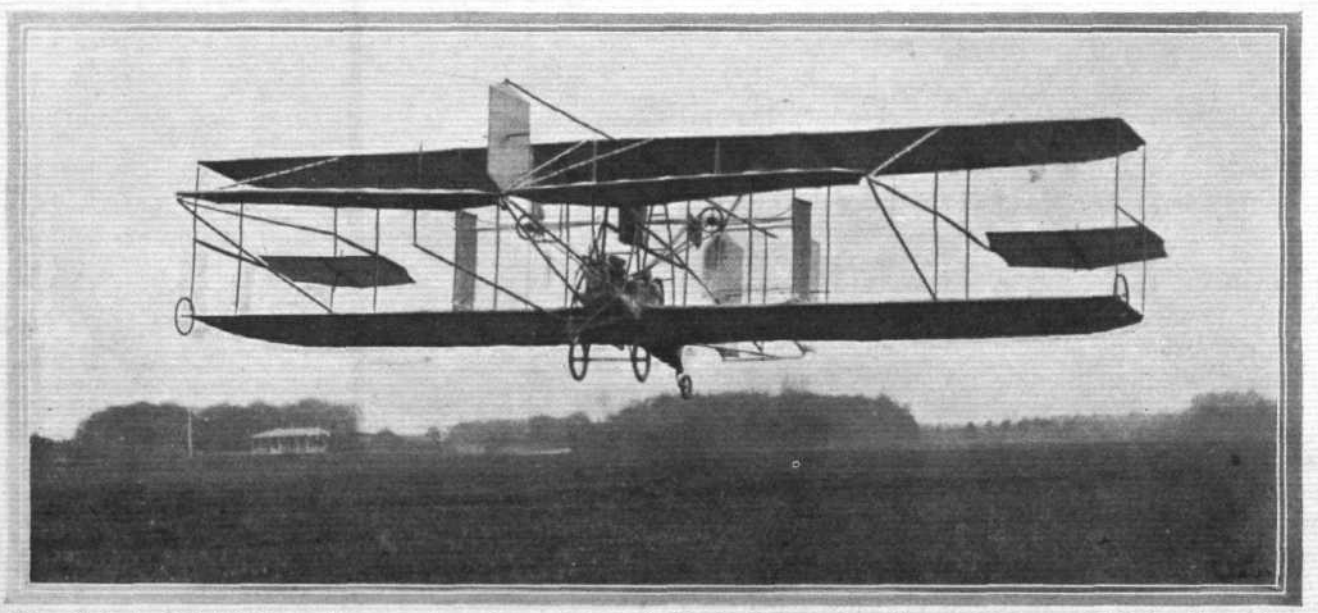
BRITISH AEROPLANE AND AIRSHIP.

Mr. Cody Flies a Mile.

ON the 14th inst. Mr. S. F. Cody, on the discarded Army aeroplane, succeeded in making a really good flight, and set up a new record for Great Britain by flying for a mile, reaching an altitude of 30 feet. On the previous day three short flights were made with a view to seeing that one or two improvements which had been made by Mr. Cody worked satisfactorily, and in view of the results Mr. Cody determined on making a great effort on the following morning. About ten o'clock the motor was started, and after a few short runs over the ground Mr. Cody started from one end of Laffan's Plain, and flew right to the other end and beyond to Danger Hill, where he alighted without mishap. News of the success quickly spread, and reached the Prince and Princess of Wales, who were attending the manœuvres at Aldershot. In the afternoon the Prince asked Mr. Cody if he would make another flight, and he once more took to the air. Unfortunately, however, in making a turn to avoid some troops, after flying for about 200 yards, the aeroplane was caught by a sudden gust of wind and driven against an embankment, damaging some of the rear framework. The damage done was not very serious, and the Prince expressed to Mr. Cody his pleasure at having seen a British aeroplane that could fly.

Royal Visitors Inspect "Dirigible II."

ON Friday week the Prince and Princess of Wales paid a visit to the balloon factory, and inspected the new model army dirigible, and also witnessed it in flight. The airship, which has now been christened "Baby," was taken out on to Cove Common, and after Col. Capper had explained its design and working, the dirigible was sent up with Capt. King, R.E., and Mr. McQuade in charge. She made a wide circle, returning practically to the starting point, a speed of about fifteen miles an hour being attained. On Tuesday the King also inspected the airship during his visit to Aldershot.



Mr. Cody in full flight on his aeroplane last week at Laffan's Plain, when he made a record flight of a mile.