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A Gyratory Milestone

IT is now possible to remark on the fact that Tuesday, November 24, 1936, deserves to be treated as a red-letter day in the history of flying. On that day a rotating-wing aircraft of helicopter type succeeded in remaining aloft for more than one hour; and what is, perhaps, more important still, it covered during that time a distance, over a closed circuit, of 27¼ miles. It was not the fact that a true helicopter established a speed of 26½ m.p.h. that was significant; but what *is* important is the fact that the machine stayed in the air for a considerable period, during which it flew circuits of a measured course, thereby showing that it was under proper control. The actual speed is, for the present, relatively unimportant. The machine was the Breguet-Dorand gyroplane, a description of which appeared in *Flight* of December 19, 1935.

Louis Breguet, the famous French pioneer aircraft constructor, has thus once again made history, and in this connection it is not without interest to recall that he began his aeronautical career with a helicopter which made its first "rise" (it could hardly be called a flight) as long ago as 1907. From that early machine, the Breguet-Richet, to the present Breguet-Dorand is a far cry, and during the interval between their production M. Breguet became famous as a designer and constructor of fixed-wing aircraft, the fact that this type offered an easier path to success doubtless having influenced M. Breguet as it influenced so many other early aeroplane designers. However, M. Breguet has never lost his faith in the ultimate success of the rotating-wing type, and he has backed his faith with prolonged research and a great deal of hard cash. That success is now within sight must be a source of gratification to M. Breguet, indeed, as it is to the rest of the aviation world.

It may be assumed that M. Breguet still has a great deal of development work to do before his gyroplane is a practical aircraft, but the one-hour flight by M. Claisse on November 24 shows that fundamentally the problem of lift and propulsion, and the more difficult one of control, has been solved. Doubtless the rest is a question of detail improvement, of simplification, and of practical mechanical engineering.

Perhaps it was to be expected, but it is nevertheless interesting to have M. Breguet confirm what Mr. de la Cierva stated long ago, that a rotary-wing aircraft is more efficient than a fixed-wing aircraft at very high and very low speeds. Mr. de la Cierva did not give actual figures, but he showed two "horse-power required" curves, one for an average aeroplane and one for the autogiro. The two curves crossed one another towards the two ends of the speed scale.

Efficiency

Monsieur Breguet has calculated that for a very refined design of his gyroplane a power of 0.06 b.h.p. per pound weight is required, or a power loading of 16.7 pounds per horse-power, at a speed of 217 m.p.h. Due to the fact that the relative drag of the gyroplane remains practically constant and at a minimum through a very large range of V/nD, M. Breguet estimates that at 700 km/h (435 m.p.h.) the same refined gyroplane will require but 0.168 h.p. per pound weight, or a power loading of 5.95 pounds per horse-power. When one remembers that the same machine is able to rise vertically, hover without forward speed, and descend vertically, one begins to realise the potentialities of the gyroplane. M. Breguet visualises a large gyroplane—amphibian, because of its ability to ascend and descend vertically—in which there is a central engine room with four engines driving the shafts of the lifting screws, and accessible by the engineers at all times, with the possibility of declutching