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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

*Technical Memorandum No. 13.*

THE OEHMICHEN PEUGEOT HELICOPTER.

Translated by Paris Office, N.A.C.A.

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To be returned to  
the files of the Langley  
Memorial Aeronautical  
Laboratory

1,7.3.2

March, 1931

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We stated in our issue of January 24th that a flight had been made for the first time in a free helicopter with an aviator on board, and that the flight had taken place in a pretty part of France near a district won back by the War. The helicopter was said to have been constructed by a large automobile factory, and it was a generally understood fact that this meant the firm of PEUGEOT, whose factories are installed at Valentigney, Doubs.

The machine is shown in the illustration appearing in the front page of "L'Auto," January 26, 1921. It is not fitted with any device to permit horizontal flight or landing. It is equipped with an engine of ancient type (Dutheil-Chalmers) of more than 10 years' date. It was constructed by Engineer OEHMICHEN at the expense of the PEUGEOT firm and under the authority of its Chief, M. Robert PEUGEOT.

Messrs. PEUGEOT and OEHMICHEN did not aim at realizing "de plano" a machine that would meet all the complicated desiderata of the question. Properly speaking, it is a sort of aerial laboratory, destined to study all the sides of the question, one after the other.

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\* From "L'Auto," January 26-27, 1921.

We have reverted to this very important question in order to explain how M. OEHMICHEN has thought out and executed his machine, and we are now able to reproduce the following unique document, which is drawn up in the form of the Minutes of the first flight on a free helicopter, made by M. Etienne OEHMICHEN, Engineer, at Valentigney, Doubs, January 15, 1921.

### THE FIRST FLIGHT.

On this day, January 15, 1921, the above-mentioned engineer (Ecole Centrale, Paris), Etienne OEHMICHEN, has made a flight at the place named "Les Graviers," in the Commune of Valentigney, Doubs, on a helicopter of his own design, comprising the following parts:

1. One frame made of reinforced wood, equipped with two recuperator propellers, Oehmichen system, 6.40 m. in diameter.
  2. One two-cylinder engine, 130 bore, 120 m. stroke, Dutheil-Charmeris type (Bayard-Clement 1909), maximum power 25 HP.
  3. One flexible belt transmission.
- One compensating equilibrium ballonnet of 144 m.<sup>2</sup> inflated with hydrogen.

It made six ascents, entirely free, to heights varying between .50 m. and 1 m. The average duration of the flights was one minute.

The wind, at a velocity of about 1.50 m., caused a few side-slips which did not, however, endanger the equilibrium, which was maintained constantly satisfactory in executing regular oscillations. There was no damage whatever. Extremely gentle landings were effected except in one case, which was due to a wrong movement on the part of the pilot.

Weight of machine: 260 kg.; weight of pilot, 76 kg.  
Total: 336 kg.

Lifting force of balloon to be deducted: 71 kg.

Remaining load lifted by the propellers:  $336 - 71 = 265$  kg.

The following gentlemen were present at the first five flights and added their signatures after the reading of the Minutes:

Messrs. BOURGEOIS, C. IENN, M. TACQUARD, FIQUET,

L. BOUTEILLER, BAILLY and G. OEHMICHEN.

The above-named gentlemen were present at the last flight, and also the following:

Dr. DUVERNOY, doctor of medicine at Valentigney, Doubs,  
and Alfred CHACURT, mechanic.

Legal witness of the above named signatures:

JULES PEUGEOT,

Mayor of Valentigney.

The helicopter with which Engineer Oehmichen succeeded in making a free flight on January 15th, is the result of patient investigations. The shape of the propeller blades is the outcome of M. Etienne Oehmichen's personal studies in animal flight. Special investigating apparatus was originated by this scholarly technician, such as the electric stroboscope, which enabled him to formulate new laws on the recuperation of energy in fluids. These laws were the subject of a communication made to the French Academy of Science, in March, 1920, of an article in the "Bulletin des Inventions," April and May, 1920, and finally of a more detailed work, entitled: "Our Masters the Birds."

The propeller shapes were not determined at random, but by the direct application of these theories. According to the author, they have been proved to be superior to any of those tested in the balance on models of reduced size and under the same conditions.

In continuation of his researches, M. Oehmichen will make experiments with stabilizing devices and will get rid of the balloon with which he has made tests so far, as we have already stated, by gradually diminishing the volume and lifting power until they are entirely canceled. He also proposes to make a series of investigations concerning translation, and these researches will be facilitated by the fact of his being already able to sustain his machine in the air.

The helicopter has, moreover, made more than SEVENTY successful captive flights, without balloon or pilot, since its construction. M. Oehmichen experienced great difficulty in the adjustment of the transmission, and this explains why the free flight tests, with a pilot on board, were made in January, 1921, instead of in November of last year, when the machine was already completed.

We may add that the S.T.Aé. - French Technical Section of Aviation - has closely followed the works of M. Oehmichen and will participate in the official tests that will shortly take place in the grounds of the Oehmichen-Peugeot Laboratory at Valentigney, - the scene of the first flights.

In noting with great satisfaction the remarkable tests and results achieved by M. Oehmichen, Eng., we feel it to be due to the firm of Peugeot and its Chief, M. Robert Peugeot, to offer them our congratulations on their avoidance of the beaten track in devoting large sums to researches on the helicopter.

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