

THE DESIGN OF A SCOUTING AEROPLANE.*

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THE title of this lecture does not mean, as you may have thought, that I am going to enter into competition with skilled aeroplane designers or harbour intentions of teaching them their business. The purpose is quite different. I desire to put before you what are the qualities that will be demanded in an aeroplane which is used for the purpose of acquiring information in war. I do not wish to praise, or to disparage, any particular type of aeroplane as a flying machine. I speak solely of the suitability or otherwise of types as instruments of war.

Before plunging into the subject of the design of an aeroplane designed for scouting, it is necessary to consider a little the work which the scouting aeroplane is intended to accomplish, and for this it is advisable that one or two points with regard to reconnaissance in general should be made clear. Reconnaissance, which is quite apart from secret service, has always in the past followed two main methods. The first is that in which a force is sent out to gain information, and is of such strength that it is prepared to deal with any opposition which it is likely to meet, and to fight for its information. The second method is that in which a very small body, possibly only a single man, is sent out in the hope of his evading the enemy's protective parties, and, by stratagem and concealment, making observations of such of the enemy's dispositions as may come within his view.

If you like to go back to the fourteenth century, you will find that, on the day of Crecy, King Philip of France, adopting one method, sent out four knights to reconnoitre the English Army, and bring him tidings of their dispositions. This reconnaissance was eminently successful. The leader of these four was a man well known (although not perhaps by name) to history; he was Henry le Moyne, one of the knights who linked their reins with those of the blind King of Bohemia, and left their bodies to mark the farthest point that any foeman had penetrated into the English lines.

Ten years later, before Poitiers, we find the Black Prince adopting the other method, and sending a force of some hundreds of men at arms to observe the French Army. So strong was this party, and so ready to fight for their information, that they charged into the rear of the French main force, and made off with a number of prisoners.

Marlborough used for reconnaissance bodies of cavalry of considerable strength. Wellington trusted mainly to the efforts of single officers, mounted on the best horses that could be procured. Throughout all military history one finds these two methods employed, sometimes simultaneously, sometimes alternately.

Of the first method of obtaining information—by force—it is only necessary to speak here for the reason that the troops which are organised for reconnaissance on a large scale present the most serious difficulties and dangers to hostile reconnaissance on a small scale. Whatever equipment or means of transport may be used by a scout, his most dangerous opponents are those of his enemy who are similarly equipped but in stronger force. The most dangerous enemy of a scout on horseback is a stronger force of the enemy on horseback; if the scout be on a bicycle, bicyclists are his most dangerous opponents. If a scout be using an aeroplane, his greatest danger will arise from the enemy's aeroplanes, in stronger force. The advantage that the single man or smaller body has is that a large force is usually slower, more visible, more noisy, and more cumbersome.

A scout has always two duties to perform and two difficulties to overcome. He has first to get information, and secondly he has to bring it back. To be successful he must carry out both. But while he may do valuable work, although he carries out the first duty only partially, he must carry out the second completely. Incomplete information is of some value if delivered to the person who can make use of it, but the best information is of no use if the scout who obtained it is killed or made prisoner before he can pass it on.

Therefore it is that, so long as the means of transport used by a scout does not preclude the possibility of acquiring information, the most important requirements of the animal, or vehicle, or vessel, or machine for scouting purposes are first, the possibility of escaping observation, and second, suitability for eluding the enemy, if discovered. For example, a horse used by a scout should be, for the first purpose, well trained, not nervous, not given to neighing; for the second purpose it should be fast, a stayer, a good fencer, and handy. If the scout should have to carry out his operations from a boat or vessel of any kind, such vessel, whatever power may be used to propel it, should be silent, it should emit no visible smoke, and it should be of a dull colour; for the second purpose it should

be fast, it should be able to cover long distances and it should be handy.

If you will consider any possible means of transport which might be used by a scout, I think you will come to the conclusion that the four essentials, always allowing a certain facility of observation, are invisibility, silence, speed and manœuvring power.

On these lines one may consider the requirements of an aeroplane for scouting work which may have to evade a number of machines designed for fighting. It seems to me that the problem will present many similarities to the problems of reconnaissance that have had to be considered by all commanders of troops from the earliest days.

There is another valuable attribute, which I only mention to show that it is not forgotten. The range of an aeroplane depends on its speed, the trustworthiness of its engine, and on the amount of fuel which it can carry. With regard to the engine, you must get the engine of the best design and the best workmanship that is procurable, coddle it like a baby, feed it on the best petrol and oil, and put your trust in Providence. As to the amount of fuel and lubricant to be carried, that depends on the particular duty to be performed. I would not dare to guess at a standard duration of flight for which fuel might have to be carried, but I am inclined to think that for some time it will not be necessary to exceed, in war, the records already attained in peace.

I have spoken, so far, about methods of reconnaissance which have been approved in the past, for the reason that I am anxious to get a firm starting point, a fixed point of departure, before entering on speculations concerning the future. For any consideration of aeroplane reconnaissance is at present speculation; we have no data as to the behaviour of either man or machine when tried in war in face of opposition of the same type. Of the possibilities of aerial reconnaissance when there is no aerial opposition, we can speak with some certainty; not only can the limitations of hostile action from the ground against a well-flown aeroplane be calculated with some accuracy, but we have also a certain amount of practical experience, gained in Tripoli to assist us. That problem presents but little difficulty, and is capable of definite solution. But the problem of warfare in the air is altogether a different matter. It is not susceptible of definite calculation, and we have no practical experience to guide us. We can only speculate, and to keep our speculations within reasonable bounds we can use analogies from other methods of reconnaissance, we can use knowledge of war and of human nature in war, we can apply mechanical knowledge, and, most important of all, we can try to use common sense.

The beginning of my speculation, as you may have guessed, is that it is probable that two types of aeroplanes will be evolved for military purposes, a fighting machine and a scouting machine. This is only an opinion; it is possible that these two types may merge into one; it is possible that they may be diversified into half a dozen. But judging by the analogy of reconnaissance on the ground, these two types will be found necessary. The fighting aeroplane will be required to overcome the air forces of the enemy, if possible to drive them to the ground; at any rate to inflict damage upon them, and, in spite of opposition, to penetrate far enough to gain accurate information of the dispositions of the enemy's troops. Also it will be required to block the enemy's endeavours to gain information by bringing to action any of his aeroplanes which may approach our lines. To fulfil these purposes the fighting aeroplane must be of such design that weapons can be used effectively by the passengers or pilot.

Here, I may say, quite frankly, that I have not seen, nor have I heard of, any aeroplane that can be considered a fighting aeroplane. There are certain types that could, with much alteration, be adapted to the purpose, but it does not seem that any designer has yet endeavoured to produce a machine of this kind. Designers, in fact, have been busy enough producing machines that will fly, and fly well and safely, without thinking of the exact use to which they might be put in war. And the fighting machine is not going to be easy to design. When you consider the use of weapons from an aeroplane—and by weapons, I mean real man-killing guns or rifles, not childish devices for dropping bombs, or grenades or crackers—you will see what limitations it imposes. No tractor screws, I am afraid, and your fighting passengers placed in front of all planes and struts and wires and stays. Then lifting power for three or four men with weapons and ammunition, and lastly, speed to give some chance of manœuvring on equal terms with your adversary.

I should like to say here, that when I talk of the enemy, I take it for granted that the enemy is as well equipped, in personnel and material as we are; that his pilots are as skilful and as brave, and his aeroplanes as fast and as powerful, type for type.

(To be concluded.)

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