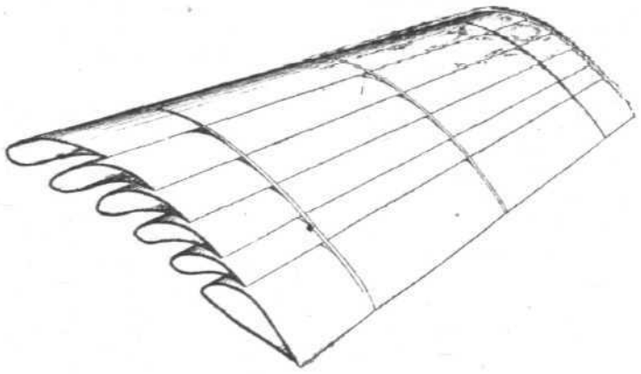
immediately started pancaking instead of getting its nose down. While doing this the horizontal speed was very low, and when the nose was pulled up the machine appeared to be hanging in the air, dropping slightly all the time. Also in coming into the aerodrome to land the machine seemed to pancake a lot, all due to the extra resistance of the attachment, but when the tail was brought down she settled gently and came to rest after a run of a few yards only. The second time Major Foote took her up he left the ground with wheels and tail skid at the same time, never bothering about getting the tail up for the preliminary run. This time the climbing angle appeared to be even better than on the first occasion, possibly because the pilot was beginning to get used to the machine.

As a practical demonstration of what is already accomplished, although in its crudest form, the exhibition was of great interest, and it requires but little imagination to foresee the effect which the new discovery will have on the future of aeroplane design. As flown on Thursday of last week, the machine had neither the adjustable leading edge nor the best leading edge shape, nor the best gap or slot width. When such good results can nevertheless be obtained, it will be seen that with more refinement much more will be achieved.

The Wing

Turning now from the practical demonstration to the details of the new Handley Page discovery, this consists of a false leading edge secured a short distance in front of the leading edge proper of the wing. The section of this false leading edge is not unlike the Schukowsky aerofoil, *i.e.*, the nose of the section is fairly thick, and maximum camber of the lower surface occurs rather far toward the trailing edge. The false leading edge is placed at a negative angle to the chord line of the main section, and the gap which separates it from the main leading edge is greater underneath than it is on top. This represents the discovery in its simplest form, and before discussing developments of this a few words regarding the possible explanation of the high lift obtained may not be out of place.

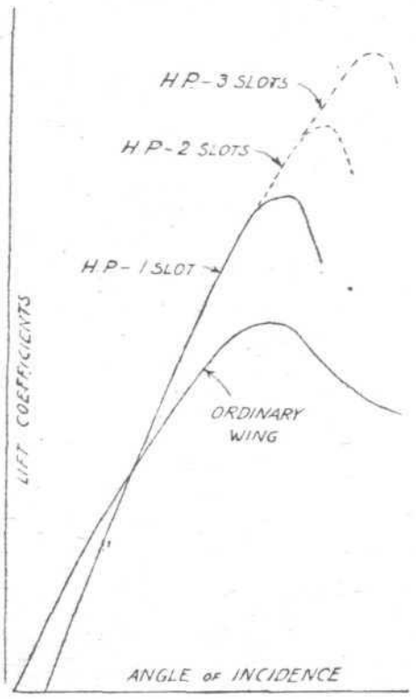


THE HANDLEY PAGE WING: Diagrammatic sketch showing a "plurality" of slots

The Handley Page Wing: Diagram showing single and double slot arrangement

Aerodynamical Features

It has already been mentioned that the slot separating the false from the main leading edge is contracted towards the upper surface. It appears that the effect of this is to give a form of Venturi tube effect. The air tries to rush through the opening in the plane, and on the face of it one would be inclined to think that the result would be a loss of lift. Here is probably where the Venturi effect comes into action. At small angles of incidence there is, as a matter of fact, a loss of lift, as shown by wind tunnel experiments, but at large angles there is a very marked increase in lift. Probably the explanation is that the positive pressure under the nose of the section is not all lost through the slot, while the quantity of air which gets through does so at a greatly-increased velocity, owing to the narrowing of the slot towards the top. The result of this increased velocity is that the air is swept upward with great force, thus augmenting the phenomenon which takes place in front of the leading edge of the ordinary wing. If this should prove the correct explanation, it is logical to conclude that the addition of another strip and its slot would add to the lift. Wind-tunnel tests show this to be the case, in fact it appears that for each slot added the lift increases. Recent tests have shown that it is possible to obtain absolute lift coefficients of close upon 2.0, or four times as great as those obtained with the majority of modern high-speed sections. Whether this represents the limit there is at present no way of ascertaining, but it should be remembered that much research work yet remains to be done on the shape of the sections and the shape of the slots separating them before the best combinations can be found. Also it should be realised that the Handley Page wing is at present in much the same stage of development as was the ordinary aerofoil about ten years ago. When looking at modern wing sections these do not appear to differ markedly from those used round about 1910 or 1911; yet the difference in efficiency is very great indeed. When the Handley Page wing has been as thoroughly tested out and refined, there is absolutely no telling what results will be obtained. As the work involved is very considerable, this will naturally take time, and the problems are not only aerodynamic but also mechanical. There does not, however, appear to be any doubts that at the stage already reached it will be possible, both aerodynamically and mechanically, to construct wings giving twice as high a maximum lift as that of present-day wings. Already with a single slot it has been found that it is possible to increase the lift coefficient from .5 to .8. With two slots, once the best combination of section and slot has been discovered, there is every reason to expect that the lift of a wing may be doubled. This will, of course, mean that for the same landing speed the wing area need only be half that of the ordinary wings, the loading per square foot of area being doubled. What this will mean in the case of adding the Handley Page system to a high-lift wing is a



The Handley Page Wing: Graph showing qualitatively the difference in the lift curves of the ordinary wing and a Handley Page wing with 1, 2 or 3 slots. The graph is not to scale, and is intended to indicate the general character only of the lift curves