



"The total drag is therefore reduced from 995 lbs. to 567 lbs., that is by about 75 per cent., so the speed would go up by about 20.3 per cent., or to about 122 m.p.h. We shall do, for this totalised condition, what was omitted in considering the improvements obtainable by item drag reduction, that is, we shall take into consideration the saving in petrol and oil due to keeping the range the same. We had originally 4 hours duration at 101.3 miles, or a range of 405 miles. At this increased speed of 122 m.p.h., therefore, we only need 3.32 hours duration, to maintain the 405 miles range. So the petrol, fuel and oil will be reduced by about 220 lbs., and the tanks by about 10 lbs., whence the useful load can be increased from 2,737 lbs. to 3,067 lbs. This combined result, of increased speed and increased useful load, is to improve the ton miles per gallon from 5.51 to 7.44."

Capt. Barnwell then concluded his paper with a brief outline of two machines which may be said to represent the "outside edge" of design. One of these was a man-driven machine, the general arrangement of which is shown in the accompanying illustration, Fig. 4. After making estimates of weights, resistances, etc., and assuming that a man can develop one horse-power for a short time, Capt. Barnwell comes to the conclusion that it appears to be impossible

for a human being to fly by his own power unless he can develop at least one and a half horse-power, or unless we can obtain materials and efficiencies at present out of our reach.

The second machine to which Capt. Barnwell referred is a design for a pure speed machine, of the general arrangement shown in Fig. 5. It is, of course, a purely imaginary design, in which no attention has been paid to cost, and little or none to safety—as the figure for landing speed will show. The engine which Capt. Barnwell imagines for such a machine is a 54-cylinder job, with a six-throw crankshaft having nine cylinders arranged radially around each crank pin. The weight all-on but "dry" is estimated at 6,000 lbs. and the maximum b.h.p. at 3,000 h.p. at 2,100 r.p.m. The estimated total weight of such a machine is 10,100 lbs., the wing area 90 sq. ft., the wing loading 112 lbs./sq. ft., the top speed about 380 m.p.h., and the stalling speed 190 m.p.h. If a retractable chassis is fitted, which is absolutely buried during flight, the wing area would become 60 sq. ft., the wing loading 168 lbs./sq. ft., and the maximum speed about 470 m.p.h. Such a machine, it will be realised, is only achieved by the entire sacrifice of utility, and by using a wing loading which would require a large aerodrome to arise from and a vast aerodrome on which to land, both with excellent surfaces.

HONOURS

The following appeared in the New Year Honours List:—

The King has been graciously pleased to signify His Majesty's intention of conferring Peerages of the United Kingdom on the following:—

To be a Baron

SIR WILLIAM BEARDMORE, Bart.—Sir William Beardmore is chairman and managing director of William Beardmore and Co., Limited, engineers and ordnance manufacturers, Parkhead Forge, Glasgow. He is also chairman of Arrol-Johnston, Limited, and is a director of Vickers, Limited, and a number of other companies. He was President of the Iron and Steel Institute in 1917.

The King has been pleased to approve of the following appointment to the Order of the Bath:—

C.B.

BASIL EDWARD HOLLOWAY, Director of Finance (Materials), Air Ministry.

The King has approved of the following award:—

Bar to the Air Force Cross.—Flying Officer THOMAS AUDLEY LANGFORD-SAINSBURY, A.F.C., R.A.F. (Air Force Cross gazetted January 1, 1919).

Foreign Honours

It is announced that the following decorations have been conferred by the Allied Powers on the officers of the

Royal Air Force in recognition of valuable services rendered in connection with the war. The King has given unrestricted permission to the officers to wear the decorations in question.

CONFERRED BY THE EMPEROR OF JAPAN.

Order of the Sacred Treasure.

First Class.—Air Marshal Sir H. M. Trenchard, Bt., K.C.B., D.S.O.

Third Class.—Wing Com. B. R. W. Beor, O.B.E.; Lieut.-Col. T. B. Phillips, O.B.E.; Lieut.-Col. R. D. Waterhouse, C.M.G.

Order of the Rising Sun

Second Class.—Maj.-Gen. Sir F. H. Sykes, G.B.E., K.C.B., C.M.G.

Third Class.—Col. E. H. Davidson, C.B.E., M.C.; Lieut.-Col. A. C. H. Maclean, C.B.E.

Fourth Class.—Squadron Leader L. F. Forbes, M.C.; Squadron Leader F. W. Stent, M.C.; Maj. G. G. Adeley; Maj. R. Chadwick, M.C., D.C.M.

Fifth Class.—Capt. W. H. J. Eldridge; Capt. F. G. Hogarth; Capt. R. R. Prentice; Lieut. D. C. W. Sanders, A.F.C.

CONFERRED BY THE KING OF THE BELGIANS

Order de la Couronne

Officier.—Lieut.-Col. T. B. Phillips, O.B.E.

D.F.C. for King Albert

FROM Brussels comes word that early this month the Duke of York will pay a visit to the Belgian capital with the object of presenting to King Albert the Distinguished Flying Cross. On the same occasion the chiefs of the Belgian Military Aviation Service will offer to King Albert the badge of their corps—two wings joined on the letter A.

R.A.F. Colledge

THE following are declared by the Civil Service Commissioners to be the successful candidates at the competitive examination held in November, 1920, for admission to the R.A.F. Cadet College; but their admission is conditional on their having passed the medical examination:—

Royal Air Force Cadet College

*Gillmore, V. O. .. 10,761	*Goldsmid, F. F. R. .. 7,255
Randle, G. H. .. 9,753	*Carter, N. .. 7,160
Newall, J. S. .. 9,627	*Tracy, J. McL. .. 6,718
Cator, F. G. .. 9,375	Brown, R. C. J. H. .. 6,543
Carter, R. H. .. 9,374	Sloan, W. J. P. .. 5,913
Nicholetts, G. E. ... 8,486	Burkinyoung, E. H. .. 5,793
*Lewes, R. .. 8,060	Jordan, R. B. .. 5,508
MacGregor, P. J. ... 7,955	Nuttall, F. E. .. 5,375
Fitzmaurice, M. J. .. 7,703	*Harris, F. S. .. 5,167
*Apthorp, D. F. A. .. 7,258	Fressanges, F. J. ... 5,052

Honorary King's Cadets who have qualified.

Berridge, T. D. .. 7,201 | Lywood, R. W. G. .. 5,329

* These candidates have received marks for military efficiency.

Aircraft for Polar Research

LECTURING on the "Future of Polar Exploration" before the Royal Geographical Society, recently, Mr. Frank Deben-

ham said the airship may at once be dismissed as being far too expensive and fragile for transport purposes, except when working from civilized and inhabited centres. For detailed work the heavier-than-air machine is much more likely to be of value. But the chances of a safe landing with an aeroplane on such country would be very small. By seaplanes from ships, excellent work could be done, and they might add considerably, not only to speed of manœuvre in pack-infested waters, but to the chances of survival of a beset ship. The seaplane would have a very definite value as a pilot alone, even though it could only be employed in comparatively loose pack-ice. As an auxiliary for plotting coastlines it would be invaluable. The enclosing of both engine and crew in a suitably-shaped body would overcome many practical difficulties of temperature and air-blast; the evolution of special alternative landing-gear to adapt the seaplane to emergency landing on sea ice would be another line of experiment likely to produce fruitful results.

A Thrilling Balloon Voyage

THE U.S. naval balloon, commanded by Lieut. Hinton, one of the officers who crossed the Atlantic in the N.C.4, which was reported missing after leaving Rockaway, New York, on December 13, landed on the next day at an old post at the mouth of the Moose River, North Ontario, after covering a distance of more than 1,000 miles. Lieut. Hinton and his two companions were lost in a forest for four days and eventually reached the Hudson Bay Co.'s post at James Bay, from which news of their safety was conveyed by Indians to Mattice, the nearest telegraphic office on the trans-continental railway.