The Haltonian Magazine and the Daedalus

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THE HALTON MAGAZINE

AND THE

DAEDALUS



VOL. VI, No. 2

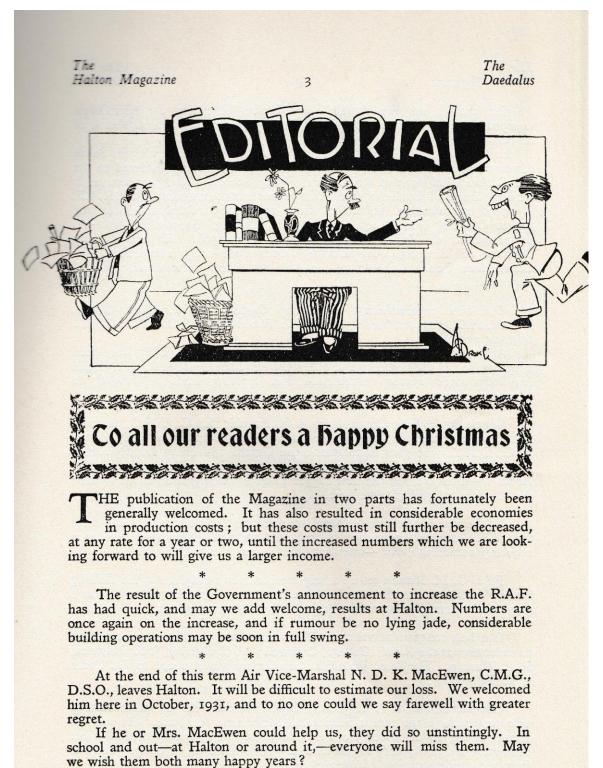
XMAS 1934



AIR COOLED AERO ENGINES AGAIN CHOSEN BY H.M. GOVERNMENT

ONCE again the British Government have chosen Siddeley air cooled engines for powering their latest training aircraft. Siddeley 7-cylinder engines, through their reliability, economy of running and ease of maintenance, have proved themselves eminently suitable for training purposes in any climate and under all conditions. Siddeley engines are known and flown all over the world.

ARMSTRONG SIDDELEY MOTORS LIMITED COVENTRY, ENGLAND. BP565A



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To our sixth commanding officer we offer a hearty welcome. Air Commodore J. T. Babington, C.B.E., D.S.O., p.s.a., has served on the staff of the Chief of the Air Staff as air representative at the League of Nations. The last four years have seen many changes at Halton and others once again are in the air. We may well expect that under his guidance the usefulness of Halton to the Service may be increased in quality as we hope in quantity.

Our thanks are due to Air Vice-Marshal MacEwen for permission to reproduce his photograph as frontispiece. The following brief sketch of his service will also be welcomed.

Air Vice-Marshal MacEwen entered the Army in 1901, serving in South Africa till the conclusion of the Boer War. In 1916 he transferred to the R.F.C., being adjutant of the Central Flying School. After war service in France, 'Iraq and India, he received a permanent commission in the R.A.F. in 1919, commanding the C.F.S. from 1920–1923. After attending the Senior Officers' War Course at the R.N. College, Greenwich, 1922–23, he proceeded to Transjordan as A.O.C., 1923–1926. He was Deputy Director of Training, Air Ministry, from 1926–1929, succeeding Air-Commodore Bonham-Carter as the fifth air officer commanding Halton Command.

Our best congratulations to Group Captain G. W. Murlis-Green, D.S.O., M.C., p.s.a., and to Group Captain F. Sowrey, D.S.O., M.C., A.F.C., on their promotion.

Air Commodore B. E. Sutton, D.S.O., O.B.E., M.C., has been appointed chief staff officer to the Air Officer Commanding R.A.F., India. Air-Commodore Sutton commanded No. 1 Wing from July, 1926, to November, 1929.

We welcome Wing Commander A. R. Arnold, D.S.C., D.F.C., to command No. 2 Apprentice Wing, in the place of Wing Commander C. N. Lowe, M.C., D.F.C., who goes to command the Oxford University Air Squadron. Rugby football, *inter alia*, will be the poorer by the loss of Wing Commander Lowe, to whom we owe the new rugger fixtures which will do much to raise the standard of performance here.

At the end of the summer term we were glad to welcome a party from the R.N. Artificer Apprentice School at Chatham. This visit is now a regularly occurring event,—one that gives us much real pleasure.

F/Lt. G. M. Buxton set up a height record for a sailplane at the Gliding Society's trials held at Sutton Bank, on Tuesday, September 4th. It was a great performance, and we offer him our best congratulations.

Our best congratulations to the following of the 24th Entry on selection to cadetships at the R.A.F. College, Cranwell : V. C. Darling, J. R. Fishwick, P. E. Warcup. The Lord Wakefield Scholarship was awarded to Flt. Cadet J. R. Fishwick.

Congratulations to No. 366419 Sgt/P. Stodart, K. G. (12th Entry), who took part in the recent Mildenhall-Melbourne Air Race. He and his cousin, flying an air speed Courier, completed the course successfully, but unhappily did not qualify for an award. This, however, in no way detracts from the sterling quality of their effort.

Flt. Cadets R. G. Yaxley and J. E. Kirk, of the 20th Entry, who recently completed their training as Flight Cadets at the R.A.F. College, Cranwell, were commissioned as Pilot Officers in July, 1934, R. G. Yaxley being awarded the Air Ministry Prize for Aeronautical Engineering.

561902 A/Sgt. Ovenden, A (16th Entry), secured a distinguished pass at the Flying Training Course, Abu Sueir, Egypt, in June, 1934.

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It is with deep regret that we have to record the deaths of 365881 Sgt/P. Light, H. T. L. (11th Entry), of 362999 Sgt/P. Robinson, G. (2nd Entry), and of 564613 L.A.C. Dowsing, W. St. G. (22nd Entry). Also of 563067 L.A.C. Buchanan, R. To their relatives we offer our sincere condolences.

Messrs. J. R. Morgan, F. T. Kirby, C. H. B. Ferguson, and J. Rann have joined the School Staff, and we extend to them a hearty welcome.

Mr. Parry-Jones and Mr. Morgan have most kindly undertaken to fill the offices respectively of Secretary and Treasurer of the O.B.A. We are glad to welcome Mr. Thompson back again after his accident,

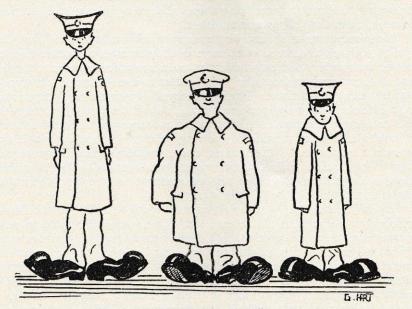
We are glad to welcome Mr. Thompson back again after his accident, to his old place in the School Stationery Store.

A correspondent has suggested that an agony column would be a helpful means of getting O.B.A. members into touch with each other, and so to renew Halton friendships. The idea seems to be a good one and will get every possible assistance here.

The latest activity of the Halton Society is its Philatelic Section, the first notice of which appears in another column. May we ask all O.B.A. members in whatever way they can to help this new venture, which should be able in time, over the wide field in which we serve, to build up a really valuable collection of stamps—particularly those of the Air Mail variety.

To the 25th Entry we say, "Au revoir and the best of luck." They were the first of the small entries but what they lacked in numbers they have more than made up for in the quality of the service they have given.

The photographs of H.M.S. *Eagle* taken during her cruise in the Far East have been most kindly loaned by F/Lt. J. H. Winch, R.A.F.



"Last month, when the storekeeper, all uns--uspecting, was fitting the small uns, He burbled—' Good heavens, They all take elevens. What the h— shall I do with the tall uns?'" A. A. C.

A Visit to Messrs. Hawker Aircraft Ltd.

THE H. G. Hawker Engineering Co., Ltd., was formed in 1921 from the

nucleus of the Sopwith Aviation Company, whose tradition of specialising in military aircraft they have inherited. Their factory is at Kingston-on-Thames, and their aerodrome at Brooklands. Recently they have bought the well-known Gloster Aircraft Company.

The machines produced by the firm, totalling 234 complete machines in the last financial year, are the Hart for high speed day bombing and for advanced training, the Audax for army co-operation, the Demon as a twoseater fighter, the Fury and Super Fury as interceptor fighters, the Nimrod as a single seater Fleet fighter, and the Osprey as a two-seater Fleet reconnaissance fighter : all of these with Kestrel engines. Both the Nimrod and Osprey are fitted with folding wings which can be quickly detached. The Hart has also been supplied with the Pegasus engine for general purposes.

Other well-known products of the firm are the Horsley Torpedo Bomber, with Condor engine, for coastal defence, and the Tomtit, with Mongoose engine, the original blind flying training machine.

Messrs. Hawker have also supplied many machines to foreign governments. Among these are the Dantorp, with Leopard engine, a torpedo bomber, and the Danecock with Jaguar engine; both these for the Royal Danish Naval Air Service. Furies, both with Kestrel and with Hispano-Suiza engine, have been supplied to the Royal Yugoslav Military Air Force. Other machines have been supplied to Norway, Estonia, Greece, Japan, Portugal, Sweden, Australia, and New Zealand. Very recently a number of Audax with Pegasus engine have been supplied for the Iraqi Army.

The first three photographs show the High Speed Fury, seen by many of our readers at the R.A.F. Display on June 30th. Since then its engine has been modified, and its top speed in normal flight is 250 miles per hour; no other fact about this machine may be published as it is still on the Air Ministry's secret list. The photographs show what a good field of view the pilot has both above and below the top plane, the stagger of the lower plane giving him a view also of his wheels.

The first photograph is by *Flight*, who have kindly lent the blocks for Figs. 4 and 5. Fig. 5 inevitably suggests to the "air-minded" that if a real war in the air ever comes the picturesque camp will become a military liability rather than an asset, and will need many aeroplanes to protect it. Figs. 6 and 7 give two views of the Hawker Hart fuselage. Fig. 6 shows well the arrangement of the centre section as it is before the gravity petrol tank is placed round the starboard bracing strut.

Recently the writer was allowed to pay an official visit with a colleague, Mr. D. L. Rundle, to the Kingston factory of Messrs. Hawker. In two crowded days of intensive sight-seeing many impressions were received of which only a selection can be given in this article.

We first inspected fuselages of which two or three dozen in later stages of assembly were in the largest shop. Tubes of stainless steel and of duralumin are used, generally of circular, but sometimes of square section. At all points of contact the round tubing is squared for a length of some three diameters to give flat contacts of considerable area. Connection is made by flat plates and tubular rivets, a good example of this being shown in the upper centre of Fig. 7. The side of a fuselage is a succession of triangles. The floor and roof of a fuselage are each a succession of quadrilaterals, each quadrilateral being diagonally braced with two streamline wires except for the neighbourhood of the cockpits, the dipping radiator, and the engine bearers. Thus the floor and roof are riggable and the sides are unriggable. The completely unriggable military aircraft is apparently not yet in view, and the menace to one half of the career of what was once called a "Fitter-Rigger" is postponed.

The cross struts of the fuselage are of duralumin tubing with ball ends which each fit into a cupped bolt passing through longeron and plates. Four of the "bulkhead" panels are diagonally braced with wires.

On machines in production during our visit the whole of the exposed struts, such as undercarriage, interplane and centre section, were of Accles and Pollock stainless streamline-section tube : it is good to see this high grade of material, which is still much neglected in favour of round tubes with wood fairings, coming into use. All the streamline wire seen during the visit was stainless : it was noticed that streamline wire was used internally in places not exposed to the air stream.

Some of the fuselages carried one fixed gun, others two, firing along grooves in the engine cowling. Of course, this arrangement makes the machine, head-on while firing, an easier target to its enemy, but allows a pilot to be at the same time a gunner. Several fuselages carried a swivel gun as well as a fixed gun.

If a critical doubt is felt regarding such superb machines it is concerning the necessity of the retractable radiator which protrudes below the fuselage in front of the pilot's feet, as seen in the lower centre of Fig. 7. As a means of effecting a powerful and practically instantaneous change in cooling it is ideal; but, sad to say, in a machine like the High Speed Fury this radiator probably knocks some ten miles an hour off the speed. When fully lowered it accounts for over two per cent. of the minimum frontal area, but owing to its bluff shape, the rear end being particularly a drawback, it will probably add seven or eight per cent. to the drag even allowing for the fact that some part of the air striking the front goes right through. A liberal allowance of closable louvres in the fairing fore and aft of the radiator would probably achieve the same degree of heat control without loss of speed, since a forced jet of air in the boundary layer lessens resistance. With a fixed radiator many other features would be unnecessary such as the flexible couplings, the parallel movement radius rods, the long elastic balance cords, and the hand wheel and chain drive for actuating the radiator.

Many of the fuselages were for sea use and had fittings on the sides of the floor for the attachment of catapulting gear. The catapulting speed is 70 m.p.h., and the modern demand is to achieve it with a fairly short run. We understood that no catapulted aircraft has yet been designed with a view to that use : machines planned for other purposes have been modified at Air Ministry request.

Some of the Ospreys being assembled were for the Royal Swedish Air Force, who had supplied Swedish-built Bristol Pegasus moderately supercharged engines. These will equip their aircraft carrier Gotland. Mr. Mace, the works manager, highly praised the Swedish-built engines as the best finished he had ever seen. This reminded us that Bessemer was a Swede, a fact which amuses Halton apprentices owing to their peculiar vernacular.

Alongside of this shop was another big shop on the ground floor with machinery for heavy processes in steel and duralumin, particularly the machining of forgings and castings such as the spools to which the oleo legs are attached, or the universal block which goes between the centre section strut ends and the fuselage fittings.

Beyond were draw benches with rollers for shaping strip steel. Rollers do not push grease into the pores of the metal as dies do. Those for making

the booms of the spars were very ingenious. A flat strip six inches wide passing through six pairs of rollers became a gaping dodecagon, the halfinch gap being flanked with two lips which will be closed to take the web rivets. The web is a strip corrugated longitudinally.

Next on the ground floor were the tank shop and the sheet metal workers, and further on the dope shop, which was one of the two places where women were employed. We did not stay many seconds in the dope shop as its atmosphere affected our guide's throat.

The gravity fuel tanks shown to us, each holding some nineteen gallons, were a good-class job in sheet aluminium with their seams inwards, their edges and corners rounded, the two largest faces shaped to aerofoil section, and a rather astonishing tunnel running almost diagonally through the midst to allow the passage of the starboard diagonal strut of the centre section plane.

In this shop a craftsman was spot welding with an oxy-acetylene flame the seams of a container of sheet aluminium used in the armament of the Audax; goggles were lent to us for close inspection of the process; the spots were about a quarter of an inch apart, and usually one dip of the welding rod in the flux lasted for three spots.

Upstairs were the lighter machinery and, usually, the less skilled operations. In passing we may note that the policy of the firm is so to design its aircraft as to need few highly-skilled craftsmen.

The first item upstairs was the assembly of wooden ribs. Though we long since said good-bye to wooden ribs at Halton, Messrs. Hawker use none other on sea-going craft. No reasons were offered for this; possibly because aluminium manufacturers claim that the resistance of duralumin to corrosion by sea-air is good. However, the wooden rib costs more to produce than the duralumin rib. All ribs both of wood and duralumin are of R.A.F. 28 profile.

The wooden rib had T-shaped spruce flanges in four laminations; the struts forming the rib web were of plain spruce about $\frac{3}{5}$ inch by $\frac{1}{4}$ inch. The spar posts of the rib carried angle plates of duralumin for attachment to the spars. The whole rib formed a clean stout durable job.

Nearby, duralumin ribs were being assembled. The flange is of two L sections placed back to back ; web tension members are of flat-sided C section, and web compression members are of two C sections back to back.

In this same shop were several small mechanisms, for example, one for giving curvature to rib flanges and another for squaring the circular ends of tubes. This latter had two circular discs, of thickness $1\frac{1}{4}$ inches and diameter about 5 inches, with blunt pointed V grooves in their rims; the turn of a handle squares the circle by driving the tube end through the grooves.

In all these minor operations the aim is to plan a scheme which avoids the need of heat treatment.

The machine for rivetting spars stands nearby. At critical points in the spar a circular liner some 6 inches long is slid into the boom, and the cup rivets, which are elsewhere at 1-inch intervals, are here spaced at $\frac{1}{2}$ -inch intervals. The man clinching the rivets is assisted by a boy 6 feet 1 inch long, sitting on the floor underneath the horizontal spar and pushing a pair of rivets upwards every two seconds. The suggestion was offered that for afternoons the machine should be inverted and the boy suspended from a hammock to put a reverse curvature into his "aeroplane-neck."

On this floor we met an ex-apprentice, A. E. Whitmarsh, late of 25 FI; he was satisfied with his work, pay and prospects.

The steel jigs for the assembly of a complete wing or a centre section are most massive. One of them was of $2\frac{1}{2}$ inches by $2\frac{1}{2}$ inches by $\frac{1}{2}$ inch angle bar braced with $\frac{3}{4}$ -inch tie-rods.

Further east on this floor were an enormous oven for stove-baking

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enamelled and japanned articles, and a big degreasing plant. Degreasing is necessary where paint has to be applied. Most duralumin is spray painted for protection against corrosion. The aforementioned use of rollers instead of dies on draw benches greatly lessens the amount of grease to be extracted. The plant can degrease a suit of old overalls in one minute.

In a bay to the south-west were some dozen girls sewing Irish linen on to main planes. Every stitch is fixed by a knot. Their speed made it impossible to see what they did. One very proficient girl who had been on this job for over eight years was asked by the foreman to go slowly to demonstrate the movements. She could not go slowly.

It was at this point we particularly noted the rigidity and strength of the wing tips, things which a few years ago were invariably delicate and ailing. Thereupon our guide pointed out the excessive robustness of the whole airframe, which he credited to naval co-operation. The sailor man is hearty and breezy and insists on sticking his hooks and grappling irons just anywhere when taking a seaplane aboard. If the unlucky bit is weak, it just comes away.

On our second afternoon we had an hour's quiet talk with a "stressmerchant," who informed us regarding more recent Air Ministry requirements in loading and strength calculations, particularly for sea-going craft. In his opinion the firm have a general average reserve factor of safety of 1.1, that is to say, for example, where a front spar must be capable of standing 7.5 times normal loading, the firm makes it to stand 7.5 \times 1.1. or 8.25 times normal loading. But the sacrifice of this ten per cent. margin in structural strength would save only some one to two per cent. in total weight.

The final item of our visit was to a separate building where cadmium and chromium plating, anodic treatment, and salt bath heat treatment are done.

Our thanks are due to the Air Ministry for planning this visit and to Messrs. Hawker for the warm welcome we received. Their works manager, Mr. W. H. Mace, and his assistant, Mr. Sellars, gave much time and care to explaining to us the firm's methods and processes. Mr. Mace is well known to many past and present Halton apprentices whom he has from time to time kindly welcomed to Messrs. Hawker's factory.

L. C.

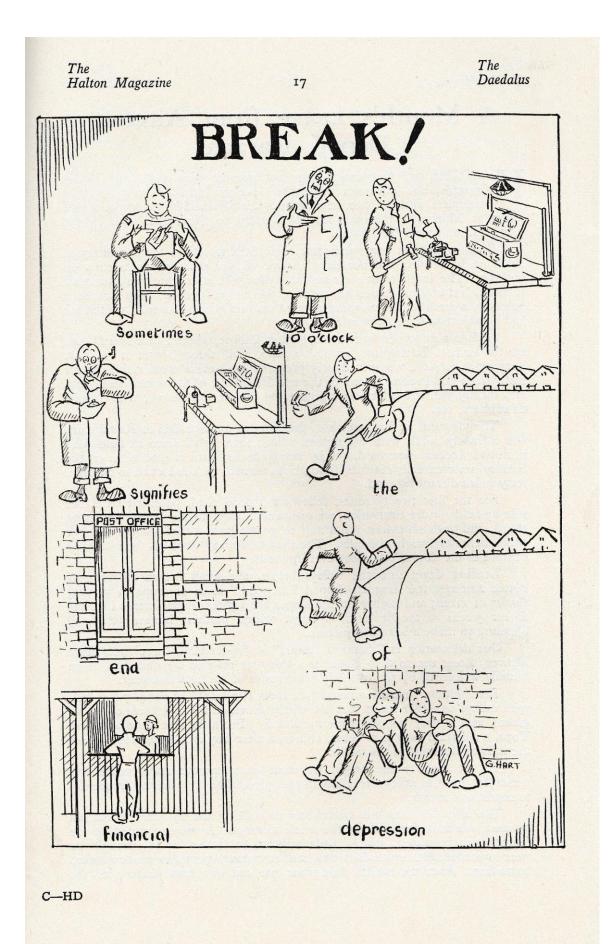
Re-written Rhymes

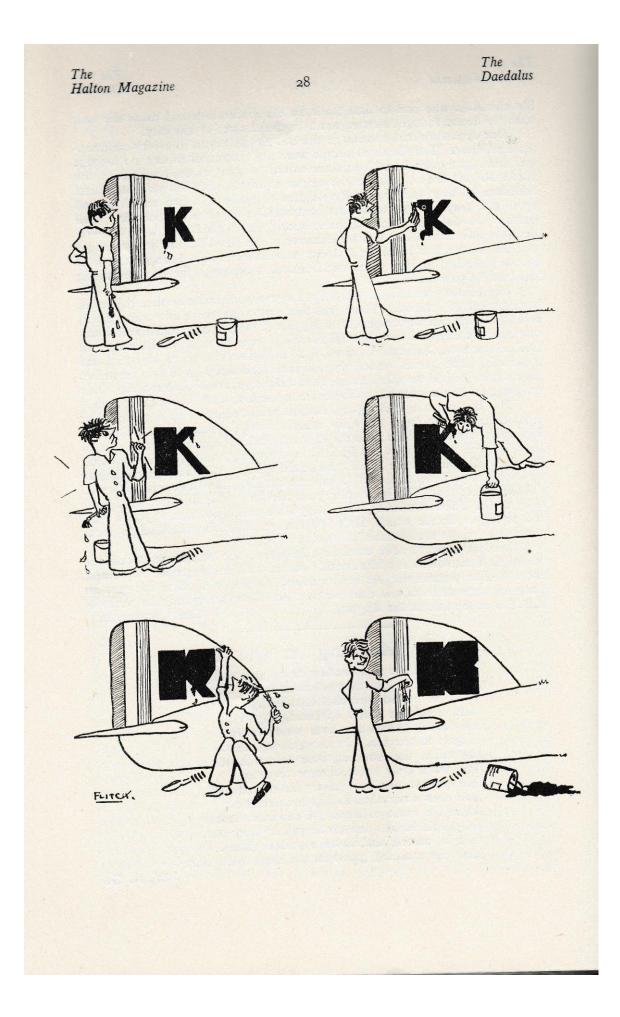
Little Miss Muffet sat on a tuffet, Wishing she had a beau. A young man espied her, And sat down beside her; Now it's little Miss Muffet and Co.



Fig. 1. The Hawker High Speed Fury doing a steeply banked turn. The maximum speed of this aeroplane in normal flight is 250 m.p.h. Photo by "Flight,"

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A British Sailplane Achievement

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On September 4th this year, F/Lt. G. M. Buxton, R.A.F., broke the previous height record for a sailplane. The following account of his achievement and the illustrative blocks are reproduced from "The Sailplane and Glider" by the courtesy of the Editor.—EDITOR.

ND then-came the storm.

A The trouble at first was that there had been a false alarm the day before. On Monday morning, just after the passage of the trough, a line of towering cumulus was to be seen all along the Pennines. Tired pilots were routed out of bed. But though the cloud tops slowly grew in angular height, they never got any nearer.

This time it looked at first like the same thing again. But soon there was no mistaking it. It was getting nearer, bigger, darker, and was sprouting anvils all along the line. Thunder growled in the north. There was no time to be lost. The RHONADLER, which had been put away, was hurriedly slapped together again ; Buxton rushed across with the SCUD to the south slope, and Dewsbery turned round to find the BLUE WREN placed invitingly beside him.

The GOLDEN WREN pilot decided that such things were not for him, and landed to give the others air. They were soon up in it, but there was none too much wind, and Robertson, who had also gone up in the PROFESSOR, lost height and landed below. Buxton, too, thought he might lose it, and shouted down for landing space on the top.

The air all this time had been quite smooth (" like cream "), and all three pilots were between 100 and 200 feet above the hill, and apparently very much in each other's way. But then it freshened and took on a slight roughness, and all began to rise a little. Collins began circling, and Buxton, while beating to and fro, went slowly up at 1 or 2 feet a second, then faster, and when at 600 feet he felt a drop of rain.

The storm cloud was now coming over. Since the pilots were all above the south slope, facing south, the dirty weather approached them from the right. The line of the storm, which ran almost due north and south, was edging sideways towards them.

At about 700 feet Buxton saw a small ragged cloud in front of him and went up through it. Collins at this time was getting lift from the storm over Roulston Scar, at the right-hand end of the south slope ; he went up through some fluffy bits of cloud which formed a flattish tongue or shelf in front of the main cloud. Dewsbery, meanwhile finding lift at 3 feet per second, flew away to the west slope of Sutton Bank, along what appeared to be the storm front. He then noticed Collins away to the east, evidently doing well, so flew along and joined him, finding improved lift as he went along : I, I_2^1 , 2, increasing to nearly 5 metres per second. We will leave them there together while we return to the lonely Buxton.

Buxton went up inside the cloud at 10 feet or more per second. He could just see his wing-tips. The ScuD whistled as if it was doing something wrong, although still rising, so he put the nose down and, doing 50 m.p.h., came out and saw a road performing evolutions below. This enabled him to straighten himself out, and he recognised the Hambleton Hotel. About this time also he caught sight of the WREN.

He then flew along under the black cloud deciding what to do next. He was going east at 40 m.p.h., after which he turned north along the "front," keeping before it. A lift of 2 feet per second soon turned into a drop of I foot

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per second, so he decided to have a "nibble" at the cloud. It was no nibble, but a mouthful. Once inside that cloud he never got out again till he had broken the British height record. While in the cloud, the chief need was to avoid spinning. An incipient spin was indicated if pulling back the stick increased the speed. He also looked round at the rudder to see that it was straight. He kept the speed at 40 m.p.h. to avoid spinning. Nevertheless, he must have been going round in wide circles, as the cloud got alternately darker and lighter. The lift all this time was between 5 and 20 feet per second.

At 5,000 feet there was a momentary wavering as Buxton made what he calls "a pitiful attempt to get down," but soon he was roaring up again, this time at what must have been quite 40 feet per second, since the variometer indicator had gone right round the dial to the zero mark again. Then he came out at last, having reached well over 7,000 feet, into a space bounded by white masses of cumulus piled high all round, shining in the sun. Here he must have been in a strong down-current, probably at the rear of the storm, for he sank rapidly. To the west it was very clear, as rivers, towns and hills came into view, lit by the setting sun ; he recognised Ingleby Greenhow in the distance. Then it occurred to him that f_2 was waiting to be won, so he set off northwards and reached Middlesbrough, where he saw the complete circle of a rainbow. Coming down from 2,000 feet at about $2\frac{1}{2}$ feet a second, he finally landed in a stubble field at North Ormesby, $22\frac{3}{4}$ miles due north of the start.



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As Others Read Us

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FROM THE 1934 RECRUITS' ESSAYS ON "WHY I WANT TO JOIN THE R.A.F." These Extracts were collected by the Editor of the "Journal of the Royal Air Force College," and it is through his courtesy that we are permitted to reprint them.—ED.

"... It is also a *healthy* open air life, therefore increasing my physical as well as moral capabilities."

"What can a man do better . . .? "

"I have already been in an aeroplane and was very well pleased with the experience."

"To work hard and help my mother who is a Widow and also those who are in charge of me that I may be able to get round the World and see the ways and customs of people, also I think the life will do me good."

" I think it is a good thing to be in the Superior Branch of the Army."

"... because I shall be related with the world's future science, flying. ... My chum is in the R.A.F. and stationed near Wendover, Bucks., and I should very much like to get out there with him."

"... it is much better than walking the streets doing nothing."

"... because civil life is not exciting. Perhaps if the examiner just knew my father who is a late W.O. in the Guards he would quite wonder why I am alive and pass my handwriting as I am just wondering what he is saying about me now."

" Is a chance of seeing a bright future and a better living from my past life."

"... I want to avail myself to work of National Importance ... I tried to enlist in the R.N. and was informed that they were only taking stokers and did not want to spend the majority of my time practically speaking under the water, and lastly the Posters issued by the R.A.F. were calling for more men and I wanted to make the number up."

"... I have not tasted any food to-day so something has got to be done." (He borrowed 5s. from the Recruiting Officer and then vanished !)

"It is an open-air life which helps to build me up while not under doctors or taking physic. . . . "

"I cannot find suitable work as an actor in civilian life. When one pays daily visits to the various agents one hears the same old tale, nothing doing,

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and this happens every day. It is a life wasted. I have looked back on my Army life in the past. I have pleasant memories. There are no worries to contend with in the Army. Everything is found for you. The Air Force is a branch of the Service of which every Britisher is proud because of its splendid work during the Great War. I should be proud to become an R.A.F."

"... There is also what might be called a ' Plum '-namely a pension."

"... as I have had too much confinement in my past life. I am without friends and presume that I could find a friend by joining this service."

"... the life appears to be conducive to good health and the surroundings generally are much nearer the ideal than obtained in living and working in the crowded and congested cities of to-day."

"... it is a genial life."

"... the life will I think harden me to the buffets and hard knocks that one has to grow accustomed to in the present day world. It will widen my views and the different men I shall perhaps meet will teach me to understand mankind more clearly."

"... I should like to join as a cook but if there are no vacancies I don't mind doing a job of hard work."

The Heath at Martlesham

Up from Deben river, where the sails come home On the tail of the tides, Creeps the thin grey mist, Kissed by the golden dusk.

Gently afloating, the elfin wisps Cover the cooling heather Where the bats flitter, And rainbow hues glitter In the dewdrops falling on the bracken In the silv'ry light of a sickle moon.

Here starts a rabbit, While there a curlew Rising from the heath, calls with its rippling call, And wings toward a slender larch,

And I in my dewy bower Await the mystic hour When the lady of April, in daffodil dress Will hasten by To be gone for ever,— For the footsteps of May draw nigh.

A. ROWAN.