

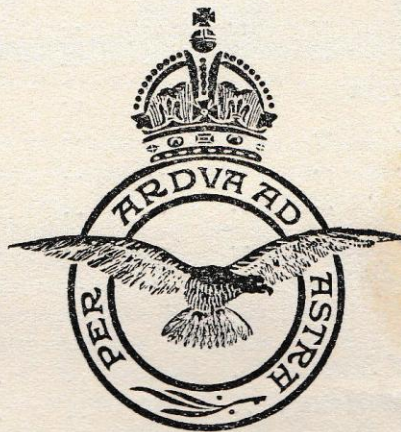
The Haltonian Magazine and the Daedalus

Volume 6 No. 1

Summer 1934

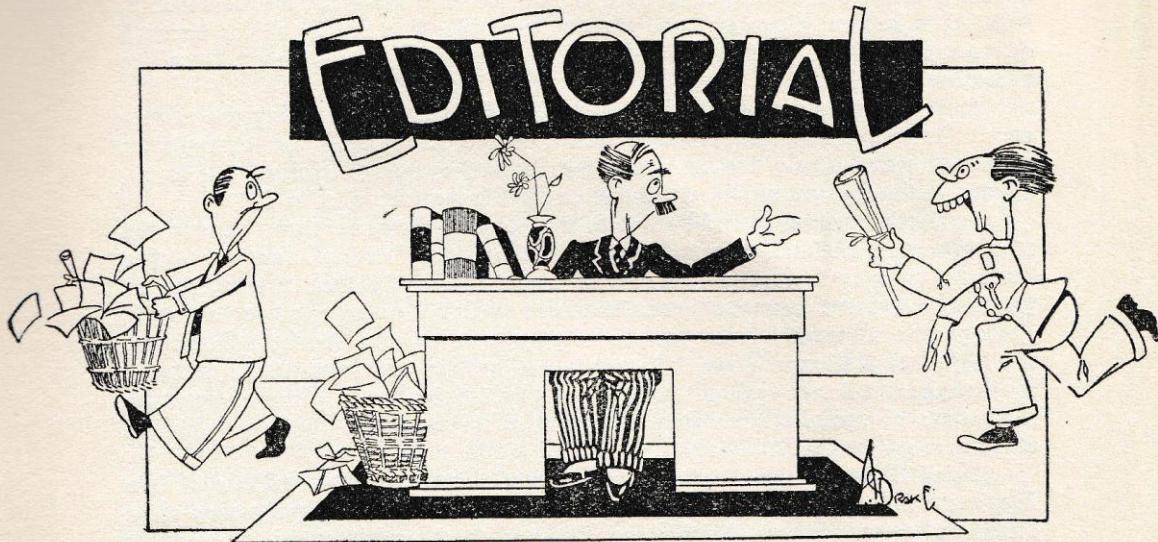
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THE
HALTON MAGAZINE
AND THE
DAEDALUS



VOL. VI, No. 1

SUMMER 1934



TEN years ago the first number of the *Halton Magazine* appeared. The *Magazine* was planned in the fertile brain of Captain A. B. Fanstone, A.F.C., and it was he who bore unaided the tremendous burden of initiation and editorship for the first year of production.

Dr. I. B. Hart, O.B.E., took over Captain Fanstone's arduous duties from Easter 1925, to Christmas 1926, and from that date to the end of 1928 Captain S. P. Smith occupied the Editorial Chair. On the amalgamation of the *Halton Magazine* and the *Daedalus* the late Principal Education Officer, Lieut.-Col. A. F. S. Caldwell, C.B.E., D.S.O., carried on till his retirement from the Educational Service in the summer of 1932. For the rest of that year and until the summer issue of 1933, the present Principal Education Officer, Dr. A. H. Robson, M.C., was Editor. These years of trial and experiment have shown that the venture was wisely planned, and though in the matter of numbers the early promise has not been maintained, it is the belief and hope of all those now responsible for production, that in the matter of quality little falling off is to be noticed.

This brief history of past achievement is, however, best told by some of the previous editors, who, in response to an invitation have given their experiences—unhappily Captain S. P. Smith's whereabouts could not be ascertained, and Colonel Caldwell characteristically disclaimed any share—but from Captain Fanstone and Dr. I. B. Hart the following messages have been received:—

When an institution has been going strong for ten years, I suppose it is rather gratifying to be called its founder. Yet it is easy enough to start anything. The important thing about a rocket is not who puts the match to it, but the length and height of its flight, and that depends purely on the quality of the rocket.—Well the *Halton Magazine* is still soaring high.

Here's to ten more years of good flying!

Twenty-five numbers have now been produced—thirty hundred pages of print—a printer's bill of six thousand pounds—countless hundreds of hours of patient work (I well remember the ordeal of wading through the hundred and thirty contributions sent in for the first number!) and all to what purpose? In a wistful mood I have just dug out the first number—Easter 1924.—Here are the first words on the first page: "A new-born

babe has a habit of thrusting himself on people who are quite uninterested in him. We believe, however, the *Halton Magazine* is a sturdy child, born in due season and not unwanted. May it live long, and ever be a credit to the proud name it bears!

"In the great drama of 'Halton' this *Magazine* has to play the name-part. It seeks to portray Halton in every mood. Halton the care-worn; Halton the care-free; Halton the grave, Halton the gay; Halton. If it can do this faithfully, yet withal artistically, it will have served its end."

And what was that end? If one may humbly say so, it was an attempt to implant in Halton that indefinable "something" which for want of a better term may be called the public-school spirit. Within a year, and in pursuit of this endeavour, various societies sprang into being: the Debating Society, the Dramatic Society, Model Engineering and Aircraft Societies, the Annual Belgian Tour, visits to Parliament and elsewhere, lectures by distinguished men—all of these have played their part. Good as were the large days of 1924, with over two thousand Apprentices, the small Halton of 1934 is a "larger" and a finer Halton.

Since I wrote the words above quoted from the first volume of the *Magazine* a score of Entries—some seventy-five hundred Apprentices—have come and gone. Halton has left its mark on them and they have left their mark on Halton. In both processes the *Halton Magazine* has played its part—I'm quite sure it always will.

A. B. F.

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The reminder from the Editor that the *Halton Magazine* has just completed the first ten years of its life brings many significant memories to me. To an Aircraft Apprentice the term "generation" implies a matter of three years. Therefore to the Haltonian of the moment, I am a stranger. Yet in as much I was once the General Editor of the *Halton Magazine* I not only appreciate the courtesy of the present Editor inviting me to take this small share in the inauguration of the second decade of its existence, but I can also claim kinship with the present generation of Aircraft Apprentices in that they will soon become, like myself, an Old Haltonian. They will then inherit that *Daedalus* portion of the *Magazine* which, in my time, had a separate and a vigorous existence under the editorship of that stalwart Old Haltonian, Mr. D. E. Williams, who is at the moment our Chief Education Officer in India, and to whom I convey, through the medium of this note of memories which, I take it, he is bound to read, my message of "Happy Days."

But this is not the only inheritance of the present generation of Aircraft Apprentices. With his "Passing Out" in due course he will inherit the tradition of Halton which the *Magazine* has, through the years, done so much to place on permanent record. For, after all, the *Halton Magazine* is, and always has been, a consistently fine production, largely because it reflects, and has reflected, the life of a consistently fine institution—HALTON.

It was in January of 1922 that I accompanied Colonel Caldwell (have you forgotten him?) from Cranwell, to help to start Halton, as a School for Aircraft Apprentices. We actually received our first Entry of Apprentices at Easter of that year, and on the staff there came to join us Messrs. Wingham, Farthing, Neville, Garrard and Laidler. It took us, perhaps, the first two years to emerge from the uncertainties of infancy. We then began to develop a sense of destiny—a feeling that we were finding and earning an increasingly vital place in the sun.

Clearly this was bound to find the outlet of self-expression. That arch-breeder of fertile brain-waves, Captain A. B. Fanstone, had been posted to us from Cranwell, and it was he who bred the idea of the *Magazine*. He

did more—he put it through. As the Founder Editor he surely deserves well of Halton. There were no half measures about it. If Halton was to have a magazine, it was going to be the best ever. And so it was. Paper, print, covers and contents all started with a bang as the best that could be obtained. Even the charges for advertisements were princely.

One can fairly claim that from that moment the *Halton Magazine* has never looked back. When I took over the reins of editorship from Captain Fanstone, I embarked upon an uneventful period of *Magazine* prosperity. Our circulation ran up to five thousand, our advertising takings exceeded £100 per issue (largely through the energy of my old colleague, Mr. W. Laidler, in the rôle of Advertising Manager), and there was no lack of material to fill the hundred or so pages that constituted each issue.

One other matter, I think, fairly calls for mention. Working quietly behind the scenes there was (and is) a helpful body of advisory workers who kept us to the straight and sane path—the Aircraft Apprentices' Advisory Committee—under the wise and stimulating lead of Mr. Kermodé. As the Editor of those days I say definitely—and I feel sure my successors will agree with me in this—that amid that vast host of services for which Halton must ever remain indebted to Mr. Kermodé, his quiet efficiency as the Chairman of this important Committee is by no means the least.

And so now the *Halton Magazine* proceeds to the eleventh year of its publication. I tender to it, and I tender to Halton, my sincere and heartiest congratulations. And I hope that in Easter 1944 the Editor will write to me again to note the passing of the years and the inauguration of yet another milestone issue of his fine publication.

I. B. H.

To mark the occasion of the conclusion of ten years' publication, Air Vice-Marshal H.R.H. The Duke of York was graciously pleased to allow the publication of his photograph.

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During the last two years the *Magazine* and the R.A.F.O.B.A. have become practically one organisation, pooling their financial resources, and in the present issue a balance sheet is published. This will show how deeply the effect of the reduction in the number of Aircraft Apprentices is being felt, and it must be to the ex-Apprentice that the *Magazine* must increasingly look in the future for every kind of support. In 1924, when the *Magazine* was published thrice yearly, 15,000 copies were sold; in 1929, when amalgamation with the *Daedalus* was carried out, the twice-yearly issue amounted to 12,000, whereas only 7,500 copies were sold in 1933. This drop in revenue is a serious matter, especially at a time when expenses, particularly in connection with the Employment Bureau, steadily increase.

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During the year the R.A.F. in general and Halton in particular have suffered a heavy loss by the death of Air Vice-Marshal F. R. Scarlett, C.B., D.S.O., who died at Andover. After service in the South African War he learned to fly—his Royal Aero. Club certificate being number 468, dated April 24th, 1913. From the C.F.S. Upavon, Commander Scarlett was appointed to the first Aircraft Carrier H.M.S. *Hermes*, and in 1914 commanded all the seaplanes of the R.N.A.S. concentrated at Calshot. In 1915 he went to the Admiralty on the Staff of the Air Department, proceeding in January 1916 to the Eastern Mediterranean in command of all ships and Units; for his services in this area he received the D.S.O. In 1918 he returned to the Admiralty as Director of the Air Department War Staff. Receiving a permanent commission in the R.A.F. in 1919, he commanded at Halton as Air

Commodore from 1920 to 1924, when he was promoted Air Vice-Marshal, commanding Coastal Area. For nine months in 1928 he acted as C.-in-C. Air Defence of Great Britain, subsequently commanding Middle East Command till his retirement on December 31st, 1931.

For the first time in its history, the R.A.F. is to be open to the inspection of the public. Empire Day, May 24th, has been selected, and Halton is one among many R.A.F. Stations to which access is permitted.

It is with deep regret that we have to record the deaths of:—366455 L.A.C. Woolley, G. W. (12th Entry); 562417 L.A.C. Beatty, C. D. (18th Entry), and Flight Cadet W. H. Kelk (23rd Entry).

Our congratulations to 363389 Cpl. R. W. Ellis, D.F.M. (18th Entry), on being awarded a Bar to the D.F.M. for distinguished service at Risalpur, and to 560994 P/Sgt. Herniman, A. E. (14th Entry) on his escape when his machine crashed into the sea at Singapore.

Mr. E. C. Classon, well known to all O.B.A. members as the founder of their Association, has retired from the Service this year. Entering the Service in 1922 he was at Halton till Easter, 1927, proceeding to India. He returned to England in 1931, and from that date was Station Education Officer at Kenley. We wish him all good fortune in the future.

L.A.C. Dunn, G.W.M. (10th Entry), has recently published a volume of verse entitled *Poems, Group I*. We congratulate him on his effort and take some small pride in the achievement, since he has been for many years a valued contributor.

Nor here would it be out of place to record our thanks to those many ex-apprentices who have regularly assisted the Editor with drawings, verse and prose. Without their ungrudging help, this magazine would indeed be hard put to it!!

The following were honoured in the King's Birthday Honours List:—
O.B.E. (Mil.): Wing Commander A. Shekleton, D.S.O.
M.B.E. (Mil.): Warrant Officer Herbert James Crane.
A.F.M.: 364249 Sgt. (Pilot) E. N. Rooms (Cranwell 1923 Entry).
Our hearty congratulations to all concerned.

Congratulations to 564353 A.C.1 Gaskell, G. E., on winning the R.A.F. Rifle Shooting Championship, together with the Sutherland Challenge Cup. His score was 325.

Halton were third in the Station match between Andover and Henlow. One consolation was, however, that A.A. Stephens (No. 1 Wing) scored the highest total with 166 out of 200.

In the Apprentice Cup, B Squadron, No. 1 Wing were first. C Squadron No. 2 Wing and Record Office, Ruislip, tied for second place.

The following were granted permanent Commissions in the R.A.F. in May, 1934: 365652 P/Sgt. Barrett, A. W. B. (11th Entry); 362962 P/Sgt. Lewis, C. G. R. (2nd Entry); 364915 P/Sgt. Maxwell, V. E. (4th Entry) and 364864 P/Sgt. Johnson, A. F. (4th Entry). To all concerned we offer our best congratulations.

Flight Cadets C. C. Francis and A. T. D. Sanders, of the 19th Entry, who recently completed their training as Flight Cadets at the R.A.F. College, Cranwell, were commissioned as Pilot Officers in December, 1933. C. C. Francis won the Aeronautical Engineering Prize, the Abdy Gerrard Fellowes Memorial Prize and the J. A. Chance Memorial Prize.

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Our best congratulations to the following of the 23rd Entry on selection to Cadetships at the R.A.F. College Cranwell: A. R. Atkins, E. J. Bunting, W. H. Kelk. The Lord Wakefield Scholarship was awarded to A. R. Atkins. The Elliott Memorial Prize was divided between Cpl./App. Witty and A/App. Foad.

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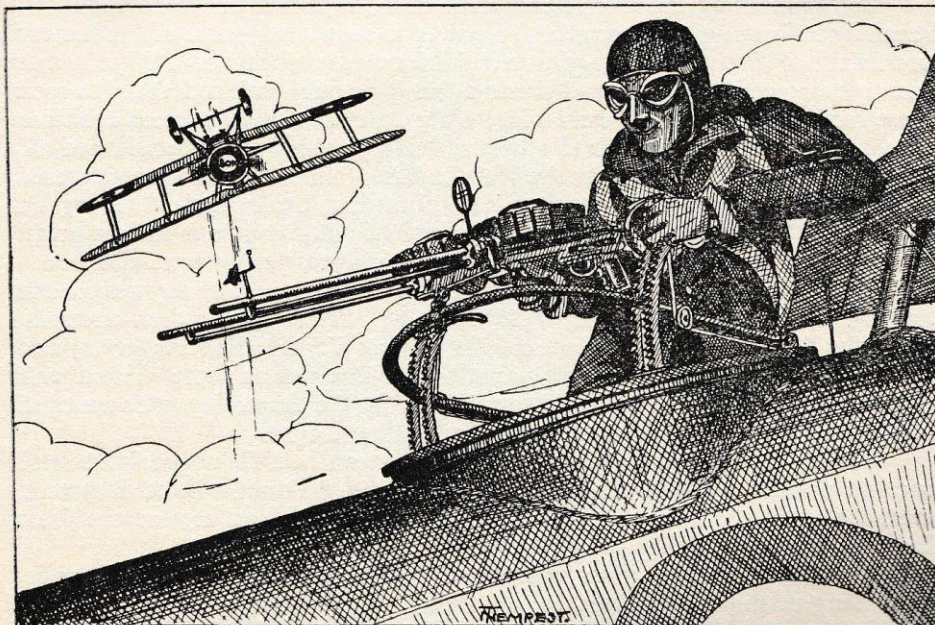
The *Magazine* is heavily the loser by the departure of Mr. F. J. Sanger, who leaves us on appointment to a new post in Shanghai. He has most ably conducted the Competition Section of the *Magazine* for the last two years. We wish him the best of luck in his new job. Mr. H. A. E. Gard, D.F.C., the Hon. Secretary and Treasurer of the O.B.A., is also leaving the Station, on posting to the Aden Command. The best tribute to Mr. Gard is the work itself, and every member of the O.B.A. will wish him good luck overseas and a quick return—if possible, to Halton—where he will, it is hoped, resume his old activities in Room 26!

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To the 24th Entry we say "Au revoir" and the best of luck. They are the last of the large entries and they have more than pulled their weight. We hope it will not be long before we see them back again on the Conversion Course.

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All members of the O.B.A. are especially asked to take notice of the announcement appearing on page vi of the advertisement columns.



THEY ALSO SERVE, WHO ONLY STAND AND WAIT.

1924—1934

Robustly through a full decade
The *Halton Magazine*
A brisk and worthy part has played
Upon the Halton scene.

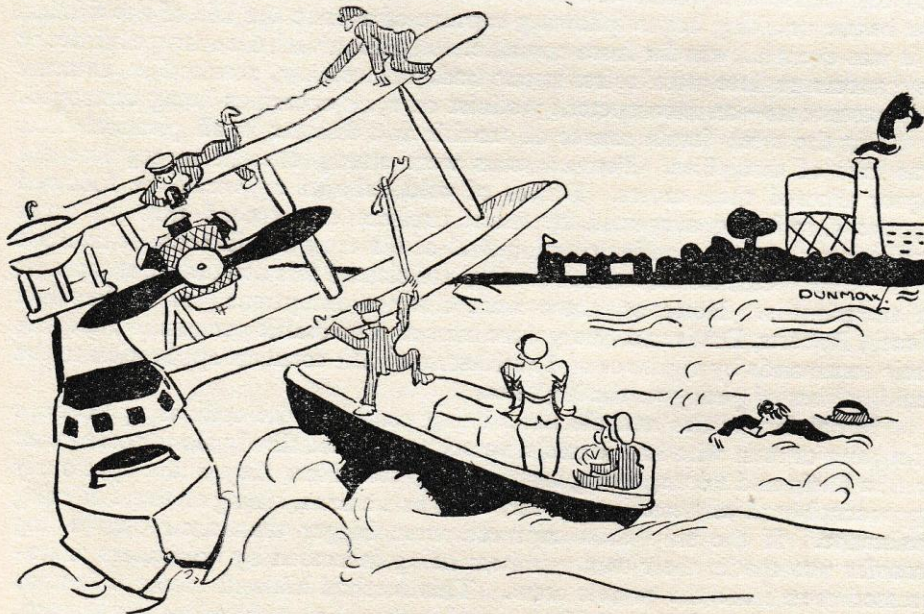
A flair for humour, records, news,
Has served it well enough,
While year by year the Halton Muse
Has gamely done her stuff.

Ten crowded years of glorious type,
Of pictures, prose and song,
Crown the endeavour, and, by cripe!
Find it "still going strong."

Where'er the Air Force Blue is worn
'Twixt here and Singapore
The Halton greeting still is borne
To those who've "gone before."

And this at least we'd have them know
Whom seas and deserts sever:
While Entries come and Entries go
The *Mag.* goes on for ever!

C. L. M.



OR DIFFERENCES IN MAG-TIMING.

Ten Years Ago

TEN years ago Vol. I, No. 1 of the *Halton Magazine* saw the light of day, hatched, appropriately enough, at Easter; 5,000 copies were bought by an expectant public.

Copies then cost 10d. each to produce and were sold for 6d., but this apparent deficit was more than covered by advertisements. In those days local tradesmen went far towards paying for our copies, and if they are to continue to do so, it is for us to show them the truth of the saying that it pays to advertise.

The first number extended a farewell to Air Vice-Marshal F. R. Scarlett, C.B., D.S.O., who handed over the Command just ten years before his sad death this Spring.

Air Vice-Marshal Scarlett, Air Vice-Marshal Lambe, Air Commodore Bonham Carter and Air Vice-Marshal MacEwen have in turn commanded Halton during these ten years, and it is due in no small degree to their encouragement that the Magazine has lived and prospered.

Much water has passed under the canal bridge during the past decade, and although Halton Camp has undergone great changes, the movement of time has been scarcely more noticeable than movement in the local waterway.

So it may be noted that original entries were split, as they are now, between two Wings, or Sections as they were called "way back." Under this arrangement, before leaving barracks in the morning, the Apprentices or Boy Mechanics, lost their Wing identity, and Workshop and School training were carried out on the bulk system.

A change was made when the Boys' Wing, stationed at Cranwell, migrated south and joined forces with us at the end of 1926, and under the new system complete entries were posted to a definite Wing, and "Wing" Schools and Workshops were formed. To-day the wheel has turned full circle and the splitting of entries between Wings, reintroduced in January, 1932, is really a partial return to the old order of things.

Although those who have watched Halton's growth may notice little of the changes which have taken place, those who knew the Camp only in 1924 would be amazed. No swimming bath, no Stadium, no cricket ground! These were constructed during the next year. Nor was it only of exercise that Halton was then thinking. While the cricket ground was being laid out, the new School buildings were going up, and in 1927 H.R.H. Princess Mary opened the Hospital, and not before it was needed.

All tastes had to be catered for. In 1925 the Model Aircraft Club was formed, under the leadership of Mr. E. G. A. Neville. The Light Aeroplane Club also, which did six years of excellent service, including the construction of a machine which won numerous competitions all over the country, was started by Messrs. Needham, Cullis and Kermod.

In the same year Captain Fanstone founded the Debating Society, of which he is still the presiding spirit, and in 1927 he and Mr. Kermod conducted the first of those delightful tours of the battlefields, which have become such a popular feature of the Summer leave.

Eight years ago the Old Haltonian Association was formed and reached a membership of 900 in the first twelve months of its existence. To-day our numbers exceed the two thousand mark.

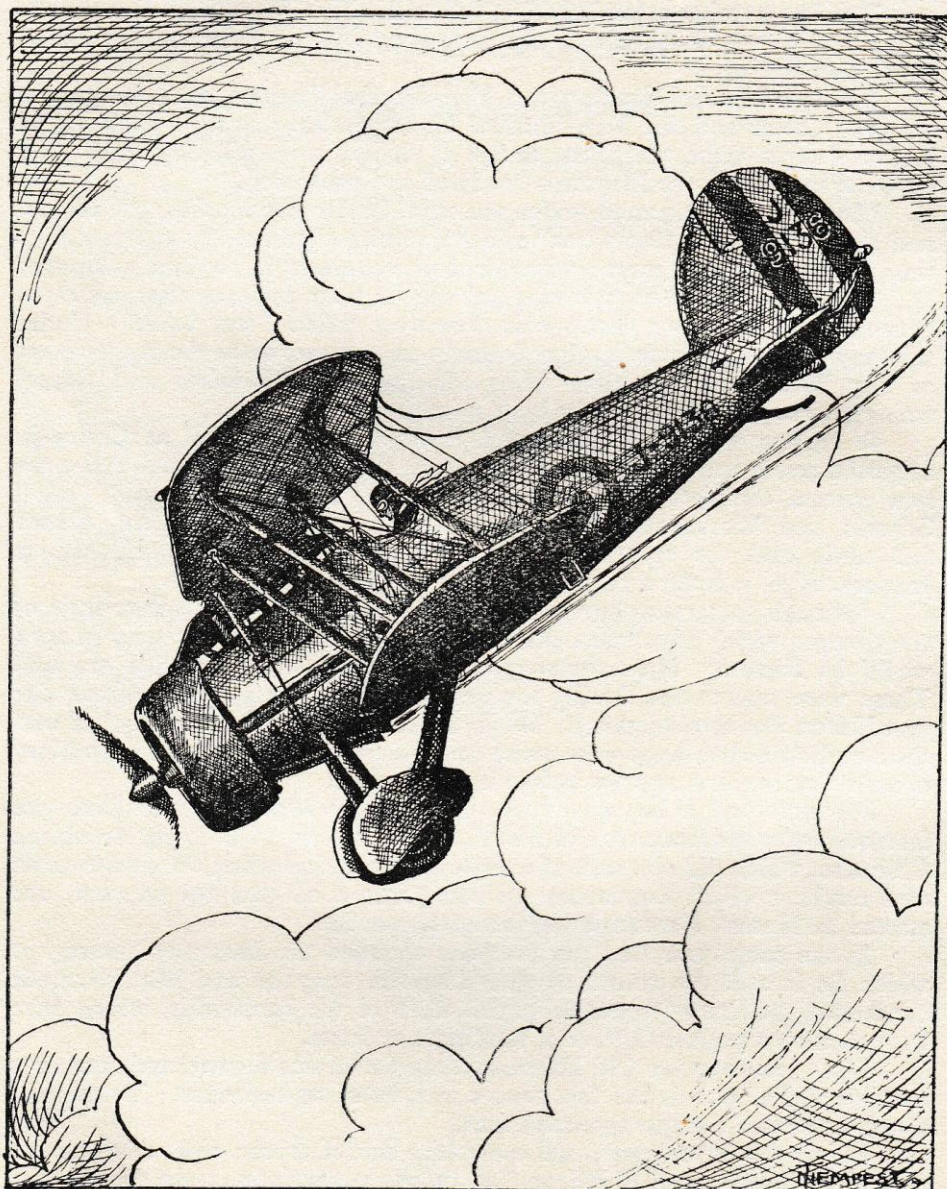
People that say money is not everything are, of course, right; but money stands for much, and if Halton has failed to continue in its growth and vigour it has certainly bowed gracefully before the demands of the National exchequer.

The closing of No. 4 Wing was a sorry business. Whereas the January, 1934 entry numbered some 180, the January, 1924 entry had been 665 strong!

Halton has been strengthened materially by the formation of the Conversion Course, which will include more and more ex-Halton boys as time goes on.

As regards numbers, Halton now, we hope, touches rock bottom, but numbers are not everything. Quantity does not affect quality, and as to which is the better there is no possible doubt.

J. B. N.



THE GLOSTER GAUNTLET.

The Conquest of Space

The writer is President of the British Interplanetary Society and the Editor wishes to take this opportunity of thanking him for his courtesy in writing the article and for the photographs here reproduced.

I NEED hardly remind readers of the *Halton Magazine* and the *Daedalus* of the pains which attended the birth of the aeroplane. It required many years of abortive effort before this child of the air finally emerged, to the bewilderment of an incredulous world. Indeed, even after the first successful flights had taken place, the general attitude was that of the man who, when shown a kangaroo for the first time, exclaimed: "There's no such animal!"

The reason for this is not far to seek. For many years past, experts—so-called, and not always self-styled—had "proved," time and time again, that heavier-than-air flight was impossible. And while the mathematical giants bellowed that an aeroplane would flout all the laws of nature, moralists screamed that it was contrary to Divine intention; that had it been intended that man should fly, he would have been born with wings—and perhaps, one is tempted to add, a propeller and an engine also. From which we may safely deduce that man knows next to nothing about the laws of nature, and still less about intentions Divine.

To-day, precisely the same attitude exists towards the idea of a vessel capable of traversing space. Such a suggestion, in other words, is looked upon as a fantastic dream of Satanic proportions. You may find it hard to believe, but when I visited Herr Willy Ley, the famous rocket experimenter, in Berlin last January, he told me that a delegation of priests had recently visited him, demanding that he ceased his ungodly work forthwith! Only the absence of the scent of frying astronomers shatters the illusion that this is the sixteenth, and not the twentieth, century.

One of the greatest arguments in favour of space travel is that so very few people believe that it is possible. History fully supports this contention. To-day, we are surrounded by the "impossibilities" of yesterday—aeroplanes, wireless telegraphy, the telephone, and countless other devices which are none the less wonderful merely because they are now taken wholly for granted. To-morrow, for a certainty, we will be surrounded by the "impossibilities" of to-day. Space ships, for example. And the curious thing is that when they *do* come, everybody will declare that they believed in them all along. I have yet to meet the man who will admit that he did not believe aeroplanes were possible!

Exactly how old the idea of interplanetary travel is no one can say. Lucian wrote a moon comedy nearly two thousand years ago, and accounts of lunar voyages have appeared from time to time ever since. In the light of modern knowledge, however, the majority of these accounts appear only as extravagant fiction. Even in recent times, H. G. Wells, in *The First Men in the Moon*, was reduced to the rather doubtful artifice of an anti-gravity screen as a means of locomotion through space. Jules Verne, on the other hand, about half a century earlier, in his famous story, *From the Earth to the Moon*, actually had the truth of interplanetary propulsion in his grasp without knowing it. For he shot the ship in his story from a gigantic cannon sunk in the earth. He did not realise, however, that what little remained of the occupants after the effects of such terrific acceleration, would soon be cremated when the ship burst into flames as a result of its meteor-like flight through the atmosphere.

By a curious coincidence, the first really scientific theory of space travel was advanced in the same year that the first aeroplane left the earth on its

spews forth gaseous bullets instead of solid ones. And, paradoxical though it may seem, a rocket motor will function better in a vacuum than in an atmosphere, because the presence of air will tend to retard the velocity of the exhaust gases, on which the speed of the ship is dependent.

But although there is no doubt about this, reaching space is not merely a matter of constructing a rocket ship, pointing it skywards, and firing the rockets. There is the earth's gravity to be taken into account. Contrary to popular belief, a rocket ship could not just set off, say at 500 miles an hour, and continue straight on its journey until "free" space was reached. At such a speed the ship would not escape from the earth at all. Its course would inevitably be a curve.

Calculations show that in order to overcome the earth's pull, a minimum velocity of seven miles a second is required—slightly more than 25,000 miles an hour. And here we meet with yet another popular misconception most difficult to dispel. The human body, it is averred, could not stand the strain of such a speed. Let me say here and now that this is rubbish. When the locomotive was invented it was confidently predicted that man would be incapable of surviving speeds of thirty miles an hour and over! The aeroplane, more than any other machine, has exploded this myth. Even so, few are inclined to believe that a speed of seven miles a second could be safely achieved. We have been crawling about the face of the earth for so many years that relatively high speeds are universally regarded with the utmost suspicion. As it happens, however, it is simple to expose the fallacy on which this widespread misconception is based. Ever since his existence man has been hurtling through space at over 66,000 miles an hour on account of the speed of the earth in its journey round the sun alone!

There is, however, a very real danger attached to the speeds which interplanetary travel demands—acceleration. Though the ultimate velocity which the ship attains—be it hundreds of thousands of miles an hour—matters not, the time taken to attain that velocity is very important indeed. Delayed falls from aeroplanes have proved that an acceleration of 32 feet per second per second can be safely borne. In a rocket ship, however, this will have to be increased, for various reasons, at least four times as much. Can the human system stand this? The answer is that it can. With characteristic thoroughness, the German rocket experimenters set out to test the human body in this respect. By means of giant centrifugal machines, several of their members were tested up to 5G—160 feet per second per second—for a period of nine minutes.

So far, so good. A rocket ship would first roar through the earth's atmosphere at a safe, but gradually accelerated, speed, until the air thinned out into the vacuum of space. In this way, there would be no danger of the ship being burnt up through friction. Then, on the fringe of frictionless space, the vessel would be steadily accelerated at 4G or so until a speed of seven miles a second was attained.

But—can we achieve this speed? The answer is "Not yet." At the moment, fuel is *the* problem of interplanetary travel. With present-day fuels, it is not a bit of use planning to construct bigger and bigger rocket ships in order to cram more and yet more fuel on board, for the fuel has to lift its own weight. Liquid oxygen and liquid hydrogen constitute the most powerful rocket fuel in use to-day. And calculations show that even with this comparatively weak fuel, it would be possible to shoot a ship from London to New York in less than an hour. This flight has been fully planned, and it is only the question of cost which prevents an immediate attempt being made. But it will surely come. It will be the first real step towards space travel.

There have been many ingenious suggestions for overcoming the fuel problem. Of these, the step rocket and the outward space station may be mentioned, though the exigencies of space prohibit a description of them here. Meanwhile, the search for better, and more powerful, fuels goes on.

At this point, a brief description of the rocket motor will not be amiss. Essentially, it is simple—merely an egg-shaped combustion chamber with a constricted mouth terminating in an exhaust tube. The liquid fuel is fed into the combustion chamber under pressure; combustion is continuous. At the comparatively low speeds obtainable in air (owing to the friction offered by the atmosphere) the rocket motor is dreadfully inefficient. Experiments have shown that a rocket travelling at 25 miles an hour utilises but 1.2 per cent. of the fuel's energy. Even at 350 miles an hour the efficiency is only 13 per cent. Rocket propulsion, therefore, is not for land, sea, or low altitude flying. The reason for this inefficiency at low speeds is that maximum efficiency can only be obtained when the velocity of the rocket ship approximates the speed of the exhaust gases. Mathematically expressed, the gases, as they leave the exhaust, must have zero velocity with regard to the rocket.

But let us return to problems, real and otherwise. It has been said, for instance, that any attempt to pass through the ionosphere—the so-called Heaviside layer—would cause the immediate destruction of both the ship and its occupants. There are no reasons for believing this to be true. As yet, the very existence of the Heaviside layer is doubtful, and its supposed lethal propensities mere conjecture.

Then there is the question of temperature. The ship's occupants, it is said, will be roasted to death immediately the vessel emerges from the protection of the earth's atmosphere and into the full glare of the sun. Or, alternatively, the frigid void will cause a lingering death by freezing. A perfect example of pessimistic and contradictory conjecture. Actually, we may expect that the side of the ship on which the sun is shining will tend to become unduly hot, while the shadow side will approximate absolute zero. Rotating the ship, in the same way that a rifle bullet spins, would neutralise these two extremes. Except in very large vessels, however, the resultant centrifugal force would present a problem here. But there are other means of temperature control which I must leave to the imagination of the reader.

Another danger dear to the popular mind is the alleged death-dealing property of the sun's emanations. In airless space, we are promised, there exists a concentrated, life-destroying barrage of cosmic, ultra-violet, infra-red, and other rays. No protoplasmic form of life, it is asserted, could hope to traverse space and remain alive.

How the public love to speculate on the death-dealing properties of mysterious rays, whose names they utter uncomprehendingly, and whose real properties they know nothing of! Experiments have shown that cosmic radiation (measured by the ionisation of air) is less than that which exists in uranium mines here on earth. Workers in these mines are subjected to a heavy bombardment of the very emanations which, we are asked to believe, will prohibit the possibility of space travel! Furthermore, it has been reported that living bacteria have been discovered in meteorites which have presumably descended upon earth from outer space.

Finally, there are meteorites. Thousands of them—millions of them—so many millions (it is said) that I instinctively wonder why, if they are so numerous, they do not obscure the sun.

It cannot be denied that meteorites offer a danger, and, for a change, a tangible danger. One would be sufficient to wreck a space ship—if it hit it. But once again popular imagination has run riot. Let us again turn to the German experimenters for instruction in the matter. Some time ago the

German interplanetary society approached Professor Graff, of the observatory near Hamburg, regarding the extent of the meteoric menace. His reply was to the effect that even in thick swarms, the observed amount of meteoric matter was less than 1 gram per cubic kilometre of space!

Incidentally, during the fall of the Leonids in 1866, which was extremely dense, it was noted that no less than 110 kilometres separated each meteorite.

And these observations, let it be remembered, concern *swarms* of meteorites. Outside such swarms, whose orbits will surely be charted and avoided, the chances of solitary meteorites colliding with a space ship appear exceedingly remote.

Luck will naturally play a part, for at the speeds encountered in space there will be no question of dodging out of the way of each individual meteorite which looks like approaching unpleasantly close. Meteorites may scrape past the ship with but feet to spare—or inches even. But a miss is as good as a mile in space as well as on land. On a journey to the moon, it has been calculated that there is only one chance in a million of an object such as a space ship being hit by a meteorite. Even our roads, with their meteoric counterpart, the motor car, do not offer such odds as this!

It will now be evident that it is futile to conjure up visions of dangers, or supposed dangers, which may, or may not, really exist. Only when man reaches space will he discover what dangers he will have to face—and overcome.

It is very difficult to predict *when* man will conquer space, but there are indications that within twenty years or so rocket ships will be making the London-New York stratosphere trips already mentioned. After which, man will edge his way further and further from the earth, until "free" space is reached.

At the time of writing, at least three countries are planning miniature rocket ships which will ascend to a height of twenty-five miles or more. And so the work goes on. And so the work will go on, until derisive jeers change to cries of bewildered amazement. And then, a few decades later, space travel will have become an accepted fact, and the thankless toil on the part of a few will be forgotten by the many. But historians, delving into dusty records of the past, will find that interplanetary travel, like all records of human accomplishment, was due to stumblings upon inconsequentials, curious things that turned out to be vital factors—to a few who strove, and, in striving, learned to appreciate their significance.

P. E. CLEATOR.

A Boxer's Soliloquy

[The Editor is glad to print this poem, which has been sent by a Cranwell Apprentice.]

'Tis not the fight that saps my strength,
'Tis not the blows that hurt,
I care not if I stretch my length
On Mother Earth—inert!
'Tis not the thought of battle lost
That brings that sinking feeling.
'Tis not a Pyrrhic victory's cost
Or thought of wounds, unhealing.
'Tis none of these I swear
That fills me with this sickening fear,
But this :—
" Will I disgrace that manly hair
Whose presence on my chest is clear? "

P. G. S.