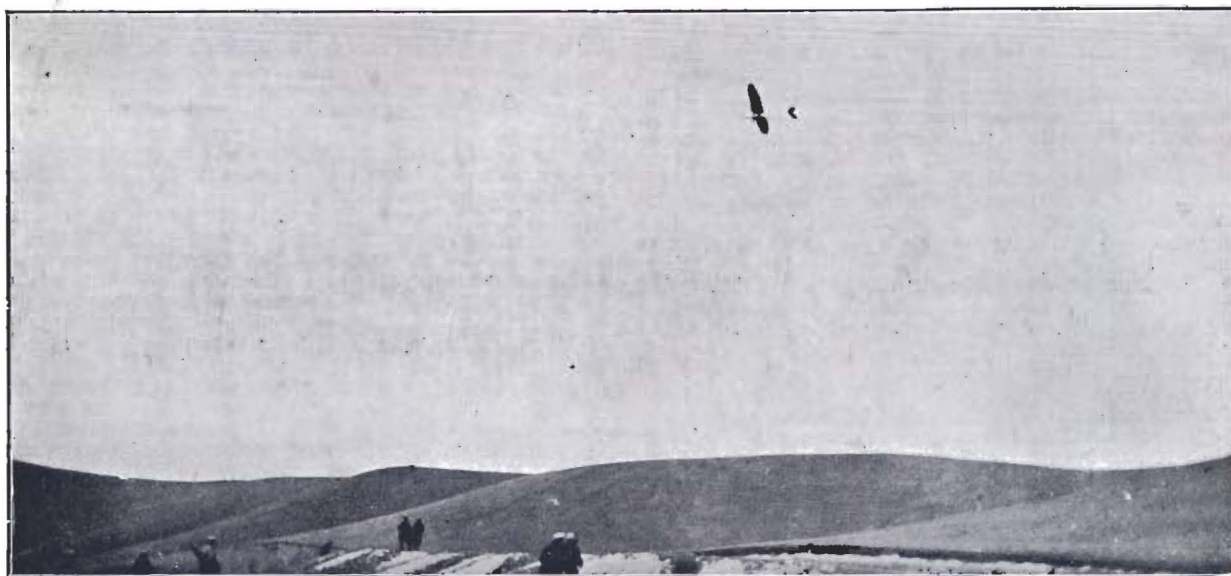


THE SAILPLANE

Price
6d.

AND GLIDER

(Founded in September, 1930, by THURSTAN JAMES)



The B.A.C. VII soaring with a Passenger at the London Gliding Club's Site at Dunstable.

EASY MONEY FOR YOUR CLUB

The most profitable way of making money is to sell something on which there is a large profit—that is why so many affluent young men are concerned with advertising. There are many club members who know people interested in firms who could very well advertise in *THE SAILPLANE*—food—clothing—boots & shoes—radio—motor-cars—bicycles—insurance books—tobacco—chocolate—gramophones—wines, spirits, etc. We want these advertisements in *THE SAILPLANE* and you can get them for us.

Many firms have intimated a desire to do what they can for gliding, or rather, the local gliding club. Very well, then, why not get these firms to advertise in *THE SAILPLANE*? For every advertisement we receive from this source, we will give the club a discount of 15 per cent. A page advertisement costs £6; half-page £3 10s.; quarter-page £1 15s.; one-eighth page £1 (special rates for contracts, of course) so that a club could easily earn 18s., 10s. 6d., etc.

Naturally it is the full page advertisement that will bring in the most income and it is on selling this space that clubs should concentrate. Compare the simple way of getting our 18s. to your old way of raising funds, and you will readily admit that ours is far the quickest, and simplest.

Now is there any reason why the Bristol Club should not get advertisements from Frys and Wills; one of the Yorkshire clubs—one from Rowntrees; the Nottingham Club one each from Raleigh Cycles and Players cigarettes; the Oxford Club—Morris and M.G. cars; the Westmorland Club—K Shoes; Glasgow Club—"Three Nuns" Tobacco; Rugby Club—B.T.H. and Lodge Plugs. Now you see what we mean. It only requires you to think what is made in your town that could very well be advertised in *THE SAILPLANE*.

We will gladly send a number of specimen copies to any club who wishes to go in for this easy money making scheme. It only needs someone to act. Don't read this

and say "what a good idea" and then forget it—get in touch with the Managing Director of your firm as soon as you can. Tell him there are 10,000 people interested in gliding in this country alone and that *THE SAILPLANE* is the only journal in the World solely devoted to Motorless flying, and as such is sent all over the world.

Don't put any Tom, Dick, or Harry on this job. Getting advertisements requires the skill of someone who can get right into the "old man's" office. Help us to help you, and the Advertiser will also reap the benefit. Not only that, but through including a few more pages of advertising it will take us less time to give you a large paper and a better paper—for the same price. When a club sends in any three advertisements we will increase the discount by 2½ per cent., six advertisements—5 per cent. In other words a rebate of 2½ per cent. or 5 per cent., as the case may be, will be given when a club's three or six advertisements have definitely appeared.

Advertisements for No. 11 issue should be sent to *THE SAILPLANE*, 44a Dover Street, London, W.1., not later than November 25th.

ON CIRCULATION.

THE SAILPLANE is the only paper in the World which concentrates entirely upon motorless flying. Its chief aim is to strengthen and unify the British gliding movement by acting as a "Clearing House" for news, information and ideas. An Australian subscriber claims that "*THE SAILPLANE* has instilled ambition in our club over here and gets us thinking cloud flying instead of long kangaroo hops."

It is regretted that the paper has not received that support to which it is due, and this appears chiefly due to the fact that instead of every club member being a subscriber, one or two receive copies and then pass them round. There is no doubt that *THE SAILPLANE* both helps to retain the enthusiasm of members and to interest those

who are not yet taking an active part, for only by taking a paper of this kind can people learn of the surprising progress which is being made in the United Kingdom.

Because of the advantages to the movement having a live, well-illustrated paper of its own, clubs should appoint a local circulation representative whose business it should be to make *THE SAILPLANE* known to every club member; to draw attention week by week to its articles, and further, to make contributions to its columns, and constructive criticism of its contents, and above all to secure a band of regular subscribers to the paper in his club, each pledged to read *THE SAILPLANE* and to make it known to friends and acquaintances.

We are prepared to allow clubs a discount of 25 per cent. on all sales and subscriptions, and the representative appointed can have a number of copies on a Sale or Return basis. We also want clubs and others to introduce us to a local News Agent of good standing so that the general public can buy the paper in this way. Posters will be available shortly.

If it is felt that in certain areas enthusiasm for gliding is not as high as one would wish, it is certain that a campaign of publicity for *THE SAILPLANE* will prove effective, because it will tell of the enthusiasm which is running high in other areas, a spirit of emulation will be fostered, and an encouragement given.

We are confident that *THE SAILPLANE*, if given its proper place in each club area, will be found to be of immense service in unifying and strengthening the whole of the movement and in creating and maintaining air-mindedness first among club members, and through them among an ever widening circle of people of progressive vision.

In this issue we are enclosing one of our subscription forms. If you are already a subscriber pass it on to a friend. If you are not, well, there is plenty of space for your signature. Many thanks.

CLUB NEWS.

After much thought we have decided to use the normal size of type for Club News, thus rendering it far more legible. It has been proved to us that, in the past, Club News has rarely been read by anybody other than immediately interested parties.

This obvious remedy has one drawback. Unless the paper is infinitely increased in acreage, Club News will have to be terse and to the point. The point in question is:—How much time has the Club spent in the air, and what was the air like when one has got there? This need not be translated too literally, but full marks will be given to any Secretary who is good enough to help us out in this way. Otherwise, Club News will have to be forced willy-nilly through the Editorial mangle and the superfluous moisture thus removed.

One excellent method of reporting Club activities would be in the form of a table, with headings such as:—Date, Machine, Pilot, Duration, Strength of Wind, and Notes. Notes would cover such details as left and right turns, spot landings, lost in fog, collision with hillside.

When *THE SAILPLANE* has a flourishing circulation, rising fortnightly to unprecedented levels, Club News will serve as a magnet for drawing more and more new Members into the Movement, and the Club who reports the most startling aerial achievements will benefit to the greatest extent. Club news passes round quickly enough inside each Club by word of mouth, gossip and hearsay. Printed Club News is for the Eager Outside World, and the Eager Outside World only yawns when a painstaking

Secretary reports that at a certain juncture the Club car ran out of gasoline and/or oil, and/or water, or that the local Mayor said many kind things when sufficiently well dined, or that they intend to do this and that one day if the weather holds good.

So please, Secretaries, send in your Real Stuff, all about what happened in mid-air. Write it on the backs of envelopes in pencil, and don't bother about the spelling. As Sir John Simon says: "**Brevity and effectiveness are often good allies.**"

SOMETHING ACCOMPLISHED.

The question has often been asked: "Where is the gliding movement leading us?" No better answers could be given than those which deal with actual performance.

Mr. C. M. C. Turner was an *ab initio* pilot who found a lot of fun in his membership of the Channel Gliding Club. Later on he became so enthusiastic that he went over to Germany for a course of gliding at the Wasser-kuppe. When he came back he bought his own machine, a B.A.C. IV, and proceeded to help with various events up and down the country, arousing much enthusiasm by his competence and energy. Now he has bought his own aeroplane, and without any tuition proceeded to make solo flights. To make sure that he was on the right track he has been polished up by the chief instructor at Hanworth. Now he is a "full fledged" power pilot.

The second case is that of Corporal Manuel. This very capable young man not only designed his own machine but built it in the attic of a small house at Hawkinge. This machine, so aptly named *CRESTED WREN* has already been described in *THE SAILPLANE*, and it aroused much enthusiasm among all those who saw it at the recent Balsa-dean meeting. "Corp" Manuel has now made a flight of 30 minutes on his machine, just as a "try-out," and there is no doubt that he will beat this time over and over again.

Here you have the answers to all the pessimism which, we are sorry to note, still abounds in some quarters. These are **not** isolated cases. Many achievements have been made during the past few months, nearly all on British designed and built machines. Bravo Turner and Manuel! We offer you our heartiest congratulations.

MISS LIPPEN'S "PROFESSOR" SAILPLANE.

An unique opportunity has arisen to buy a *PROFESSOR* sailplane complete with trailer of the most up-to-date pattern. It was on this machine that Miss Lippens made the world's duration record for women. Miss Lippens would like to sell her machine in view of the difficulties of taking it back to Belgium.

She is over here for a brief holiday and is anxious to dispose of the machine at a reasonable price, but should she fail to sell it, she will take it back with her.

The machine is being looked after with the Channel Club's machines close to Folkestone, and arrangements can be made to see it. Miss Lippens realises that in the present depressed state of affairs people have little money to spend so she is willing to accept a very reduced price for her machine and trailer which cost over £225.

The price is £150 but one rather gathers that any reasonable offer will be considered. One could imagine that a group of three or four pilots might well club together to buy this machine with its outstanding record.

Enquiries should be addressed to: Miss Lippens, c/o "The British Gliding Association," 44a Dover Street, W.1.

CELLON DOPE

FOR

SAILPLANES and GLIDERS

Cellon Ltd., Upper Ham Road, Kingston-on-Thames.

'Phone No. KINGSTON 6061.

Telegrams AJAWB, Phone, Kingston-on-Thames

ANSWERING MR. NORWAY

Sir,—I have read with intense interest Mr. N. S. Norway's letter in the issue of Nov. 6 of THE SAILPLANE because he is a man of considerable experience in aviation and in the past has been intimately connected with what has been a much disparaged phase of aviation. He is, therefore, able to understand and sympathise with the difficulties of any new and original phase of aeronautics, and he knows the importance of avoiding misrepresentation. We are all grateful to think he has the courage to join the motorless flying movement and take such a practical and valuable interest in it.

It is consequently disappointing to observe that in his opening sentence he falls into a serious error through stating "... the soaring season is now practically over for the year." Nothing is further from the truth if our largest and active club, The London Gliding Club, is any criterion. I can assure Mr. Norway that if he will consult the members of that body he will be surprised at the record of their winter activities. It is I believe a fact that they have actually done as many hours flying in the winter as in the summer.

It cannot be too strongly stressed that one of the great charms of the gliding movement is the fact that it is an all-the-year round pursuit and any club that slackens its pace because of the change of season is doing itself, its members, and the gliding movement as a whole, a disservice.

Mr. Norway goes on to say that the Balsdean site "... was only suitable for primary training purposes." Again he is in error and has evidently forgotten that Herr Hirth soared for two hours 40 mins. over this site on a B.A.C. IV intermediate type machine. Mr. Refell for 1 hour 40 mins., and Capt. Stratton for over 25 minutes on the DAGNALL sailplane, Herr Kronfeld for 40 mins. on the SCUD, and last but not least, Miss Lippens for 1 hour 5 mins. on her privately owned PROFESSOR, a world's record for women. There are probably several others but these serve to disprove his statements.

May one suggest to those who are minded to support Mr. Norway's point of view, that the future of soaring should not depend upon finding a site that is so good that it provides an air flow upon which almost anything will soar, and thus does not call for efficiency and manoeuvrability in the craft. Balsdean site is not ideal but we have it on the authority of Herr Kronfeld among others that it is of reasonable quality for all purposes. I suggest in all seriousness that if the British gliding movement cannot produce machines that will give a good account of themselves upon such sites as Balsdean then the whole movement should look with misgiving towards the future. Fortunately there is ample evidence already that this is not likely to be the case.

Mr. Norway uses the word "fiasco" repeatedly in the course of his letter and he states in general terms that the Balsdean meeting was a failure. "... in fact (he writes) the meeting was a complete fiasco from the soaring point of view." That is perhaps his reading of the results, but I submit he takes the wrong point of view or at least a very narrow one.

Surely a more accurate and balanced statement would be to say that we have no light wind soarers as yet in this country that could demonstrate their effectiveness in conditions that are typical. Due to this, the meeting failed to give a good display of soaring which was most regrettable because the public was not given a spectacle that was intended to impress them deeply.

Had he expressed himself so I would have agreed with him but I cannot agree that the results of the Balsdean meeting warrant the use of the word "fiasco." That is, I submit, distortion of the facts and an exaggeration.

There is much of interest in what Mr. Norway says in the latter part of his letter and no doubt the B.G.A. Contest Committee will give his suggestions very careful consideration and will no doubt be grateful to him for having made them. Right through his letter there is just one fault and that a serious one. In all his suggestions never once does he deal with the practical financial questions involved, which, if overlooked lead inevitably to "Fiasco" with a capital "F."

THE BRITISH GLIDING ASSOCIATION has to look at all questions from a very practical point of view and it is impossible to take undue risks with the very slender resources at its disposal.

He speaks lightly of raising prize money. Those of us who have had the pleasure and advantage of assisting our most excellent Treasurer on the Finance Committee, know just what is involved in this question of raising money for prizes. It is a most heart-breaking and

thankless task involving disappointment after disappointment.

One of the curses of the club and the movement as a whole is the far too general disregard of such mundane matters as keeping within one's means. It was no chance thing that Balsdean was finally chosen as the site for the International Meeting. A great deal of careful and anxious thought was given to the question of a site before Balsdean was finally selected because of the sites available, it was the one least likely, in the event of bad weather, to result in a financial fiasco. There is the plain truth and as long as the B.G.A. continues to place confidence in the present Treasurer and his Finance Committee, I think I may say without the slightest fear of contradiction, this policy of financial safety first will continue to dominate.

The fundamental requirement of the movement is sound, financial management, and all other considerations must be subservient to it. It may seem to those more interested in the scientific and technical aspect of soaring flight, vexatious that financial considerations should dominate the situation, but be that as it may, we live in a world where practical considerations rule. We must adjust ourselves to circumstances we cannot control, and achieve our purpose by adapting ourselves to the conditions under which we work.

When Mr. Norway has had as long a connection with the movement as I have and understands what a large and quite unnecessary amount of calamity of profits we have had to put up with, his sympathy will, I am sure, be with those who appreciate that our very useful movement cannot stand either the strong meat or drink suitable to the more mature and robust. Neither is there wisdom in walking before crawling and running before walking.

E. C. GORDON ENGLAND.

Sir,—I feel that I must criticise some of the statements in Mr. Norway's letter in the current issue of THE SAILPLANE. First of all let me say at once that I am entirely in agreement with him when he criticises the policy of using sites of the Balsdean variety for Competitions. I am not so sure, however, that he is putting up a practical proposition when he speaks of a 4-day Meeting using sites as much as 30 miles from a central point. I am afraid that would be equally impossible. Also I feel that I cannot agree with his description of the "perfect site," unless he has a different definition for the word precipice from the usually accepted one, namely a cliff.

I quite agree that a long flat plain in front of the hill is essential, but I am pretty certain that the actual hill would provide a far better and steadier upwind if it had an angle of 45° in stead of 90°. The air above a precipice is going to be full of eddies, caused by the very abrupt deflection of the wind from its horizontal path across the plain, and it is not going to provide nearly such a wide belt of upwind, as the more gradual slope. I believe I am right in saying that this is the German opinion.

My last criticism is in respect of his statement that the "soaring season is now closing." This is absolutely incorrect and conveys an altogether wrong and indeed dangerous impression. I am going to suggest that the soaring season is now about to commence. Winter is the time for soaring, the winds are better, the weather generally more reliable, it is not so tiring hauling machines about and although the days are short and cold, there are plenty of fine ones. Besides, there are fewer counter-attractions. No tennis, swimming or runs down to the sea in the car.

Before the start of last winter the London Gliding Club considered the advisability of closing down for two months, but decided against doing so. We were deeply rewarded for our decision. Practically right through the winter we had soaring winds every week-end, and an infinitely better turnout of Members than during the following summer. Indeed, we became quite depressed in July and August thinking that our members had got fed up with Gliding, the assembly at week-ends being so poor. But no; they are already turning up again, and last week-end, in spite of the rain and the fact that there was to be no flying as we were building the Clubhouse, we had close on 40 Members present instead of the bare dozen or so who turned up regularly in the summer months. Therefore, I say to Clubs: don't shut down in the winter, its your best time, make the most of it and soar.

In conclusion, good luck to THE SAILPLANE, and why not every subscriber try to find another subscriber, then we can have a bigger and better paper than ever.

[A most admirable suggestion.—ED.]

DOUGLAS CULVER.

CHRISTMAS CARDS

The Gliding Movement is quite old enough to have its own Christmas and New Year Cards. There is no reason why we should not all have some card for our greetings which is definitely characteristic of our Motorless Flying activities. One cannot expect to find such cards at the ordinary stationers and so THE SAILPLANE is stepping into the breach to create and supply a demand. We have been able to secure four designs of card which are reproduced on this and the following page. The method of reproduction does not do the efforts of the artists full justice but that of course cannot be helped and your imagination must be allowed to run riot.

The idea has been to keep the design as simple as possible with a view to cheapness and ease of reproduction. The inscriptions will be of the simplest form:—"With all good wishes for Christmas and the New Year from . . ." will probably be selected. If any individual is anxious to have his own message and name printed this could be effected at an increased cost provided he orders a quantity.

The four designs have each been given a letter of the alphabet. "A" is a design reminiscent of a woodcut. It is in black and white printed on a rectangular card and offset slightly so that a margin remains on the right-hand side. In this space of an inch or so will be printed the conventional message. The idea by the way to use as far as possible the existing "blocks" so that the cards will be the same size as that in which they are now reproduced.



A.—This card is symbolical of the whole gamut of motorless flying activity.

The next card "B" is rather cunning. It is folded and in the cover is an opening. On the border of the opening is depicted the forward part of a sailplane with a pilot's head peering forward. All this is in blue. Through the cloud-surrounded opening in the cover, can be seen the ground also in shades of blue over which the pilot is threading his "thermally" supported way. When one turns the page over the whole landscape is revealed and beneath is the name of the sender. This card will probably cost more than the others, but not much.

The third card, "C," is outstandingly original. A very cleanly designed machine sails forward out of the picture. Behind is a nice large cumulus cloud whose lower convolutions form the Christmas Greeting. Above it some sky-writing aeroplane has traced the number of the New Year. This design can either be on a plain card or on the cover of a folded one with the greeting on the inside page. This seems preferable.

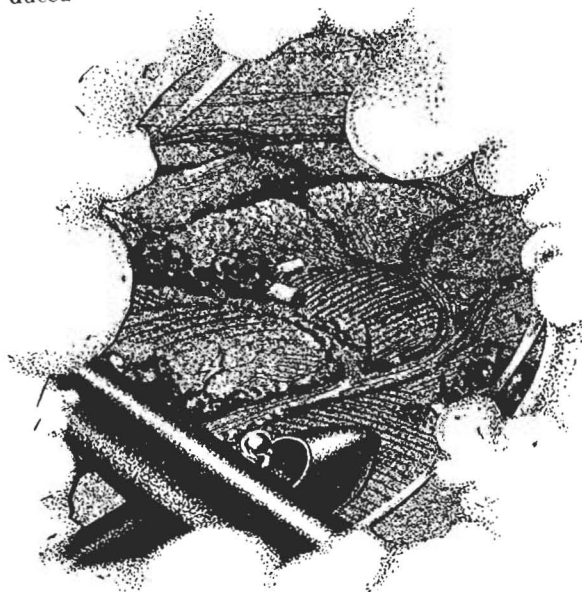
The last card, "D," is a frankly humorous effort which will appeal to some but not every one. It seems to me to be particularly joyous. It is designed for reproduction on a card with the sender's name at the bottom.

Now all these cards will cost somewhere about 2½d. each. The actual price depends entirely upon the number ordered and we are anxious to arrive at this number with the minimum delay. Envelopes will be extra at the usual sorts of rates. The best way of dealing with the situation seems to be for those who want Christmas cards to make their choice and decide on the number they require. Their selection and the number ordered should be sent to the B.G.A. Office by return and marked "Cards."

If the whole Movement, as it should, supports this effort and Cards are ordered in thousands, it will be possible to print the whole selection. If support is poor we shall only be able to print one card. It is therefore essential that every letter on the subject should state whether the writer would be content in the latter event to order the same number of the most popular card.

In any case the first letter will **not** be considered as an official order. When the final arrangements have been made the Secretary will notify those, who have written, of the selection and the price. **He will not despatch any cards until he has received the money.** This arrangement is essential to obviate costly accounts.

We are particularly anxious to make this idea a success. The major portion of the proceeds are to be used to swell the funds of the B.G.A. for it is not likely that anyone will remember to put a nice fat cheque in the Association's stocking. We ask for the fullest co-operation. We suggest that if any Clubs have thought of producing their own Christmas Cards that they refrain and buy a quantity of the B.G.A. Cards which could have a special message printed inside.



*Christmas
Greetings*

B.—This one is in blue and is folded. The glider and clouds are on the cover through an opening in which can be seen the landscape that is on the inside back page.

One can easily understand a Club's desire to have something of local colour. If this could for once be suppressed it would enable the B.G.A. to bank a little money against those Competitions which are to be held, probably in Scotland, next August when we are all going into camp together as a sort of combined seaside and gliding holiday!

In fact Clubs with a large membership, and there are quite a number which boast of scores of members, might very well swell their own funds by ordering a quantity of cards with a special Club inscription inside. These cards could then be retailed to members and their friends, and the Club might benefit by the difference between quantity and retail prices.

Another advantage of buying these cards is their valuable propaganda effect. It is not only the question of sending out cards that are unusual but of letting your ground-minded friends know that the Movement flourishes and that Gliding is slowly climbing the up-grade. They will be impressed to think that your Club or your Association is in a position to have cards of its own.

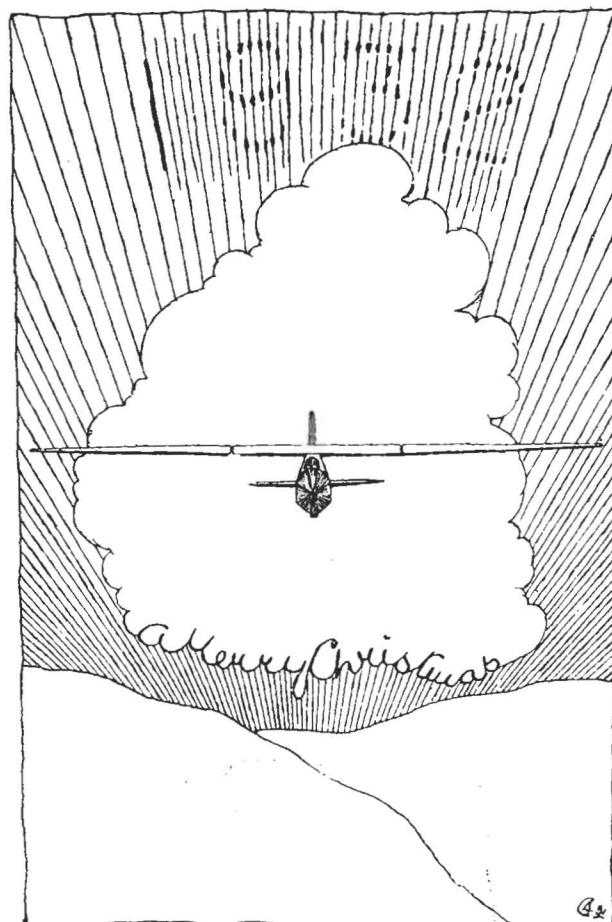
The great thing about this scheme of Christmas Cards is that it has been arranged to suit everybody. Large orders will be welcome and are indeed expected but small orders will be just as popular. In fact we are counting on the support of all those individuals who only send three cards every year. In fact if everybody who is interested in Gliding only bought one card the Association would benefit considerably. The result of sending a card specifically designed round a gliding motif will be appreciable. One can imagine the effect.

"Look at this! Old 'Dusty' Miller still goes gliding. His card is rather snappy, I think. Let's go and see how he's getting along."

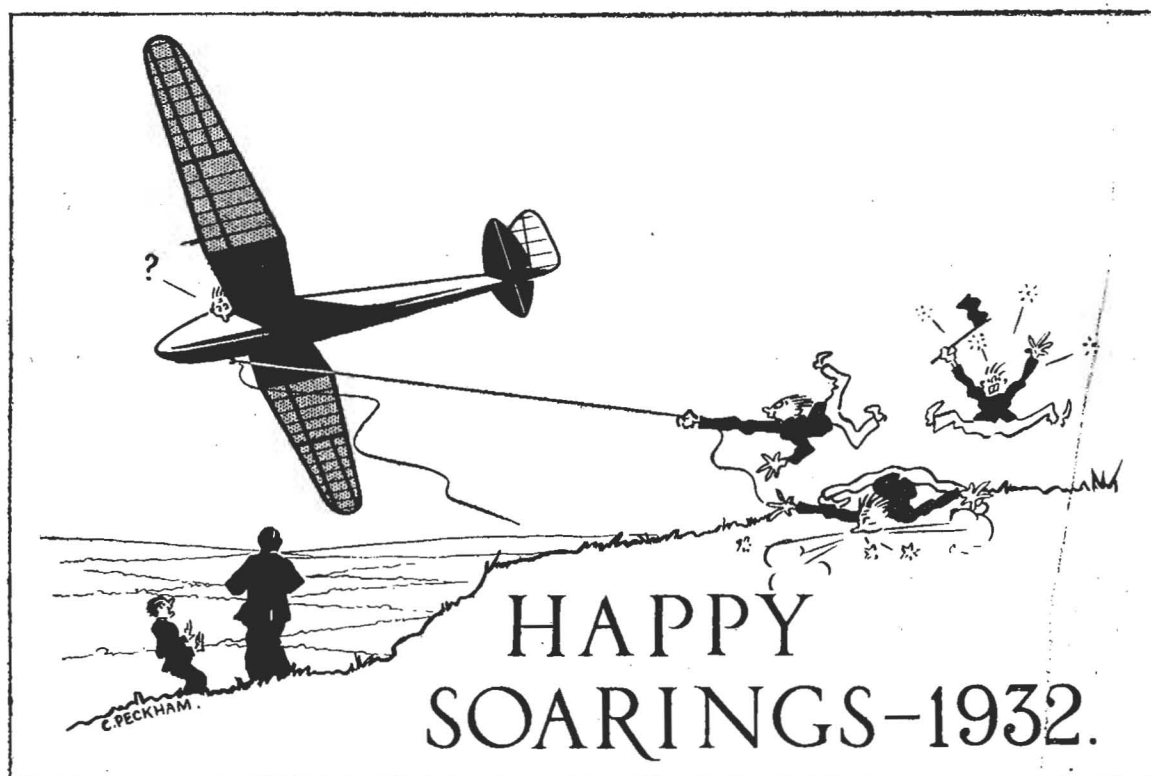
So potential members are lured out to the ground where a persuasive Secretary will have an excellent opportunity to bring them within the fold.

One might enlarge at length upon the possibilities but it seems unnecessary, they will become certainties if only people will overcome their usual inertia and take advantage of their opportunities.

Please write to the Secretary by return and tell him how many cards of which particular sort you want.—T.J.



C.—This card epitomises the modern trend—soaring beneath cumulus clouds.



D.—The high-hatted person may carp at this card which reminds glider pilots of all these contre-temps so enliven their sport.

A FEW NOTES ON FLYING AND FLYING THINGS

By ALEX KEITH.

As the power of a helicopter with a large screw is superior to one with a small screw, so will be the machine which can utilise all its supporting surface as an elevator be to the present-day helicopter.

The present-day machine requires the petrol engine to give it power to rise. Birds only require muscular power. Birds and all flying creatures have been millions of years experimenting—man with any success only 30 years. The main mechanical difference is that creatures use the whole or nearly the whole of their horizontal surfaces for generating power whereas only the surface covered by the radius of the propeller or tractor is used in present-day machines. It may be likened to a man in boots and a man in snow shoes walking over soft snow. Air giving very much less grip than snow, requires a much larger gripping surface.

There will doubtless be found mechanical ways of utilising the supporting surfaces of aeroplanes as developers of power in ways different from creatures. But it is well to understand what is wanted and perhaps flying creatures may give some help. Since about 1873 I have been a strong believer that man could fly if he only could grip the air sufficiently.

In 1905 I met the late Mr. Jose Weiss at the Aeronautical Society's meeting and from that time until his death we worked more or less together. He had been given a gold medal for a glider exhibited in Paris in 1905. This model led M. Bleriot to develop a monoplane which was the progenitor of his cross-channel machine. Mr. Jose Weiss's machines were automatic gliding and soaring machines. He worked entirely by experiment, with free machines in free air on the hillside.

Neither of us were trained engineers, but both had some knowledge of mechanics. I had attended Professor Tait's class in the Edinburgh University in 1874 to pick up any information I could on the possibility of flying. We were there shown the experiment of blowing on the upper surface of a curved surface of paper



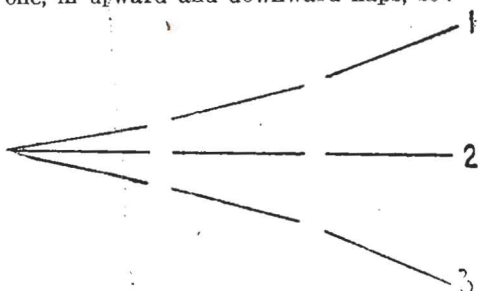
The Professor remarking, "If flying ever comes this reaction on the upper surface will have something to do with it," or words to that effect.

While working with Jose Weiss I set myself to try to find a mathematical design which would fit the varying shapes of all flying things, believing that in the perfect machine the surfaces would continually change shape but still remain true to one or other patterns of the design. Mr. Weiss gave great help and a patent was the result. Several gliders were built on patterns of this design and gave good results when tried in free air. The Great War prevented further experiments and the small company which had been formed to help development was struck off the roll, being heavily in debt. The patents which would still have required much experiment to complete, have now lapsed.

It may be of use to future experimenters to jot down one or two points which seem important.

FIRST. The elevator of to-day acts as a drag—an increase or decrease of the span would cause the machine to rise or sink. A large spanned glider glides at a better angle than a short spanned one of the same weight. This change of length of span is the only movement which can be observed in a gliding bird following a steamer. It can always be seen if looked for and is necessary to enable the bird to keep the proper distance behind the steamer in the varying speed and direction of the air current it glides in.

SECOND. In the flapping wing there are three segments—the middle one changing its angle more rapidly than the inner one and the outer one more rapidly than the middle one, in upward and downward flaps, so:—



This gives great supporting power to the whole wing. The amount of change of angle varies according to size of span, being greater in small creatures and less in larger ones.

THIRD. The front to rear angles of the three segments are changed in like manner in upward and downward strokes.

FOURTH.—The form most suitable for a glider, soarer or flapper is not necessarily the same as for an aeroplane, because the aeroplane is dragged through the air by its propeller, whereas the glider or soarer is propelled by the air acting on its horizontal surfaces. The speed of the latter is also much slower, and gives time for the air to move to some extent according to the varying pressure on its surfaces, i.e., produces an inward movement on the upper surface towards the centre line and the reverse on the under-side of the wing. A depressed rear edge near the body of the glider increases the lift both on the upper and lower surfaces, and a raised tip at the rear of the outer segment also tends to increase the lift. In the Weiss Gliders an angle of 7 deg. to 7½ deg. at the body and the same reversed at the tips was found best. The exact angle will depend on the speed of the machine. For the Weiss Gliders this angle was shown to be correct by a drag taking place if it was either increased or lessened. I am told that lately when flaps were depressed near the body of a machine to act as a drag it was found that the machine was raised. In fast machines these angles would, of course, be quite out of the question.

FIFTH. The number of flaps or beats per minute varies according to size. In creatures it varies also according to respirations. With a flying man, the number would be about 20 to 23 respirations. This is the number Mr. Weiss had calculated for man's size, compared to flying creatures. The weights of the various parts of the wing should be so arranged that the distance of the mean weight from the fulcrum will produce by pendulum motion the desired number of beats per second. This prevents waste of power. Curiously the wings we built for a flapping wing on a man carrying machine when hung as a pendulum beat 20 to the minute.

LAW OF SIZE TO WEIGHT.

SIXTH. The law of the size of the horizontal surface (each surface calculated separately) to the weight carried hold good from small creatures to large present-day machines. There is a small variation all through the scale of heavier or lighter creatures, but this only amounts to 1 to 50 in the small creatures and very much less in large ones. Making allowance for this, the law extends from small butterflies weighing half a grain to present-day machines, a thousand million times larger.

1 gram = 15.43 grains
1 K = 1,000 grammes
1 ton = 1,000 K
40 ton machine 40,000 K

15.43 x 40,000 x 1,000 = 617,200,000
Butterfly, say ½ grain x 2 = 2
1,234,400,000

If the horizontal area is doubled the carrying capacity is increased two and a half-fold.

SEVENTH. In the helicopter one end of the blade is always acting against the other. In flapping wings there would be a dead point at top and bottom of the flap but no opposition, so if pendulum motion was used there would be little loss of power. At the dead points there would still be the gliding motion and inertia to keep the glider steady.

EIGHTH. The rear edge of wings is always flexible and tapers to a very fine edge. The front edge is very rigid and where possible, also, as a fine edge.

NINTH. If the extent of the carrying surface could be made to contract the moment extra power pressed on it, a smaller safety allowance could be used.

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"THE SAILPLANE."

TENTH. The foregoing notes may help some experimenters to see where future advances can be made. Time and experiment will be required. But advances already made have been tremendous, since the time I was continuously told that flying was a "Scientific impossibility."

ELEVENTH. Engineers tell me that the power developed in aeroplanes is as much as can be expected from the power used. That may be. But a flapping bird or glider gains height more slowly and horizontal speed is not required. A hundred or hundred and forty miles per hour is not aimed at, rather the rising of a man running up steps or walking on snow shoes. What is wanted is a better grip on the air, by, I believe, using the whole supporting surface as a developer of power.

TWELVE. The Keith Weiss design for the upper surfaces was an attempt to find a mathematical form to fit all the varying forms of wings. In the belief that a law lay under all these changes of form and that a perfect wing would alter its shape continually, but each shape would fit one of the forms of the design, altering to what was best at the moment, utilising the various air currents according to the desires of the flier. This design was founded on the highest possible parabola, say one with the distance from axis to focus, one sixth to one seventh of its arc.

Some of the ideas mentioned in my notes are the result of watching birds and studying their anatomy and go further than I have actually proved by experiment, but which I think may be useful in the advance of gliding and human flying.

As a first experiment I would suggest the following to test the difference of grip of the air in a simple straight wing and one in three sections:—

See diagram—A = pulley with cord passing round it once or twice, one set of ends of cord connecting with B' B'' B''' and the other ends with C' C'' C'''.

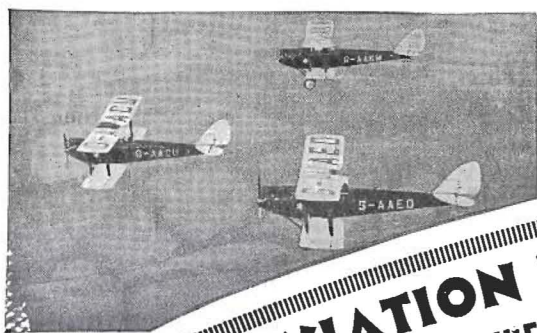
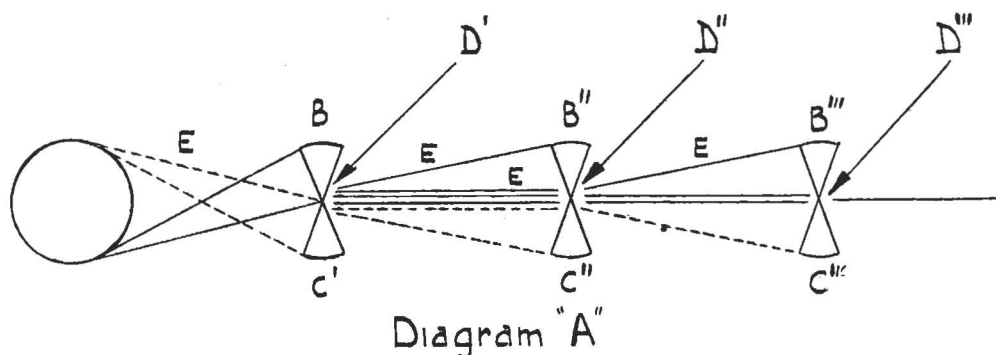
B' B'' B''' = arcs of circles with D' D'' D''' as centres. C' C'' C''' arcs or same circles as B' B'' B''' but on opposite sides.

D' D'' D''' = pivot points on which the three sections work, slightly in front of line of pressure on wings. E cords connecting pulley with sections of wing.

Pulley "a" to be partially revolved, first in one direction and then in the other.

If the plane can be allowed to take the line of least resistance in up and down strokes the result will be better.

B' B'' B''' and C' C'' C''' should not project beyond wing covering.



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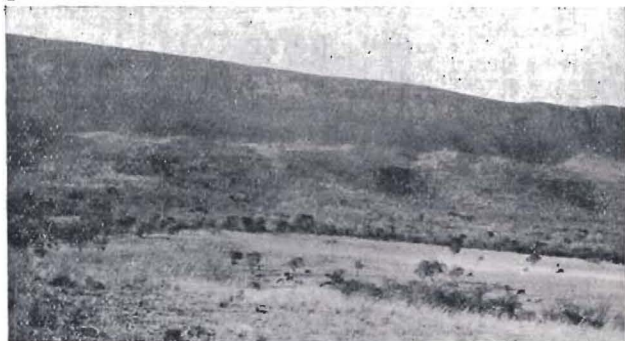
Gliding in South Africa

By S. W. VINE.

I thought it might be of interest to readers of THE SAILPLANE to have a few words from South Africa with regard to Gliding. As to soaring, I am unable to give any facts as it has not yet been accomplished, but will shortly be attempted.

From the result of experiments and observation we have probably as fine a country as could be desired for this sport. Continual sunshine, moderate winds, thermic currents in abundance, ranges of hills and mountains all over the country, and everything that goes to make up a soarer's paradise.

In this particular part of the country where I live, Krugersdorp, Transvaal, we are 6,000 ft. above sea level



The sort of ridge Mr. Norway would like. This ridge stretches for 12 miles.

and it has been stated by some of our flying authorities that Gliding would be almost impossible and very difficult to accomplish as the air is too rarefied, etc., etc., all of which did not act as a stimulant to the few enthusiasts who might have come forward to form clubs and get down to practical work and so help the movement forward.

As I had carried out Gliding experiments in Pretoria (4,500 ft. above sea level) in 1912 with a biplane glider of 200 square feet wing area weighing 80 lbs., with some success I was determined to have another go at it last year, when I began to get news from overseas of the wonderful performances of some of the experts in Germany. I thought my previous experience with the old biplane would qualify me for the primary business so I designed and built a secondary type of machine, 40 feet span, 190 square feet wing area, high wing, fabric covered fuselage, weight 260 lbs.

The trials of this machine proved very educative in many ways although only short hops were accomplished. This machine with my weight, 170 lbs., would rise easily at a speed of 15 m.p.h. at this altitude.

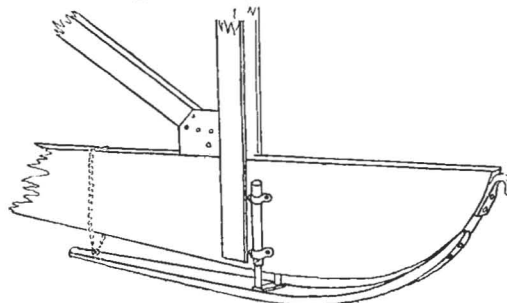
Unfortunately while making progress with this machine it was totally wrecked by a gust of wind which carried it across the veldt in cartwheel fashion. The nigger who let go at the critical moment thought it was a huge joke but I told him I disagreed.

After this experience I decided to build a primary type machine to experiment with. A friend, Mr. P. M. Goed-volk, a Science Teacher in the High School here, being very interested in gliding, offered to help with the construction and so our primary type machine was built and affectionately named FLIP. We have had some real good fun and practice with this machine and are quite satisfied with the performance which has proved to us the suitability of conditions for Gliding here.

This machine is 34 feet span, 170 square feet wing area, weight 220 lbs., gliding angle 10—1. The method of launching we use has been very successful and was devised to overcome the difficulty of obtaining a catapult launching crew. By this method, a launching height of 200 feet is accomplished with the aid of a car and driver only.

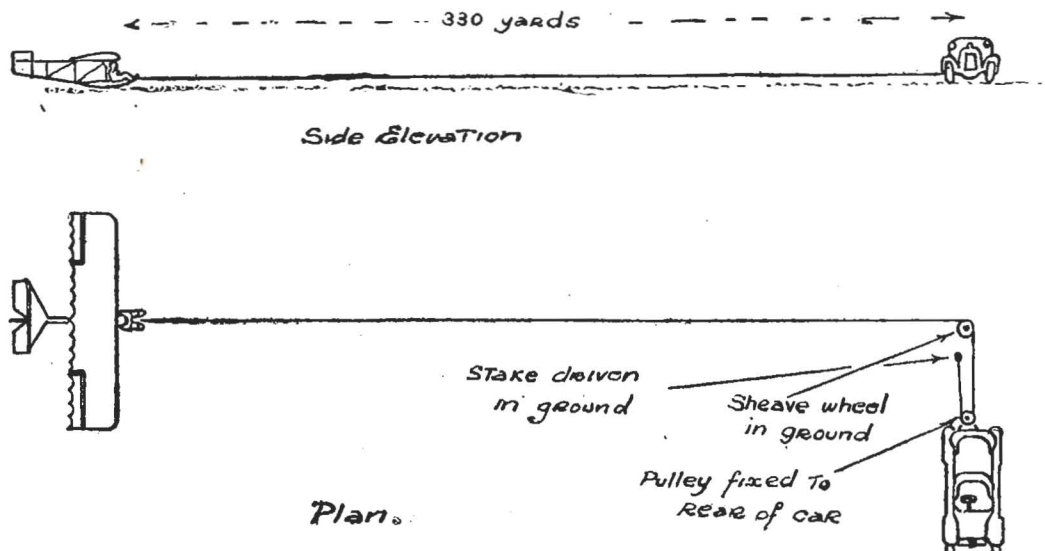
We use 1,000 feet of $\frac{1}{4}$ -in. dia. flexible wire rope and the arrangement is shown in the sketch. For initial pupil flights the car runs only 100 yards to a flag in a direction at right angles to the line of flight in low gear at 12 m.p.h.; this gives the glider a towed flight of 200 yards at a speed of 24 m.p.h. For more advanced flights the sheave wheel in the ground is not used but the car is driven straight ahead for 200 yards to a flag at 15 m.p.h. in low gear; this gives the glider a speed of 30 m.p.h. for a towed flight of 500 yards.

This method is perfectly safe and has never failed us and the excessive speed of ordinary auto-towing over rough ground is avoided. I am now busily putting the finishing touches to a high performance sailplane of 52 ft. span with a special wing half the chord of which is

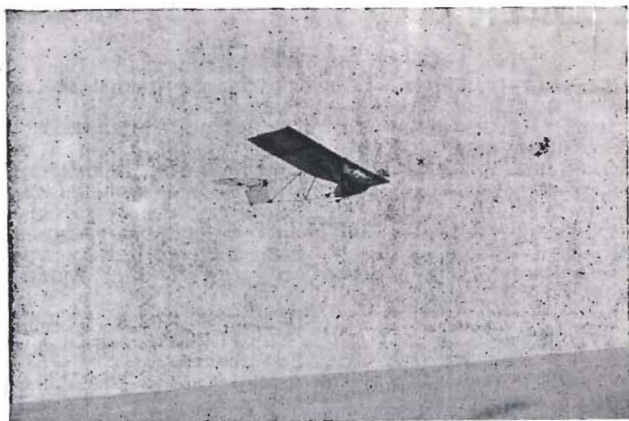


flexible having a wing section practically identical with that of the Vulture, the bird which seems to be specially adapted to soaring at high altitudes. I hope this machine will still further prove the possibilities of motorless flight under the conditions prevailing here.

The other sketch shows an unbreakable skid, which will stand terrible punishment in pancakes or landing with drift, and acts as a very efficient shock absorber. It is made from bicycle tubing. The bottom pair of tubes sliding into the top pair against the B.S.A. air-gun springs. A cable anchor at the rear keeps the skid under tension. The skid is made of American Hickory. We had constant trouble with skids until we used this one, "since then we've used no other."



Details of this method of launching are given above.



This is "Flip."

WHAT YOU MAY TOW

We understand from the Secretary of the B.G.A. that aircraft of the following dimensions may be trailed behind motor-vehicles and that brakes are not required: length, 30 ft.; width, 7ft. 6in.; weight, 1 ton. We suspect, however, that such towage will invalidate insurance unless these have been properly endorsed.

THE B.A.C. IX.

We are advised that a pamphlet and price list of parts is now available. Write, enclosing 6d. in stamps to B.A.C. Ltd., 17 Lower Stone Street, Maidstone.

AEROFOIL CHARACTERISTICS

People are always asking for particulars about aerofoil characteristics. The Air Ministry has been good enough to recommend the following Reports and Memoranda which can be bought at H.M. Stationery Office, Adastral House, Kingsway, W.C.2.

R. and M. No. 1383.—Wind Tunnel Tests on Aerofoils at Negative Incidences.

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R. and M. No. 928.—Test of Four Thick Aerofoils, R.A.F. 30, 31, 32 and 33.

R. and M. No. 1052.—Full Scale and Model Measurements of Lift and Drag of Bristol Fighter with R.A.F. 30 Wings: Part I—Full Scale; Part II—Model Experiments; Part III—Comparison of Model and Full Scale Results.

FORTHCOMING LECTURE.

The Imperial College Gliding Club, jointly with "The British Gliding Association" and The London Gliding Club, announces a free Lecture on Monday, Nov. 23, in the lecture hall of the City and Guilds (Eng.) College, Exhibition Road, South Kensington, at 5.30 p.m. The title of the Lecture is "Clouds," and will be delivered by Sir Gilbert Walker, C.S.I., F.R.S. The Chair will be taken by Air-Commodore J. A. Chamier, C.B., please take this as a cordial invitation.

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CORRESPONDENCE

Experiments With Rockets.

Sir,—With reference to the article on Rocket experiments published in THE SAILPLANE on Oct. 23, it appears that there is no reason why short flight should not be made with the type of rockets mentioned.

Taking a "cleaned-up" ZOGLING type machine—such as the DAGNALL TWIN—as a suitable type existing for such experiments, I have made the following calculations; they are not dead accurate, but if by their short-comings they start further discussion, they will have achieved something.

The data is as follows:—

Machine:—

Gross Weight	...	...	...	340 lbs.
Optimum gliding angle	...	...	...	1/13
Optimum gliding speed	...	...	...	40 ft./sec.

Condition of launch (approximating to a four-a-side shock cord launch):—

Speed at finish of launch	...	...	40 ft./sec.
Length of run	...	...	30 ft./sec.
Co-efficient of friction between skid and ground	...	...	0.25

Launching:—

(1) Resistance due to friction

Weight x 0.25

= 340 x 0.25 lbs.

= 85 lbs.

This will decrease as the speed rises, becoming zero as the machine takes off.

(2) Force required in accelerating the machine from 0 to 40 ft./sec.

Time required is ... 1.5 secs.

∴ acceleration is ... 26.6 ft./sec. 2

Force required to give a mass of 340 lbs. this acceleration is

340×26.6

$\frac{340 \times 26.6}{32.2}$ lbs.

= 281 lbs. ... (2)

Combining (1) and (2)

The maximum launching effort required is 366 lbs., and ignoring the decrease in friction, this should be maintained for 1.5 secs.

Flight:—

The weight of the machine being 340 lbs. with the pilot, and the gliding angle at optimum speed being 13/1 it is obvious that the drag at this speed is approximately

340

$\frac{340}{13}$ lbs.

= 26.2 lbs.

a thrust of 26.2 lbs. would, therefore, be required to keep the machine in level flight at a speed of 40 ft./sec.

Using two together of the rockets mentioned as developing 25 lbs. for 30 secs., would enable the machine to climb to a height of 84 feet in still air.

In all the calculations the speed of the machine has been disregarded in using the thrust of the rocket. This seems reasonable, as the speed of the machine is insignificant compared with speed of the gases from the rocket.

In view of the limits, propellor propulsion seems likely to impose on really high speeds. Rocket propulsion, if it can be developed, seems to offer a very interesting alternative, and a gliding club could very well carry out some valuable research into the design, the question of firing, and re-loading a rocket propulsion unit.

Are there any accounts of the German experiments available?

G. J. C. PAUL.

Training Sailplane Pilots.

Sir,—May I level a criticism and a suggestion at our present system of training sailplane pilots?

Some sailplane pilots trained solely on ZOGGLINGS from the *ab initio* stage are now showing considerable skill at soaring on high-performance sailplanes, and possibly after few, if any, mishaps. This has been made possible only at the expense of a vast expenditure of energy in manhandling, and extreme caution in the pupils' steps of advancement from hops to "S" turns and onwards.

Truly, he has been trained successfully, but equally truly, very inefficiently.

One is convinced that the only efficient way of training is by dual control in a two-seater sailplane, which will definitely soar with two up, under an instructor.

A pupil requires two things to make him a good pilot; a capable instructor, and experience, i.e., time in the air. Under the present system one sees these disadvantages:—

(1) For the first several "hops" the pupil has no sense of "feel." The few seconds duration of flight does not give that experience. His actions are not mechanical for a long time. The novelty of the launch experience knocks the theory out of the pupil's head for some seconds. The "flight" is then over. But each launch means a good deal of hard work and time.

(2) Should the pupil have an inherent inaptitude for flying, most especially in a moment of difficulty; or slow reactions, it will be discovered most frequently in the wreckage. This is most likely to happen at a height when doing his first turns or when avoiding obstacles.

(3) Proper instruction can only be given during flight and by demonstration.

With a two-seater of high performance a pupil can be trained from the first to the final stage **with one sailplane**. This reduces club equipment expenditure to half the normal. Flown solo, a two-seater with the lighter wing-loading has an increased performance for competitive soaring.

For half the number of launches, club members can put in double the flying time. Passenger flights teach one a good deal, and each can take turns at the controls. Joys are doubled when they are shared.

In training we must aim at three things:—

(a) Sound and simple instruction;

(b) The highest "time in the air" against man/hours manhandling, which is practically the equivalent of "experience."

(c) No breakages.

One feels that the two-seater dual control sailplane fulfils these requirements.

As for the method of instruction. First the instructor takes off and turns parallel to the ridge and hands over to the pupil to practice straight and level flying. The instructor takes over for turning to retrace the course along the ridge, regaining height lost. Thence take-offs, turns and landings are taught, and finally complete soaring flights with an instructor present to deal with emergencies.

When capable of soaring the pupil is sent off solo, first with long straight glides from the top of the ridge, and then "S" turns and soaring.

A pupil should never fly any flying machine solo until he can fly it safely. One would be very interested to hear these points debated.

L. P. MOORE.

Very Catching.

Sir,—I was greatly interested in Mr. Sebert Humphries' questions and answers in the issue of Nov. 6.

The phenomenon of questioning is like a disease; very catching but that of answering never attains epidemic proportions, being relegated to persons of either superior intellect or vast experience.

After reading the paper in question, I was overcome by a mild attack of "query-itis" so pen herewith a few questions which perhaps Mr. Sebert Humphries would like to prescribe an antidote for in the shape of answers.

(1) How many times must a fellow pilot a glider to be able to think of all the questions and be able to answer same as per article in question?

(2) Is it necessary to have experience of airships, parachute-drops, quiet reclines on the top of factory chimneys, etc., before one is able to overcome the "undue terror" spoken of?

(3) How many times should one pass the "A," "B" and "C" tests before one consents to receive tickets for same?

(4) Has Mr. Sebert Humphries ever heard the expression "Sez You"?

EUGENE BRAME.

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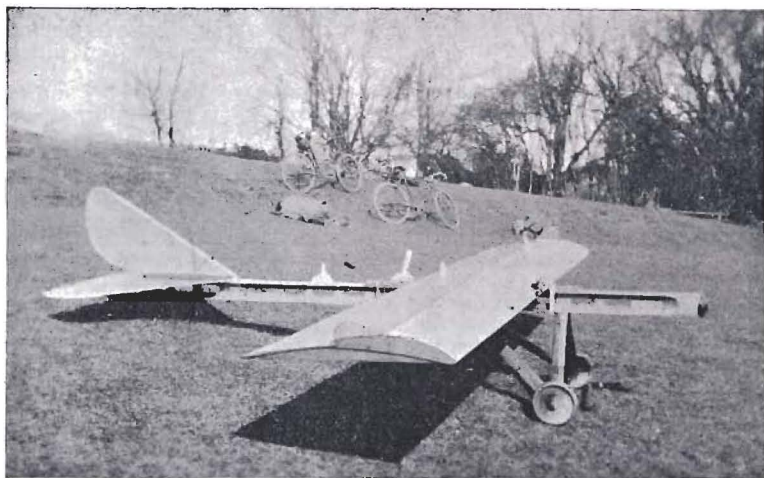
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Sir,—I was interested to read in the Sept. 11 number of THE SAILPLANE the remarks by Mr. S. Scott Hall regarding the large Dresden D-B9 (No. 51) and the air brakes with which this machine is fitted, also your footnote regarding its success. This is of particular interest to me because I was experimenting with a similar idea in 1928.

I built a large model glider for the purpose with a span of 8 ft., total weight 14 lbs., and with a fully sprung



Mr. Lewis's Model referred to above.

wheeled undercarriage. The fuselage was just an "I"-sectioned boom, loaded at the nose with lead. The wing section was specially developed to follow the lines of the section given by Judge from Dr. Hankin's measurements of the Dusky Horned Owl. You will see that the rear half of the chord is a very thin single surface. The hinged flap was the rear portion of the front top surface, and extended the full length of the wing.

I proved to my own satisfaction that this was an effective air brake which also added to the lift of this wing by induced drag with an upward as well as rearward component. The glider soared admirably with the flap closed. I actually got it to take off in a series of hops down the hillside with the flaps open and at a reduced speed. The method of launching was to allow the machine to roll down the slope into the wind and gain its own impetus.

It occurred to me that this may be interesting to some of my fellow readers of THE SAILPLANE. If so, I should be pleased to give anyone interested any further information about it, as also my theories on which the design was based.

I should like to know if this is anything like the air brake as used by our German friends on the Dresden Glider.

W. F. LEWIS.

[Herr Lippisch's brakes were two small flaps which were placed flush against the leading edge in such a position that the wing was divided into three parts. The effect of raising these flaps was to increase the induced drag by reducing the span.—Ed.]

NEWS FROM THE CLUBS

THE IMPERIAL COLLEGE GLIDING CLUB

Many members have joined us since Oct., compensating for those we have lost at the end of the last Academic Year. The number of our members is now over 40, and 70 per cent. of these are new members without any flying experience.

Primary training has been continued at Kingsbury since the middle of Oct.—220 launches were made during three week-ends without any mishap.

At the sporting invitation of The London Gliding Club, we paid a visit to their Dunstable ground on Nov. 7. The first flight was made from the top by P. Adorjan who, flying into wind along the ridge, made a flight of 57½ secs.

The north-westerly wind gradually changed to west increasing the difficulties of flying. It was necessary to launch into wind and then turn through 180° down-wind to avoid the high-tension cables. G. Konried satisfactorily solved this problem during his flight of 51.6 secs. duration. Next H. W. Dean, the Club Secretary, qualified for his "A" Certificate with a flight of 40 secs. duration.

The last flight was the most exciting of the meeting. J. H. Payne attempted a similar flight to that of G. Konried, but in turning was thrown on to the hill by the wind. The left wing and the centre-section were damaged, so we perforce adjourned to the neighbouring hostelry for consolation.

We shall be flying again within a fortnight.

CROFT GLIDING CLUB.

This Club is now firmly established with a total membership of 50. Much hard work has been done recently in drafting rules, organising Committees, Dances, Lectures, etc. By far the greatest number of the members are employees of The Croft Granite, Brick and Concrete Company and we have been fortunate in persuading Mr.

N. F. Spence (Managing Director of the Company) to become the Club's first President. We are fortunate also in having as our Instructor, Mr. L. E. Headley who is an R.A.F. pilot.

We are one of those optimistic Clubs who believe they can survive on an annual subscription of 25s. per member, but we do appreciate that this amount has to be supplemented by the proceeds from various social activities. With this object in view we are postponing the purchase of a B.A.C. V machine until the new year, by which time a substantial sum in cash should be available.

A local site has been found suitable for auto-towed gliding and preliminary ground training has already begun.

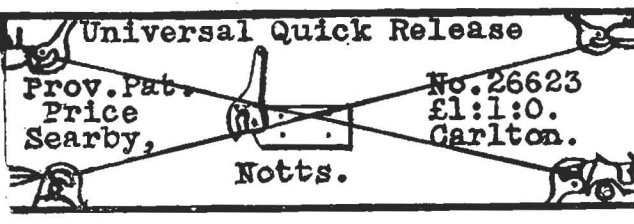
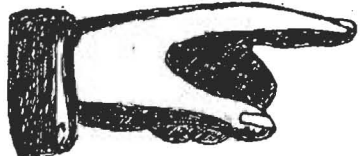
It has been suggested that we should build our first machine, but we believe (rightly or wrongly) that this practice tends to deprive the Club of its keen "flyers" during the building period leaving only the keen "constructionists" who are usually in a distinct (but useful) minority.

A Competition for the Club Badge design has resulted in the adoption of a very neat winged badge in blue enamel and chromium plate.

Our Secretary is Mr. H. E. T. Jewell, 17 Arbor Road, Croft, near Leicester.

THE BRADFORD AND DISTRICT GLIDING CLUB.

Representatives of various Yorkshire Gliding Clubs met at the Midland Hotel, Bradford, on Oct. 17, to discuss a proposal of amalgamation. The following clubs were represented—Ilkley, Bradford, Leeds, Huddersfield, and Cononley. Delegates from each club put forward their views on the subject of an amalgamation and the general trend of opinion was towards an amalgamation for soaring training, but primary training should still be carried



out by individual clubs. On Oct. 26, the Leeds Gliding Club held its Annual General Meeting, members of the Bradford Club were present. It was decided to wind up the Leeds Club and amalgamate with the Bradford Club, under the name of the Bradford and District Gliding Club. The first meeting of the new Club was held at Baildon Moor on Saturday, Oct. 31. The greater part of the afternoon was spent in giving flips to the newly-joined members from Leeds who were unfamiliar with the Bradford Club's Dickson machine.

THE FURNESS GLIDING CLUB

For our meeting on Oct. 17 and 18 we again secured the use of a site on Kirkby Moors, where Herr Magersuppe last year soared splendidly with the SCARBORO Two-seater.

On the 17th the weather was good, but a complete lack of wind prevented Herr Magersuppe from entertaining the crowd by soaring flights in the TERN, which was lent to us by Messrs Airspeed Ltd., of York. He therefore took off by auto-towing, but the car eventually dived into a hollow and threw both occupants through the windscreen.

After this he had to content himself and the spectators with a series of long glides in the TERN and in the Club's own machine rigged as a B.A.C. III.

On the 18th, instead of the westerly wind for which we had prayed, we were given a north-easterly breeze. Barographs and observers were therefore useless and again Herr Magersuppe had to make the best of a bad job, which he did by launching the available machines across wind and landing them on a declared spot whence they could be easily recovered. A hunt for thermals was fruitless.

In the meantime our friends from Preston, Accrington and Kendal had arrived, and we heartily trust that they enjoyed their trip. Mr. Graham made one flight on the Preston R.F.D., which proved the tricky nature of the terrain on this day. We must explain that the change of site had rather upset our organisation; otherwise we might have found time to be more hospitable and entertaining to our visitors.

The day ended with a three-mile glide, Herr Magersuppe, in the TERN, cheering up the departing spectators by circling over the Askam railway station before landing on the village green or thereabouts.

To all our helpers and to the DAILY MAIL who lent us a loud-speaker outfit, and to the farmers who by their generosity made the meeting possible, we tender our heartiest thanks.

If only the meeting had taken place one week earlier, when the breeze was in the right direction, we know now that the TERN would have created new records while we sat quietly as spectators.

THE LONDON GLIDING CLUB

The position at the London Club is now as follows:—

Accommodation.—One hangar in use, a second in the course of erection, dreams of a third. Clubhouse in the course of erection; this will contain a lounge, kitchen, living-room, lobby, professional's quarters and usual offices. Dreams of sleeping accommodation to be added. Also of a verandah facing launching point on hill-top.

Machines.—In use at present: ZOGLING; DAGLING, with nacelle and pedals; PRUFLING, with enlarged rudder and lengthened nose; PROFESSOR; and Two-seater. Privately-owned and in use: HOLS DER TEUFEL; KASSELL 20; Cloud-craft PHANTOM.

Flying.—With a handsome westerly wind a "C" pilot may tour from the Bowl to Whipsnade Zoo and back. The PROFESSOR has ignored the ridge altogether, after reaching about 600 feet, and departed on a long cloud flight which ended in Luton Hoo Park. With a foul wind beginners are hand-launched from foothills running at right-angles to the main ridge. Their betters (temporarily) are auto-launched with considerable severity, sufficient to admit one or two 90° turns. Auto-launching has removed the last horror from a week-end on which the wind refuses to blow up-hill.

The moral support of Mr. Turvey, of Totternhoe, and of the landlord of the "Rifle Volunteer," is greatly appreciated.

THE SOUTHERN COUNTIES SOARING CLUB

The Club is now housing two privately-owned machines and three Club machines. A Trojan is used for towing to the starting-point and is capable of handling two machines at a time. The Club has been presented with a Buick two-seater car, which is used for auto-towing the R.F.D. sailplane and the PRUFLING.

With a cable of just over 200 feet, the R.F.D. is said to average two minutes in "almost still air."

A member who had flown in Australia without a Certificate obtained his three Certificates on our site within a month of joining us. We also have a considerable number of "B" certificates, and on Oct. 25 three "C's" and a "B" were flown in one afternoon.

For the "C" we use the DAGNALL TWIN, which is easily controlled and appears to fly as well as the PRUFLING. (We guess that the TWIN belongs to the same delightful class of vehicle as the HOLS DER TEUFEL.—ED.).

Mr. Lowe-Wylde recently called on us and put in forty auto-towed flights within three hours, by means of his colossal energy and by landing his machine each time at his starting-point. We have also had two visits by the North Kent Club, who have thus obtained a number of otherwise delayed "A" Certificates.

The early sunset prevents us from flying on Saturday afternoons, but we are in action every Sunday, weather permitting.

HOME-MADE AIR-SPEED INDICATOR

One of our readers is very anxious to have information on how to construct an air-speed indicator, preferably the tube type. Perhaps some kind readers will furnish THE SAILPLANE with full details, together with drawings, for early publication.

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