THE SAILPLANE & GLIDER

(*Founded in September, 1930, by* THURSTAN JAMES).

The only Journal in the World devoted solely to Moterless Flight.

OFFICIAL ORGAN OF THE BRITISH GLIDING ASSOCIATION.

Editor: ALAN E. SLATER.

Editorial Offices: 43, CHANCERY LANE, W.C. 2. *Telephone:* HOLBORN 0309.

Subscription Rates (Post Free): Annual 15s. 0d.; Half-Yearly, 7s. 6d.; Quarterly, 3s. 9d.

Vol. 4. No. 14. July 28, 1933. **Published fortnightly on alternate Fridays. Price 6d.**

The Offices of the SAILPLANE *viewed from the historic XVIth Century gateway of Lincoln's Inn.*

CONTENTS.

Aeronautical Lessons of Huish.

The chief aeronautical lesson of the Huish meeting is, of course, the discovery that it is possible to practise the technique of picking up thermal currents solely by using a car and a 1,000-foot cable. We do not think this result was expected by either side in the controversy as to whether high-performance work was possible on the site, since it had been assumed that any such flying would be done by slope-soaring along the hill and picking up thermal currents blowing in from the plains.

But it should not be assumed that similar results could be obtained as easily on *any* flat ground. The thermal currents at Huish were picked up over the *top* of a fairly high hill. It will be noticed by those who get up early enough (or have not yet gone to bed) that the first cumulus clouds in the early morning form almost invariably above the highest ground. In fact, it is our opinion that, with all the talk about cumulus forming over cornfields, far too much stress has been put upon agriculture, and too little upon contour lines, in discussions on the question of where thermal currents are to be expected. It is to be noted that, in his flight to All Cannings, Mr. Collins lost the best part of the thermal lift as soon as he got away from the hill, and was unable to find any more.

Another useful lesson from Huish is pointed out by Mr. Cuss in his article. It is that better soaring could be obtained at Draycott Hill with a wind blowing obliquely on to it, than over Huish Hill, which was less high but directly faced the wind.

The Press.

The meeting was well reported in the Press of Wiltshire and surrounding counties, largely owing to the efforts of Mr. Cuss. But it received scant mention, if any, in those London papers which circulate nationally. All we have received from our press-cutting agency is a short preliminary announcement in the *Morning Post*, and an account of Mr. Collins's thermal flights in *The Times*, supplied by its aeronautical correspondent. The latter account appears to have suffered at the hands of some sub-editor, who, apparently in an effort to shorten it, has contracted Mr. Collins's two thermal flights into a single one, and made him soar from Draycott Hill to All Cannings and all the way back again. A similar report also appeared in *Nature*, which is high honour.

Anyway, it would seem that the only sort of motorless flying that the Press will now take notice of, is the high-performance work, and not, as some fondly imagine, accounts of how the Youth of Britain can be got into the air on short gliding hops, barely long enough for them to feel the use of the controls.

A LETTER ABOUT HUISH.

Sir,—

THE SAILPLANE, July 14th, page 151: "These history-making flights have given Huishites a scorn of slope-wind soaring."

Please note the following facts:—

(1) Collins, the thermal soaring pilot, learnt his trade by an enormous amount of slope-wind (sometimes slope-gale) soaring in many different machines.

(2) Your scornful correspondent piled up two machines in two consecutive flights, at Huish.

(3) Champagne is all very well, but if you refuse to drink anything less rare and refreshing you are likely to die of thirst.

SLOPE-WINDY.

CORRECTIONS.

Sundry feats of verbal jugglery were performed upon our last issue after it was out of our hands. The photograph on page 147 was described as: "J. Laver soaring the DORSLING for 4 hrs. 11 mins. soaring it." For "soaring it" read "at Pewsey Hill." And for the final photograph of the TERN on page 148, instead of "Mr. Reffell at Pewsey Hill," read "Mr. Reffell soaring it." Also the intended preamble to the 4th of the "Glider Pilot's Letters to his Son" was substituted by the preamble to an earlier one.

THE "SAILPLANE" COMPETITION.

Entrants for this Competition are asked to send an article of not less than 250 words, accompanied by one or more illustrations, which can be either drawings or photographs. The subject matter must be related to motorless flight. No part of the entry may have been published elsewhere.

Competitors should state that they are entering for the Competition, and give name, address, and gliding club (if any). These will not be published if so desired.

The best entry received during any one month will entitle the winner to receive THE SAILPLANE free for six months. In addition, the sender of any entry published, whether a winner or not, will receive two extra copies of the issue in which it is published.

The Editor's decision is final.

AN AUTO-LAUNCH AT HUISH.

G. E. Collins flying the Southdown "B.A.C. VII." The cable has just been released.

SOME NEW RECORDS.

A world's distance record for a passenger-carrying glider is claimed by the German pilot Burzlaner, who was announced in the press of July 11th to have flown with a passenger from Duisburg in the Ruhr, Germany, to Eindhoven in Holland, a distance of 48 miles.

A message from Warsaw states that Piotr Mlynarski, of the Lwow Aero Club, has soared for 5 hours 52 minutes over the town of Lwow (once known as Lemberg). This is claimed to be a record for soaring over flat country. The start was made at 10.27 a.m., the glider being towed by an aeroplane. Eight minutes later it cast off at 2,000 feet over the Sknilow aerodrome, and headed for Lwow. While soaring over the town, the pilot reached a height of 5,300 feet. He landed back at the aerodrome at 4.37 p.m.

The Hungarian duration record has been beaten by the pilot Kalenyi, an engineer, with a flight of 7 hrs. 3 mins.

In America a glider pilot named Sutherland has looped the loop 40 times, and another, Randolph, has performed a spin of 2,300 feet. Whether either of these feats constitutes a record, we cannot yet say.

R. Kronfeld, on the 8th of July, was towed in his sailplane to 2,000 feet over Saint-Quentin-Roupy. Casting off, he made contact with a thunderstorm front and landed at Jeumont, 71 miles away. The flight lasted from 2.10 to 5 p.m. It is the longest motorless flight yet made over French territory.

THE ORIGIN OF "SAILPLANE."

Who invented the word "Sailplane," and when? It was used by Mr. Howard Flanders, as two words with a hyphen between, in the first issue of the *B.G.A. Journal* in March, 1930, and in the same month by Mr. Dagnall, in his advertisements, as a single word. Its first use in the daily press, as far as our press-cutting collection shows, was in June, 1930, when the *Daily Express* used it both as a noun and as a verb in describing Kronfeld's flight from Lewes to Portsmouth.

We think the true origin of the word should be put on record before it is forgotten, and would be glad to hear from anyone who can shed light on the subject. It is, of course, an attempt at translating the German word *Segelflugzeug*—literally "sail-flight machine," for which "glider" is an unsatisfactory substitute; although the French seem to get along happily with their word *planeur*, which they use for all types of motorless planes.

But whoever concocted the name was probably not aware that it is actually older than the word "aeroplane." It was, in fact, invented by Sir George Cayley, the "Father of British Aeronautics," over a century ago. Cayley's "Aeronautical and Miscellaneous Notebook" is shortly to be published by the Newcomen Society, and, in a preliminary description of the work in *The Times*, J. E. Hodgson, the aeronautical historian, points out that Cayley applied the word "sailplane" to his first model glider, which he built in December, 1804. Of this first "sailplane" and its performance Cayley wrote as follows:

"It was very pretty to see it sail down a steep hill, and it gave the idea that a larger instrument would be a better and a safer conveyance down the Alps than even a sure-footed mule, let him meditate his track ever so intensely."

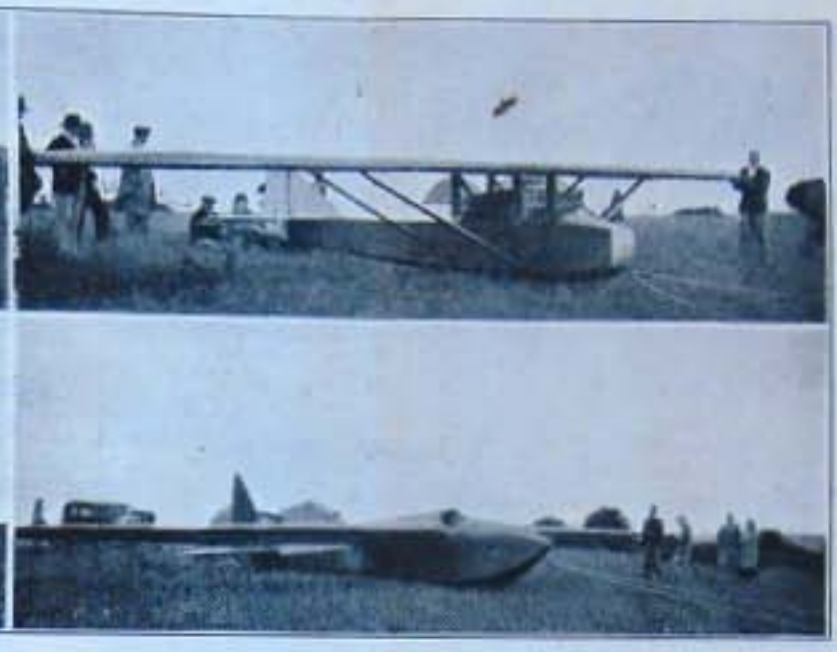
Now turn to your SAILPLANE for July 31st, 1931, page 15, and you will read the following:

"Another idea, suggested by Major Zimmer-Vorhans, is that of aerial tobogganing. On their cheap gliders the peasants descend from the mountains to market in the valley. They start by catapult, and, oblivious of ice-covered tracks and broken-down bridges, fly down to the valley; then in the evening they are towed up to the heights by a special aerial tug (high-powered biplane with large span and low air-speed). Each one in turn casts loose from his place in the row and lands by his own door."

But Sir George Cayley thought of it first—at any rate of the first half!

A BUSY QUARTETTE AT HUISH

The "Falcon."
The "B.A.C. VII."



The "Dorsling."
The "Tern."
(Photos by members of Bryanston School, Blandford.)

GLIDERS ON THE FILMS.

One of the rare appearances of gliders on the news films occurred two weeks ago, when Pathé showed three gliders being towed behind an aeroplane in California. The formation looked very pretty high in the sky, the gliders being side by side, and the towing machine accompanied by another aeroplane on each side of it. Two of them made shocking landings. One nearly overshot into a group of onlookers and had to rub its nose hard into the ground, sending up a cloud of dust. The other landed in the middle of a turn, and slid along sideways with its wing scraping the ground. The audience made no comments. No doubt, being convinced that gliders have no controls, they regarded such landings as normal.

One of the gliders was of most original design. A good picture of it appeared recently in a Birmingham paper. It has a hanging "boot," and a narrow tube for fuselage, just like Kronfeld's giant AUSTRIA. But the wings, supported by a strut each side, are of normal sailplane design except for a kink like the CONDOR. Then there is a cruciform tail with an enormous vertical fin, as much of it being below as above, so that its lower point scrapes along the ground, ready to catch in any obstruction.

THE ALPS CROSSED AGAIN.

Several Sunday papers on July 16th reported from Turin that "Captain Kronfel, the Austrian air ace, successfully glided over the Alps yesterday and reached Udine, whence he glided again to Milan. From Milan he is to glide over the Appenines to Rome."

Later we shall no doubt hear from a reliable source whether he glided, soared, or was aero-towed (it is all the same to a newspaper correspondent); also how he obtained his Captaincy and dropped the final "d" from his name.

BETTER HAVE STUCK TO PARACHUTING.

Frau Dr. Lola Schröter, who has made a reputation as an exhibition parachute-jumper, was making turns in a glider over the Hirschberg aerodrome, in Silesia, when she crashed and broke both legs.

Some experimental parachute drops by Frau Schröter from a two-seater glider were described in our issue of July 22nd, 1932.

GLIDERS ARE SAFER.

The Hon. J. Grimston, of the London Gliding Club, who holds the "C" soaring certificate, was involved in an aeroplane accident on July 12th, when an aeroplane in which he was about to land, at the Eastchurch aerodrome, Isle of Sheppey, collided at 100 feet with another which

AN AMERICAN SOARING SITE.

An excellent new soaring site has been discovered at Pig Meadows, in the Blue Ridge Mountains of Virginia, 100 miles from Washington, D.C. Recently six members of the Washington Glider Club set out with a FRANKLIN UTILITY glider at dawn, and proceeded to the new site for a day's soaring, to see if it was any good.

The site stands 2,500 feet above the neighbouring valley. Commander Ralph Barnaby started at 10.30 with a flight four miles to the north and back. Don Hamilton, who had first discovered the site, was launched and lost 1,500 feet of height, but regained it all and 500 feet to spare. E. W. Spink, B. F. von Berniwitz and T. J. Marhoefer followed with 20 minutes each. Then Bert Brooks, who had already had one launch but failed to maintain his height, was given another chance. But Bert Brooks went too far, got out of the rising currents, and had to land in the valley below, thus, as the *National Aeronautic Magazine* briefly puts it, "terminating the day's operations."

A GERMAN WINCH-LAUNCHING FATALITY.

The two-seater MAINZER BUB' was being launched by means of a mechanical winch, when the pilot, Paul Breitenbach, apparently thinking he had cast off the cable, began to turn. The glider was then caught back by the still attached cable. Those at the winch, seeing there was something wrong, struck at the cable, but it was too late, and the glider dived to earth. Breitenbach was killed immediately, and Hans Ott, who was in the back seat, succumbed to his injuries on June 30th.

A LUCKY ESCAPE.

A few days ago, according to the *Star*, an aeroplane, which was towing a glider at Darmstadt, stalled and crashed, and its pilot was killed. The pilot of the glider had the presence of mind to release the cable at once, and was able to make a safe landing.

AN ARTIFICIAL HILL AT MILAN.

A naval base is being constructed by the Italians at Milan, and, in the course of this colossal work, much earth is being excavated. An engineer connected with the Provincial Committee for Soaring Flight has had the idea of using this excavated earth for building an artificial hill at Baggio, an old airship ground. A writer in the *Gazzetta dello Sport* suggests that the hill should be placed at the aviation base, in the space between the land and water alighting areas: "We do not think this a very practical solution," says *Les Ailes*, "either for the gliders, or for the aeroplanes, or for the seaplanes."

It may be remembered that Lilienthal used an artificial hill for his gliding experiments some 40 years ago.

THE HUISH MEETING

The Dagnall Sailplane at Huish.

THE FOURTH WEEK-END.

By C. T. Cuss (Chairman, Wiltshire Light Aeroplane and Glider Club).

The public present on the evening of Saturday, July 8th, were delighted to see three pilots soaring on the south-westerly wind directed upwards at various angles by the eight-miles-long range of hills north of the Vale of Pewsey, between Martinsell at the east end and Easton at the west end.

Following various flights during the day, Mr. J. Laver, of the Dorset Club, was launched in the DORSLING at 5.43 p.m. by means of elastic rope and crew, over the ridge of Draycott Hill. After feeling the lift on both sides of the launching point and gaining height between each turn, he moved off in an easterly direction over Gopher's Wood to Huish Hill ridge, against which the wind was blowing at nearly 90 deg., and after working the length of the Huish ridge a number of times at an altitude of about 450 feet, Mr. Laver endeavoured to cross the gulf to Martinsell Hill, but in doing so he lost height and turned when over the main road, then regained height and returned towards the eastern end of the range. When approaching Draycott Hill, Mr. Laver was rather far out over the Pewsey Vale and lost so much height that it looked as though he would be forced to make a low-level landing. Recovering lift, however, after the DORSLING had passed below the level of the ridge, he soared again to about 450 feet and passed easily over a bad spot which, due to turbulence, would have given him some trouble at a lower level. Continuing in the same direction above the ridge, he passed out of sight at 6.30 p.m. and landed shortly afterwards at "Adams Grave," on Walker's Hill, below the White Horse. The flight had lasted a little more than 47 minutes. The distance following the ridge from the starting point to the Marlborough Road and return to "Adam's Grave" measured about five and a half miles, whilst the total distance flown probably exceeded 20 miles.

A motor-cyclist kindly brought the news of the pilot's whereabouts and landing, with a request for a launching crew, the response of Mr. Whidborne and crew resulted in Mr. Laver returning airborne to H.Q. at Draycott, but the velocity of the wind had fallen, necessitating a low level landing and a "wind" up the hill to the B.G.A. hangar.

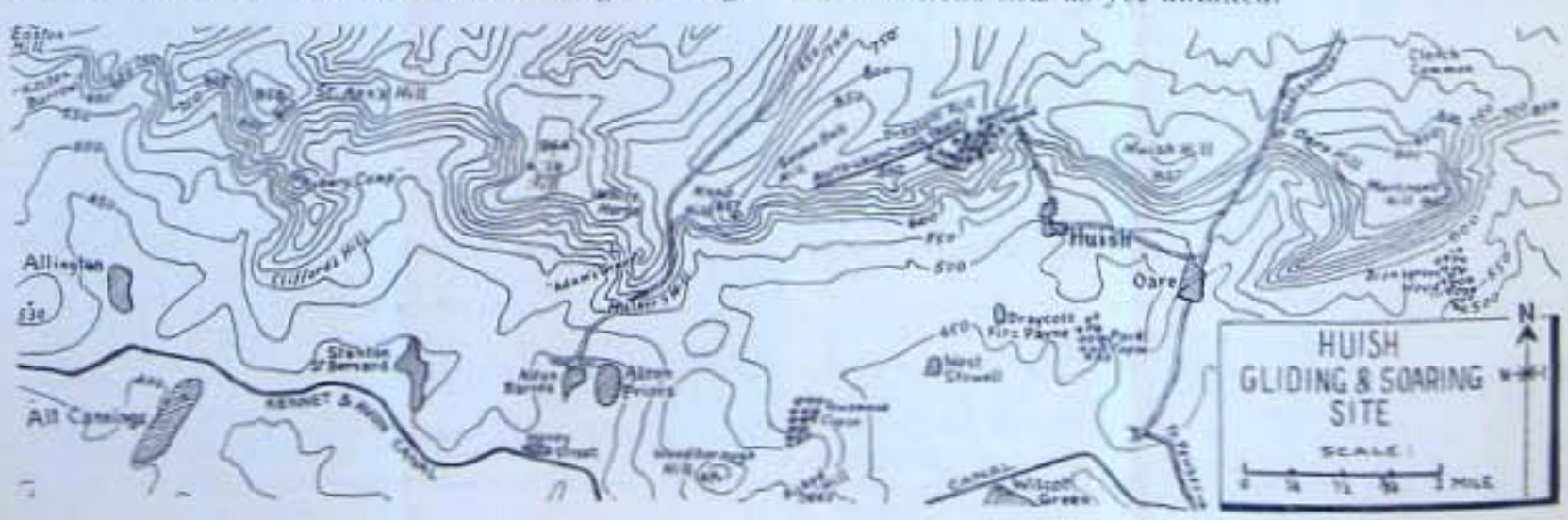
Whilst this flight was in progress Mr. Collins was launched at Draycott Hill in the Scarborough FALCON, and a very pretty flight of 29 minutes 44 seconds resulted.

The Portsmouth Club's "Fusilier," with its new nacelle, at Huish.

Mr. Slingsby next piloted the FALCON, being hand-elastic launched from Draycott Hill, and an extremely steady flight of 18 mins. 44 secs. was made. The flatness of the turns was conspicuous and the altitude reached was estimated to be about 400 feet.

The impression resulting from observing these three flights was that an oblique wind on the steeper hillsides with well-formed streamline bottoms, provided more lift than was obtained from the same wind blowing square on to the Huish Hill, with equivalent streamline base, but *a little less steep*.

My grateful thanks to everyone, which includes "the salt of the Earth," for coming to Wiltshire and demonstrating a duration flight 579 times longer than the world record 31 years ago and four times as long as Squadron-Leader Gray's British record 11 years ago and also thermal and cloud lifts as yet untaxed.



THE FINAL WEEK.

The commencement, on July 7th, of a spell of what may be called typical british weather (depressions coming in from the Atlantic, with winds changing between south and west as the various secondaries go by) gave the first opportunity of seeing what could be done in the way of ordinary slope-soaring along the Huish ridge. The ridge is so irregular that Mr. Laver, who had had less experience than the others who soared there, must have found it particularly exciting. He told us that he thought his having to land on Walker's Hill was due to his having crept round the outside of it, instead of going over the slight "col" between "Adam's Grave" and the White Horse. The DORSLING had a variometer, by the way, designed by Mr. Norman Wright, the Dorset Club's chairman, and we have been promised a description of it.

The next week-end began promisingly with a south wind, but the last of the series of depressions went by, so that, on the Saturday evening, the wind went round to north-west and refused to budge.

On the morning of July 15th, Mr. Hiscox's HOL'S DER TEUFEL distinguished itself by getting up to 900 feet above the hill-top in a wind from due south. This bears out Mr. Hiscox's theory that, under average conditions, a glider can climb above a hilltop to the extent of twice the height of the hill, though it is unusual for the HOL'S to do so at Dunstable. The HOL'S was still able to soar till about 5 p.m., when the wind dropped and went round to north.

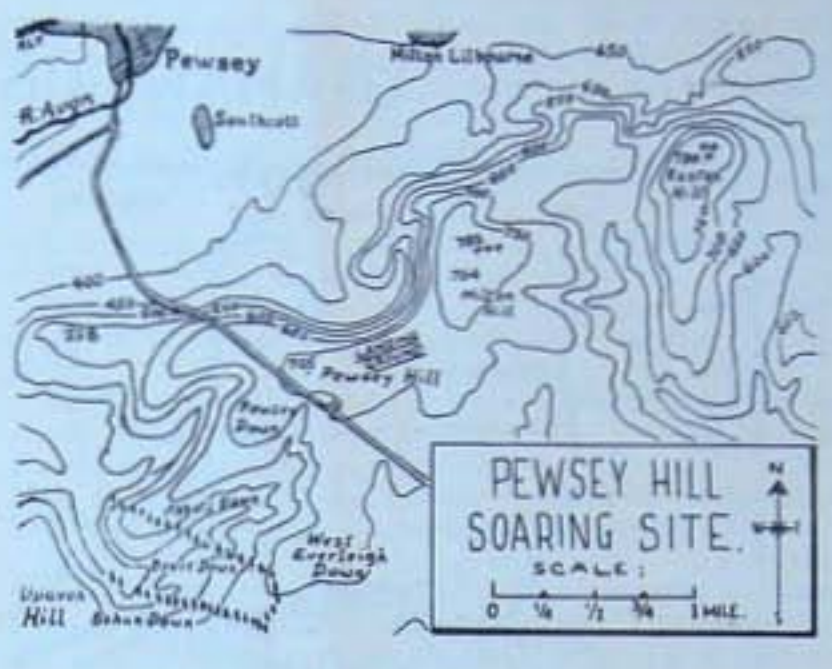
Mr. Collins was hard at it, as usual, giving instructional and passenger flights. We can recommend anyone whose fault is insufficient banking on turns, to go up with Mr. Collins, having first told him of said fault.

The "Tern's" temporary undercarriage.
Of questionable aerodynamic efficiency, but what matter?
It is only for ground transport.

After the experience of being banked over at 85 degrees, anything less than that feels quite tame. But an experience of Mr. Collins's landings, with violently alternating right and left horizontal sideslip, sets one wondering how much diagonal bracing there is in the fuselage.

Both B.A.C. two-seaters were now in working order, and, as Mr. J. P. Dewsbery had turned up from the London Club, passenger flights could be given in double quantity. Incidentally, his altimeter showed a greater casting-off height than that of Mr. Collins, so the latter took up both altimeters at once, and found that his own was reading 100 to 200 feet too low. So it seems likely that Mr. Collins's thermal flights, made earlier in the meeting, took him to a greater height that was at first believed.

The FALCON had unfortunately gone. But two other machines had arrived, the Portsmouth Club's FUSILIER (a DAGLING with a fine new nacelle), and the North Kent



Club's DAGLING, also with nacelle, and a pawnbroker's half-ball on the nose. Unfortunately the latter machine was crashed, pawnbroker's fitting and all, on its first flight. It was launched cross-wind, and performed a half-roll immediately on getting into the air.

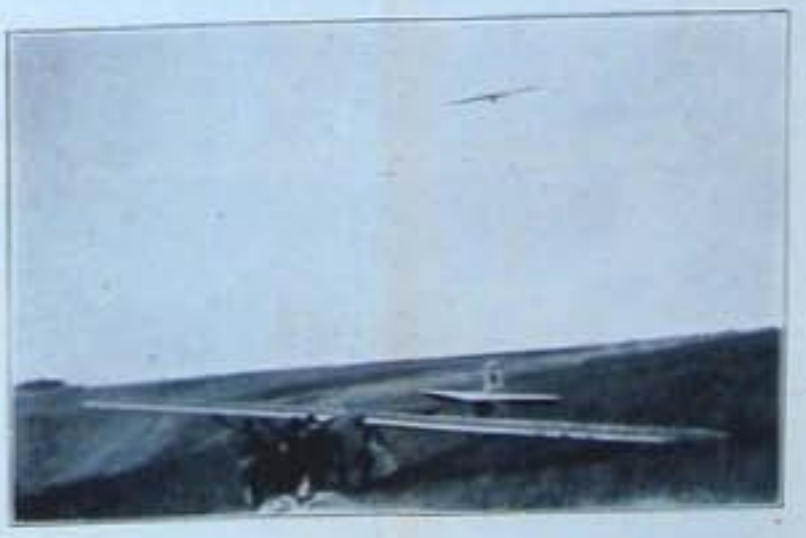
Visitors from other parts were again in evidence. But we were sorry to have missed those who came from Ulster and the North of England earlier in the week.

On Sunday, July 16th, the north-west wind set people talking about Pewsey Hill, where soaring had taken place a month before. Later in the day, the TERN, DORSLING and HOL'S DER TEUFEL set out there. The wind was about north-west-west, and it was again noticed that machines which lost height after the launch, and got well below the level of the hill-top, could easily regain height from the lower levels. The HOL'S DER TEUFEL was flown by D. Hiscox, H. E. Bolton and L. A. Dessouter. Mr. Dessouter made a spectacular landing by touching the grass at speed, zooming over the barbed-wire fence, and sitting down the other side. A. H. Reffell, G. A. Little and A. F. McGlashlan flew the TERN. During the evening a fine thunderstorm "front" came along, complete with cylindrical roll-cloud. Mr. Bolton was tipped over to 50 deg. by some queer sort of gust, just as it arrived. Mr. Little went up in the hope of connecting with the up-current in front of it, but the wind was too feeble to lift him much above the hill. He found the air extremely bumpy.

A similar, but less well-marked, "front" had passed over Huish earlier in the day. Mr. Collins was auto-launched towards it, but the cable unfortunately broke before he got very far up.

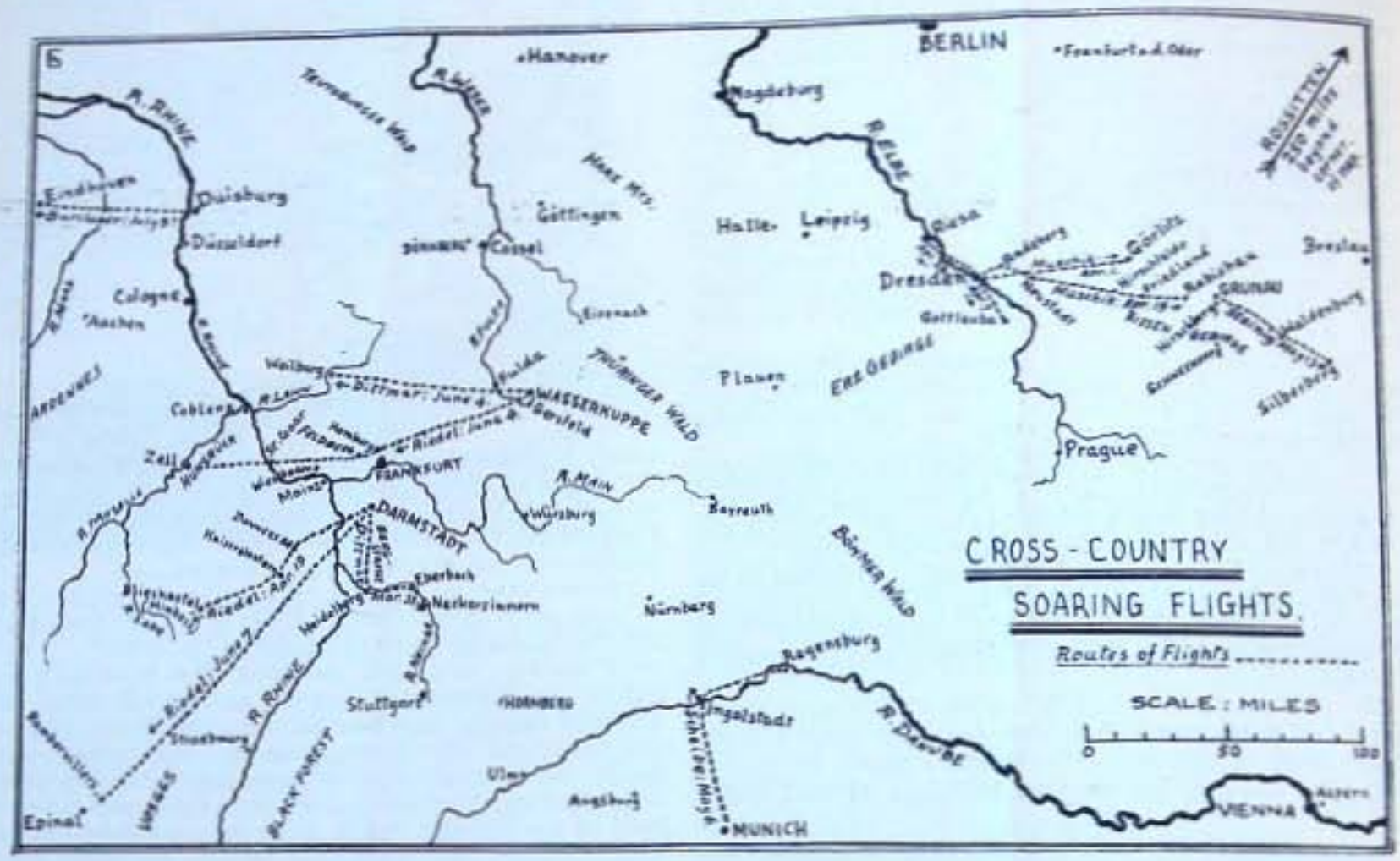
So the meeting closed without any further cross-country flying. Most of the visiting machines were put on their trailers and towed away into the night.

AT PEWSEY.



Dr. McGlashlan soaring the "Tern," and the "Hol's der Teufel" just landed, on Pewsey Hill.

GERMAN DISTANCE FLIGHTS



In our issue of May 12th, 1933 (p. 102), we gave particulars of three cross-country soaring flights, viz., on March 31st, by Heinrich Dittmar in the CONDOR, Darmstadt to Neckarzimmern, 40 miles; April 1st, by Muschik, in the D-B 10, Dresden to Görlitz, 60 miles; April 19th, by Reidel in the CONDOR, Darmstadt to Mimbach, 74 miles.

Since then, news has come of several more such flights this year. It is important to note that flights such as these are now becoming general in many parts of Germany, whereas in previous years nearly all the outstanding flights used to be made in the course of the annual Rhön Competitions. Also that, whereas the meteorologists had in the past to build up their theories upon isolated incidents during such flights, they are now getting their data in wholesale quantities, and are no doubt becoming correspondingly sure of themselves.

The following particulars are taken mostly from *Flugsport*.

Muschik's Flights from Dresden.

On April 7th, Muschik, after an aeroplane tow above the Dresden aerodrome, soared in and below cumulus clouds, gaining 1,300 feet of height above the casting-off level, and landed at Börnersdorf in the Gottleuba Valley.

The "DB-10."

On April 19th, the same pilot nearly succeeded in flying in the D-B 10 all the way from Dresden to the Grunau Gliding School in Silesia. He was towed to 2,800 feet above the aerodrome (3,300 feet above sea level) by a B.F.W. aeroplane, and cast off. The cloud base was reached at 5,000 feet, above Radeberg, and, flying blind, Muschik got up to 6,900 feet inside the cloud, up-currents of 14.8 ft. per second being found. Using various cumulus clouds, and flying mostly in continuous circles, he passed over Neustadt, Hirschfelde, and Friedland (Czechoslovakia), where he again got up to 6,900 feet. He tried hard to reach Hirschberg, but it was getting late and up-currents were failing; he even got into a down-current of 8½ feet per second, presumably due to mountains. He landed at Rabishau, 12 miles short of Grunau, after a flight of 3½ hours, having covered 80 miles.

On April 28th Muschik tried for height. He cast off at 2,100 feet, after an aeroplane tow, and got up to 7,050 feet, mostly in clouds. After flying for 2¾ hours, he landed in Riesa, 28 miles away.

By these last two flights, together with a duration flight of 6 hours 53 minutes, Muschik has obtained the "Silver C" badge.

A Thunderstorm Flight.

On May 6th, at 5 p.m., the pilot Scheibe started from the Schleissheim aerodrome, Munich, towed by a B.F.W. aeroplane. He cast off at 4,600 feet, in front of a thunderstorm "front." He quickly rose to 6,600 feet, and, keeping in front of the storm, which was now travelling northwards, arrived near Ingolstadt at a height of 8,900 feet, his greatest height. The storm then changed direction towards the north-east, and followed the course of the Danube. Scheibe kept on till it was getting dark, and then made for the aerodrome at Regensburg, so that he could be conveniently aero-towed back home the next day.

His machine was the Mü 6, designed and built in 1931 by the Munich Academic Flying Group. It has rectangular wings of 46 ft. span, strutted, and of two-spar construction; in fact, it somewhat resembles the KASSEL 20.

Another "Silver C."

Paul Steinig qualified for his "Silver C" badge on May 13th with a flight of 53 miles and a height of 3,900 feet above the starting point. He had done a duration flight of 5 hours 51 minutes on a previous occasion. This flight of 53 miles was from Grunau to Schönwalde, near the Silberberg Castle, and beat by 8 miles Wolf Hirth's longest distance flight from Grunau. A photograph of Hirth soaring at Silberberg appeared in our issue of April 14th, page 75.

Steinig flew in the STANAVO. The flight was remarkable in that it was carried out entirely with the help of only two cumulus clouds. The first took him as far as Waldenburg, where he found a convenient slope and continued to soar over it. He had not been doing so for more than 5 minutes when another fine cumulus came along, and with its help he carried out the remainder of the flight. The weather report from Breslau on that day gave the wind as W.N.W., of force 4 (15 m.p.h.) at 7 a.m. and force 1 (2 m.p.h.) at 6 p.m. It is evident, therefore, that the long distance achieved was due to the unusually long life of each cloud, rather than to the speed of the wind. The same weather reports gave the type of low cloud as "No. 5" (layer of stratus or strato-cumulus) at 7 a.m., covering one-quarter of the sky, and "No. 4" (strato-cumulus formed by the spreading out of cumulus) at 6 p.m., covering one-half the sky. At Berlin the clouds were large-size cumulus at both times. The flight followed mountainous country all the way, and that fact may have been responsible for his finding such good clouds.

Riedel and Dittmar.

On June 4th, Riedel in the FAFNIR and Dittmar in the CONDOR carried out simultaneous flights to the west, starting from the Wasserkuppe.

Riedel started with an aeroplane tow at 1.25 p.m. He cast off at a low altitude above the Wasserkuppe and proceeded to soar westwards, passing over Bad Homburg, the Feldberg (Taunus Hills), and St. Goar (on the Rhine), and landing at Grenderich, on the Hunsrück range, a little short of Zell on the Moselle. The distance was 124 miles, and greatest height 7,050 feet. The Rhine has only been crossed once before in a soaring flight from the Wasserkuppe, when Wolf Hirth did so in his MUSTERLE during the Rhön Competitions two years ago.

Dittmar also started with an aero-tow. After four hours he landed at Obertiefenbach, near Weilburg on the Lahn.

The accompanying map shows, besides the flights already mentioned, Riedel's flight from Darmstadt into France on June 7th (described in THE SAILPLANE for June 23rd, page 135), and the two-seater flight from Duisburg into Holland, described elsewhere in this issue.

[Note: The "Silver C" badge is awarded for a soaring flight of 5 hours' duration, one of 50 kilometres distance, and a climb of 1,000 metres above the starting-point, or the casting-off point in the case of a tow. There are now eleven holders of the badge.]

ATTACK ON DURATION RECORD.

It is reported in the press that Flight-Lieut. E. C. Mole is considering a fresh attempt on the World's duration record for soaring, which at present stands at 21 hours 34 mins., and is held by Lieut. Cocke, of U.S.A. Mr. Mole made two attempts last year, at Ingleby Greenhow and Sutton Bank respectively, in the TERN, but they were cut short by bad weather in the one case and lack of wind in the other. (See THE SAILPLANE for August 12th, 1932.)

The new attempt is planned to take place at Dunstable Downs, using the WILLOW WREN.

THE "PROFESSOR" AND THE "WILLOW WREN"

THOUGHTS AFTER SOARING BOTH.

By DIE-HARD.

All kinds of stories have grown up round the PROFESSOR. She has been spoken of, and written of, with contempt, inasmuch as she, like the PRÜFLING, is no longer popular as a training machine in Germany.

The PROFESSOR is said to show a liability to spin, is said to be clumsy on turns, difficult to land, groggy on her ailerons, fierce on her elevator—in fact, altogether a bit of a nightmare.

These things give a false impression of a machine which, apart from having a really useful performance, is an excellent training machine since she is *not* fool-proof. A good PRÜFLING pilot ought to be able to handle a PROFESSOR, and a good PROFESSOR pilot ought to be able to handle anything.

The PROFESSOR certainly has to be treated with patience and respect. In rough conditions her occasional reluctance to pick up her low wing is never too funny, but she is willing to do so and, if given time and a good kick of top-rudder, can be induced to emerge without any indulgence in excessive air-speed. But it certainly feels queer when one slips and lurches down the sky with the stick hopefully jammed up against ones upper knee, the air-speed indicator registering a healthy 33 m.p.h. through it all.

It is this curious phenomenon which drives a highly-strung beginner into a troubled frame of mind made manifest by a subsequent temptestuous flying-style. But as soon as one has satisfied oneself that she can easily be *kicked* out of her difficulties by hearty use of the rudder, one can settle down peacefully and have a very stately ride at great heights.

The elevator is sufficiently powerful, but the machine is remarkably stable fore and aft in bumps, *if left to herself*. In consequence, provided that the lateral movements of the stick are truly lateral and not diagonal, one need pay little attention to the fore-and-aft adjustment.

The "Professor" being flown by Capt. Needham in 1931.

The machine flies charmingly at 30—32 m.p.h. and, even when carrying a 12-stone pilot through bumps, is not too unhygienic at 28 m.p.h., though this is getting near to trouble.

The rudder is nice and the machine turns fast, provided that one keeps the speed up to about 32—33 m.p.h., and also provided that one is not too niggardly with the banking. The great trick in pulling off a fruity turn seems to be to throw oneself into the turn body and soul, and *will* her to go where one wants her. No half measures.

In other words the venerable PROFESSOR is a rare old bird when one gets to know her. She has a lot of character, and, unless one sets to work with sufficient peace of mind to find out her idiosyncrasies, one is liable to mistake her funny little ways for vices.

Then one gets into the WILLOW WREN. The only word that describes her is "nice," which is rather an abused word. But she is definitely "nice." She is absurdly easy to fly and nothing but ignorance combined with violence could get her into trouble.

She is almost noiseless apart from a slight hum in the drag-wires (which is an excellent guide for maintaining a steady speed) and a gentle hiss over the centre section (which one can only hear when one turns one's head sideways).

The controls are beautifully balanced and incredibly firm in action without being ultra-sensitive. In bumps the ailerons instantly flick the low wing up, where in the PROFESSOR the ailerons drag the low wing up like a bucket in a well. The rudder is glorious. Stalling merely causes her to sink quietly.

The "Willow Wren" soaring recently at Dunstable.

In consequence, one is attacked violently by the bacillus of over-confidence, against which not all pilots have been rendered immune. One is filled with a childish desire to stunt, so that even an old man sets to work to do violent flat turns, racing turns, diving turns, climbing turns, to steer a course that is *all* turns, to hover over loving couples and fountains of lift, to practise side-slips —in other words, to indulge in all forms of legitimate aerial foolery.

Part of the joy of flying her is due to the comfort in which the pilot is buried, with protection up to his chin and good cushions underneath and behind him. The pedals are very comfortably placed. One puts a certain amount of weight on to one's heels, which brings the force on to the pedal-anchorage and *not* on to the control-wires and rudder-horns. One then steers with the big— or little—toe, an aristocratic procedure greatly to be preferred to the usual clodhoppery which eventually tears pedals out by the roots.

The streamlining of the WILLOW WREN is obviously excellent; this is shown by the high speeds at which she can travel, and by her silence. The exactitude of her controls must come from perfect balance as well as from adequate control-areas. Her general feeling of *tautness* is altogether admirable and suggests a beefy strength that certainly has a soothing effect on a pilot. Landings are easy so long as they are not preceded by too steep a dive, in which case she gets up a big pace and is reluctant to lose it. In other words, don't *cram* her down on to the ground. She will only give a loud laugh and spring into the air again. There can be no excuse for getting into this trouble, since her surplus height can be worked off so easily by quick turns and/or slips.

So far, only her designer-builder-pilot, Corporal Manuel, can see how to improve on her, and such improvements, which are all minor, are to be built into the new machine now on order.

One day there will have to be a GIANT WREN, in effect a modernised PROFESSOR. The cock-pit will be closed and the instruments legion. And then we shall all be terribly serious and get next to no-kick at all out of this soaring business.

A SUGGESTION FOR WINCH-LAUNCHING

By E. BRAME.
(R.A.E. Aero Club.)

Anyone having experience of the gliding movement in this country will be aware of the great difficulty of finding suitable terrain. More than one club has ceased to exist through not finding a gliding hill. Those clubs who are fortunate in having a suitable hill, often go for weeks and weeks without a suitable wind.

This state of affairs is most unfortunate for the movement, and more so because many good hills do exist but are either sacred game preserves or belong to several owners, all of whom cannot be persuaded to grant the necessary permission.

The late Mr. Lowe-Wylde, realising these difficulties, tried to solve them by his system of auto-towing and later by his motor-cycle engined gliders. To many people, this later development was departing from the true spirit of gliding. Even the experienced soaring experts have to utilize a method of launching which is by no means perfect, entailing an expensive elastic rope and many willing hands to provide the necessary energy.

Referring again to auto-towing, it has been found by experience that the popular makes of medium-powered cars have not the power to give the 36 m.p.h. necessary over grass, or the stamina to do so for very long even on special smooth grass. Again, owners of large paddocks or aerodrome authorities will not stand for the damage done by a large and necessarily heavy car tearing up their turf.

What can be done about all this?

The answer is a winch. A winch does not have to be very powerful to launch a 200 lbs. glider with a 160 lbs. pilot on board because is not accelerating nearly a ton of old iron across the field as in the case of auto-towing with a heavy car.

If the winch system is decided on, the question naturally arises, how driven?

Many methods can be thought of, some very practical but also expensive. The job of the winch is to produce a uniform, smooth acceleration of not more than about ½G for long launches and up to ¾G for catapult launches. Considering the former case as the most useful, the engineer with lots of money to burn would design something either worked by steam, as being the most flexible prime mover, or possibly electric. The petrol engine, in spite of being the lightest and most convenient form of prime mover, he would consider last, because it is also one of the most inflexible of prime movers, necessitating a clutch and gears, etc., and no really practical form of gear has yet been devised to give a uniform smooth acceleration.

One cannot visualize a gliding club unloading a donkey-engine and boiler off their trailer and, later, members taking turns at stoking up whilst others waylay the local coal vendor for fuel. One can visualise, though, a wealthy club possessing an electric winch and running a lead

across a couple of fields to the farm which is on the grid system, ten years hence.

Coming down to earth, what about now?

Here is a suggestion. Use any car, an Austin Seven if one likes, and remove both rear wheels after jacking the rear axle up with good blocks of timber with grooves cut to fit the axle.

The next step is to fit to one wheel a drum large enough to carry, say, 1,000 feet of 15 cwt. flexible steel cable. The other wheel should be fitted with a standard flat-faced belt pulley as used on mill shafting. A suitable gear is selected after the engine has been started up, and the glider attached at the other end of the field.

On letting in the clutch, the load of the glider will hold the drum stationary, but the differential gear will drive the flat pulley round at a high speed—twice the speed in fact, of the normal axle speed when used on the road. By the use of a plank as a lever between the pulley and the ground, the flat pulley can be retarded in speed, whence the drum will slowly begin to rotate. By the application of varying amounts of pressure, the drum and glider can be smoothly accelerated.

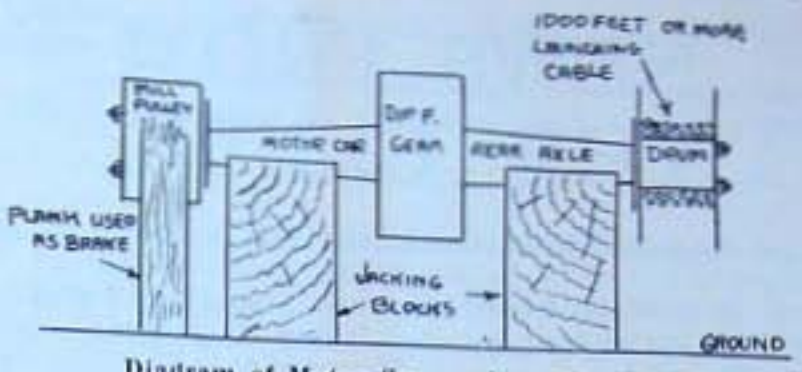


Diagram of Motor Car used as Winch for launching Gliders.

The whole contraption can quite easily be loaded on to its own car, together with other glider equipment, for transportation.

The drum should preferably be a narrow deep-flanged type, as this will facilitate the acceleration imparted to the glider, since the diameter increases, and this will allow the cable to lay better and not pile up in one spot.

NEWS FROM FRANCE

A "C" OVER FLAT COUNTRY.

For the first time in France, a pilot has obtained his "C" certificate over flat country by means of an aero-towed start. On July 1st, Capt. Rémy, flying a KASSEL 25, was towed up by an aeroplane piloted by Georges Abrial, starting at 3.30 p.m. The sky was cloudy with slightly thundery conditions. Rémy cast off at 1,600 feet and flew round in thermal currents above the neighbourhood of Saint-Cyr, rising to 2,400 feet. The flight lasted 50 minutes, of which 35 minutes were spent above the casting-off level.

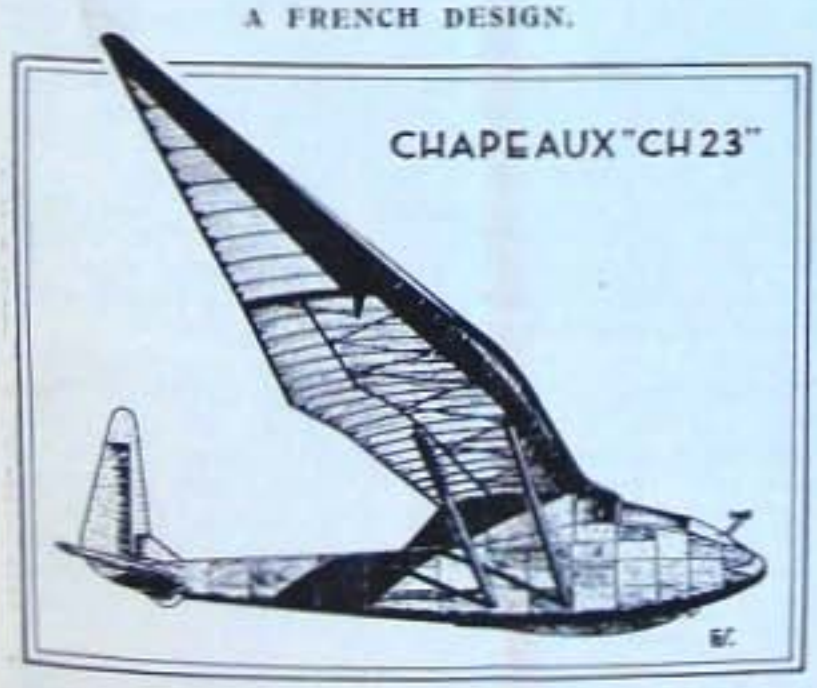
The next day it was Abrial's turn to fly the KASSEL, but, in spite of the presence of cumulus, according to *Les Ailes*, he only achieved a 20 minutes' plain glide from a casting-off height of 3,000 feet.

Abrial, it may be remembered, once expressed the opinion, in an article published in THE SAILPLANE of November 11th, 1932, that "Contrary to what one might think (and this has been my opinion till recently), flight under the clouds is easily accomplished. Indeed, in suitable weather, the result is semi-automatic and demands less manœuvring and decision than hill flying."

We thought at the time that he was being unduly optimistic, and had been led to this opinion through having soared on a day when thermal lift was unusually easy to find. It seems evident now that the amount of cumulus cloud in the sky is not always a guide to the amount of thermal current to be expected lower down. On the day of this last flight, the Paris weather reports, both at 7 a.m. and 6 p.m., indicated a cloudless sky, so there could not have been much cumulus about at the time of Abrial's flight.

In THE SAILPLANE article referred to, Georges Abrial, who is President of the private gliding group *l'Air*, outlined a scheme of motorless flying training over flat country, whereby the "C" certificates were to be obtained by means of aeroplane-towed starts, so that Captain Rémy's achievement has at last brought the scheme to fruition.

A FRENCH DESIGN.



The sailplane "Chapeaux Ch-23," a photograph and description of which appeared in our issue of March 3rd, 1933.
(Drawing by G. H. J. J. Schuurmans Stekhoven, Utrecht, Holland.)

THE FLIGHT OVER PARIS.

Georges Bouvier, whose gliding flight over Paris on July 5th was reported in our last issue, has sent a short account of it to *Les Ailes*. It appears that the flight lasted 45 minutes; not half an hour, nor 2 hrs. 10 mins., as variously stated in the press.

He started from Chartres at 10.45 a.m., towed by Abrial (who flew in a glider over Paris last year). Bouvier writes: "I arrived over Paris at 11.50. I released vertically above Sacré Cœur at 11.55, at a height of 1,700 metres (5,600 feet). I made several circles in the triangle Sacré Cœur, Madeleine, Louvre, and landed at Le Bourget at 12.40.

"Obliged, according to orders received, to remain at a high altitude, I could not try to prolong my flight by descending into the lower levels to search for ascending currents which could have kept me up. I could observe that, although the sky above was clear and the air quiet, a sheet of haze had settled over Paris, between 700 and 2,500 feet. On the other hand, a fierce wind from the north-east obliged me to retain a big enough margin to be sure of being able to land at Le Bourget. The first part of the flight, from Chartres to Villacoublay, carried out at 1,600 feet, was very, very uncomfortable; I was much shaken up by the eddies from the ground which abound in that region."

KRONFELD IN PICARDY.

During the week-end of July 8th-9th, the Aéro-Club de Picardie held a grand celebration of its twenty-fifth birthday at Amiens. R. Kronfeld took part with his sailplane AUSTRIA II., and gave an aerobatic display, including loops and spinning dives. His performance was a great success, and, according to a French report, incontestably the "*clou du meeting.*"

NEWS FROM THE CLUBS.

R. E. Clear, the Portsmouth Club's youngest "A" pilot (age 16), in the club's nacelled "Dagling."

BRADFORD AND COUNTY GLIDING CLUB.

Sunday, June 11th.—Short training flights made by Christian and Flather on REYNARD.

Sunday, June 18th.—Rained like blazes, so members departed to Verity's and put in some useful work on DICKSON, which is being re-built with further improvements.

Sunday, June 25th.—Wind east and not very strong. The HOL's was rigged and flights made by Stedman and Hastwell. During late afternoon Sharpe's car was seen in the distance beetling along with a huge trailer waving along behind like a flag. The "caravan" halted at the top of the slope, and all the members except one departed to have a look at the PROFESSOR, which in spite of its hectic journey from Dunstable, seemed to have stood it bravely. Sundry roars and yells from the direction of the HOL's at last reminded the said members that Stedman was waiting to be "poked forth," and this was duly accomplished. The HOL's was then taken back to the farm and introduced to its new pal, which was being rigged for a trial. Sharpe was the victim this time, and he put up a good show in a test hop and short glide, after which we packed up. (We understand that this is Miss Lippens's PROFESSOR.—ED.)

Sunday, July 2nd.—No wind! One flight made on REYNARD by Cox, but it was decided that we should not carry on.

Sunday, July 9th.—Rather a bad day in many ways. HOL's and REYNARD were brought out, but the wind was so light that any attempt at soaring was impossible. Stedman and Sharpe flew her off the long west slope, and Cox from the top of Hope Hill. This was his first flip in this machine, and he is in agreement with the others that it is a good kite. REYNARD did some good work. Jowett made his second qualifying flight, and then went off for his "B," which he obtained with a good flight of 67 secs., with very little wind to help him. Alderson then departed from Hope Hill, but though his thirst is abating, he still "draws more pints" than are good for one. Armstrong then took the air, but banked too steeply on turns, and made rather a heavy landing. We are now doing some maintenance jobs on REYNARD.

The blackest part of the day was caused by the car (?), now christened by Sharpe the "B.C." (The Editor would not dare let us state what those initials mean!) In spite of threats and abuse it positively refused to function. It just sat on its back axle and laughed at the members toiling up the hill retrieving machines.

The members responsible for its purchase are now trying frantically to dispose of it before November 5th, as the others have promised an interesting ceremony on that date, in which they are to take a prominent part.

Wednesday, July 12th.—The first mid-week meeting. If these continue there looks like being some fun! The culprit (no names, no pack-drill) pokes his head out of his office window about 4.30 p.m., and if a west wind blows him in again he starts work on the 'phone. As a result harassed blokes are to be seen rushing about, spinning yarns to wives and wives-to-be, and also to their bosses, and then they hie them to the farm, only to be roundly cursed by the said culprit for not bringing some pals to help.

Stedman and Sharpe put up some good soaring practice on the HOL's, and learnt quite a lot about our West Slope, which they are keeping under their berets for future use.

Sunday, July 15th.—Rain and no wind prevented flying, but some useful work was put in by the honest and *dutiful* members who *did* turn up.

HARROGATE CLUB.

We learn that Mr. E. T. W. Addyman is camping near the Filling Station, 1½ miles on the Appleby side of Brough.

He has found some splendid open gliding and soaring ground near Hilton, about 4 miles away.

He has his light-wind sailplane ZEPHYR with him, and is expecting others for the week-end, July 22nd-23rd.

LONDON GLIDING CLUB.

Saturday, July 8th.—Horrid wind along the hill; a few auto-launches in the evening.

Sunday, July 9th.—Wind along the hill, from the S.W., its natural gustiness increased by the hillside burbles. Speed about 25 m.p.h. clear of the ground, so that the WILLOW WREN could occasionally hover when flown dead-slow. The whole sky seemed to be full of turbulence, with occasional rainstorms stamping across the plain; clouds low and ragged, short bursts of sunshine. An extremely interesting day.

The PROFESSOR was launched first and hectically fled to and fro below the hilltop, the pilot clearly unhappy, and reasonably so. An optimistic gent, complete with aneroid, then mounted the R.F.D., reaching the bottom of the hill intact after a Wild Western ride which, though stimulating, left his mouth rather dry. (Hence the bar.) The WILLOW WREN soared like a dog with a tin on his tail. The PRÜFLING plunged down without delay. Altogether, things were quite stirring.

Our chairman thereupon hopped into the PROFESSOR, soared at a good height without a tremor of the machine and landed on the top, thus steadying things down a bit. Dewsbery spent the dinner-hour in the WILLOW WREN, touching 700 feet, but even then the Zoo was unapproachable owing to a barrage of down-draughts combined with the head-wind. Nicholson, too, flew the machine really handsomely. He was also given a ride in the PROFESSOR. But, as the local paper said about the amateur theatricals: "Where all so good, t'were invidious to particularise"; and some of the stoutest flights were the short ones that brought the PRÜFLING, kicking and wriggling, precipitately to earth without damage. The R.F.D., meanwhile, had been put on one side as hopeless. In the evening she was auto-launched in a comparative calm and thoroughly hit on the nose by a Great Big Plumber Who Stalled (most of us have done it, so hush!).

During all these bits of fun a pleasant young man from Cranwell, Murray, took his "A" and "B" in the PRÜFLING, and his "C" in the PROFESSOR. If you want to learn the rudiments of flying go to Cranwell, if they will have you. His Aero Club certificate will be unique, especially as his photograph is to include his kilt. It certainly was a complete clean-up, dismissing the entire certificate-complex from A to Z (or C) in one day. Which is just as it should be. You don't learn to fly properly until much later than that.

In the afternoon the WILLOW WREN and the PROFESSOR were having a frolic together at about 200 feet above the hill, when the former was lifted by a giant hand which, as usual, came in over the bastion. The PROFESSOR was already coming up from the bowl and duly was similarly

seized. Both machines set out across the plain, diagonally across wind, toward the greenhouses which bear about due west from the launching point. The aneroid hand went on lifting for about five minutes, until the height recorded in both machines was about plus 700 feet (above start). They were clearly passing through a travelling barrage of lift, *or* through a temporary upward surge caused by an aerial congestion up against the ridge. The WREN pilot noticed a boiling cloud over his head and the PROFESSOR pilot formed an impression of a vague "front" in the clouds, far too indeterminate to justify a bolt down-wind, which could so easily end ignominiously a mile or two away with a smashed machine, and at best would cause a great deal of retrieving work.

So the WREN scurried round in descending circles and then ran home, while the PROFESSOR frivolously pushed ahead for the Totternhoe Windmill, which she rounded so low that she had only exactly enough height to spare for a cosy landing after the run home, 2,000 yards away.

The only sensible alternative would have been a beat back to Whipsnade where the wind was blowing very fairly up the hillside. Both pilots are left with the conviction that 1,000 feet is the bare minimum to be attained before going away down-wind (thus providing a margin of height for error), and with the idea that these great surges of lift are possibly non-existent behind the ridge. Time, variometers, and rashness, alone will tell.

We were very glad to see the Founder of THE SAILPLANE. Readers will be glad to know that he looks fat and wealthy, and wears a *scream* of a bow tie.

On **Saturday, July 15th,** a southerly wind in which the main ridge could not be used, so that flying was limited to auto-launches.

On **Sunday** the air over England seethed with erratic breezes, rain-storms which in some areas became cloud-bursts, thunder here and there, and flat calms. At Dunstable the PROFESSOR and KASSELL 20 soared when the breeze was at its best, but were otherwise handicapped by their fairly large turning-circle, which tended to bring them out of the narrow and patchy lift. The WILLOW WREN, being essentially quick and precise in her turns, soared repeatedly to heights of about 200 feet by aneroid, carrying on through the worst storm. (After the rain the pilot landed and dried his upper garments by hanging them on the rudder.)

The PRÜFLING managed to prolong her descents appreciably, to a maximum of about two minutes, enabling Briscoe to take his "A" and "B" in the day. The WALKER-DOVE emerged from the workshop with a new nacelle made by Manuel during the week. Her efficiency is now really good, and Jones, in obtaining his "B" with 75 seconds during a flat calm, did an honest "S" turn, and then very nearly flew clean out of the grounds in the direction of Totternhoe. Goslett, having obtained his "A," brought her down on his next flight with a hearty dive, after which she floated a couple of hundred yards, climbed up on to the hangar ridge, and sat on the top, just as if she had a trace of PROFESSOR blood in her pedigree. Four of her six pilots obtained either an "A" or else something toward their "B," while the fifth, a would-be PRÜFLING pilot, found a novel way of landing half a mile from the prescribed spot. He had the decency to blush, and no doubt his soul is now in a thoroughly healthy state!

In all, seven pilots flew the PROFESSOR, nine the PRÜFLING, six the WALKER-DOVE-MANUEL-R.F.D., six the KASSEL 20, and seven the WILLOW WREN. We certainly missed the HOL's DER TEUFEL; she would have revelled in the conditions. We cannot swear to the number of flights, but we actually recorded 52 with flying-money to match.

What is wanted next is a nice quiet Sunday, with a faint breeze trickling *down* the hill, so that the new batch of ground-hopping beginners can be brought to hill-top standard. Having put this in writing, we shall probably get nothing but easterly gales for months. Which reminds one of the picture, in the *Sydney Bulletin*, of the parson standing on his bed with an umbrella over his head and water all over the floor, the rain pouring in through the ceiling; he had prayed hard for an end to the drought, and now all he could say was "But, Lord *this* is *ridiculous!*"

Anyway, we emerged from a long day without a single breakage, for about the first time this year, so it seems!

ULSTER GLIDING AND AVIATION CLUB.

On **Saturday, June 17th,** the wind was strong enough to soar over a short ridge on the western side of the Cave Hill, near Belfast. There is a drop down to the road here of about 250 feet; the gradient is 1 in 6 maximum and the length of beat available is only 500 yards.

At the start the wind was force 6; ground speed was nil with about 55 km./hour air-speed. With uneven ground stretching for miles upwind, conditions were very bumpy. This sort of flying is excellent practice and a welcome variation from flying in the steady conditions of sites where the wind blows in off the sea. Some delay was caused by heavy rain squalls and by a landing at the bottom, about half-a-mile on the far side of the road. The best height above the start was 350 feet. Landing on the top was easier than in some places we have been to.

While we thank the Editor for his kind remarks about our flying in a "sea breeze" at Magilligan, we would disclaim any pretence to being the first to accomplish this. We feel sure it must have been done many times at places such as Rossitten. It would appear that under these conditions, the combination of the convection current above the land, and the upward deflection of cold air from the sea, by the cliffs, gives rise to up-currents which are much stronger than the mere ground wind would lead one to believe.

[The Rossitten site is on a long narrow strip of land

Two of the Ulster Club's many sites.

only a mile wide, with the Baltic Sea on one side and a lagoon 30 miles wide on the other. This would hardly produce much of a "sea breeze," that is, a wind entirely caused by the diurnal heating of the land by the sun. It is more likely, however, that soaring in a pure "sea breeze" may have been done in America in such places as Cape Cod and the district round Los Angeles, possibly also at Vauville in France.

The coastline of Germany consists almost entirely of low sand dunes, and in consequence the Germans have not been able to work out a technique of picking up thermal and cloud currents when "slope soaring" in a wind off the sea. Such a technique must necessarily differ from that used inland. Here, then, is an opportunity for the Ulster Club to make a useful contribution to the world's progress in the art of soaring flight.—ED.]

PORTSMOUTH GLIDING CLUB.

The Club's primary "Dagling" in action.
Above: H. G. Lympany soaring it along Portsdown Hill.
Below: L. Allen taking off from the top of Portsdown.

OFFICIAL NOTICES

Council Meeting.

The next Council Meeting of the British Gliding Association will be held at 7, Albemarle Street, W., on Monday, July 31st, at 6.30 p.m.

Change in Telephone Number.

The B.G.A.'s telephone number has been changed to MAYFAIR 3497.

FOR SALE.—Buick Car, suitable for auto-towing and general utility work. Portable hangar, will house six fully-rigged machines. What offers?—Write Secretary, B.G.A., 19, Berkeley Street, W.1.

FOR SALE.—B.A.C. IV. Secondary Machine, complete with trailer and auto-towing cable; cheap. Apply J. Inglis, "Dryden," Ashkirk, Selkirk, Scotland.

WHEN REPLYING TO ADVERTISEMENTS PLEASE MENTION "THE SAILPLANE"

Printed & Published in Great Britain for the BRITISH GLIDING ASSOCIATION, by COMMONWEAL PRESS LTD 43 Chancery Lane, London, W.C.2