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OFFICIAL ORGAN of THE BRITISH GLIDING ASSOCIATION

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MARCH, 1935

Published Monthly

Camps and Meetings

LAST summer a reader wrote to ask where he could get a week or two of continuous gliding instruction during his summer holidays. Nobody could tell him, and he finished up by joining a club and putting in a few week-ends there.

This year things promise to be very different. On another page full details are announced of an instruction camp to be held at Dunstable in the first fortnight of August. Although run by the London Gliding Club, it is outside the ordinary club activities, and, we imagine, if it is successful, more facilities of the same kind will be arranged. At the other end of England there is to be an instruction camp of several weeks' duration at Sutton Bank (see Yorkshire Gliding Club news), though the dates have not yet been fixed.

The German gliding schools have a great reputation, but are rather troublesome to get into nowadays, owing to their being more or less under State control, and long notice must be given. In Austria there appear to be courses open to all comers, on the Gaisberg (see next page). We would be pleased to hear what it is like from anyone who intends taking the plunge.

Meanwhile, for those who are further advanced but still willing to learn from experience, there is the Sutton Bank meeting at Easter. Sutton Bank has shown what success can come to a gliding organisation when it is run primarily in the interests of those who fly, and it deserves every possible support.

Our Cover Picture

THE photograph reproduced on the front cover was taken by the Editor somewhere over Belgium on July 29th, 1934, from a hired "Leopard Moth" in which three members of the London Gliding Club had been visiting the German soaring competitions. Below is a layer of strato-cumulus at two or three thousand feet, while far above is a sheet of alto-cumulus stretching away over the North Sea. We were being considerably delayed by a strong south-west wind, which is blowing from left to right across the picture.

Both upper and lower cloud sheets may be looked on as an example of the tendency of vertical currents

in unstable layers of air to arrange themselves "cells." Cells such as these have been studied by Gilbert Walker, who believes that the shape of cell depends largely on the amount of "shear," difference in speed between the top and bottom of layer. In this case it will be seen that the lower clouds are arranged in rolls parallel to the wind direction. The upper sheet is also thickened into long strips parallel to the wind; these are divided into smaller lumps which are themselves further subdivided into innumerable little "cells"; the latter are, however, somewhat irregularly distributed and show a tendency to flock together.

The lower sheet has the typical appearance of kind of strato-cumulus which forms the upper limit of a region of turbulence which has spread upwards from the ground during the day. This became only too evident when, realising we should not get home tonight, we dived down through it to look for a landing place, and roared over the tree-tops in the gathering mist and darkness in a vain attempt to find Inglevert.

Sailplane Construction

THE series of articles on this subject, for which we are indebted to Mr. Butterfield, of the Furness Gliding Club and of Vickers Armstrong's, is now in full swing again, and we hope to go on publishing them month by month. The following synopsis, furnished by Mr. Butterfield, will give readers an idea of what to expect, though it may not be strictly adhered to:—

- 1.—Layout (published in January).
- 2.—Workshop and tools (in this issue).
- 3.—Ordering and selection of materials, with typical summary schedule.
- 4.—Properties of materials, with a list of weights and strengths; applicable heat treatment; seasoning of timber; preparation of glue.
- 5.—Types of joint assembly of ribs and spars; feathering of plywood struts.
- 6.—Types of fuselage and assembly; checking alignment and c.g., with incidence.
- 7.—Rigging and controls; attachment of cables; splicing of strand steel cables.
- 8.—Doping, varnishing and general finish.

From Here and There

The Multitude Record.—On February 25th, according to a Press report, an aeroplane piloted by M. Fedosiev towed five gliders into the air at Moscow. This is claimed to be a world's towing record.

Strap Yourself In.—On February 3rd, M. Paul Mechenet, while flying a glider at 500 feet, near Marseilles, was struck by a violent gust of wind and thrown out of his machine, with fatal results.

Putting Them Wise.—"In a sailplane, high above the limitations of our fellows, on a glorious morning over glorious hills and downs and moors, one is inspired without constraint. Personally, I sing, loudly and wordlessly. Or sometimes I am shamed to silence by the beauty of the world, and try to fuse myself and my machine into the upturned basin of the sky while I have still its freedom. It is not often that one can be absolutely certain that one is beautifying an already beautiful scene."—From an article on "Silent Flight: A Glider's Secret," in *The Times*.

Gliding Courses in Austria.—An inquirer has kindly passed on to us the following information, obtained from the Anglo-Continental Express Co., Ltd.: The Aero Club of Salzburg is arranging gliding courses for beginners and advanced pupils on the Gaisberg, near Salzburg. The courses last two to three weeks, and include instruction in repair work. Pupils may stay either at the mountain hotel at the top, or in peasants' houses, having their meals at the hotel. The cost for the beginners' course, the agency states, would come to about £19, including return fare from London, three weeks' board and accommodation, and the gliding course. The place is 20 minutes by car from Salzburg.

Pushed Down 600 Feet.—Early in February, according to the Croydon Correspondent of *Flight*, a pilot of Spartan Air Lines on the Isle of Wight route experienced a downward bump near Dorking which brought him down from 1,000 feet to 400 feet. This was during a period of north winds, and it may be remembered that the North Downs, which overlook Dorking, drop suddenly on their south side some 400 to 600 feet. He therefore finished up below the top of the hill; nevertheless, this is not as bad as it sounds, since a reverse eddy would be blowing up the south face, as we proved many years ago by making a model glider soar in it under similar conditions. On the 16th, during a gale, a pilot on the same service purposely made a detour "to avoid country where bumps would be bad," although the wind that day was W.S.W., not north at all. Another interesting fact is that an air-liner pilot, during the same gale, "obtained absolute steadiness" at 4,000 feet; not till he came down to land did the bumps begin; there was, however, an inversion between 3,000 and 4,500 feet, according to the Duxford 7 a.m. report, so possibly that damped out the bumps.

Soaring at Dublin.—The Dublin Gliding Club is reported to have held its first outdoor meeting on January 27th. Sixty members were present, and about 40 ground-hops were made on the club's Primary. Capt. A. G. Quirke, president of the club, soared this machine for a quarter of an hour. Four more machines are under construction by the club.

Wingless Flight.—During a violent storm on February 24th, according to Press reports, some children on their way to school at Lausanne were "swept up into the air by the gale and flung down many yards away," while a farm hand at Crolles "had a terrifying experience, as he was blown high into the air and fell in a gorse bush 20 yards away."

Yorkshire Gliding Club (Proprietary), Ltd.—This is the title of a new limited liability company, formed with £100 capital in £1 shares. The directors are C. S. Craven, A. M. Verity, and N. H. Sharpe, and the stated objects: "To acquire an interest in the freehold land and premises at Sutton Bank, Yorkshire, and use for the purpose of gliding, soaring, and aviation," etc.

A "Sudden Gust."—It is a common delusion among the public that, if you go into the air without an engine, you are "at the mercy of" every gust of wind, and that those who stay on the ground are in no such danger. At an inquest at Sutton (Surrey) on Ernest Adams, a cyclist, aged 38, a witness stated that he was "caught by a terrific gust of wind" and blown into a moving car; the jury added a rider "that high wind caused the accident." Further comment on the comparative safety of land, sea and air sports is provided by a recent Press report, which stated that on Sunday, February 10th, 300 people met with accidents while skiing in the outskirts of Vienna, of whom 68 suffered fractures of legs and arms.

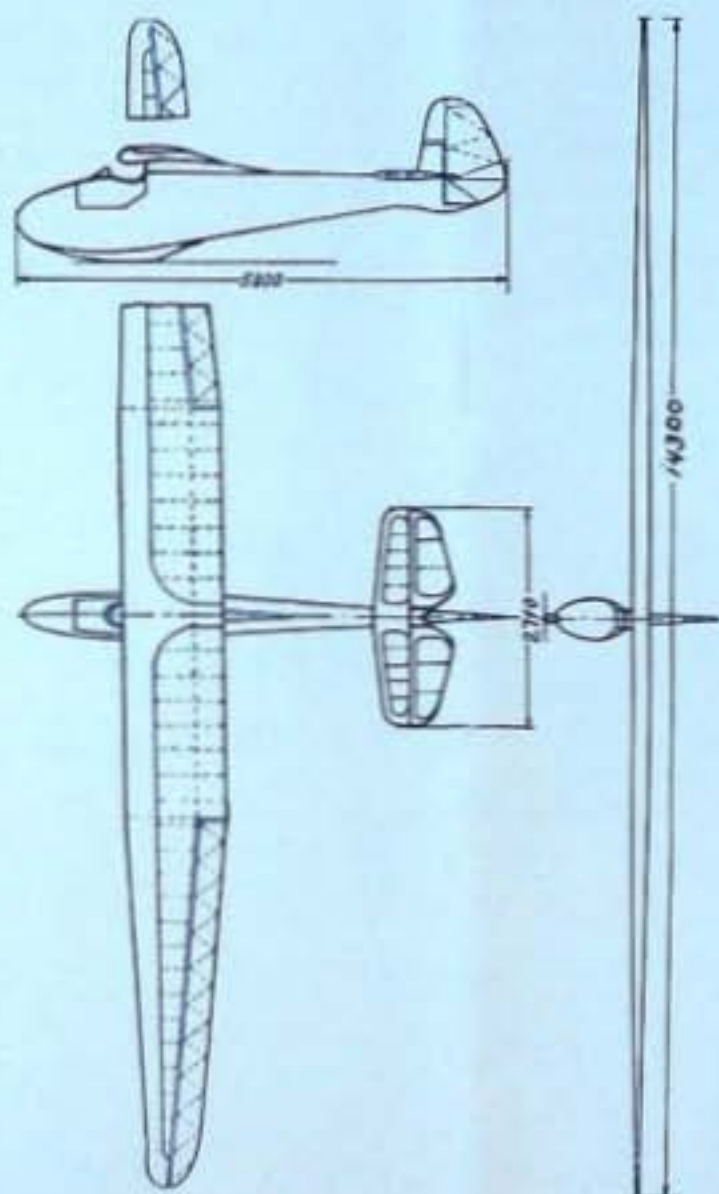
Gliding History in Turkey.—Every country in the world would seem to have its gliding pioneers, and Turkey is no exception. A. Hilmi Omer, writing to *The Times* from Stambul (Constantinople), carries his country's aviation history as far back as A.D. 1002, in which year Cevheri, a very well-known Turkish scholar, ascended to the dome of Nishapur Mosque and declared to the populace below that he was about to do something which had never been tried before. He then took "two smooth surfaces, which he bound with ropes to his body as wings," told his audience he would fly, and took off; "but he fell straightway to the ground and immediately died." A more successful experimenter, if the account is to be believed, was Heyari Fen Ahmed Tchelebi, during the reign of Murad IV. (1616-1633). This pilot, "beginning with some practice at Ok Meydan in Stambul, on windy days, with eagle wings, ultimately flew from Galata Tower, on the European side, to Dogangilar Square at Scutari, on the Anatolian side of the Bosphorus." Whereupon Murad IV., observing, "It is not right to permit such an able man to survive here," exiled him to Algeria.

The Rhönbussard

THAT the RHÖNBUSSARD is one of the most popular sailplanes in Germany is shown by the fact that, at the last Rhön Competitions, 16 out of the 100 machines present were of this type; but we have hitherto not been able to afford space to describe it. The type was first seen at the German Competitions of 1933, and became known in this country last year when Miss Meakin was aeroplane-towed in one from Germany to England, and later gave aerobatic demonstrations all over the country, and on July 14th carried out a cross-country flight of 40 miles from Bristol to Salisbury. This particular machine has been spending the winter in the Science Museum at South Kensington, but we understand it will be coming out again shortly.

The machine is suited to all forms of soaring flight and is stressed for aerobatics. The wing is in two parts, and is attached to the fuselage by two bolts, which facilitates easy rigging. The wing section in the inner part is Göttingen 535, but from where the aileron begins it is straightened out into a symmetrical section at the tip. The ailerons, which are long and narrow, move differentially and are worked by push-rod. The fuselage is of oval section and is specially reinforced in the region of the cockpit. At its after end a projecting spur protects the base of the rudder against damage on the ground.

Dimensions and calculated performance are: Span, 14.3 m. (46 ft. 11 ins.); length, 5.80 m. (19 ft.); aspect



The "Rhönbussard."



Launch of a "Rhönbussard" at last year's German soaring competitions.

ratio, 1:14.3; area, 14 sq. m. (150.7 sq. ft.); weight empty, 135 kg.; all-up, 215 kg. (298 and 474 lb.); wing loading, 15 kg. per sq. m. (2.1 lbs. per sq. ft.); gliding angle 1 in 20 (*Flugsport* gave 1 in 22); sinking rate, 70 cm. (2 ft. 3.6 ins.) per second; flight speed at best gliding angle, 64 km. (39.8 miles) per hour; landing speed 46 km. (28.6 miles) per hour. Maximum permissible speeds in km. per hour: Diverting, 250 (155 m.p.h.); aero-towing, 120 (75 m.p.h.); and towing and winch launching, 80 (50 m.p.h.).

When first brought out, the type was manufactured by Schleicher of Poppenhausen, but the sole rights are now held by Trommer-Michael of Markranstadt, near Leipzig, the agent for Britain and Colonies being Messrs. Exner, 14, Cockspur Street, S.W.1. The identity of the designer is not stated, but we should guess it to be Hans Jacobs, the designer of the RHÖNADLER, who has had a similar history.

Correspondence

Gliding Club Statistics

SIR,

It would be interesting to know how the Furness, London and Southdown Clubs can each claim to have more certificated pilots than members.

W. WEBSTER

[It would, if they did. But what they really claim is that the number of certificates granted to members in the past exceeds the present number of members.—Ed.]

Gusts and Safe Pilotage

Mr. H. C. Bergel's last article on "The Technique of Safe Pilotage" has brought in two communications on the question whether a gust can overtake a sailplane from behind, "Die-Hard" taking the affirmative view while Mr. G. O. Smith denies it. Owing to our usual shortage of space, they will have to be published later. Meanwhile another few weeks' grace has been given to those who wish to ask Mr. Bergel any further questions on pilotage; they should now do so before March 20th.

A Thermal Flight in Winter

SOMETHING new in soaring flight is reported from Germany, where Heinrich Dittmar, holder of the world's distance and height records for soaring, has carried out a purely thermal flight (i.e. in invisible thermal currents with no clouds at their tops to show their whereabouts) in the winter time, this being claimed as the first time such a thing has been done in winter.

The flight was made on February 7th, and started at mid-day with an aero-tow at Griesheim, near Darmstadt. The pilot, after casting off at a height, crossed the Rhine and went away in a south-westerly direction, finally landing at Neustadt an der Hardt, 40 miles distant.

The *Kölnischer Zeitung's* correspondent says that it was the first sunny winter's day of the year. The Air Ministry's weather reports do not give surface observations at Darmstadt, but at Strasbourg, 60 miles south of the landing place, there was strato-cumulus at about 4,000 feet, covering one-tenth of the sky in the morning (7 hrs.) and three-quarters in the evening (18 hrs.). The wind there was N.E., 19 to 24 m.p.h., at 7 hrs., and N.N.E., 25 to 31 m.p.h. at 18 hrs.

Fortunately, lapse-rate observations are available from Darmstadt, where an ascent was made at 7 hrs., giving the following results:--

Height.	Temperature.	Relative Humidity.
445 feet	26 deg. Fahr.	69 per cent.
980	24	65
2,620	18	68
3,280	15	67
3,940	15	62
6,560	5	52

Strasbourg, at 495 feet, is at about the same level as Darmstadt (445 feet), and had a ground temperature of 27 deg. at 7 hrs. on that day, and 28 deg. at 18 hrs., with a maximum temperature during the day of 30 deg. Assuming similar conditions at Darmstadt then, at the hottest part of the day, air leaving the ground at 30 deg., and cooling at the usual rate of 5 deg. per 1,000 feet as it went up, would remain warmer than its surroundings till it had risen to about 3,000 feet—which is enough to account for the thermals. Between 3,000 and 4,000 feet there was a stable layer.

Advanced Soaring

By P. A. WILLS

(Continued)

2. The Necessary Technique

WE will now assume that the daring pilot (or Youth) has got his "C," and is reasonably proficient at slope-soaring and normal turns and landings. What are the next steps? Two tricks must be learnt.

The first is to learn how to lose height quickly and accurately by means of side-slipping. This is an essential for landings in small fields, and without it a cross-country flight is likely to end expensively. There are, of course, many ways of losing height, such as circles, S-turns, swish-tailing, etc., but when near the ground I favour the common and garden side-slip as the safest and easiest. Most of the crashery at this year's Sutton Bank meeting could have been avoided by more and better side-slipping.

The thing to remember is that it is almost impossible to spin from a side-slip, as the rudder is in the full opposite position to the bank. The top wing has to roll right over before the aircraft can begin to spin, and this is a slow business that can easily be corrected in time by an increase of flying-speed. Consequently it is possible to hold the nose well up and push the wing well down at an angle that will seem uncomfortable at first. Normal flying speed should never be exceeded, and even a mile or two an hour less is safe, and will result in a very rapid loss of height. However, if the slip is very slow aileron control will naturally be sluggish, and the time required to pull up the lower wing considerable: be careful, therefore, not to slip the wing into the ground, but commence your righting movement at a reasonable height. On the other hand, a slip made at too high a speed means that on coming out one finds oneself at no height but covering the ground at a spanking pace. In this circumstance there

remains nothing to do but to pray; with luck the stall will arrive before the far hedge.

A slip correctly done can increase your sinking speed at will by anything from two to four times, and renders landings in small fields gilt-edged.

The second necessary trick is, of course, the art of circling; and thermal circling means doing correct air-circles, which is much more difficult than simply circling round a fixed and visible point on the ground. I find the only satisfactory method is to do this by instrument-flying alone; glue your eyes firmly to the



air-speed indicator and the variometer. At first I found that to focus intently on two dials a few feet in front of one, with a steadily revolving background beyond and out of focus, very quickly brought on giddiness, and after two or three circles had been completed I had to straighten up; but apparently this is a habit that can quickly be acquired, and now I find I can do it quite indefinitely without any trouble.



Start on a fairly unstable day (generally speaking, there is little thermal activity between the months of October and April), with enough wind for at least 300—400 feet to be acquired on hill-lift alone. Stand out as far as possible from the crest of the hill, and cruise up and down, watching the rate-of-climb indicator with one eye. The chances are that the up-current will not be struck head on, but that one wing will enter it first. That wing will therefore lift, and the machine will tend to turn out of the up-current. This is the prime rule of advanced soaring—always do the reverse of what your machine tries to do; it will always try to *avoid* lift.

In this case, therefore, quickly bring up the lower wing and turn rapidly and sharply the opposite way, say 60°. Then straighten up and watch the variometer. If the lift continues for, say, 5 seconds, and the instrument still records anything over 3 ft./sec. climb, put the machine into a fairly tight circle—a 300 bank is not too much. Now rivet your attention to your instruments; keep the speed accurately to normal; do your utmost to hold your turn correctly, with neither too little nor too much bank. If you acquire too much, the resulting side-slip will register instantly as a loss of height on the variometer. I find it a good scheme, when at length one is comfortably "set" in the circle, to take off as much rudder and aileron as possible, and to continue the circle chiefly on the elevator. Once settled in a 300 bank, position can be kept with the rudder almost straight, and the stick nearly central and slightly back.

Your rate of ascent is unlikely to be steady all the way round the circle; it will be greatest at one point and least at the opposite point (i.e. 180° further on). This shows that you are not in the exact centre of the rising column, and it is possible, though not easy, to edge over towards the point of more lift by doing a series of eccentric circles or else by straightening up momentarily at the correct point, 90° before the point of best lift. Remember, you are trying to do *air-circles*, in order to circle along with the column of rising air, which is blowing along with the wind. So take no notice of the ground below moving away up-wind, but try to "get set" into a steady circle, and, once in, move your controls as little as possible.

However, you must keep one eye on the ground at this preliminary stage, so that you do not get carried unawares too far behind the hill. If this happens, you may be unable to get back to the hill and yet too low to go off with your thermal. When you first pick up the up-current you are in front of the hill, and so

benefit from the combined hill-lift and up-current. you circle you are naturally carried back over the hill and immediately you are behind it you lose the first and the second has to do the work alone.

Up-currents break away from the ground with a low initial velocity, and have seldom accelerated to speed sufficient to support a sailplane below 1,500 or 2,000 feet. It is a matter of experience alone to be when it is safe to burn one's boats and go on; misheart-burnings will be caused by being too daring in the reverse. However, once you have definitely cut off the painter, the ground ceases to hold more than academic or artistic interest. Your instruments almost must be served. Keep the air-speed steady, and whenever one wing tends to drop turn the other wing. Slightly faulty circles will bring you out of one side of the column, and as one wing emerges it will drop sharply. Sometimes when this happens the situation can be saved by doing a figure 8, and starting a series of circles in the opposite direction. However, once rising column is lost, it is amazingly difficult to find it again; one has no fixed point from which to estimate its direction.

The column is not a straight vertical line from ground to the cloud above, but slanting with the wind and presumably wavering about in the manner of a huge column of smoke. I have tried dozens of times but have never been able to estimate the whereabouts of a rising current from the position of the cloud above except, of course, when one is right up to cloud-level. Keep an eye on the altimeter, and another (it is about your ninth, I know) on the cloud-level above. On no account allow yourself to be sucked into a cloud before you are fully ready and equipped for blind-flying.

(To be continued)

(Illustrations by H. McClelland)

Summer Camp at Dunstable

A camp for gliding instruction has been arranged to be held at Dunstable Downs, Beds., from August 1st to 14th inclusive. Details are as follows:—

Mr. G. E. Collins will be Chief Instructor.

Special machines will be purchased in addition to the normal club fleet, and their use will be restricted to camp members.

Sleeping accommodation will be provided in simple marquees each equipped with camp beds, bed linen, washstand and lantern; there will be not more than three persons in any one tent, and parties of three booking at the same time will be accommodated together. Meals will be served in the new club house.

Membership of the camp is strictly limited, and applications will be considered in order of receipt to the Secretary. Closing date for applications: May 15. Full catering service, consisting of breakfast, lunch and supper, is included in the camping fees. The fee per person will be £12 12s. inclusive.

The organisers reserve the right to cancel the organisation if sufficient support is not forthcoming. Forms of application and full details may be obtained from the Secretary, London Gliding Club, 13, Victoria Street, London, S.W.1.

Sea Waves and Soaring Flight

By A. E. SLATER

THE two letters published last month, concerning the flight of the albatross and similar birds, seem to show that it is the over-specialisation in present-day science which is to blame for the lack of a complete understanding of the many methods by which these birds fly. The geophysicist, whose business it is to study waves, as a rule knows nothing of soaring flight, and the soaring pilot is no geophysicist; while the ornithologist, who professes to know more about the flight of birds than anybody, is lamentably ignorant of either subject, usually regarding it as a sacrilege to apply mathematical formulæ to such beautiful creatures at all.

The following notes are an attempt to show how these branches of knowledge can be correlated; those who would know more should read Vaughan Cornish's "Ocean Waves and other Kindred Geophysical Phenomena," published last year at 7s. 6d. This deals not only with water waves, but with waves in sand and snow, the movements of sand dunes caused by the peculiar wind flow round them, and river "bores"; it also includes an excellent section by Dr. Harold Jeffreys, who goes into the physics of it all. For the diligent student, if he knows German, there is H. Thorade's "Probleme der Wasserwellen" (Hamburg, 1931), which summarises with Teutonic thoroughness almost every important research done on the subject in the course of the world's history; but it costs 35s. at present exchange rates. Manfred Curry, in his "Yacht Racing" and "Wind and Water," also retails scientific opinion on waves, but gives no references.

Wave Formulæ

There is general agreement on the following formulæ which, however, are only approximate, and are subject to certain limiting conditions:—

- No. 1.—Speed of fully grown waves = $\frac{4}{5}$ wind speed.
- No. 2.—Wave speed (in m.p.h.) = $3\frac{1}{2} \times$ period (in secs.).
- No. 3.—Wave length (in feet) = $5\frac{1}{2} \times$ (period)².
- No. 4.—Length/height = $1\frac{1}{2} \times$ period (for larger waves).
- No. 5.—Wave height (feet) = $0.7 \times$ wind speed (for larger waves).
- No. 6.—Maximum height of growing waves (in feet) = $1.5 \times \sqrt{\text{fetch}}$ (in nautical miles).
- No. 7.—Steepest slope = $180^\circ \times$ height/length.
- No. 8.—Limiting conditions for unbroken wave-crest:—length/height ratio not less than 7 to 1; sharpness of crest not less than 120° .

The Lee Eddy

When the wind blows across the roof of a building, it doesn't immediately charge down the other side; on the contrary, it goes on for some distance and then turns downwards and comes back up the wall; and toy parachutes or model gliders can be caused to get carried by it up to roof level—if they don't dart in at a window on the way. The same thing will happen on a hill, if its slopes are steep enough; but if the leeward

slope is very gentle the wind will blow down the incline rather than reverse its direction. How steep, then, must the slope be for a reverse eddy to form?

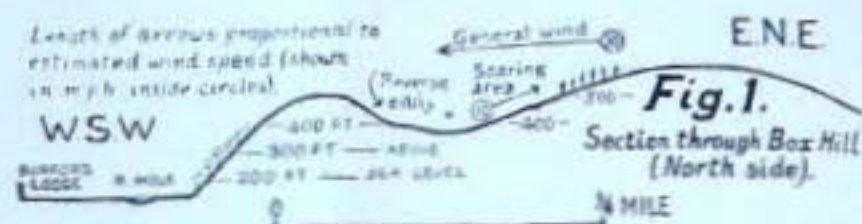


Fig. 1 is a section, drawn to scale, across the small valley on the north side of Box Hill, Surrey. When a high wind is blowing from the east across the hill-tops, a model glider can be made to soar up the east side of the valley in a reverse westerly eddy of 10 to 15 m.p.h. But when the east wind across the top is only light or moderate, the circulation in the valley becomes fitful: there will be a light zephyr up the hill for a few minutes, followed by one down the hill, then a calm—usual in that order.

When we come to consider fully-grown storm waves, not only are they flatter than the sort of hill shown in Fig. 1 (see formulæ Nos. 4 and 7), but they travel nearly as fast as the wind (formula No. 1), so that, relatively speaking, only a gentle breeze is blowing across the crest and over the trough.

Yet the letters of Dr. Mottram and Mr. Hamilton, published in this journal last month, made it obvious enough that not only is there a reverse current blowing up the lee side of a wave, but the birds rely on its being always there when they want it; further, Mr. Hamilton mentions the "great speed" with which they fly in it, which suggests that they actually have to increase their relative sinking speed by flying faster, in order to avoid being lifted up out of the trough.

Most scientists seem agreed as to the presence of the eddy, though Manfred Curry mentions some who think that "calm reigns in the troughs." He refutes this by pointing out that ripples may be seen there, forgetting that if a body of air is being carried along in the trough, whether stagnant or rotating, it must anyhow be travelling at a spanking pace over the water. Many people, in fact, fall into the trap of confusing speeds relative to the sea with speeds relative to the wave crests, so Fig. 2 and Fig. 3 have been constructed to show the difference. A wind speed of 35 m.p.h. has been assumed, which gives a wave speed of 28 m.p.h., length 328 feet, height $24\frac{1}{2}$ feet, and period 8 seconds. Allowance has also been made for the fact that the surface water moves forward at the crests and backwards in the troughs; this, according to a formula referred to later, amounts to about 6 m.p.h. in each direction. There is also the speed at which the wind blows the surface water along, but, as evidence shows that this is probably less than one mile an hour, it has been ignored.

We now come to a most important point which I believe to be the key to the whole situation. Compare Fig. 2 with Fig. 1. There is a striking difference.

In Fig. 1 there is a strong wind blowing across the top of the valley, but the surface of the land is at rest in relation to the hill-top. In Fig. 2, taking the wave crest as a fixed point, while the wind is blowing gently forward over the crest, all the water is rushing backwards at great speed. In fact, to render the slopes of a hill analogous to the slopes of a wave, you would have to cover the whole ground with moving staircases, and set them moving opposite to the direction of the wind and *four times as fast* (formula No. 1). And if for the staircase steps we substitute the smaller waves, with which the sea is always plentifully sprinkled on a windy day, their frictional effect in dragging back the air in the troughs is surely enough to explain the extraordinary strength of the reverse eddy above such gentle slopes.

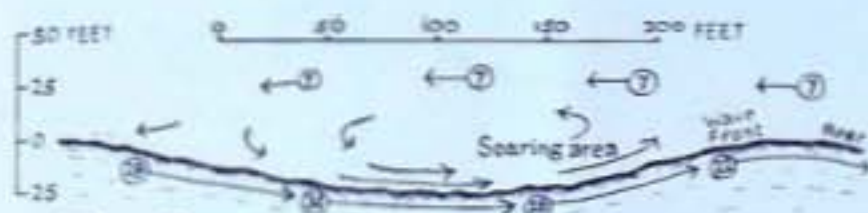


Fig. 2.—Motion of Air & Water RELATIVE TO WAVE.



Fig. 3.—Motion of Air & Water RELATIVE TO SEA.

Length of arrows proportional to estimated speed (shown in circles in m.p.h.). Air circulation in trough is conjectured only.

Cross Winds

That this reverse eddy actually plays an important part in building up the waves is shown, according to Cornish, by what happens when a swell from a distant storm crosses the wind-waves at an angle. Formula No. 1 then no longer holds; the wind cannot build up waves of such length, and the reduction of height of the waves is even more striking than their reduction in speed. As Cornish described it on one such occasion:—

... the swift passage of one corrugated surface through the other must have completely disarranged the sequence of aerial vortices and superposed curves of flowing air by which the waves of the sea are moulded, driven and developed to their greatest height and speed.

Mr. Hamilton relates that on one occasion a squall came up at right angles to the previous wind and blew approximately parallel to the wave crests, and that all the birds then stopped soaring owing, he believes, to the wind no longer blowing upwards over the crests. Here again there is some confusion between direction relative to the waves and relative to the water. It is evident from Fig. 4 that, if the wind's speed was unchanged, in order to blow along the crests it would only need to veer through an angle whose cosine is $4/5$ (assuming formula No. 1 to hold).

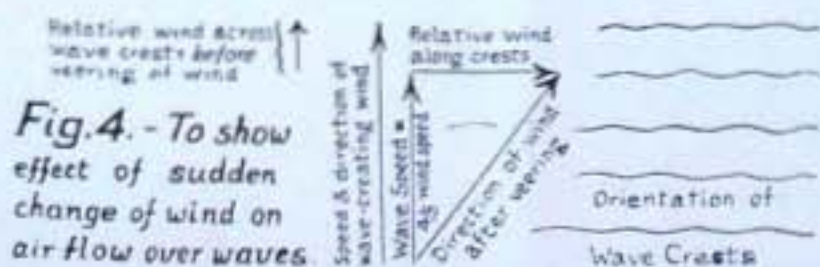


Fig. 4.—To show effect of sudden change of wind on air flow over waves.

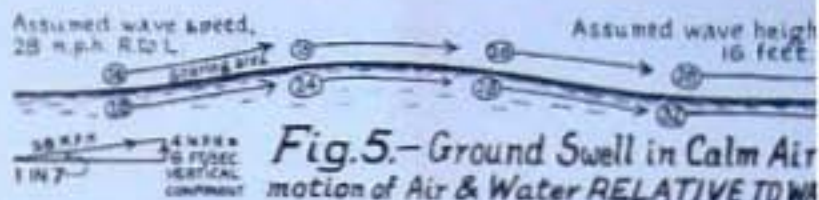


Fig. 5.—Ground Swell in Calm Air motion of Air & Water RELATIVE TO WAVE.

Wave Soaring in Still Air

Mr. Hamilton mentions another method of soaring seen by him. On a calm day, with a ground swell the birds would soar over an occasional extra large roller, keeping over the advancing front "with all six inches to spare." Fig. 5 shows the motion of air and water *relative to the wave* in this case, and a comparison with Fig. 2 will show how very different the conditions are in the two cases.

First, the birds are soaring on the "up-wind" side of the wave, not the down-wind side as they would be in Figs. 2 and 3. Secondly, the relative velocity "blowing" across the crest is equal to the wave speed, i.e., 4 times as fast as in Fig. 2. Why, then, is there no reverse eddy, or none strong enough to lift a bird? Because, thirdly, the slopes of a ground-swell are equally steep on each side, whereas a wave built up actively maintained by the wind is steeper in front where the reverse eddy is; and, fourthly (and most important of all, to my mind), there is no friction between air and water to build up an eddy. In fact, comparing Fig. 5 with Fig. 1, it will be seen that to get corresponding conditions at Box Hill, imaginary moving staircases would have to be moving *with* the wind, at similar speed, and would actually tend to destroy, by friction, any reverse eddy that might be present in the valley.

Note another curious difference. A glider soaring in front of a hill will get better lift some way above the ground than close to the hill-side, owing to the lower layers of air getting slowed up by friction with the ground. Yet, in the case we are considering, birds kept as close to the water as they could. Fig. 5 shows the reason why: the sea surface is relatively moving "up the slope" just as fast as the air, so that there is no friction at all. And, as the amount of lift must fall off with height, since it ultimately vanishes obviously the best lift is close to the surface.

As regards the strength of the up-current, the rate of rise of the steepest part of the wave-front can be calculated from the fact that, as a wave passes, each water particle describes a circle in a vertical plane, so divide the wave height by the period and multiply by π .

A very similar method of soaring, but close inshore was described thus by Hawley Bowlus, the American sailplane designer, in *Popular Science Monthly* November, 1930:—

Almost any calm morning you can find pelicans soaring in formation along the waves on the rising air above their crests. The instant the wave starts to break, the pelican will hop to the next wave farther out and ride the up-currents above it. They will fly for miles thus without moving a wing.

It should be noted that in this case the formulae given above do not apply; a wave in shallow water is retarded and finally "breaks," owing to its top overtaking its base. So that, while the relative up-current gets slower, its angle of ascent grows steeper until the breaking of the wave.

(To be continued)

Sailplane Construction for the Amateur

By W. BUTTERFIELD

The Workshop

THIS should be as roomy as possible, well ventilated and dry. It should be well lighted at all times. If artificial lighting and heating are available so much the better. A good sized doorway is an asset, and one which will admit a completely equipped trailer is a delight. Nothing can be more irritating than continually working in a confined space, or scheming how to get the finished work in or out, except perhaps the damaging (through unforeseen circumstances) of a well finished component.

If the workshop chosen is conveniently situated, i.e. easily reached by the majority of the constructional group of members, good attendances are assured. Unfortunately the high rent and rates of the centrally situated workshop are often prohibitive, in which case give preference to one which is handy for the ground engineer or the man in charge of construction, for travelling time is time scandalously wasted.

Equipment

It is advisable to provide a couple of benches equipped with suitable vices, one for the mechanical work and one for woodwork. Woodworkers cannot do a satisfactory job when musing about in iron filings and vice versa.

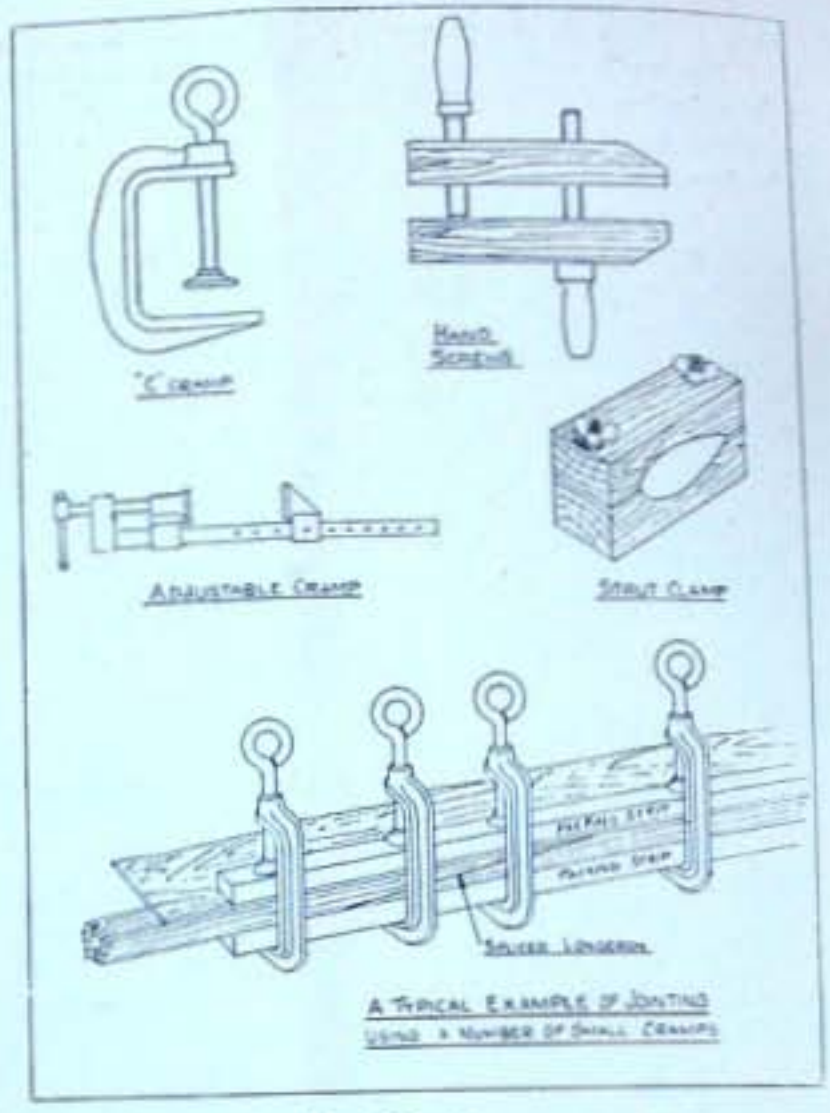
The packing cases which come to hand with the raw materials can often be used as trestles or sawing stools, while a few trestles are always useful for supporting the assembly boards. An indoor tennis table is ideal for this purpose. A chest of drawers, a cupboard, lockers and racks should be provided in which to store tools and other gear, and a place should be allocated for everything. These storage places need not be elaborate; old orange boxes will serve admirably for tiers of shelves, while tobacco tins are convenient receptacles for brads, screws, bolts, nuts, etc. Above all, keep the place tidy and keep your tools in good condition; remember that a good craftsman may always be judged by the condition of his tools.

Paint, varnish and dope brushes should always be cleaned after use or stored in air-tight vessels—not forgetting to replace the lid or stopper.

Sandpaper, fabric, and paper drawings must be kept clean and dry. Drawings set out on boards can be preserved as records by applying a coat of thin transparent spirit varnish. If this is done, spares can be produced without direct reference to the machine, which may be dumped in some outlandish spot miles away from the workshop.

Tools

Tools need not be so varied as those of a good carpenter's or patternmaker's kit. In fact, the necessary tools will suggest themselves as the work proceeds, and will depend to some extent upon whether you purchase timber in the rough or in the machine-planed condition. The number of tools required will also be governed by the size of the working party; brad hammers, screwdrivers, chisels, etc., should be provided in duplicate; small spanners, size 2B.A. and 1" B.S.F. of the open and tubular box types, are always useful.



A List of Desirable Tools

SAWS.

- One Rip Saw.
- One Panel Saw.
- One Tenon or Dovetail.
- One Pad Saw.
- One Bow Saw.
- One Mechanic's Hack Saw.

WOOD CHISELS.—1½" wide, 1", ¾" and ½".

COLD CHISELS.—1" or ¾" wide.

PUNCHES.

- One Centre Punch.
- One Nail Punch (fine).
- One Pin Punch, 1/8" dia.
- One Pin Punch, 1/16" dia.
- One each Washer Punch, 1/8", 1/16" and 1/32" dia.
- Snap Punch for Rivet Heads.

PLANES.

- One Jack Plane.
- One Iron Smooth Plane.
- One small Iron "Bullnose."

SQUARES.—Large and small.

SCREWDRIVERS.—Large and small.

PLIERS.—Side Cutting and Round Nose.

PISCERS.—One pair of handy size.

OH STONES.—One Coarse and one Smooth.

ONE BENCH GRINDER.

HAMMERS.

- One Mechanic's 1-lb.
- One Sprig Hammer.
- Two Brad Hammers.
- One Claw Hammer.

SCISSORS.

- Tin Snips.
- Bench Lever Shears to cut 1/8" sheet.

DRILLS.

- One Wheel Brace.
- One Joiner's Brace.
- A set of Centre Bits.
- A set of Screw Bits.
- An assortment of Twist Drills.
- A Bench Drilling Machine if funds allow.

SPANNERS.—Adjustable and fixed types.

HAND SCREW, Grabs, and Clamps in variety.

You must now decide upon the methods of manufacture and assembly, for if you decide to adopt the "All Glue and No Brads" type of construction there is one useful gadget which will be required by the dozen—that is the "C" clamp, cramp, or grab. Call it what you will, this little tool, used in conjunction with stiff strips of wood, makes it possible to unite joints of infinite length. (See sketches.)

Metal parts will, of course, be secured to timber parts by means of small diameter bolts or rivets; hollow rivets or eyelets are occasionally used. Metal will be secured to metal by welding, sweating, brazing, riveting or bolting. But where timber is attached to timber there is nothing better than glue.

News from the Clubs

London Gliding Club



H. C. Bergel in the "Grunau Baby" and H. L. Richardson in the "Falcon," on January 27th.

Saturday, January 26th.—The FALCON was taken out and soared by Richardson, Morland, and Ivanoff for some 15 minutes each.

Sunday, January 27th.—Strong N.W. wind. Ivanoff and Richardson again soared the FALCON. GRUNAU BABY was taken by Collins to 800 ft.; Bergel then took it up to something over 750 ft. and practised stalled turns. Humphries went out in the CRESTED WREN and got up to 500 ft.

Among visitors at the club house were Campbell Black (of Mildenhall and Melbourne) and Miss Florence Desmond.

Over the tea cups a pilot told of how he was once soaring above Dunstable Downs and watching his shadow creeping over the ground, when he saw the shadow of another sailplane come up and "crash" into it. As he had felt nothing, he took a look round the sky, but could see nothing either, which was even more mystifying, until at last the other fellow emerged from between himself and the sun—obviously just where he should have been. Another pilot capped this with a tale of how he flew across an aerodrome in a "Moth" with its shadow chasing along in front; but, when he turned, his shadow went straight on. He thought he must be Peter Pan—until he caught sight of the other "Moth."

Saturday, February 2nd.—Whatever meetings were going on in London, flying at Dunstable proceeded as usual. A stiff west wind blew against the hill and Ivanoff had his first experience of the GRUNAU BABY. Dewsbery, Nicholson, and Collins also soared in it, while Richardson flew the FALCON. In the PRÜFLING Baker soared for half an hour (thus completing his two hours to qualify for the FALCON) and Challier for half an hour. Three other pilots flew it but couldn't keep up.

Sunday, February 3rd.—Flying started at 8.10 a.m., and the super-DAGLING and PRÜFLING were each flown twice before breakfast. The S.W. wind started light, but increased gradually to 30 m.p.h. by the afternoon, so that the GRUNAU BABY was repeatedly launched by only one man pulling on the nose, while the FALCON, with one supporter at each strut, took off gracefully from their shoulders with the help of a little tug on the nose from a third man.

Clouds were low at first, and pilots were skimming through their bases. GRUNAU BABY was flown by Nicholson twice, Dewsbery twice, Collins, and then for a long time by Ivanoff. Morland, Richardson, and Armstrong flew the FALCON. Humphries in the CRESTED WREN got up to 500 ft. by what appeared to be cloud lift; at times the clouds were in long rolls parallel to the wind, so that he flew down the intervening "lane" with vertical walls of cloud on either side. Dewsbery reported that the low clouds (which were stratus, not cumulus) were continually forming in the air which was being forced upwards as it approached the hill; further out to windward there were no low clouds at all.

The PRÜFLING had a rough time, being unable to rise out of the turbulent region, but was soared with much self-confidence, mostly at 40 m.p.h. air speed, by Payne, Sproule, and Fitzwilliam.

Sunday, February 10th.—The day began and ended calm, but in between was a period of light, smooth west wind. To judge by the flying money receipts, about 36 people flew during the day.

GRUNAU BABY was taken up for three-quarters of an hour by Dewsbery and 1½ hours by Ivanoff. FALCON was soared, for

20 to 30 minutes each, by Thomas, Hiscox, Bolton, Richards and Miss Meakin, and Baker had his first flight in it. PRÜFLING was unable to keep its height for more than one hour—it invariably lost it on the first turn. It was flown by M. Davidson, Keeble, Sutton, Paget, and others. The BLUE WREN was ground-hopped and then flown down from the top by owner.

The nacelled DAGLING, like the PRÜFLING, kept its height one beat only. Grant, H. Collins, and Baxter flew it seven times, and Curtis tried for a "C" on it. On an open DAGLING A. L. Robertson got his "A" with 41 seconds, and Ray his with 58 seconds, while the Duke of Grafton got his "B" with 1 minute 18 seconds. Primary instruction went on all day at the bottom.

Sunday, February 17th.—A fairly strong wind directly up the hill at first, but backing later. Curtis, with 23 minutes, and Paget, with 22 minutes, both got their "C" on the PRÜFLING which was also flown, mostly twice, by Keeble, Hafner, Fring, H. Collins, Payne (23 and 25 minutes), and Sproule, who completed his 2 hours and qualified for the FALCON. Miss Meakin flew the FALCON for 1 hour during the luncheon interval; others who flew it were Baker (20 and 15 minutes), Morland (15 and 15 minutes), Richardson (45 minutes), Goldman, Thomas, Bolton, and Sproule (who flew it for the first time—a way in ecstasy).

GRUNAU BABY was flown by Collins (with aerobatic Ivanoff (1 hour), Hiscox (20 and 10 minutes), Nicholson, a Morland (first time in it). Cooper flew his green SCUD, Brice the other SCUD, Nicholson his green (formerly yellow) WREN and Humphries stayed up in his red, or CRESTED WREN for hours 36 minutes, finding an invariable ceiling at 520 ft. above the Bowl and 600 ft. above the Zoo. (If this was due to inversion, why the difference? Was it because, at the Bowl some of the air slipped round the end of the Downs, where at the Zoo it all had to go over the top, and raised the inversion layer a little higher?) He also found that air conditions at a particular spot were curiously different each time he visited it.

Down at the bottom, instruction was carried on in an open DAGLING, a nacelled DAGLING, and in the nacelled ZÖGLING belonging to the newly formed Cambridge Club. Once the latter was bravely taken off the top, but it looked too uncontrollable in the gusty weather and thenceforward remained at the bottom.

One member, who is a hospital student, and has hitherto played rugby every Saturday and glided every Sunday, informs us that he is giving up the rugby so as to get twice as much flying.

The Annual Report.—We should explain that the "Report for 1934," reviewed last month, is not the usual report read out at the Annual General Meeting (which will, no doubt, be circulated later), but a special brochure issued chiefly for the Press; consequently ordinary members have not received it.

A list of private and club machines was included in it, which we reproduce below, as it will no doubt be of interest.

List of Machines.—The club itself owns ten machines: 4 primary training gliders, British FALCON sailplane, PRÜFLING, PROFESSOR high performance sailplane, GRUNAU BABY sailplane, KASSEL two-seater, POPPENHAUSEN two-seater. An additional GRUNAU BABY is on order.

Privately owned machines number 16. The following list gives the names of the machines and of the club members who own them or share in their ownership:—

- RHÖNADLER: G. E. Collins.
- SCUD II.: P. A. Wills and G. M. Buxton.
- SCUD II. (green): R. P. Cooper.
- CRESTED WREN: J. P. Dewsbery, H. Petre and S. Humphries.
- WILLOW WREN (green): C. Nicholson, D. MacClement, etc.
- GOLDEN WREN: G. O. Smith, A. L. Slater and R. G. Robertson.
- BLUE WREN: A. E. Slater.
- FALCON II.: C. E. Hardwick.
- B.A.C. VII. (two-seater): A. T. Isaac.
- KASSEL 20: J. C. Dent, A. Ivanoff, C. A. Cornell, G. Hall and A. E. Slater.
- HOLS DER TRÜBEL: B. Baizer, H. Collins, S. Whidborne, etc.
- WESTPREUSSEN: F. G. Eisner.
- DUNSTABLE DEVIL: D. G. Hiscox.
- RHÖNREISSARD: Miss J. Meakin.
- Nyborg sailplane: T. G. Nyborg.
- ZÖGLING: J. S. Sproule.

Five further machines are under construction for members.

Yorkshire Gliding Club

January 20th.—In between trundling and flipping DICKSON about the moor for the benefit of our persevering novices, PROFESSOR was ground-hopped and several "C" pilots received their initiation. Both machines were then flown home intact.

January 27th.—This was a day of great snows in Yorkshire, but a small group of hardy (I forbear the use of the obvious prefix) fellows departed as usual for Sutton Bank. They arrived after an uncomfortable journey at the foot of the bank, only to find it definitely impassable. They made a detour, with car, through Kilburn to the foot of White Horse Bank, where they left car and proceeded on foot through waist-deep drifts to the club house, where they "rescued" Holdsworth from temporary imprisonment. These resolute fellows were justifiably proud of their achievement.

February 4th.—This day had evidently been set aside by our programme arrangers for a further display of drizzle and fog, so the interior of the club house again received attention.

February 11th.—Persistent rain continued its performance until it showed signs of fatigue about 3.45 p.m., when DICKSON was brought hastily, almost feverishly, on to the moor, and in the remaining hour of daylight was hopped or flipped sixteen times, after which DICKSON, or her pilot, decided to call it a day and stalled at about 25 ft. Three landing wires were strained beyond breaking point, and the lame duck was taken in.

February 18th.—In a strong W. wind Holdsworth tried to lift Hots off the ground at too steep an angle and slipped off the winch cable in a stalled condition, at about 15 ft. The resultant landing has necessitated rebuilding of keel and nacelle. Holdsworth undamaged and fit to proceed with the job.

Easter Meeting at Sutton Bank, near Thirsk, Yorks.

Saturday, April 20th, to Tuesday, April 23rd.

Visitors.—It is hoped that many members of other clubs will attend, all have a hearty invitation to do so. All visitors will be made honorary Associate Members of the Yorkshire Club for the period of the meeting. Catering facilities for all meals will be available at the clubhouse (fully licensed), and there will be limited sleeping accommodation in the men's dormitory.

Intending visitors are asked to write to the Hon. Secretary without delay, stating requirements as regards catering and sleeping accommodation.

NOTE.—Under the terms of the lease of Sutton Bank no flying may take place on Good Friday, but visitors may, of course, foregather and establish camps, etc., on that day.

Competitions.—With the co-operation of visiting pilots it is hoped to organise informal competitions, for which the Yorkshire Club is offering silver trophies, to be won outright. (The Hon. Secretary writes that there are three solid silver trophies, and each "pot" holds about a pint, so the subsequent expenses of the winners won't be too heavy.)

Short Period Flying Membership of the Yorkshire Club, for visitors wishing to fly club machines, will be available for *approved pilots only*, the charge being 10s. for the period of the meeting, plus usual flying fees and damage liability to the first £10. Elementary training will be available only for full yearly members of the club.

Whitsuntide Meeting.

At Whitsuntide it is hoped to hold an Open Meeting similar to the Easter event. This would extend from Saturday, June 8th, to Tuesday, June 11th. Full details will be issued later.

Summer Training Courses at Sutton Bank.

It is intended to run a continuous training course for several weeks during the summer, when an instructor of the club will be in residence. Special short-period courses will be arranged for holders of the "B" gliding certificate or the power-flying "A" licence. Elementary training facilities will also be available for club members. Full details, together with particulars of fees, etc., will be issued later.

Elgin Gliding Club

This club was formed at the beginning of February, according to the Scottish Press, yet within a week of its formation 80 members had joined and the membership list had to be closed, although applications are "still pouring in from all parts of Moray and the neighbouring counties." Several farmers in the Elgin area have come forward with offers to loan fields for training purposes until the proposed municipal aerodrome, of which the club hopes to have the use, is ready.

Ulster Gliding Club

January 27th.—GRUNAU BABY II. was taken for an airing to Magilligan after a lengthy period of hibernation. Not having been there, your correspondent has had to rely upon hearsay; nevertheless, there appears to have been quite a remarkable demonstration of the art of side-slipping, tail-swishing and the like. No doubt this is the direct result of Collins's masterly technique at Sutton Bank, bubbling out from some of his ardent Ulster admirers; in fact, it is surprising that no loops, spins, rolls, or any other of that master's repertoire were attempted. Maybe it was the fact that G.B. II. rubbed her nose rather severely on landing at one time and had to retire to the repair shop—maybe not! Anyhow, Liddell, Harris, and Baster all enjoyed themselves and Mackie and Mrs. Mackie applauded in a suitable manner.

The GRUNAU BABY, by the way, has become a veritable laboratory, what with one thing and another. Bubbles, tubes, needles, levels, not to mention a rudder indicator, to assure the harassed pilot that he can't be in a spin, because his indicator says so—"says you!" Nevertheless it really is an attempt to prevent a dislocated neck in thunderstorms (cf. Buxton's flight at Sutton Bank) and Harris is to be congratulated once more upon another masterly effort.

Mackie has taken to power planes and we await the result with interest; so far, he says it's good training for gliding; maybe we had better see the Air Minister about it. Still, it may pass—one never knows.

Harrogate Aircraft Club

The Annual Report, which we have received, states that the club has again improved its position and now possesses a new training glider, new launching rope, materials, and two other partly-constructed gliders. Mr. Gordon Jefferson has presented a partly constructed machine and another fuselage. Membership has increased from 43 to 52.

The former practice of leaving machines housed in buildings or on hill tops in the winter months has been abandoned because of damage caused by damp, due to fog, which almost continually covers hills above 600 ft. during winter. Machines are kept dry at headquarters, and transported by lorry or trailer, as and when required.

The club has made an arrangement with Yorkshire Air Services for dual instruction on aeroplanes at Newton House Aerodrome.

Mr. H. L. Brook, who took part in the Air Race to Australia, and is a member of the club, gained his earliest flying experience on the original DICKSON glider built by the club. A model high-wing monoplane built by him was flown as a kite, one Saturday afternoon, on half a mile of fine cotton; as the cotton was invisible, and there was nothing to give away the scale, the club got the credit locally of making a splendid soaring flight on one of its gliders.

Among officers elected at the Annual General Meeting were: President, the Rt. Hon. J. W. Hills, M.P.; Treasurer, B. Harman; Secretary, E. T. W. Addyman.

Jersey Gliding Club

We are now the proud possessors of a hangar, and, as it may be of interest to other clubs, here are the particulars: 40ft. by 20ft. sectional building, 8ft. to the eaves, £46 delivered to Jersey. Cost to erect (cost price), £16. We have also spent a great deal of time clearing gorse from one of the slopes on our site. Also, we have been fortunate enough to have had a car presented to the club, and this is being put in condition for its future job of retrieving, etc. So now everything looks promising for when the weather is once more suitable.

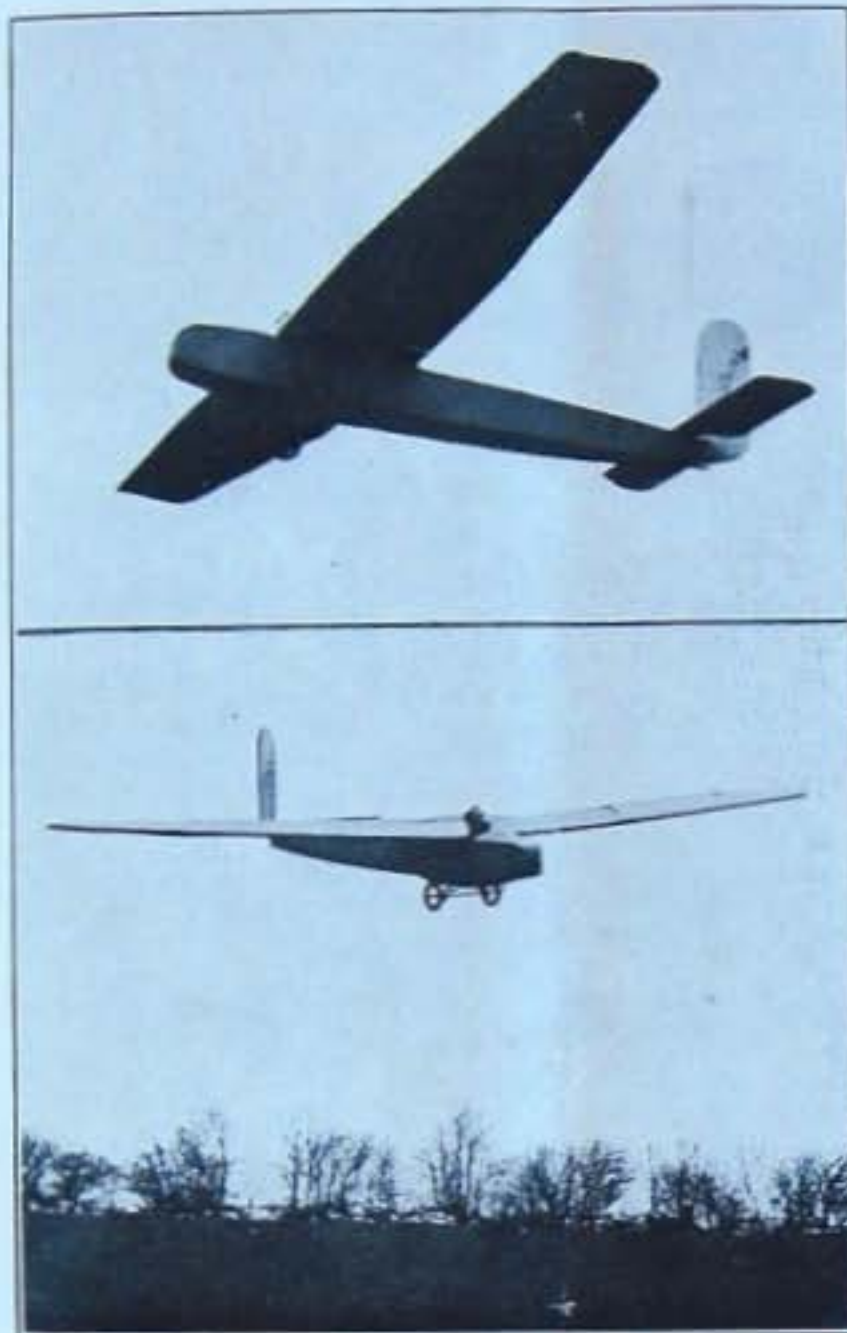
Pwllheli and District Gliding Club

We have acquired a new unfinished DICKSON Primary, which requires the wings building up and the whole covering with fabric; but several parts are duplicated, which will be useful.

The response in forming a gliding club has been disappointing, but we are hoping that members will roll up when they see that we mean business.

The secretary wishes to record his appreciation of his very friendly reception by the London Gliding Club on his recent visit, and for the very helpful instruction and advice given.

Leicestershire Air Sports Club



The "Albatross," designed and flown by Capt. Latimer-Needham, in 1930, has now grown a pair of wheels and is flying regularly with the Leicester Club. In the upper photograph, A. E. Coltman is seen hovering stationary in it in a high wind, and below he is coming in to land.

Sunday, January 20th.—Wind N., 15 m.p.h. The ALBATROSS was flown by Coltman, Jarvis, and Adcock.

Sunday, January 27th.—Wind N.W., 20-30 m.p.h. A very gusty day. The ALBATROSS put up some very fine flights and was off the ground in less than five yards run. One gust of wind made the ALBATROSS hover motionless for 10 seconds, maintaining height. Our field has a gradient of about 1 in 20, so under more favourable conditions the machine should soar easily.

Sunday, February 3rd.—Wind W., 15 m.p.h. The most unfavourable wind direction. As we had to take off and land across the narrow side of field, the B.A.C. II. was catapult launched, and succeeded in making 25 flights during the afternoon; the members present put up a good show and everybody was happy.

Sunday, February 10th.—Field day at Beeby. What wind there was, was blowing from the west, unfortunately, restricting the length of our flights. Mr. A. C. Isaac, of Rugby, brought his B.A.C. VII. two-seater over, to the delight of our members, and made a few flights, winch launched. The ALBATROSS and B.A.C. II. were also flying regularly.

Sunday, February 17th.—The ALBATROSS was inspected by the B.G.A. representative regarding renewal of C. of A., and is now in the workshop for overhaul.

A Club at Kirby Moorside

Mr. Slingsby, whose sailplane works are at Kirby Moorside, Yorks, has helped to form a gliding club for the district round about. We hear it already has over 25 members. Primary instruction will be given locally, and no doubt Sutton Bank will be available for soaring.

Wilts. Aviation and Gliding Club

No recent flying has been carried out owing to the nature of the ground preventing the towing car from obtaining a grip despite the addition of ropes to the wheels. Much work, however, has been done at the workshop at Market Lavington, where the wing of the new machine has been completed and the ribs of the other one are ready. Work has been commenced on the B.A.C. VII. two-seater, which will be owned by a member of the club.

Our membership now stands at 25, and at a recent general meeting a proposition was made that we affiliate with the B.G.A. No seconder was found for this motion, and it was unanimously decided to defer the matter until such time as the B.G.A. has reorganised itself on a sound and effective basis, truly representative of all the clubs. We are, therefore, standing by the smaller clubs and helping them in their fight for recognition.

[The above was written on January 31st, before the Special General Meeting of the B.G.A., at which it was decided that every club could become either "associated" or "affiliated."—

Midland Gliding Club

The club fleet has been increased to three machines; now the DAGLING has been acquired, and a PROFESSOR, bought from the London Gliding Club, will be ready shortly. Twelve members are ready to try for their "A" certificates, and four for "B," as soon as weather conditions are suitable. The hangar floor is now finished.

On visiting the club on February 24th, we found all the members brimming with self-confidence, and being pulled off into rather a gusty wind by five or six people on each bunji; the high air-speed made the controls rather lively, but that didn't worry anybody. In an unguarded moment the wind picked up the nacelled DAGLING and turned it, first upside down, then right side up again, at the expense of only slight damage to the tail. Recently several glides were made off the high ground at the back; nobody achieved more than 25 seconds, but this was in a dead calm, and with the wind blowing up the hill 30 seconds should be easily attainable.

On the club notice board, surrounded with a thick black paper, was a newspaper cutting about the Frenchman who didn't get himself in and was thrown out of his machine at 500 feet.

Guernsey Gliding Club

The club held their Annual General Meeting at headquarters in Doyle Road, on January 29th. Capt. O. Priaux, the President, occupied the chair. The following officials were appointed for 1935: President, Capt. O. Priaux (unanimously re-elected); Vice-President, T. C. Joseph; Hon. Secretary, C. H. Adey; Hon. Treasurer, B. C. de Guerin. Committee: Messrs. J. Beaumont, R. S. Mallett, R. E. Le Lacheur, C. H. Hollis, E. Laker, Paint, and C. Brehaut. Ground Committee: Ground Capt. E. Laker; Messrs. J. Wheadon and C. H. Hollis. Messrs. Falla and N. Paint were appointed auditors.

A vote of thanks was passed to the retiring Secretary, B. C. de Guerin, the auditors, and Mr. J. Stacey, who so kindly allowed the club the use of his premises for storing the gliders.

It was decided that in future the annual subscription be 10 guineas and that no entrance fee should be imposed. The meeting felt that many Guernsey people interested in aviation would like to support the club, and decided on a nominal subscription of 10s. 6d. for non-flying members.

During the year 1934, the club achieved a reasonable amount of success in spite of several mishaps, and members are looking forward with great enthusiasm to the coming season. Operations will be resumed as soon as a suitable ground is found. Full particulars of the club's activities will be gladly given by the Hon. Secretary, Mr. C. H. Adey, of La Vallee, Oberlands, St. Martin.

Former Llandudno Gliding Club

In the January issue, under the heading "Pwllheli Gliding Club" we reported the existence, five years ago, of a Llandudno Gliding Club. In 1931 the present Editor, who was not then Editor, wrote to the address given but had the letter returned by the Post Office.

Mr. Guy Beeton, Hon. Treasurer of the Midland Gliding Club, now writes to say that he was responsible for the attempt to form a gliding club in Llandudno but, though he tried hard, he was unable to carry out the plan through lack of support.

Dorset Gliding Club

Maiden Newton, Sunday, January 27th.—The strong north wind and brilliant sunshine well rewarded those who turned up early, and work was at once started, overhauling the cars and other details. Amongst the visitors was Mr. Seth-Smith, of the London Gliding Club, who was very interested, and expressed the wish to join the club. As there were not enough members present to operate, lunch was taken. Then other members turned up, and, owing to the direction of the wind, the glider was dragged to the valley bottom. Walden, after some slides, made his first five flights.

More members arrived and Seth-Smith returned to do his bit as a full flying member. After L. B. Davis and Wall had made two short flights each, the launching gear was shifted further up the slope, and from here Davis made two steady flights. Seth-Smith, in what was to him a strange machine and on a strange site, made a very steady flight.

Launches were then made from still further up the slope. Worssam, in a flight of 19 seconds, showed such promising form that, given enough time, we hoped that he would get his "A" certificate. However, time only permitted launches being made from the "Pimple" on the south slope, and from here Lansdown made a flight of 21 seconds, landing conditions rather bumpy. Worssam then had his first flight from this place, and owing to conditions had quite an exciting flight of 23 seconds. By way of contrast, Seth-Smith made another steady flight, also of 23 seconds, afterwards commenting very favourably on the machine and its responsiveness to the controls, particularly the new rudder. To end the meeting, Stephens, who had been driving the launching car all the time, then made a flight of 21 seconds.

In spite of the fact that operations were not started till about 2 p.m. with only one car working and the time taken in shifting the launching gear three times, 31 launches were made and much progress shown. Members who formerly zoomed and stalled in still air, now managed to control the glider creditably in relatively much more difficult conditions.

Official Notices

Council Meetings

The 62nd Council Meeting of the British Gliding Association was held at 7, Albemarle Street, W.1, on December 21st, 1934. Present: Capt. Latimer-Needham (in the chair), Mr. Wills, Mr. Sanguinetti, Mr. Gordon England, Mr. Bergel, Capt. Stratton, Mr. Whidborne, Mr. Culver, Mr. Buxton, Mr. Grice, Mr. Keffell, Mr. Howard-Flanders (Hon. Secretary).

Mr. Gordon England outlined the purpose and result of the delegation's visit to the Air Ministry. Draft rules were then placed before the council which embody the requirements of the Air Ministry. The council approved the rules for submission to a special general meeting to be called for the purpose.

Mr. C. Elliott was elected as a member. Mr. L. Headley was appointed official observer for the Leicestershire Air Sports Club. The secretaryship was confirmed and the hon. secretary's resignation accepted, to take effect from the date of the annual general meeting.

The 63rd Council Meeting was held at 39, Victoria Street S.W.1, on February 2nd, 1935. Present: Mr. Wills (in the chair), Mr. Manning, Mr. Turner, Mr. Morland, Mr. Sanguinetti, Mr. Hobden, Capt. Latimer-Needham, Mr. Cuthell, Mr. Bergel, Mr. Scarlet, Mr. Sharpe, Mr. Seaward, Mr. Houlberg, Capt. Stratton, Mr. Grice, Mr. Culver, Mr. Howard-Flanders (hon. secretary).

As the auditor's report had been returned to them by the hon. secretary without being first submitted to the hon. treasurer, it was resolved: "That the auditor's report and accounts be accepted subject to the hon. treasurer being given the right to make a statement as and when he had had the opportunity of studying the accounts."

It was resolved that: "This council wishes to express its regret to the Air Ministry that any statements should have appeared in the Press relative to the subsidy before this council meeting."

Mr. B. V. Leak, Mr. D. C. Dugdale, Mr. Alan Keffell, and Mr. Wallace Richards were elected as members.

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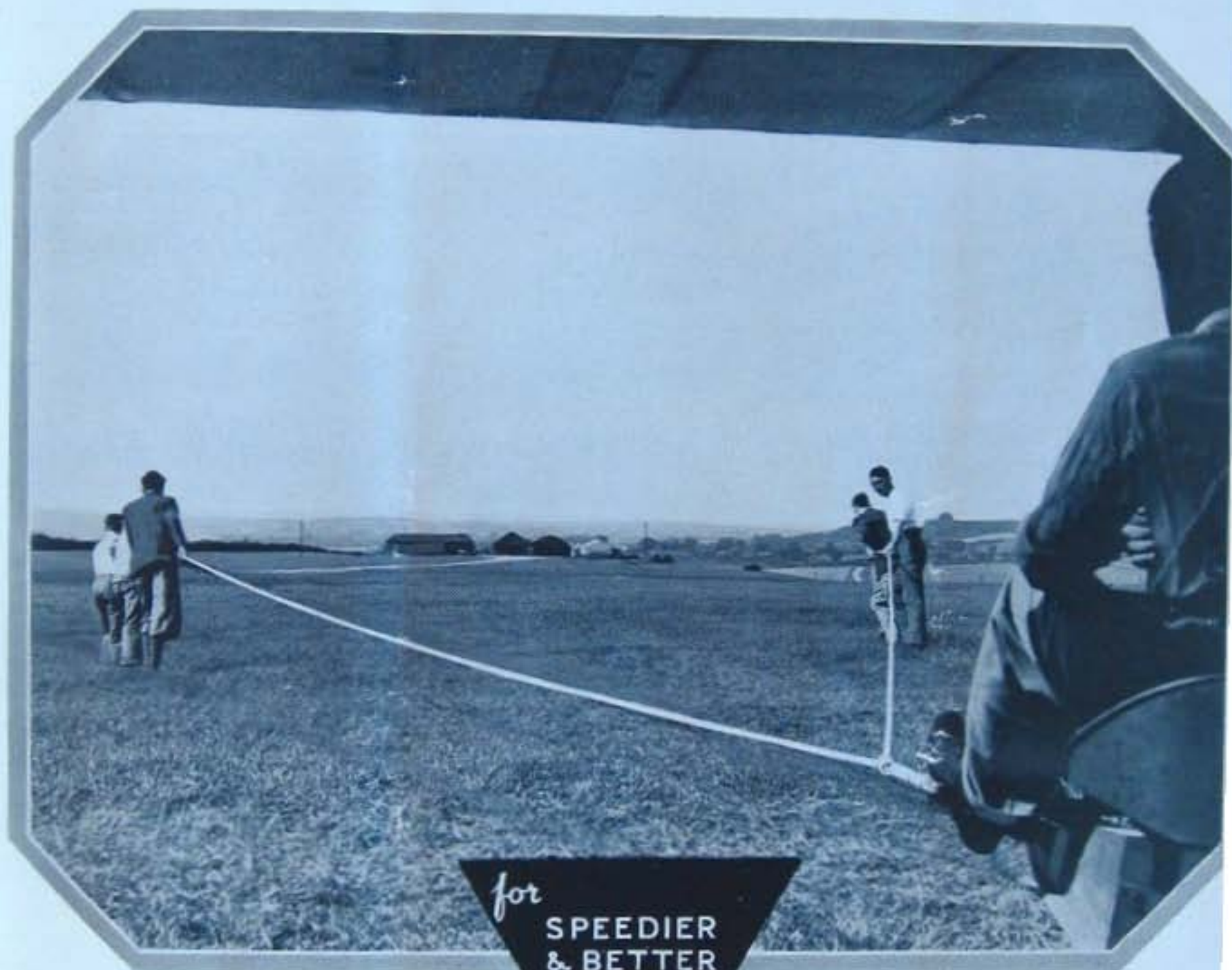
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