APRIL, 1947

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Sailplane and Glider

The First Journal devoted to Soaring and Gliding

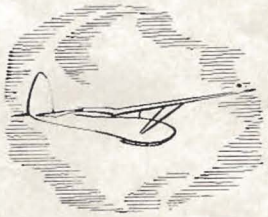


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Sailplane and Glider

THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

APRIL 1947 ★ Vol XV No 4

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CONTENTS

	Page
Editorial	1
Convection and the Soaring Pilot ..	2
5,000 feet in three minutes ..	4
The Trend of Sailplane Design ..	6
Beginners' Page	10
Australian Gliding	12
News from the Clubs	15
Letters to the Editor	19
Royal Aero Club Gliding Certificates	21

A NEW TREND

DURING the war it was confidently expected by all those who loved flying, whether new to it or old hands, that after the war there would be a great increase in the number of people wishing to fly themselves. There were various estimates about the number of private owners for example, who would want to buy light aeroplanes. There were to be airfields everywhere and plenty of light and cheap aircraft. Because so many people would want to fly, machines could not be expensive and facilities would likewise be within the reach of all. People would of course want to glide in large numbers and because of improved methods of manufacture Sailplanes would be cheap.

Well now we have the realisation. Apparently there are numbers of would-be flyers, but not enough. There are not enough because it is too expensive, and this goes for both power flying and gliding. But where facilities are provided, as in the A.T.C., it is apparently not difficult to keep some 90 Gliding Schools going.

How to get the price down is going to be the problem on whose solution on which will depend the future of the sport.

There are other factors however, which have their effect. One is the cost of winches, aero-towing even of auto-towing as a means of getting launched. Another is the need for suitable sites for gliding clubs. Not all the latter are within easy reach of centres of population. Imaginative dreamers foresaw landing strips near every village, where both gliding and light plane flying could be practised. But both initial cost and overheads seem to have put those dreams back into the pipe.

The outlook for those who wish to fly, with all facilities laid on, as they were in the war, is indeed somewhat black. It is clear that a good deal of self help is required for those whose pockets do not match their ambitions.

As might be expected therefore, both in the gliding world and in the light aircraft field, various people are getting down to work on their own ideas and machines.

Before the war there was a schism in the Soaring world between those who would admit no adventitious aids to a Sailplane once it was in the air, and those who wished to have a small auxiliary motor attached to enable them to take-off and search for thermals for a longer time than the fleeting two or three minutes of a circuit.

About 5,000 people have taken their "A" Gliding Certificates since 1939. About 150,000 people flew with the R.A.F., and a great number of these want to fly again, and most of them express a preference to flying something with a "fan." But to possess something with a "fan" and fly it demands at least a four figure income, and it is the tragedy of too many of the ex-members of the R.A.F. Air Crews that such an income is not likely to come their way for a long time to come.

But the love of flying is still there and it must be satisfied.

We are not surprised therefore to hear of various groups of people therefore who are getting together to make their own power aircraft.

These groups do not aim at anything very ambitious, and few of them are thinking in terms of engines of more than forty horse power. Some indeed are thinking truly in terms of power assisted sailplanes. Stanley Sproule, for example, is said to be attaching an 8 h.p. motor to an "MU 13."

It is the latter group which is most likely to attach to it Soaring devotees. Any possibility of soaring without having to use the help of other people, or going to a special site, is going to attract many more people, previously power minded, than are attracted by present conditions. Some enthusiasts still have their dreams of small-rocket-assisted take-offs, and there have been many discussions in *Sailplane* Office of such possibilities.

A new Association has been formed, the Ultra Light Aircraft Association, which, including as it does, such well known members of the Soaring fraternity as Sproule, Group Captain Mole, Latimer Needham, and E. L. Baynes, designer of the "Scud 1" and "II", cannot be ignored. Indeed it has made great strides already towards receiving official recognition from the M.C.A.

Anything which will encourage Soaring is the proper interest of *Sailplane*, and we shall therefore occasionally devote some small amount of space to this new development.

Recently the Editor journeyed to Stuttgart to see Wolf Hirth, famous designer of many Sailplanes, creator, with others, of the "Grunau Baby," the "Minimoa," "Habicht," etc., and also of a pusher type 20 h.p. power-assisted Sailplane, details of which will appear in our next issue.

CONVECTION AND THE SOARING PILOT

By F/Lt. H. NEUBROCH

THE soaring pilot has at all times been limited in the extent of his achievements by the state of knowledge in three distinct fields, and the degree of application of that knowledge. The influence of these three—flying technique, skill and experience; suitable equipment; and knowledge of the best exploitation of atmospheric conditions—can be traced separately in the development of top achievements, both in this country and the gliding movement at large.

Gliding skill on relatively elementary types has long ago opened up all the possibilities of slope soaring. At the *Daily Mail* competition on Itford Hill, in Sussex, in October, 1922, a French pilot entered a strange-looking contraption with two almost identical sets of wings, one in the orthodox position, the other in place of the tailplane. It was known as the " Peyret," and proved to be the winner, with a soaring time of 3 hours 21 minutes.

Meteorological research pointed the way to thermal flight. In July, 1933, Mr. G. E. Collins, flying a B.A.C. two-seater at Huish, near Marlborough, was probably the first man in Britain to turn thermals to good account. Detecting them with a sensitive variometer, he doubled the times of his previous glides of 2½ minutes by circling in the up-currents. A few days later he used the same technique to cover a distance of six miles. Eighteen months later flights of fifty miles or over, achieved by the aid of thermals, were almost a commonplace.

The first cross-country in the vigorous vertical development ahead of a cold front was made by Max Kegel in 1926, but this method suffered from a serious limitation, in that the average ground-speed for the complete cross-country would be no higher than the speed of the advancing cold front, *i.e.* 20 to 30 m.p.h. Furthermore, as vigorous cold fronts are comparatively rare, the more usual meteorological situation in which successful cross-country flights were carried out was one in which thermals were found.

This type of weather, together with a moderately strong wind, often gives cloud-lanes; Kronfeld had soared these as long ago as 1928.

Thermal soaring brought gliding to sites not fortunate enough to have a soaring ridge, and new technical developments, among them launching by winch and aero tow, soon followed. Sailplanes of better penetration and a more nearly complete instrument panel enabled pilots to break height, distance and endurance records time and again; in short, thermal soaring, using the meteorological phenomenon known as *convection*, opened up a new field of possibilities which includes—with the exception of ridge lift and the standing wave—all atmospheric conditions ever likely to be encountered in human gliding flight. By 1939, British soaring pilots had experienced cloud, frontal and " pure thermal " soaring, and recent post-war flights have indicated that further development may well be expected mainly along the above traditional lines.

But, as Professor Georgii has pointed out as long ago as 1934, these do not exhaust all the forms of convection soaring which could be utilised. Further meteorological research and technical development may open up such fascinating fields as open sea gliding, and night soaring in the upper air long after convection has died down near the surface.

In the remainder of this article it is hoped to discuss all forms of convection, both of the type already used in practice, and also of the type which the writer believes will eventually be explored and put to good account by the soaring pilot.

THE *Meteorological Glossary* explains that " in convection heat is carried from one place to another by the bodily transfer of the matter containing it." It is this motion of the air in a vertical plane which is of paramount importance to the glider pilot, so that the study of *convection* will not be unprofitable.

Convection may be expected to develop when a parcel of air near the earth's surface is heated by solar radiation, expands (thus decreasing its weight per unit volume) and rises, or conversely, when air at great height cools and sinks. If, however, the atmosphere is in a state of equilibrium, vertical currents will cease as soon as the source of heating (or cooling) is removed. To continue the process of convection, *instability* of the atmosphere is essential; in an unstable airmass vertical currents of considerable intensity may continue throughout the night.

An airmass is considered unstable when its *lapse rate* (decrease of temperature with height) is greater than the *adiabatic* lapse rate, *i.e.* greater than the loss of heat of an ascending parcel of air which is not subject to any gain or loss of heat through external causes. Instability may be caused by the daily solar heating (due to radiation from the earth's surface) of the lower layer of the atmosphere, or by cooling at great height. This latter may be due to a process known as *advection*, that is the transfer of heat in a horizontal direction.

From the above remarks on the nature and causes of convection it is hoped to build a system of gliding in convection currents which will indicate the avenues still awaiting exploration.

(*a*) *Vertical currents as a result of local overheating.*

Every glider pilot is familiar with thermal up-currents which are usually found on clear summer days. These are the result of the heating of the lower layers of the atmosphere. It is, however, not the air which is directly heated by the sun, but the earth's surface which re-radiates solar heat to the air in contact with it. It stands to reason that those parts of the air will receive the greatest share of heat which are immediately above those portions of the earth's surface absorbing least and radiating most of the solar energy received. This explains the quality, from a soaring point of view, of such surfaces as dry, rocky ground, clay, chalk pits and roof tops, when solar heating is strong.

According to one theory, a stream of air rises from such heated surfaces, according to another, a sort

of bubble of warm air collects over them which breaks away after a definite period to rise and give good lift. Problems connected with this effect, such as the periodicity of the rising bubbles, are now the subject of study by a Research Committee of the British Gliding Association.

When solar heating decreases in the late afternoon, direct radiation from surfaces which do not absorb any appreciable amounts of solar heat will decrease in proportion. Radiation from different surfaces which previously absorbed a large portion of the energy received will, however, continue for a while. Thus it is sometimes found that small lakes, swamps and wooded areas will still supply enough up-currents in the late afternoon to support a sailplane.

Cumuloform clouds may form over areas of up-currents, depending on the temperature and water-vapour content of the atmosphere, but the above effect will be distributed unevenly according to the nature of the terrain.

If the water-vapour content is insufficient, "pure" thermals (*i.e.* without cloud formation) will develop, and as the rising air will not be visually identifiable, the extra burden of finding the thermal will fall on the pilot. But once the technique of finding and using thermals up to cloudbase is mastered, cross-country flights in pure thermals will be no more difficult than those in which the pilot finds his lift by circling under locally formed cumulus clouds. The writer's Silver "C" flight, in June, 1946, was carried out in conditions of pure thermals which formed over villages and towns, fields and quarries, and 92 miles were covered in 3½ hours.

(*b*) *Cloud Streets.*

When a warm, moist, unstable airmass and a strong wind combine, they often form cloud streets of evenly distributed stratocumulus rollers stretching far into the distance. The axes of these cloud rollers, usually about three miles apart, lie down-wind, so that the glider pilot may fly along them without losing height. High ground speeds are therefore possible, and this type of convection is ideal for distance cross-country flights. Phillip Wills' record flight of 209 miles in April, 1938, was made on a day when cloud streets formed over southern England when that part of the country lay in the north-easterly circulation of a High centred over the Shetlands, and C. J. Wingfield speaks of "the father and mother of all cloud streets" which took him from Droitwich to Staines when he covered 147½ miles in July, 1946.

Cloud streets are found at medium height (approximately 4—8,000 ft.) and best lift will be found just underneath and on the sunny side of them, while down-currents will be greatest about halfway down on the shady side. They are best approached by aero tow.

Cloud streets prevailed over Germany on July 28th, 1938, and enabled 27 pilots, starting from the Rhoen, to carry out flights in excess of 90 miles. W. Spaete put up the best show by flying to Koblowitz, 271 miles away. The weather map showed a Low centred over the British Isles, with a warm, moist circulation from the south-east. Cloud-base was at 4,000 ft., tops at 6,500 ft.

(*To be continued*).

What About This "Front" Soaring?

WHEREVER glider pilots get together the word, "front," is sure to creep into the conversation. We have discussed fronts for many years, yet, apparently, no one has soared in frontal conditions enough to tell us what we need to know in order to do it ourselves. For all the front soaring we have done in Southern California the tremendous power of the front might as well remain legendary.

An academic study of fronts indicates that there are two general types: "warm" and "cold." A front is formed wherever two masses of air of differing temperature come together. A warm front is created where a mass of air slides up over a wedge of cooler air. This wedge may be a hundred miles or more in length and may have a depth of 10,000 feet or more. A cold front is created where a wedge of air wedges under a mass of warmer air and pushes the warmer air upwards. Cold fronts are steep and they move fast. At the line of contact between the two masses, the air is scooped up rapidly and here is where "front soaring" begins. The idea is to stay out ahead of the front, in the uprising air, like a surf-rider scooting along in the fore of a wave. The front may extend hundreds of miles. By utilizing the speed of the front itself while running down the length of it great distances and altitudes are possible. Warm fronts have considerably less to offer since they are much milder in action.

So much for an academic treatment of frontal soaring. How do we find these fronts in actual practice? The answer is in study of the weather maps—first of all. The daily weather maps show them as heavy black lines. Sometimes they are coloured. They are drawn through selected points on the isobars. The approach of a cold front is preceded by lowering temperatures, lowering clouds and increasing winds which gradually shift direction and finally, at the front itself, shift 90 degrees or so to the original direction. Much nasty weather, with rains and squalls, is involved. A man taking off ahead of a cold front must have a substantial amount of conceit concerning his piloting ability. The glider, too, must be strong.

If one were to study the weather maps of several years running and plot the occurrence of frontal conditions favourable to soaring, it would appear that it might be possible to predict with reasonable accuracy the occurrence of future fronts, and thus assure reasonable success is making contact. (*With acknowledgment to the Southern California Gliding Association.*)

5,000 FEET IN THREE MINUTES

By FRED ISLER

THE 4th of May was a beautiful day in Switzerland, too beautiful for studying in our Polytechnical High School. And so at noon, I went with a friend, who owns a little car—" letter box " we call it—to the Birrfeld, the tiny aerodrome of the Birrfeld Sailplane School, where many other clubs have their aircraft serviced.

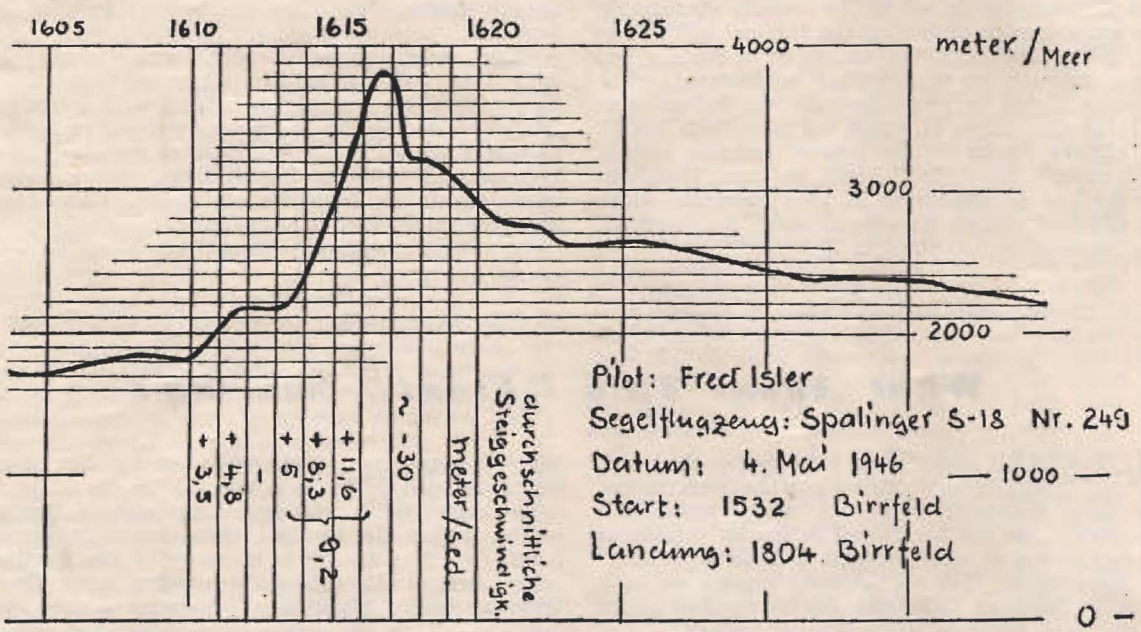
Two hours after our departure from Zurich our " Spalinger S-18 " was assembled, and at 15.30 our professional instructor, Max Leder, launched me with a school winch. At 500 I cast off and a short time after I found a nice thermal. In the smooth air I circled, gaining 5 feet a second, till I was 5,000 feet above the airfield.

For about an hour I was unable to find any possibility of ascending higher. In the south I saw the whole range of the Alps and in the north the Black Forest of Germany. Underneath me I saw the tennis and golf players at Schniznach Bad quite near to the Habsburg Castle, which overlooks our airfield—it was a gay and lovely day.

But all at once, my peace of mind was shaken ; I saw big cumulus forming over the Black Forest, and I could not resist the temptation to try and fly in it. At first it seemed very difficult to fly towards the Rhine, but the nearer I came to the big cumulus the more unconcernedly I could fly.

At once the sailplane began to shake, the right wing lifted and I began to circle and climb, but very soon I lost the area of lift. I flew for a little while and kept turning, and the story began to repeat itself. The brave bird climbed, first 5, then to 15—20—30 feet a second, finding both variometer indicators stuck at the top. It became dark and still, the instruments were perfectly steady, except for the altimeter, which kept turning higher and higher. But suddenly I seemed to be in a great water bath ; water entered every little slit of my cockpit. My altimeter stood still, now began to turn in the opposite direction, faster and faster. I was being forced down through the cloud. With air-brakes open I was just able to keep control till all at once the ghostly clouds disappeared ; my brave bird found again its normal speed and I saw far below me the silver band of the Rhine again, shining in the sunlight.

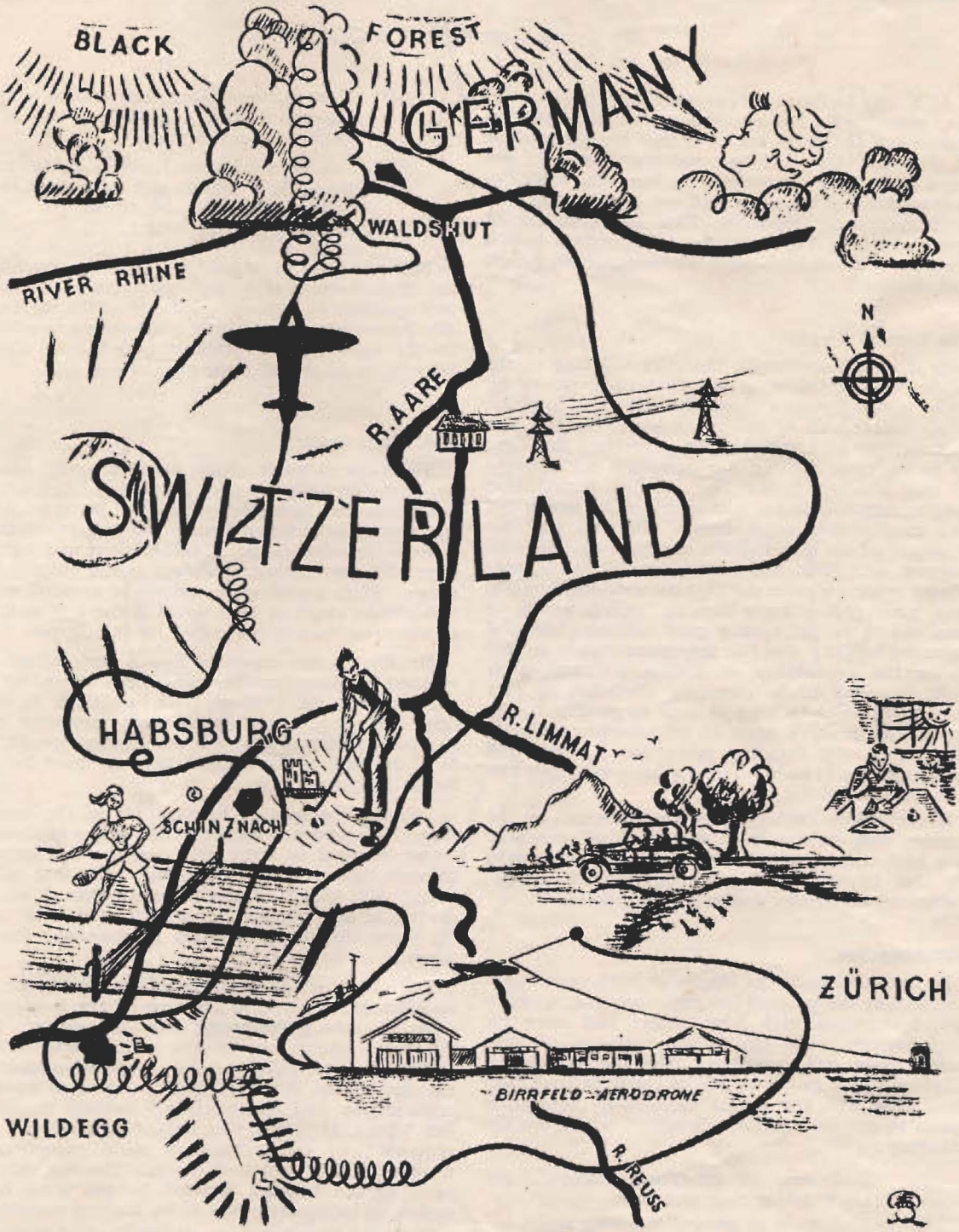
Without a sailplane well equipped for blind flying I wasn't willing to try again my luck with these invisible devilish forces inside the clouds. I flew back towards the tennis players who had finished their game. My flight had revealed to me an awe-inspiring forces of nature ; and I had had a great and illuminating experience.



Before the flight I had always thought I would be very turbulent inside a cumulus, but instead I found very smooth air, till I reached the watery zone which ended my unpremeditated flight.

We, in Switzerland, are not much experienced in blind flying. Only about 10% of our 400 sailplanes have a C of A for cloud flying. At the present time, standing wave flying is very much in fashion in our country, but for good performances in flat country it is necessary to make use of cumulus clouds.

To gain the experience and confidence in the air my club is continuing the training begun this winter in the traditional Easter camp, which takes place at the Birrfeld.


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THE TREND OF SAILPLANE DESIGN

By Group-Captain L. P. MOORE

LACK of facilities of every kind has so far prevented a real rennaissance of the sailplane movement, but there are signs that by mid-summer of this year there will be a welcome change of circunstance. The meantime is one for intensive preparation and planning and not least in the field of technical development. This seems to be an opportune time for hazarding a forecast as to the lines upon which high-performance sailplane design will develop.

The General Trend.

It is easy to prescribe that the sailplane of the future must combine good penetrating power for rapid transit between thermals, with very low sink at the other end of the speed scale, for the best exploitation of thermals. There seems, however, to be no means within our grasp for achievement of this ideal, and the best of high-performance sailplanes to-day is but a compromise between these two incompatible requirements. Because the rate of ascent of air in a thermal increases rapidly with increase of height above the ground, it is more advantageous to enter the thermal well up by virtue of a good gliding angle than to reach it nearer its base and be reliant upon a good minimum sink for regaining height. For this important reason as well as for the probability of finding stronger winds aloft, it seems to be normally advisable to plan one's flight so as to keep as near as possible to the top of the unstable layer in use, starting off only when high and avoiding going too far downhill before starting to restore the original height or better in the first available thermal.

Hence where cross-country performance is the primary aim, sinking speed should, I feel, give way to a high cruising speed at the optimum glide angle. On that hypothesis may we examine the single-seater and two-seater design in more detail.

Miniaturisation.

In trying to burn the candle at both ends, over-emphasising the value of low minimum sink, we have landed ourselves with fifty footers and more for single-seaters, while the weight and size of two-seaters leaves one speechless. Now the weight of a sailplane varies as the square of the wing span, and small span and low weight have many invaluable points to recommend them, amongst which are the following :—

(i) Reduction in structural material, and construction time and cost.

(ii) Reduction in ground handling facilities.

(iii) Smaller trailer and towing car.

(iv) Smaller launching crew.

(v) Less hangar space.

(vi) More manouvreable—hence safer to land, easier to fly and more likely to help in the solution of gust soaring.

(vii) Can be winch towed with a lighter cable having less windage and hence for a given cable length can be towed to a considerably greater height.

The only price to be paid for this very formidable list of advantages is a small reduction in minimum sink qualities at the low speed end of the scale, and this I consider to be of little consequence in relation to the cross-country problem and the invaluable benefits to be gained from reduction of size.

The Single-Seater.

There are so many closely interdependent factors to be taken into account that it is difficult to determine the best starting point. Because of the operational advantages just mentioned, one favours a do-or-die exploitation of the smallest and lightest type and goes for single-seaters of the 30/35 footer range. High aspect ratio cannot be avoided where flat gliding angle at high speed is the aim and one of about eighteen is prescribed for both types.

Mr. Baynes has shown us how a very robust and efficient sailplane can be made for a weight of the order of 150 lbs. (" Scud II "), although its wide open cockpit and under-wing struts probably spoil its performance badly at the higher speeds. A G.A. drawing of the type I have in mind for the future is shown at Fig. 1.

The light weight of fuselage aft of the normal centre of pressure is such that the wings need to be swept forward in order to bring the c.p. forward towards the c.g. (roughly coincident with the pilot's seat). But that is admirable as it enhances aileron control at and beyond the critical stall point. At the same time a parasol sling arrangement for the fuselage is obviated.

The chord of the main-plane is aligned near the no-lift angle relative to the axis of the fuselage in order to reduce downwash over the latter. This not only reduces one of the serious drag factors common to present-day types but makes possible the use of the otherwise highly ingenious fuselage cross-section and constructional method employed for " Scud II." By this only four longerons are required and construction is made exceptionally simple, robust, light and cheap. The low fineness ratio of the fuselage assisted by the wing flaps, makes an adequately tail-down landing possible.

Full span flaps largely neutralise the higher landing speed otherwise to be expected from the higher wing loading. This feature, combined with increased handiness resulting from small size and with powerful

air-brakes, is calculated to make landings easy and safe.

A wing section having a stationary c.p. over the flight range saves weight by reduction of elevator loadings and, furthermore, improves fore and aft stability.

The butterfly type of tail surfaces adopted has much to commend it. For the requisite rudder and elevator power it has less weight and drag. At the same time it is lifted well clear of long grass and other obstructions during the launch and landing.

To be continued.

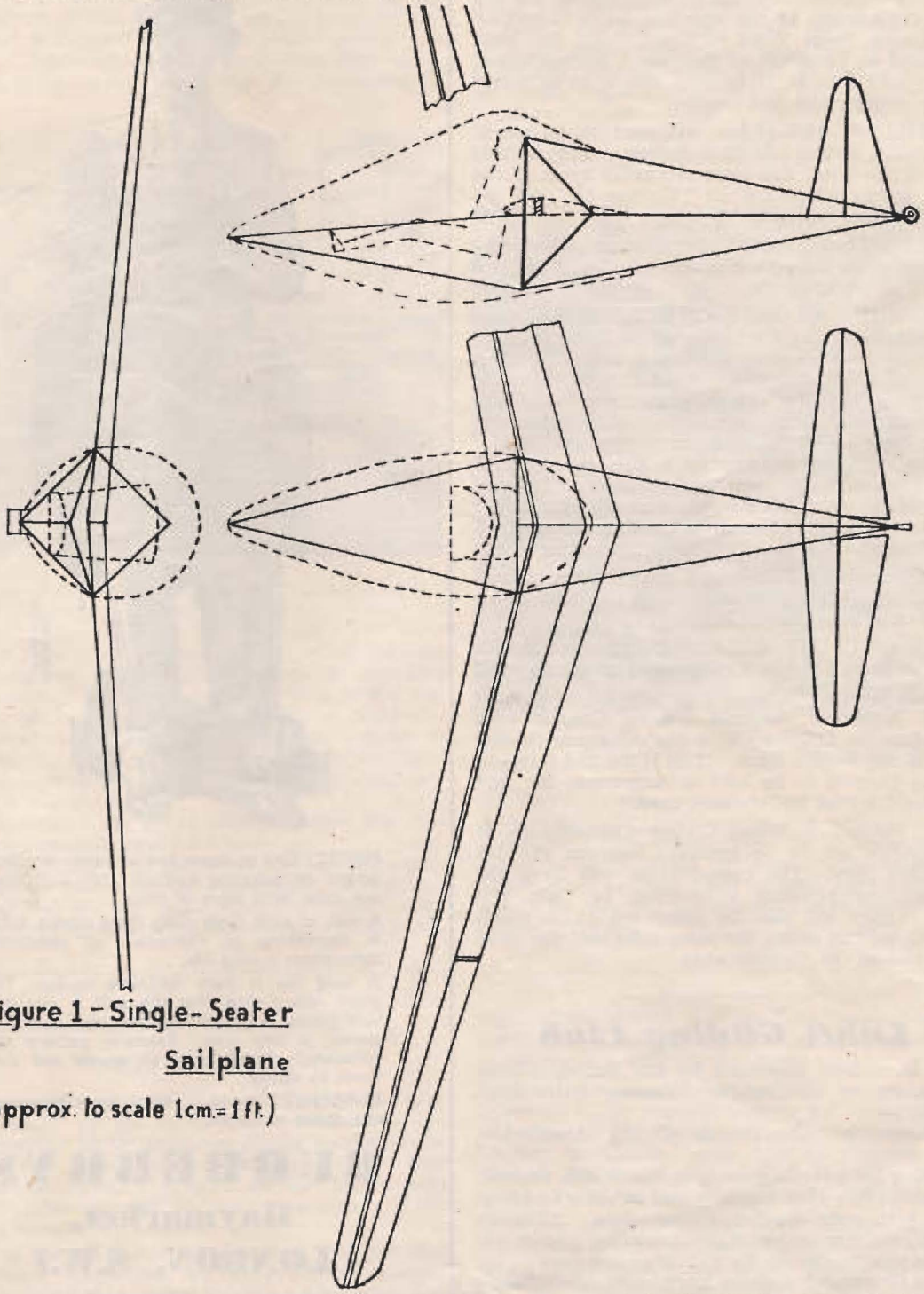


Figure 1 - Single-Seater Sailplane

(approx. to scale 1cm.=1ft.)

NEWS IN BRIEF

MR. GORDON MANLEY, well known for his explanation of the standing wave caused by the famous Helm Wind of Cross Fells, has been succeeded as President of the Royal Meteorological Society by Dr. G. M. B. Dobson, who is an authority on the stratosphere and beyond.

GERMAN-BUILT gliders will soon be in use at A.T.C. gliding schools in Britain. They include some of the finest and most airworthy types in the world, among which are the " Grunau II " and the " S.G " primary trainer.

SPAIN'S Civil Aviation Department is offering applicants between the ages of 15 and 23, free training as glider pilots.

BRIGADIER GEORGE CHATTERTON, former commander of the Glider Pilot Regiment, has flown to New York to establish a branch of a travel agency of which he is the founder-director. Joining him on the board is Colonel John Lyne, who took over command of the Gliders when Chatterton was demobilised. When Chatterton returns to London, Lyne will fly to the Argentine to open a branch of their business in Buenos Aires. Colonel Lyne is employing many of his men who served in the Glider Regiment. Negotiations are in hand for the purchase of a house in Grosvenor Square as head offices.

ONE hundred A.T.C. officers are to given instruction at gliding clubs run by the British Air Forces of Occupation in Germany.

MRS. GWLADYS ROGERSON, the first British woman to obtain a glider pilot certificate, died recently, aged 49.

THE Argentine National Soaring Contest took place on February 2 at the Albatross Gliding Club, Merlo, Buenos Aires. This is the 2nd National Soaring Contest to be held in Argentina, the first being at Cordoba in February 1945.

THE Swedish National Gliding Competitions at Orebro are to be arranged between the 3rd and 13th July. The competitions will have the Swedish championship in soaring as their real object; they will also be connected to an international contest under the same rules and the same conditions as the championship.

Lahti Gliding Club

We have been requested by the British Gliding Association to publish the following letter from Finland :—

The Secretary, The British Gliding Association, London.

Having got your address from the British Council, the Lahti Glide Club turns to you in order to get in touch with some English gliding clubs. Although we are working under many hardships our motto for this year is, double the gliding of last year !

Glide Greetings : Lahden Purjelentokerho (Gliding Club of Lahti).

Secretary : Lauri Lampén, Lahti, Kymintie 6, Finland.



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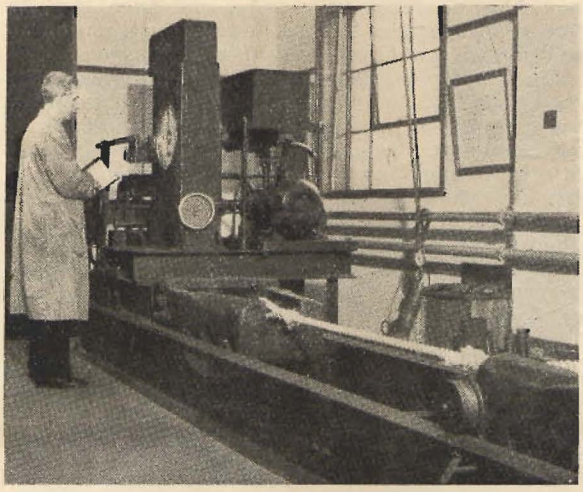
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NYLON TOW-ROPES

IN 1943, British Ropes Limited completed for the Ministry of Aircraft Production, large quantities of glider tow-ropes made from Italian Hemp and Manila. Admirable as these special-type glider ropes proved to be, a new technique was developed by



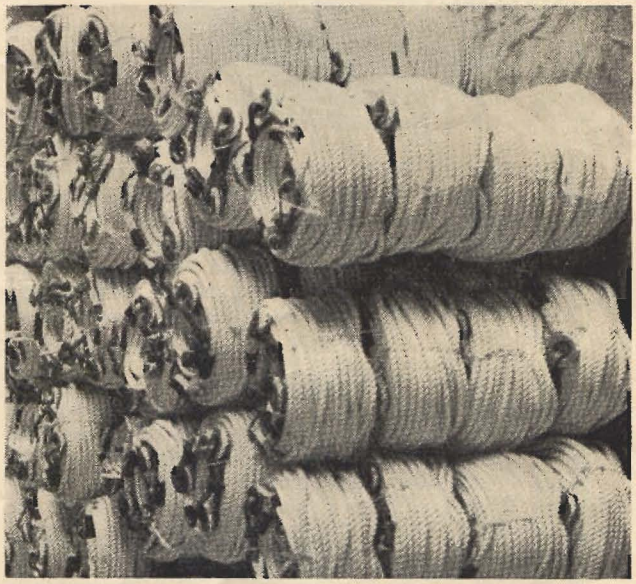
Testing Nylon Rope on a 30 tons Tensile Testing Machine.

Aircraft Research and Development, which required something even better. This involved the snatching of a loaded glider from the ground without the tug-aircraft having to land. The operation demanded the use of an improved towing system, capable of withstanding the shock of high peak loads, but light in weight, so as not to stress unduly either the air-frame or the glider.

In less than 96 hours British Ropes had the required tow cable ready for use.

The first test was so successful that contracts were immediately placed for bulk quantities; in the first instance for pick-up work only, but, later when heavier type gliders were developed, for orthodox towing. A special feature of the rope was the incorporation of a telephone cable in each strand which allowed of intercommunication between the glider and the towing plane.

Among the more outstanding properties of this relatively new cordage are: tremendous strength; great elasticity—in some cases extending to 40% above the original length before fracture—resistance to water, to the action of chemicals, to rot and marine decay. It can be considered non-inflammable, is smooth, flexible, and easy to handle. It does not



Nylon Glider Tow Rope, ready for export.

deteriorate in storage even when wet, and can be cleaned with soap and water.

British Ropes claim that the introduction of Nylon is undoubtedly the most outstanding innovation in the cordage world to date, and believe that it may be only the forerunner of even more revolutionary changes.

INTERNATIONAL GLIDING CONTESTS

A tremendous blow to British air prestige has been averted by the news that arrangements can now go ahead for international gliding contests to be held in this country in conjunction with the 1948 Olympic Games as the result of an offer by Viscount Kemsley, chairman of Kemsley Newspapers, Ltd., to be guarantor for £1,000.

Before Lord Kemsley came forward with his offer there was a danger that the British Gliding Association would have to notify the F.A.I. that they had not the financial resources to stage the contests here. Switzerland or Sweden, which have both made offers, would then probably have had the distinction of staging the first gliding competitions in conjunction with the Olympics.

"Lord Kemsley's generous offer makes all the difference to our hopes of keeping the contests here," said Mr. E. H. Spence, secretary of the British Gliding Association, when told of the offer. "I have no doubt that my council will now be able to tell the F.A.I. we can go ahead with arrangements."

On the same day as the guarantee was received, Mr. Spence heard from the Ministry of Civil Aviation that a civil airfield would be lent to the organisers if a service aerodrome was not available.

A public appeal for donations to make the financial backing absolutely certain will probably be issued.

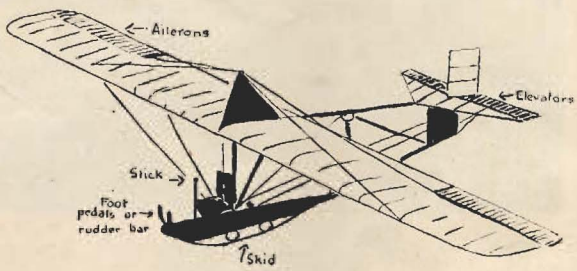


2. Training and Technique

LAST month I gave you the elementary rules of flying, or rather, of gliding. Stick forward, nose down; stick back, nose up. Stick right, right bank; stick left, left bank. Left rudder, nose left; right rudder, nose right. And when in doubt, stick forward and feet straight ahead. There you have the five-finger exercises of gliding, and indeed of all flying. From there it is up to you whether you are keen to go on or not. You may stay in the stage of being able to pick out a tune with one finger, but there is no real reason why you should not practise hard and perfect your technique till you can play really well, though—to continue the simile—unless you have the divine spark you may never be a Paderewski or a Kreisler. It is just the same with gliding. Given enough enthusiasm and the right kind of encouragement and instruction it is easy to become a crack pilot even if you have no natural gift for it, simply by being expert technically. But you must be keen and you must work hard.

Study the records of any Gliding Club and you will see that far more people begin to fly than ever keep it up. They drop off for various reasons—expense, illness, a disapproving parent, lack of time. Then, since most clubs can only function at week-ends the weather is a great deterrent; rain and hail and fog and snow can all make gliding most uncomfortable. But if you can be one of the ten per cent. tough enough to follow right through the course you will have won your entry into a select band. In odd places all over the world you will bump into someone who recognises your badge and from then on you will be among friends, even though you can't understand a word of each other's language.

The gliding badges are three—or five, if you aspire to be one of the aces. They are International, varying only in the letters at their head, each letter representing the country of origin. The badge itself is a blue enamel button worn in the lapel. The A has one white seagull, the B two, and the C three (as on page 24). Then there is a Silver A and a Golden C, but these are relatively rare and it may be a long while before you see one. The minimum requirements are these :—



Elementary "Primary."

A.—30 seconds free flight in a straight line.

B.—45 seconds flight making an S curve.

C.—A flight if 5 minutes *above* the release point.

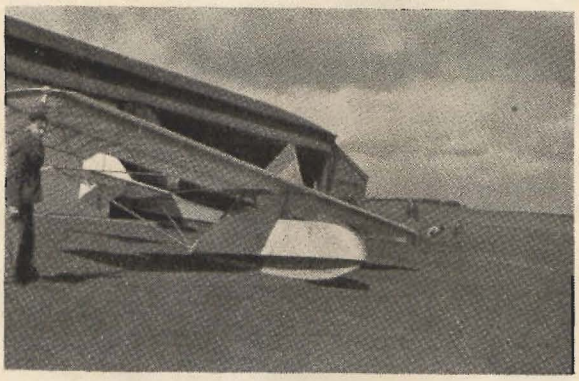
You will see that the first two are easy—just a matter of controlling the machine well enough to bring it down straight and level again a few seconds later (though it is quite astonishing how long thirty seconds in the air can seem . . . .). For the C you have to be capable of soaring—that is, of finding and using an up-current. These exist in various places. The easiest to find are those caused by the wind sweeping up over the face of a hill. Unless it is a very exceptional wind or a very exceptional hill you will not get very high or very far, but with the wind in the right direction you can be sure of lift. So most elementary gliding clubs are situated on one of these hills. Primary training is carried out at the foot of the hill, and later on the pilots are launched from the top, there to beat up and down from one end of the slope to the other as long as they please. This is not very exciting but it is a good way to pile up time in the air and concentrate on technique. Much more skill is needed when flying from flat country. There the up-currents are due either to cloud lift or to bubbles of hot air breaking away through some irregularity in the ground. It takes knowledge to find these and experience to stay in them, so I am going to leave that till a more advanced lesson.

Your first day at the club will be spent learning the uses of the ailerons. These control the lateral



Veronica Platt.

balance of the machine, and the movements become instinctive almost immediately. Sit in the seat with your feet up on the rudder bars, hold the stick gently with one hand, look ahead to the horizon, and relax. One of the members will then rock the wings and it will be your job to try and keep them level by balancing movements of the ailerons. As the right wing drops bring the stick over to the left to counteract it. The right wing will lift; but if you have over-corrected, the left wing will drop instead. This is why I said "Relax." Make all movements smoothly and gently and the glider will respond. Remember, too, that all machines are naturally stable. Later on you will be able to prove this by flying hands and feet off, when the primary will probably fly better than with you guiding it! But don't try this till you are expert. Just remember that it can be done and give her her head.



Nacelled Primary—"Dagling."

After a few minutes you will be responding instinctively as soon as the machine is rocked, and when the instructor thinks you have the hang of it, he will give you a "ground slide." Strapped in the primary you will be towed behind a car, pulled along by the winch cable, or just dragged by your fellow pupils from one side of the field to the other. The idea is to keep straight and not let either wing drop. If it does (and it will) correct it by opposite movement of the stick.

When you can do this effectively the speed of the tow will be slightly increased and for one ecstatic moment the glider will be airborne. It will seem enormously high at first and you will be amazed and incredulous to find you were never more than eighteen inches off the ground . . .. But with each successive tow from now on you will be taken higher and higher, always on the end of the tow rope. When you can fly straight and level right across the field at a height of about fifteen feet the instructor will give the signal for you to release the cable and come down alone. (These signals are given by flags, but as they unfortunately vary from club to club I will not specify any for fear of muddling you. The instructor will explain and all you have to do is to obey implicitly. He knows how to fly and he knows how to make *you* fly, so ignore anything said to you by your fellow learners and concentrate on believing faithfully everything the instructor tells you. That is why he is there.)

(*Continued on page* 14)

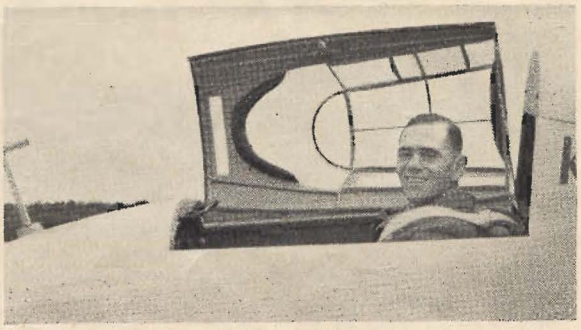
CLUB PERSONALITIES

T. REX YOUNG

(*Chairman Bristol Gliding Club*)

REX YOUNG returned to Bristol in January of 1946 and ever since has taken the leading part in re-establishing Bristol Gliding Club. His enthusiasm for flying dates back to the Great War when he served in France as an air observer. This enthusiasm found an outlet when, in 1938, he obtained an "A" licence in the C.A.G. Flying as his passenger one is impressed by the thoroughness of his routine and cockpit drill which is not one of time-wasting over-caution but simply consistently good airmanship.

For pleasure flying and also to get about the country on business, Rex uses his blue "Hornet Moth" and last year piled up a respectable total of hours. Power-flying experience is probably the reason for the "Young Touch" in handling sailplanes which is visible to watchers on the ground, as a marked smoothness of manoeuvre and impeccability of approach judgment. Rex "converted" to gliders as an A.T.C. instructor at N.E. 26.E.G.S. at Greatham at the outset of the A.T.C. gliding programme. After putting in a great deal of work



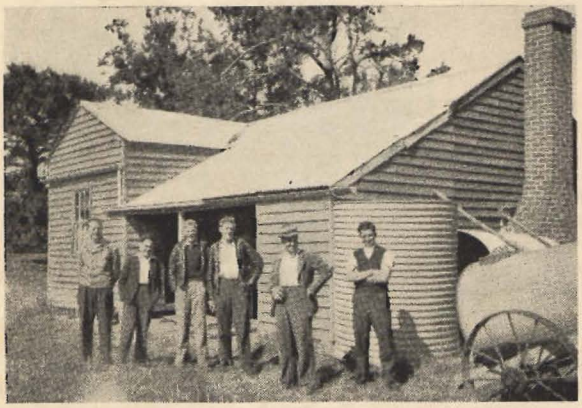
T. Rex Young.

there as C.F.I., he continued instructing at 92 G.S. at Charmy Down on his return to the south. Here he qualified for his "C" with a very creditable flight of thirteen minutes in semi-darkness over a shallow gully in a hard-used "Grunau." This effort was followed up some months later by a flight of over five hours in a "Weihe" at Rana in Czechoslovakia as a member of the British delegation to that country last year. This flight was accomplished over an exceptionally short slope simultaneously in use by five other sailplanes, and, furthermore, on "the morning after the night before"!

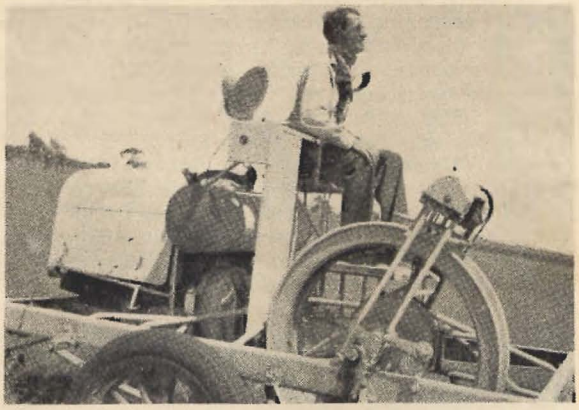
Handling the tasks of B.G.A. Council-Member, Chairman and C.F.I. of the Bristol Club, and also the usual one of making a living, keeps "T.R." very busy indeed. He has a characteristically thorough manner of getting right down to these tasks which results from the combination of his unbounded enthusiasm, wide business experience and shrewd judgment. People with whom he comes into contact are seldom slow to appreciate these valuable talents, but he nevertheless seems to adopt the role of "willing horse" with unfailing reliability.

(*Continued on page* 16)

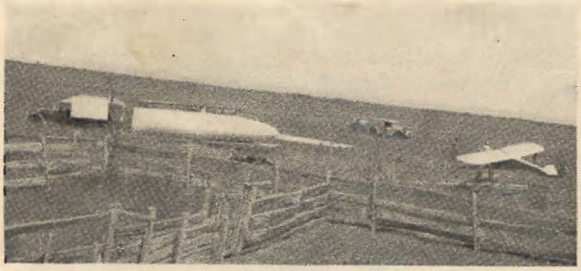
AUSTRALIAN GLIDING
YARRAM (Dec. 1946)



The Shearers' Quarters, where some members camped.



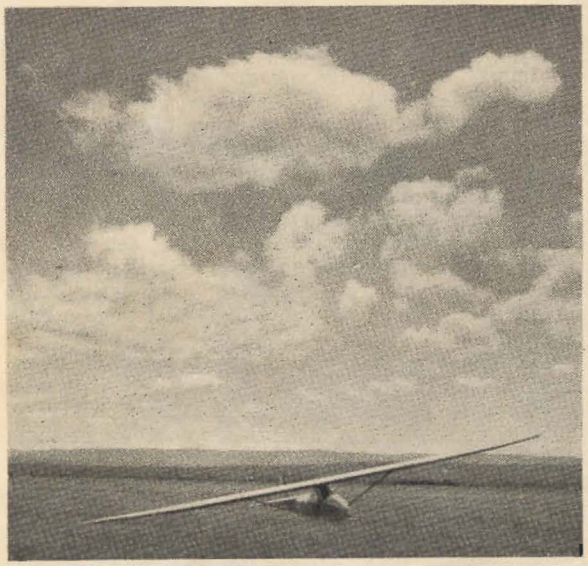
Ron Roberts on Winch. Note field telephones.



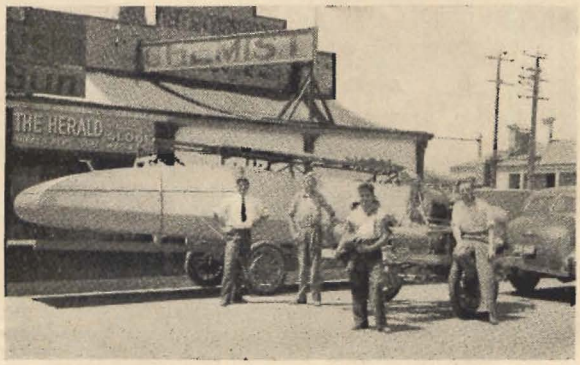
The Flying Field: Blue "Grunau" on trailer. "Utility" rigged winch in centre.



". . . . and there was I." Ian Lacy shoots a line at Dot Roache and Claire Landy.



Grey "Grunau."



Blue "Grunau" and Winch No. 1a homeward bound.

AUSTRALIAN GLIDING

NEW SOUTH WALES

Members of the Sydney Metropolitan Gliding Club and the Hinkler Gliding Club arrived at Kiama on Christmas Day and spent the day rigging the machines and making camp. The long-awaited southerly wind did not arrive until after the camp had finished. From a flying point of view the meeting was not a success, but it was a huge success as a holiday. The town of Kiama is a popular summer beach holiday resort on the New South Wales coast approximately 70 miles south of Sydney. There are many rounded hills inland above the town, and slope soaring flights of up to 3 hours have been made at the site.

26th Dec. This was the first flying day—the wind was from the north. The Grey " H.17 " was given 6 launchings by auto towing around a pulley. On the 6th launching the " H.17 " made a poor launch, and after a quick circuit landed downwind and uphill and overturned. The fin, rudder, left wing and nose of fuselage were damaged, but the pilot, Cecil Hughes, was not injured apart from scratches and bruises. The " H.17 " was repaired again by Saturday afternoon. The " Falcon " made only one launching.

27th Dec. The " Falcon " made 3 auto-pulley launchings into a fairly strong north wind, but a low hanging fog over the hill top made further flying dangerous.

28th Dec. The " Falcon " did 13 launchings into a gusty north wind.

29th Dec. A strong west wind stopped flying altogether, the average launching was approximately 250 feet above the hill, and as the wind had too much north in it to use the north-east bowl, all flights were merely extended circuits.

The total flying for the camp with the " Falcon " was 19 launchings for 54 minutes.

Gliding at Fleurs Airstrip.

1st Jan. The " Falcon " two-seater, made 12 flights for 1 hour 27½ minutes' duration, including a flight of 27 minutes, by Jack Munn. He was launched to 400 feet and succeeded in reaching an altitude of 2,200 feet (thermal soaring).

5th and 6th Jan. Sydney Technical Gliding Club. 4 trainees made 22 flights (car tows) in the Club's two-seater primary. (An enclosed fuselage is being designed for this machine.)

9th and 10th Jan. Cumberland Phoenix Gliding Club. 32 launchings were made in the " Utility " by 4 members (all car tows). Unfortunately while making a fairly tight turn at about 200 feet altitude, the " Utility " stalled and spun into the ground completely wrecking the machine. The pilot, John Edwards, suffered slight concussion and a broken nose, but after treatment at the Parramatta District Hospital was allowed to go home.

A.W.A. Gliding Club. 24 launchings were made with primary. 12 flights and 12 hops. C. Tamplin and D. Hatton are doing circuits from about 500 feet altitude. E. Baker and R. Todhunter are doing hops.

12th Jan. Cross wind—Force 4 to 5. Later in afternoon the wind dropped and 8 flights were made in " Falcon " for 38 minutes. Several new members of the Sydney Metropolitan Gliding Club had their first flights in the " Falcon." Average height on the tow was 700 feet and duration 5 minutes. Three test flights were made with the " Heron "—the last was to a height of 250 feet. The machine is reported to be very light on the controls and to have handled very well in the gusty conditions.

Sydney Soaring Club. The famous " Kite II " sailplane used by this Club has been sold to Gil Miles of the A.W.A. Gliding Club. It is understood that Gil Miles's " Prufling " is for sale for £160 (including trailer).

SOUTH AUSTRALIA

Waikerie Gliding Club.

The two-seater " Pelican " was in the workshop twice—Les Brown was doing his first landing after a perfect touchdown but struck a stump hidden in the grass and wiped off the undercarriage.

While repairs were being made it was decided to incorporate several improvements, including moving the seats forward a little and fitting a second release almost under the rear cockpit. After several flights, during which the release was tried out without much success, Bob Rowe was winching Jock Barratt and Colin Buckley, when portion of the bottom of the fuselage parted from the machine, leaving Colin in a rather precarious position.

The two-seater " Pelican " was flown on 7 days during December 1946, 40 launchings being made for a total time of 2 hours 33 minutes 40 seconds. Allan Killmier and John Morris, of the Gliding and Soaring Club of South Australia, were present at Waikerie on 28th and 29th, and had some flights in the " Pelican."

Work is being carried out on the fuselage bulkheads of a new two-seater.

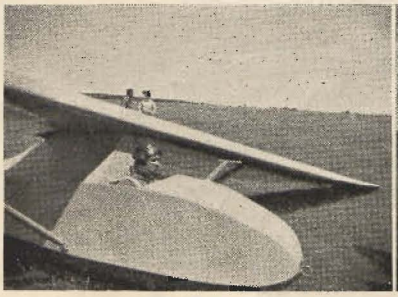
Gliding and Soaring Club of South Australia.—Gawler Airstrip.

15th Dec. The new two-seater was scheduled to be test flown and preparations were being made for the holiday gliding camp. The Club gliders had been transported to the Airstrip (25 miles north of Adelaide). At 10.5 a.m. a test flight of Mick Cowey's " Utility " was made by Clarrie Moir with unfortunate results. The machine—a single seater fitted with an open towing hook on the nose of the fuselage—was auto-towed. The towline used was approximately 800 feet of 15 hundredweight cable, and the tow was made from the N.E. end of the N.E.—S.W. strip into a Force 0 to 2, S.W. wind. After a long run along the ground on the skid, the machine climbed to a height of between 300 and 400 feet. The tow car was doing 40 miles per hour by this time. The machine then appeared to fly level and turned slightly to the left. The cable ring dropped off the nose hook as the machine flew over the edge of the strip and according to eyewitnesses the machine

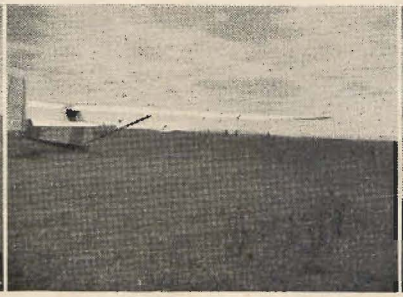
appeared to be stalling as the pilot commenced a rate 1 to 1½ turn to the left. After turning through about 120 degrees and at about 250 feet altitude, it commenced spinning to the left and had revolved about 4 times when it struck the ground with the right wing and bottom of fuselage, at a point about 40 yards from the strip and about ½ mile from take off position. The fuselage was wrecked back to the bulkhead behind the pilot and the spars were broken in both wings. The pilot sustained two fractures of the right leg and was taken by ambulance to the Royal Adelaide Hospital.

Trailer Hauling. There were some anxious moments with the trailers on the mountain roads, particularly on the Traralgon—Yarram section, which was negotiated at night by Hyde and party (4 altogether) in Duckworth's Dodge, towing the Club's *big open trailer* with the "Merlin" and "Utility," and by Rob Dowling and party (5 altogether) with the Blue "Grunau" on an *open trailer* (just completed).

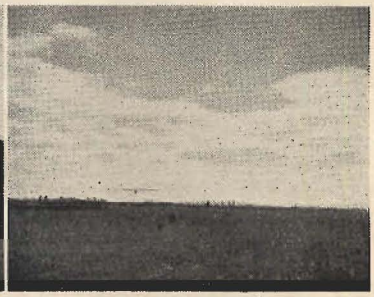
Winch No. 1A had been towed down to Yarram *via* Leongatha and Foster by Duckworth and party (4 altogether) on 14th Dec., 1946, with his Dodge Van. The Club's Grey "Grunau" in its *enclosed trailer* was towed by Jack Hearn and party (6 altogether) in his Dodge tourer, *via* Traralgon on Christmas Day.



Rob Dowling waiting to take off behind the Avro.



Slack taken up.



"Off."

As a result of this mishap the Club (being without an instructor) found it necessary to abandon its scheduled Holiday Gliding Camp at the Airstrip. The Club gliders were not flown at all and are still at Gawler Airstrip.

QUEENSLAND

Toowoomba Gliding Club.

The "Falcon" two-seater (J. Munn) design construction is being held up on account of metal fittings. A "Grunau" is also being built. Three Club members—Currey, Keane and Chamberlin—have purchased a 50 ft. span sailplane (in need of re-build) similar to "Kestrel" type, and some primary wings and other material at Brisbane on 15th December, 1946.

VICTORIA

The Gliding Club of Victoria.

This meeting was held in conjunction with the Yarram Aero Club on Mr. Herb Nicol's property, 4 miles east of Yarram. This was the first time the Club held a flying meeting in conjunction with an Aero Club. The field which is used for grazing sheep, is approximately 1,100 acres of flat ground nearly all cleared, and is near the Yarram Aerodrome, where the Yarram Aero Club have their hangar, which houses 6 machines. ("Avro Trainers" and "Tiger Moths.")

Mr. Nicol made his shearers' quarters available to the Gliding Club for camping. The quarters consist of a 3 room building with kitchen and sleeping quarters and a shower shed nearby. The camp was about 1½ miles from the point on the field where the gliders and other Club equipment were left and about 6 miles from the Yarram township. Yarram is situated in south-eastern Victoria (Gippsland), 100 miles from Melbourne.

R. Duckworth and R. Pollard arrived by motorcycle on Christmas night after working Christmas Eve and Christmas Day with Jack Wood fitting a new clutch plate to the 1940 Buick Sedan, which Jack (party of 6) drove down the next day with *Winch No. 4* in tow.

Altogether about 40 members of the Gliding Club and their friends attended the meeting.

TRAINING AND TECHNIQUE—*continued from page 11.*

At the Club where I learnt, it was the custom to stand a round of beer after the first free flight; on others nothing is celebrated till you have your A. This is just a matter of going on as you have begun till you are making tows of about 100 feet in height, releasing the cable, and gliding straight ahead in free flight. When you can stay thirty seconds in the air you will be given the A—but not if you slow your airspeed to stalling point in the effort to make the glide last longer. The machine has a "best angle of glide" which you will discover from experience. Learn to keep your eyes on the horizon and you will soon get the idea of where it should be. If it disappears and you see only blue sky, the nose is far too high and you are about to stall—dive her at once. If the amount of ground is too large in relation to the amount of sky you are flying with the nose too far down. Lift it a very little till the horizon is in the normal place. But make all movements gently and smoothly. Keep your muscles and nerves relaxed and you will fly well.

NEWS FROM THE CLUBS

YORKSHIRE GLIDING CLUB

No activity to report. The site has been snowbound and inaccessible since the bad weather began. We have, in fact, been more or less immobolised since last September, and our loss in revenue would have been very serious had we been operating on borrowed capital.

BRISTOL GLIDING CLUB

Since writing the last monthly report, flying activity at Lulsgate has been nil. The damaged "Cadet" has now returned to the site, after being snowed up for a week on the way, and the snow is now more or less off the aerodrome, so training will be restarted at once. Conversion to the "Grunau" for those up to the exacting standard of eligibility set is also in the offing.

By the time these notes appear, we shall, weather permitting, have staged our first "At Home" and flying display. Two British manufacturers have promised to demonstrate some of their post-war sailplanes, and visitors from other clubs have been invited, so a good field is anticipated.

We have recently been fortunate in securing the services as Vice-Presidents of Capt. C. F. Uwins, O.B.E., A.F.C., and of R. J. Ashley-Hall, Esq. Captain Uwins is, of course, one of the world's most experienced test-pilots, and Mr. Ashley-Hall is Chairman of the Bristol and Wessex Aeroplane Club and a noted amateur pilot.

Our second post-war Annual General Meeting will be held on 2nd April at the Grand Hotel, Bristol, and it is hoped that all interested in gliding and private flying generally will attend.

SCOTTISH GLIDING UNION LTD.

This month we have the sad duty of reporting the passing of one of our most enthusiastic pre-war members. Mrs. Rogerson, wife of our hard-working secretary, died on Thursday, 24th February.

In the years of 1938-39, and early 1940, the happy surroundings in the old Club-house at East Feal, were largely the contribution of Mrs. Rogerson, to the gliding cause.

Not content with the more domesticated side of the game, she also completed successfully a gliding training course in 1939, and qualified for the "A" and "B" gliding certificates.

All Club members extend their deepest sympathy to Mr. Rogerson, who has decided for health reasons to relinquish the duties he has carried out so ably, since 1937.

There has been no gliding in the past few weeks, as Balado is snowed under, and most approach roads entirely blocked. The back-room boys, however, have been creating a series of noises off, and when the weather permits flying, we hope to burst out again with new equipment, and lots of elbow grease.

A steady stream of applications for membership continues to arrive. The main difficulty with this promising sign of development is to convince prospective members that chromium - plated bar counters, although an asset to a club, and to be included in future club-room installations, are not essential flying equipment, and so, if they wish to fly, they must for the present at least, join the ever-increasing group of "gliding labourers."

CAMBRIDGE UNIVERSITY GLIDING CLUB

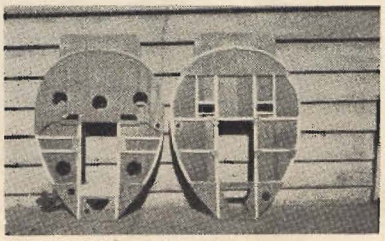
Weather prevented all flying in February and early March but the aircraft were taken out again on March 15th when the runways at Cransden Lodge Aerodrome were fit for auto-towing.

The "Cambridge" is now almost ready for flying again. New ailerons and new false spars have been fitted: little of the original 1935 aircraft now appears to be left.

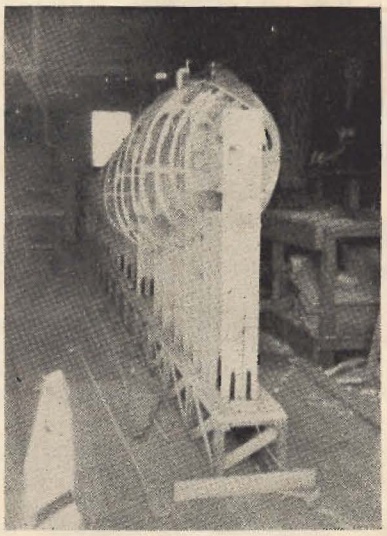
A new trailer is being built for the "Kranich" which unfortunately has not yet been repaired. The Club is holding a Soaring Camp at Great Hucklow from April 8th—17th by kind co-operation with the Derbyshire and Lancashire G.C., when everyone hopes for good weather. It is hoped the new "Kite" will arrive in time for the Camp.

The Club "Olympia" has been promised for mid-May.

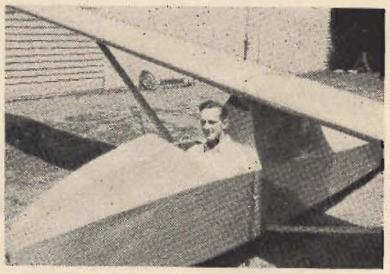
GLIDING CLUB OF VICTORIA:—



Bulkheads Hardinge-Davies' "Chilton" Olympia.

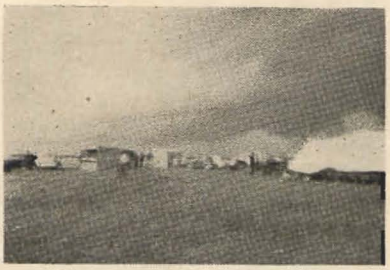


Fuselage on Assembly Jig.



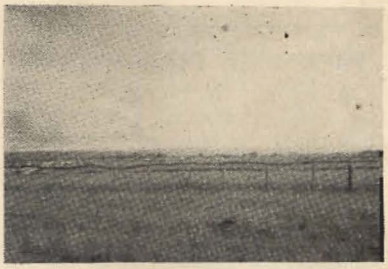
Hardinge-Davies' Grey "Grunau" at Geelong, Dec. 1945.

News from the Clubs—continued.



Western approach of storm front which washed out passenger flying after the display.

Gliding Club of Victoria



Northern arm of front.

OBITUARY

THE British Gliding Movement lost one of its pioneers when the death occurred recently of Herbert John Dunning at the age of 54.

" Bert " began gliding in 1930 and was one of the first to join the Worthing Gliding Club which operated on the Kithurst Hill site now used by the Portsmouth Gliding Club.

He never rose to any prominence as a pilot, but he was safe. He qualified for his " C " at Steep Down, Lancing, on 12th May, 1935.

It was as a constructor that he became well known, and up until the outbreak of the war, gliders and powered aircraft, of first-class workmanship, were turned out from his well-equipped workshop with amazing speed.

His generosity was well known and many pilots had their first experience of gliding in his " Grunau Baby," which he entered in the National Contest of 1936, piloted by Alan Reffel.

His last sailplane, known as the " Lancia," was an outstanding success from the first test flight, and its high performance greatly impressed all pilots who had the privilege of flying it.

" Bert " flew the " Lancia " only twice. On all other occasions he would tow it miles to the Portsmouth club's many soaring sites and was quite happy to rig it and let others fly it.

He was a quiet, simple man, who put far more into gliding than he ever took out of it, and we who are left will feel his loss keenly.

K.J.F.

CLUB PERSONALITIES—*continued from page* 11.

From conversation with him, it becomes evident that one of his major aims is the expansion of the gliding movement in this country as a whole, and his efforts in this direction are already becoming known. Having this aim, it is fortunate that the sincerity of his personality is such that his circle of friendships is exactly as wide as his travels.

THERE has been comment about the fewness of British Gliding features in Sailplane and of the preponderance of foreign pictures.

WE are doing everything possible to obtain news and ample photographs from clubs all over the country, but when these are not forthcoming we cannot do very much about it.

GLIDING organizations overseas are, in many cases, much more prompt with their news and prolific with their pictures. We would therefore stress that unless the clubs and photo-minded enthusiasts do their part, British gliding cannot receive the publicity it deserves and needs so badly.

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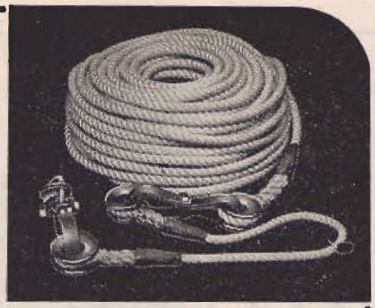
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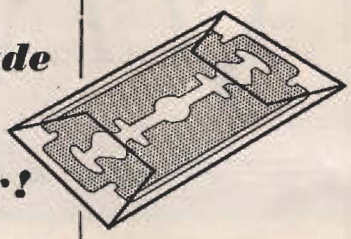
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The "Nimbus" is also a good-looking sailplane, with its clean lines, Triplex coupé and unobtrusive centre-wheel undercarriage. The air frame, too, is fully bonded to latest requirements. Launched by aero-towing or winch — ideal for instruction and aerobatics — it will be an immediate favourite at all glider and sailplane clubs.

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Wing Area	240 sq. ft.
Span	62 ft.
Overall Length	27 ft. 4 ins.
Aspect Ratio	16
Empty Weight	800 lbs.
Sea-level conditions — 2 crew, each weighing 200 lbs.	
Minimum Gliding Angle	1 in 25·8
Sinking Speed	2·3 ft. p.s. at 38 m.p.h.
Stalling Speed	35 m.p.h.
Recommended Approach Speed	42 m.p.h.
Maximum Permissible Speed	130 m.p.h.

Short* NIMBUS *sailplane

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LETTERS TO THE EDITOR

In a recent Editorial you mention that this Club has several satellite elementary training grounds in operation.

Unfortunately, owing to present conditions we have been unable to re-start the three which were working before the war; and up to now we have been able to do very little training at all. It has, however, been a matter of great concern to the Committee; and at a recent meeting a curtailed and modified training scheme for *ab-initios* and pilots with power experience was planned to start in March.

Briefly, prospective pilots would be trained on a flat aerodrome up to the "B" Certificate and circuit stage. When passed out from this school they would continue their training with winch circuits on the Long Mynd. The aerodrome is situated about 40 miles from Birmingham; and it can only be used on Saturday afternoons. For this reason, and since our instructors cannot arrive before about 2.30 o'clock, we are unable to start until the evenings become longer.

We hope to form classes of up to 12, of pilots who will undertake to spend 5 or 6 consecutive Saturdays at the school.

The success of this scheme will entirely depend upon the keenness and regular attendance of people "prepared to do almost anything to get some flying" (to quote the famous Mr. Windyhover). Unfortunately, this will rule out some others of your correspondents, because we cannot enroll them unless they can pay their entrance fee and subscription!

We plan to start on Saturday, March 1st. Pupils will be enrolled from a waiting list which is now open. If anyone reading this is interested, send a postcard stating:

1. Gliding or power-flying experience, if any.
2. If you have the use of a motor vehicle.
3. At what time on a Saturday you are free; and where you would start from. (It should be possible to pool transport.

The Secretary, Mr. F. G. BATTY, F.C.A., 2, Lombard Street West, West Bromwich, Staffs., will send further details on receipt of the above information.

In view of the tenor of your correspondence columns recently, we will inform you of the response we get, and how it works in practice.

C. J. WINGFIELD,
Chairman, Midland Gliding Club Ltd.

Apparantly Mr. Young feels very badly over my Jan letter, but if he will only read it again he will notice my comments on the Czechoslovakia visit were made only to illustrate my arguement on the general trend of articles published in the SAILPLANE.

It is evident however that Mr. Rice saw my meaning, hence his very excellent account which also appeared in the Jan issue.

If I may be permitted to comment on another subject, nothing to do with the above, but concerning the success of a school or club.

Financial support although all important is not the thing which keeps a club going but the continuing enthusism of the SO VERY FEW people who are the first to arrive on the flying field, and who, when the day's flying is finished, may just be seen in the dark putting away the machines and gear long after the crowd have departed.

G. E. NUNN.
79, Danson Lane,
Welling, Kent.

Never let it be said that the flame of interest burns low in the gliding clubs of Germany with the advent of the dark winter days.



Utersen Air Field, Hamburg.
15° below Zero.

The enclosed photograph depicts the spirit of determination which exists in 85 Wing Club at Utersen Airfield, Hamburg. The masked figure in the "Zögling" is about to do a circuit in 15 degrees below zero. Do you, Mr. Editor, think we are mad too? as do the unenlightened masses who surround us?

LOUIS LEITH
(Committee member for 85 Wing Gliding Club).

The publication in the February issue of a review of the film "Gallant Journey" and of the photograph of a "breath-taking" balloon launch vividly reminded me of the early gliding efforts of the East Grinstead Troop of Boy Scouts with whom I was Patrol Leader.

I believe the activities of these lads in the Gliding Movement might be of interest to readers of SAILPLANE, and venture, briefly, to record some of them.

In the winter of 1910-11, no member of the Troop had as yet seen an airplane, but illustrations and reports in the daily papers continually fired their enthusiasm, and they finally decided to build a glider. As Bleriot was then very much in the news they built something on the lines of his machine. The result was vaguely reminiscent of a flying rat-trap. Its principal feature were two bicycle wheels and good hefty timbers. The contraption was taken to Stone Hill and placed in position on the highest rock. Cameras were placed at suitable points, launching ropes attached, the elevator optimistically set to "rise." The launching crew did their stuff. Alas, its existence was shortlived. It took a straight header into the ground and was completely wrecked. Removal was simplified by offering it to a nearby farmer for firewood.

It wasn't long before Glider No. 2 was discussed, but it was decided first to gain some first-hand information as to details and construction. A visit was paid to the recently opened aerodrome at Shoreham, where complete freedom was allowed to inspect the aeroplanes, and first-hand information as to details and construction was gained.

The Spring of 1912 saw Glider No. 2 well in hand. This machine had a wing span of 22 feet by 5 feet rear-outriggers to tailplane and

elevator, but no rudder, as we did not anticipate lengthy flights which would necessitate turns. The weight of the machine was about 100 lbs.

Space was left in the centre of the bottom wing for the passenger or pilot. No undercarriage and wheels were fixed, the idea being for the passenger to stand in the space in the lower wing and to pick the machine up in his hands by two bars. When lifted by the passenger this raised the front of the machine about two feet off the ground. Launching ropes were attached to the tips of the wings, and four or five boys on each rope comprised the launching team.

When we were all ready the passenger shouted out, "Ready, run," and off we went, the two teams with the passenger running inside the machine.

It was anticipated that when towed like this into a fairly strong wind from the top of a hill, the glider would rise to such height as allowed by the two ropes. The towing teams would keep on the move down the hill, and finally, having lost the wind, the machine would gracefully glide to earth; the landing shock being taken up by the pilot's feet.

When in the air, and the length of glide permitting, the pilot could swing himself up and stand on the two bars by which he first lifted the wings.

The machine was ready for test flying by April 1912, but the first test was only partially successful owing to insufficient wind.

The second attempt, in May, had better results. At the top of the hill chosen for the launch, several people were required to hold the machine down, and as soon as the launching teams started off and the machine was released, it shot up into the air to a height of about 25 feet and was then towed down the hill.

Several flights were enjoyed by the various members of the party, and then a heavy landing broke a strut. We had plenty of spare parts, and while repairs were being carried out, someone was sent for "Doctor" (the Scout-Master); he arrived just as the glider was being placed in position for another flight and said he was going to have it. Towing teams got in position. "Doctor" took his place between the lifting bars, bent down, lifted up the machine and promptly found himself about 30 feet up in the air, hanging down by his arms underneath the wings. Luckily the towing team held on, and the "Doctor" was pulled down to land intact. Numerous flights were enjoyed until finally, after one exceptionally good glide, the machine was brought up to the top of the hill, dumped down and, for some reason, everyone let go of it. In an instant the wind caught it up and rolled it off across the field. Although not severe, damage was too extensive for emergency repairs. Glider No. 2 lasted through 1912, and proved a good machine for preliminary gliding.



East Grinstead's Troop of Gliding Pioneers.

A year later the boys were at work on a more ambitious machine —Glider 3, but on trial it was not a success, and it was finally dismantled.

About this time one enthusiast appeared with a pair of wings attached to a bicycle, with which he used to tear down hills. He managed to keep his neck intact, but not the bike. No records were broken.

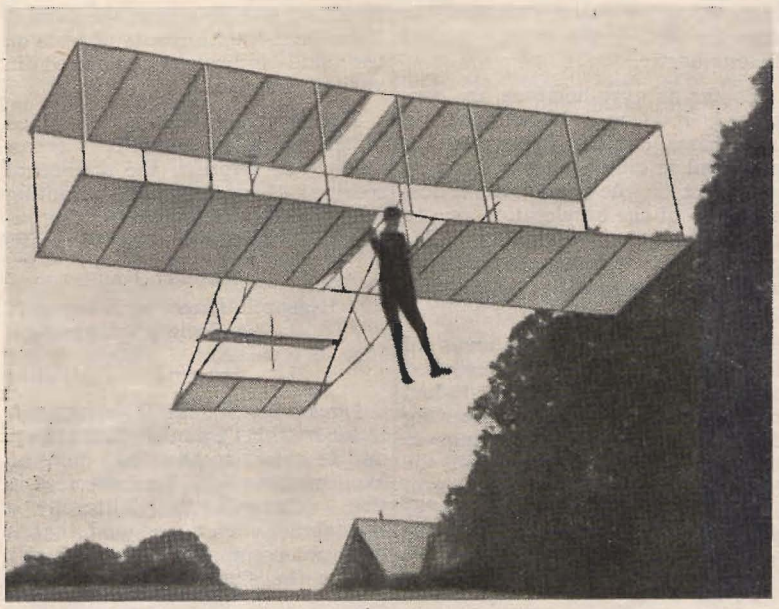
Glider 4 was begun on a very ambitious scale, and was our winter work for 1913-14. The new machine was a biplane with a wing span of 30 feet, an undercarriage with wheels, shock absorbers, proper seat and controls for the pilot, and was, in fact, practically a copy of the Wright Bros. glider.

By July 1914, this machine was ready and we were waiting for a favourable day to try it but, eventually we proceeded to camp before the trial took place. The war intervened and when we returned in 1919, Glider No. 4 had ceased to exist as a usable machine.



A Vintage Model.

Between the two wars, the boys or now young men, formed a Gliding Club, and this existed as a flourishing concern up to a year or two prior to the last war, but



Note absence of Rudder.

thinking back on those early pioneering days, the grand fun we had in constructing and flying our own machines, one cannot help thinking that something should be done to encourage youth movements generally to take up this thrilling sport.

MAJOR G. J. SMITH.

The interest which my paper, "Angle of Attack Indicator for Sailplanes," aroused by its republication in your journal should lead to more rapid progress in the application of the instrument to motorless flight. However, before its universal application there is still much to be done in studying the response of this instrument and of the pilot to its indications. What I hope to emphasize in this letter is that the problem should not reduce to futile argument over the relative merits of particular instruments. Personally, I hold no brief for any of the many flow direction indicators except that, for it to be used by the sailplanist, simplicity and ease of maintenance should enjoy weighty consideration.

In my paper I mentioned the instrument used by the Wright Brothers. While I did not analyze its behaviour, I tried to indicate by introducing the stability equation for a vane, that critical damping must be approached if the instrument is to indicate the instantaneous flight condition of the sailplane. This fact was sharply depicted to me in flying with this instrument under soaring conditions when considerable turbulence exists in the air mass. While I cannot claim long years of experience with the instrument, I can, however, state that the Soaring Society of America has done considerable research in the response of the instrument under such severe conditions as thunderstorm flying. Based on cine recordings taken during ,the above-mentioned Thunderstorm Research, we were forced to introduce damping of greater than the commonly accepted critical value. It may in fact be necessary to introduce a time delay of the order of one second in order to permit the angle of attack meter to be used as a primary flight instrument.

So much for general considerations concerning the research of the Soaring Society of America on this intrument. It is now my pleasure to acknowledge, in particular, the interest of Mr. A. York Bramble in this problem. His analysis of my paper and his description of his particular design of relative flow meter I have read with due consideration in the February 1947 number of SAILPLANE AND GLIDER. As I mentioned before, I hold no brief for any particular configuration of angle of attack or skid meters. I also emphasized the necessity of proper damping. These thoughts I wish to convey to Mr. Bramble.

More fundamental than instrument design, however, are the concepts which lead to the ultimate application of the instrument. I cannot help but to disagree strongly with Mr. Bramble's fundamental concepts on the air flight path instrumentation. First, let us consider the philosophy of including both dynamic pressure and absolute angle of attack (measured from the zero lift line of the airfoil). If it were desired to measure the total lift rather than reserve lift of the wing, thus including dynamic pressure or speed and the lift coefficient, it would be a simple matter to do so with an accelerometer reading the acceleration normal to the zero lift line of the airfoil. The expression of this function then becomes :

$$\frac{a}{g} W = L = a \frac{dC_L}{da} (\tfrac{1}{2}\rho U^2) S$$

ROYAL AERO CLUB GLIDING CERTIFICATES

"A" CERTIFICATES: 54 (6169—6223) **"B" CERTIFICATES: 16**

No.	*Name.*	*A.T.C. School or Gliding Club.*	*Date taken.*
6030	Alec Field Atkin	182 G.S., Salmesbury	25. 1.47
6121	Dolores Theresa Moggridge	Somerset Ae. Club	19. 1.47
6125	James Edward Williams	North Somerset G.C.	21. 1.47
6174	Ronald Frank Tayler	Bristol G.C.	15.12.46
6177	Guy Kestell Pridham	R.N. G.U. Ford	4. 1.47
6178	Geoffrey Sidney Haylock	Ditto	4. 1.47
6179	James Grantham	Cambridge University G.C.	23.11.46
6183	Kenneth Martin Nicol	Ditto	6.12.46
6185	Alfred John Rose	122 G.S., Harrow	27. 1.46
6193	Edward Frederick Elleman	Air Div. G.C., Barntrup	18. 8.46
6194	John Frame Chard	B.A.F.O. G.C.	30.10.46
6195	Lionel Gordon Sherriff	Ditto	18. 9.46
6196	Arthur Bruce Hammond	Ditto	5. 8.46
6201	Stanley Burt	Somerset Ae. Club	19. 1.47
6202	Charles Campbell	North Somerset G.C.	20. 1.47
6206	Sydney Henstock	47 G.S., Hucknall	22.12.46

"C" CERTIFICATES: 6

4549	Ramon Clackett	R.A.E. Tech. College G.C.	18. 7.46
4747	Arthur Sherriff	Leicester G.C.	18. 8.46
5005	Alan James Ellison	2 Gp. G.C., Oerlinghausen	15.12.46
6179	James Grantham	Cambridge University G.C.	18. 1.47
6194	John Frame Chard	B.A.F.O. G.C.	3.11.46
6196	Arthur Bruce Hammond	Ditto	22. 9.46

SILVER BADGE: 1

L. H. Huntley	No. 82 (Cert. No. 4002)	

It is apparent that the measure of " a," the acceleration normal to the zero lift line, includes the terms which Bramble apparently wished to integrate. Needless to say, the human pilot as a control responsive to accelerations is no better than mechanical control devices lacking stabilization from displacement and velocity terms.

It was a feeble effort on my part to try in non-mathematical terms to show that the airspeed of an airplane in gliding flight is the result of the past history of the glider's attitude with respect to the horizon. What I wished to bring out was that the instantaneous attitude of the sailplane with respect to its flight path is a measure of the forces tending to control the airspeed. In other words, the integration over a period of time of the attitude of the aircraft will determine the kinetic energy (the velocity) of the craft. I refer you for a more lucid treatment of this behaviour to Langewiesche's book, " Stick and Rudder."

That an airfoil stalls at a fixed angle of attack essentially independent of airspeed except for the effect of large Reynold's number changes on the stall angle of attack is well known and can be found in any standard aerodynamics textbook.

In reply to the uncertainty of definition over my use of " attitude," I wish to clarify this simply by stating that I refer to the attitude of the airplane with respect to its flight path unless otherwise modified. Taking the attitude to be an instantaneous parameter determining the flight condition, it is evident that a measure of airspeed is neither necessary nor desirable when flying by angle of attack. Airspeed would be useful only for navigation.

Mr. Bramble is perfectly correct in his analysis of the example of inverted flight which I used to illustrate the behaviour of the angle of attack meter under various attitudes. In my illustration of inverted flight, I carried the " reducto absurdum " to the absolute absurd. My humble apologies and my thanks to Mr. Bramble. Nevertheless, the fact that the angle of attack does indicate instantaneous attitude rather than the integration of part attitudes (as does the ASI) is the point I wished to emphasize.

So far as gyro-horizons are concerned, it is well known that in continuous circling flight such as practised in cloud soaring the gyro will erect on the apparent vertical made up of the acceleration due to turning and due to gravity. The gyro horizon becomes useless and, in fact, dangerous after 15 minutes of circling.

Problems of position error of flight path instruments mounted on the wing tip have been studied by Eujen and Steinhoff. The wing tip vortices affect the readings so that a skid indicator will be functionally responsive to angle of attack. The angle of attack meter so located will, in turn, be markedly influenced by roll.

So far little has been said about the skid indicator (flight path indicator in the plane of the sailplane). During the past summer I have soared with a simple skid vane consisting of a counterbalanced strip of balsa mounted on a vertical pivot directly on the nose of my " Kirby Kite." I can vouch for the excellent response of this vane when compared to the ball bank indicator. The fundamental principles of control and response are again satisfied by this instrument which indicates the displacement from symmetrical flight rather than an acceleration tending to produce that displacement which is what the ball bank does. Furthermore, I advance the following opinion to our British soaring associates, hoping it will arouse as good an argument as has the angle of attack problem: In circling flight since one wing has a slightly greater speed than the other, symmetrical flow over the fuselage is not necessarily attained when the accelerations are normal to the plane of the aircraft. That is, when the ball bank is centred. Therefore, for the drag of the sailplane to be a minimum (the flow over the fuselage to be axial) requires a flow direction indicator to be centred. I have tried to detect differences in performance flying with the ball bank (or bubble) compared to flight with the balsa vane skid indicator. Having no accurate measurements, I can only say that I feel a gain of 0.2 m/s at a 30° mark. We, in America, would appreciate hearing from British enthusiasts of tests on the skid indicator performed in various sailplanes.

I trust this exchange is received in the spirit in which it is transmitted, to improve the science of soaring—the science of extracting energy from atmospheric discontinuities with heavier-than-air craft.

AUGUST RASPET,
Research Director, Soaring Society of America.

I read Mr. P. R. Wijewardine's letter in the December SAILPLANE, and he seems to have had quite an exciting time with his loose seat in the " Rhonadler." Naturally a seat should be so designed that it does not come adrift during flight, but in the event of a very heavy landing it is better that the seat should come away from the subframe and slide forward with the pilot and thus save structural damage to both machine and pilot, also it is advisable that the seat should be easily detachable so that the controls beneath it can be inspected and oiled. It is particularly important to have a " weak link " and easily detachable seat in a training machine which is subjected to frequent heavy landings, but not quite so important in a sailplane, the pilot of which may be expected to know how to land gently. The S.T.G. seat has two *long* tongues of 3/16 inch ply which drop in behind the front member of the seat substructure. In the event of a very heavy landing the plywood tongues come adrift or bend backwards as the seat slides forwards with the pilot without damage to the substructure. For sailplanes it might be advisable to fix two short pieces of strap to the seat and press a hole in the other end of each strap over screw heads in the substructure. The Technical Committee's recommendation goes too far. But Mr. Wijewardine is quite right to draw attention to the matter, so that designers can give this point special attention in future.

ERIK T. W. ADDYMASS.

I was very interested in the article " Let's have done with the ' Dagling,' " by Wing-Commander

G. E. P. Green in the February issue of the SAILPLANE, and would like to offer a few comments which, if you consider sufficiently interesting, please publish.

During the past year, while I was concerned with A.T.C. gliding, I gave some thought to the question of *ab-initio* training partly for professional reasons and partly to see if I could help civilian clubs by suggesting some means whereby such training could be undertaken economically and regardless of the site available. First I will deal with sites.

Despite the well-known lack of suitable hill soaring sites in this country and, with one or two exceptions, their complete inaccessability (shades of the Mynd !) which make a use of a car imperative so making gliding a rich man's sport in these days of high prices, there is no lack of suitable training sites.

I think it is more or less universally agreed now that the best site for elementary training purposes is a flat aerodrome. This view was adequately proven, if it needed it, last summer when S./Ldr. J. C. C. Taylor ran an A.T.C. gliding instructor's course at Dunstable. All had been trained on flat sites and, after a few days' further practice at Eaton Bray, a flat site, all easily qualified for the R.A.C. " C " certificate at the first attempt on the hill when the correct wind did at last arrive. This, I suggest, points to the fact that *ab-initio* training need not, and indeed, is better not carried out on the soaring site. The reasons are many :—

(1) Distance from centres of population to most soaring sites makes a " week-end " necessary whereas any handy field (the local football pitch or even public parks) would enable a lot of donkey work to be done on week-day evenings in the summer, and incidentally probably attract many new customers.

(2) Soaring sites are usually very restricted as regards space and accommodation.

(3) Training and soaring don't mix. We proved that at Salzgitter on numerous occasions.

And so on.

As regards equipment and methods, I do not agree with the view that the present Club training methods to-day " are right where they were ten years ago," and, therefore, the " Dagling " and all primaries should be abolished in favour of the A.T.C. method of training. The A.T.C. decision to use only one type of glider was influenced more by the saving on initial expenditure rather than optimum training methods. Moreover, it is far from economical in practice, the glider damage per launch rate being sufficiently high to put the average civilian club on the financial rocks in a very short space of time. There is, however, a way in which I believe this high rate can be reduced and the fiendish ground slide elimitated, but there is still a lot of development and experimental work to be done before any facts can be established and the need for a primary reduced.

One of the main drawbacks to the present gliding movement in this country is, the lack of customers, the present practising population being about 3,000 and the need for more support if it is to survive is very apparent. I know you are an exponent of more financial aid before teeming thousands of enthusiasts can satisfy their burning desire to become airborne in a glider. I am afraid that here I must disagree with you, in part at any rate. If there were these enthusiasts then I am certain the necessary money would soon be forthcoming, not from Treasury sources but by private subscription. After all, before we had cinemas there was little or no demand for them, and it was not until Hollywood started thrusting them in front of us that the demand was created. A similar thing is happening in Germany now with gliding by the R.A.F. It is in this role that the " Dagling " has a great use. I think that it is more that the present " Dagling " is right where it was ten years ago and, as Wing-Commander Green points out, there is much room for improvement, notably in its shock-absorbing properties and handling qualities ; but improvements msut be made without making it an expensive gadget. When you consider that the " S.G.38 " was built in Germany, admittedly in very large quantities (Phillip Wills suggests 30,000, although I think that figure rather high) for as little as the equivalent of £10, half-a-dozen at even three times that price would prove a very profitable investment for any British club considering undertaking *ab-initio* instruction, despite the increase in number of launches required to attain proficiency. After all, even the R.A.F. trains its pilots on such aircraft as the " Tiger Moth " (not " Sopwith Camels ") before they fly " Hawards " or " Masters," and I compare " Daglings " to " Sopwith Camels." I think there is little or no doubt that by far the best method of elementary training is on high-performance two-seater gliders such as the " Kranich," but so far there is no suitable two-seater yet built in this country that is of sufficiently high-performance to allow a " useful " time to be spent airborne after release on a winch circuit even on a stable windless day, that can be operated within the financial limits of British Clubs (and the boundaries of most of their landing areas !), and is sufficiently simple from the instructor point of view to allow instruction to be given by comparatively inexperienced (the " TX 8/45 " was produced for the A.T.C. with that end in view).

The " Kranich," by the way, is definitely not " easy " from the rear, or instructor's seat, especially climbing on the winch, hill soaring and approaching to land. It will be interesting to see how Short's " Nimbus " fares in this respect, although I fear its price will play havoc with insurance premiums if used for elementary training.

So it appears that single-seater training on gliders of the "Dagling " type launched by muscle power and a " bunje " is still the most economical method of training, but what we do need is a greatly improved type and many more of them. In fact, so many that anyone with the inclination, a few pounds to spare and a tennis court can " have a crack " at this gliding business, and acquire the necessary taste before proceeding to the club soaring sites.

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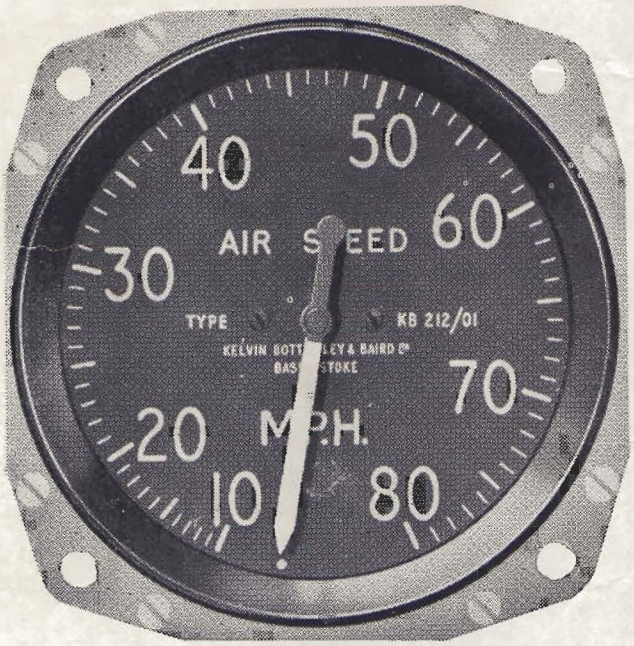
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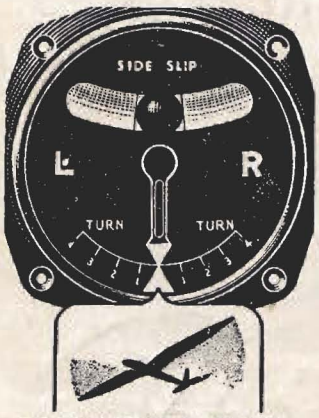
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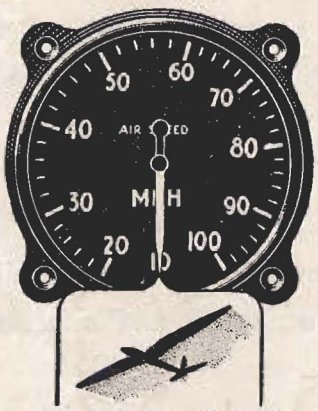
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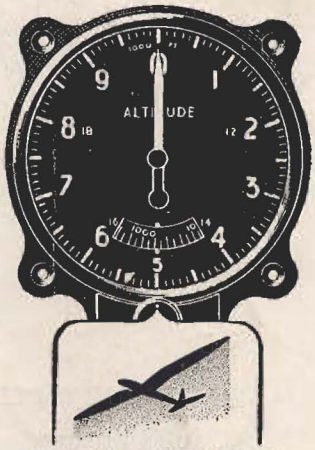
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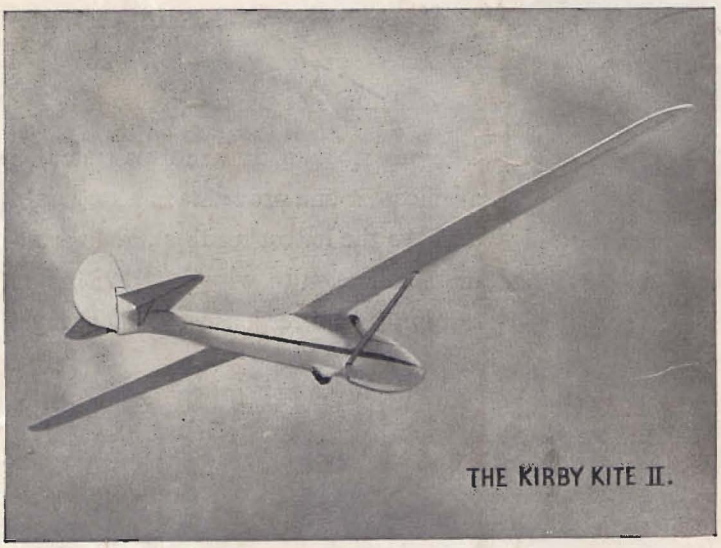


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