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THE SAILPLANE AND GLIDER

Price 3d.

ACHIEVEMENT.

On Feb. 21, a Saturday, Messrs. D. C. Smith and T. Graham Humby, who are members of the London Gliding Club, made flights of 7 minutes and 8½ minutes' duration respectively, thus qualifying for their "C" Certificates, as they landed above their start-point. Later, when in our reminiscent dotage, some, or one, of us writes a history of the British Gliding Movement, this Saturday will assume special significance. After nearly a year of hard work, bitter disappointments, and mistakes due to ignorance, two persons have been trained by a collection of amateurs to perform the most difficult of all kinds of aerial navigation, motorless flight,—and this is the point of fundamental importance, these two sailflyers have received no tuition on power craft. All their tuition has been obtained on motorless aircraft and their instruction from other members of the Club, who may or may not be power-pilots, but all of whom are self-trained nor have they obtained their "C" Certificates in Germany.

The ambitions of a year ago have been justified, and we can forge even more strongly ahead now that one Club has proved our contentions that by Gliding, and Gliding alone, with no subsidy, it is economically possible to train our young men as pilots of no mean order. Well done London!

Sailplane Technology.

This number of The Sailplane sees the beginning of a new feature: even if this feature really started with the detailed report of Herr Lippisch's lecture. This is a section which will appear in the last issue of every month and will be devoted to the Technology of Sailplaning. This rather ferocious-looking word means, according to the dictionary, an explanation of terms peculiar to an art. Thus under this heading we shall publish discussions of technical interest in the design, construction and piloting of sailplanes as well as technical information related to the allied science of Meteorology.

FEB. 23, 1930.—The first trials of the Lowe-Wylde glider built by the Kent Club in five weeks.
—(Courtesy "Kent Messenger.")

This week we publish some observations on Herr Lippisch's lecture by Mr. L. C. Williams, who had the advantage of discussing with Herr Lippisch certain aspects which were not explained in the lecture. Among these observations will be discovered a formula for calculating the thickness of plywood required for the torsion-resisting leading-edge of the wing of a sailplane. It is this kind of information that we seek to collect and make available for designers in our columns.

"Kentigern," an English soaring pilot, contributes for the same section a descriptive article in which he explains how the Speed Diagram helps the pilot of a sailplane to get the most out of his craft.

THE H.A.C. COMPETITION AT WEETON.

Four Clubs took part in the H.A.C. Competitions at Weeton on Feb. 22. This competition was organised by the Harrogate Aircraft Club, who were ably represented by Mr. H. S. Crabtree and Mr. N. C. Hodgson. The H.A.C. presented a silver Cup, which is to be competed for monthly and is to be awarded to the Club whose team of six flies the furthest aggregate distance. The Cup was won on this, the first, competition by the Bradford team, with an aggregate of 1,449 yards. The longest flight was made by Mr. J. Allen, of the Ilkley Club, with a flight of 334 yards. It should be noted that the H.A.C. only put a team of five on the field.

Mr. Waplington, of the B.G.A., was present, as well as Messrs. Pennington, Love and Worrall, of N.F.S., together with Mr. Lowe-Wylde, all of whom flew over from Sherburn-in-Elmet. At the end of the day the Cup was presented by Mrs. Addyman to Mr. Jones, who is the very capable Instructor of the Bradford Club.

Messrs. Crabtree and Addyman will welcome any constructive criticism from members of the competing Clubs, who should address their remarks to either of the above two gentlemen. We should also be prepared to give a certain amount of space to discussion in The Sailplane.

Awarding a prize for aggregate distance seems an excellent idea, as it combines the maximum time in the air with the necessity of flying the machine at its best angle. The Sailplane has consistently urged on the B.G.A. the folly of staging duration attempts on Zoglings during inter-Club competitions. But a distance flight is another matter. We append herewith some criticisms of the meeting from Mr. Crabtree, who was one of the organisers:—

Mr. Crabtree's Views on Weeton.

I was very favourably impressed with the general flying during the Harrogate Aircraft Club's Competition at Weeton. The ground as a gliding ground is far from ideal. The slope is steep and flattens out suddenly. The drop from the top of the hill to the level ground is about 80 feet. If the ground was an even slope and twice as long the flying would have been even better and certain power pilots would have been able to show themselves capable of taking their "B" tickets.

Many pilots considered that the only way to make certain of long distances was to gain as much height as possible by pulling the stick straight back as soon as the word "release" was given. But the converse is true, for the only way to glide for maximum distance is to go off the hill in the cleanest possible way, thereby keeping the speed of the machine up and being able, with this speed, to hold the machine in her best gliding angle. It will be found that after a certain amount of practice a pilot can definitely out-time and out-distance such people who like to do the spectacular zoom, and will eventually beat these people in every way when he begins soaring.

This fact was definitely proved by the flight of Mr. J. Allen. He held the machine to the earth while the rope was pulling him off and kept the machine in its best gliding angle during the whole flight, so that with no spectacular zoom he achieved the best flight of the day of 334 yards. Besides this, he flew for just over half a minute.

There is no doubt that the zoom start is spectacular, but it is also known to be extremely dangerous and ought to be stamped out, before it causes an accident, by every Club instructor who sees it. Naturally, most aeroplane pilots fall, unaware of the danger, into this bad habit. I well remember a certain Spanish aeroplane pilot at the Wasserkuppe who, on his first trial glide in an intermediate machine, similarly pulled the machine off. When asked for an explanation of this gross crime, he said he had been accustomed to fly a 3-engined plane and expected the sailplane to handle similarly!

In the early afternoon at Weeton the wind was rather gusty. This appeared to give some pilots a little too much to think about at a time. Most of these people were *ab initios*, who obviously needed more training from an easier slope.

The competition showed the local clubs where they stood with each other. The Bradford Club proved themselves as a team to be the most efficient. They have undoubtedly been very efficiently trained by Capt. Jones, and if they attempt to improve their method of take-off and practice getting as much distance as possible, there is no reason why they should not hold on to the Harrogate Cup indefinitely.

The Harrogate Club had bad luck in not being able to procure their best men for their team. They are also rather inclined to want "spectacle" rather than good gliding. Mr. Gosling, the team's captain, however, is adverse to this, and naturally headed their list.

I expected better flying from the Leeds Club, although late in the day they secured some "A" licences.

Local gliding pilots have yet to learn that their training in preliminary machines is solely to make them efficient sailplane pilots. Zooming up into the air and diving down again is all very well, but it gets one nowhere in the end, except possibly into the grave.

H. S. C.

THE FIRST BRITISH SAILPLANE?

We hear that the new Dagnall high-efficiency machine has already passed its first trials and actually soared for some time, although the site was chosen more for convenience than as being in good soaring country. The tests were made to assure the designer of the airworthiness of his designs. We gather that feelings are most sanguine about this machine and that the week-end Mar. 7-8 is going to see some developments in this direction.

AN ORGANISED TRIP TO THE RHON COMPETITIONS.

One of the Gliding Clubs has informed The Sailplane that it has been able to make extremely reasonable arrangements for a trip to this year's Rhön Competitions. The Club can quote an inclusive figure, which covers all costs of transport and board at the best hotel on the Wasserkuppe. This figure makes the trip possible for the poorest of us.

Now the trip was organised for the benefit of Club members, but the response has been so excellent that the organisers think that other persons interested in the movement might like to take advantage of these facilities, and they therefore propose to organise, if enough support is forthcoming, a trip for non-members. Inquiries should be marked "Tour," and addressed to The Sailplane, 175, Piccadilly, W.1.

A KENTISH ANNIVERSARY.

The Kent Gliding Club, which claims to be the oldest in the country by a few days, held its annual dinner on Feb. 23 at the Royal Star Hotel, Maidstone. This was the anniversary of the first flight made in this country on a Zogling-type glider. The machine was built in about five weeks by members of the Club to the designs and under the supervision of Mr. C. H. Lowe-Wylde. Mr. Lowe-Wylde was also the pilot. This machine is still in service with the Kent Club and has done them yeoman service.

About fifty members and friends attended the dinner. Colonel The Master of Sempill was in the Chair, the three Vice-Presidents of the Club, Lieut.-Col. J. T. C. Moore-Brabazon, General R. H. Morgan and Colonel H. R. Robinson, were there as well. Among the guests were Mr. Eric Gordon England, Chairman of *The British Gliding Association;* Sir Charles Igglesden, the Proprietor of the *Kentish Express;* Mr. R. P. Boorman, of the *Kent Messenger*, and Mr. F. R. Connor, of the *South-Eastern Gazette*.

The Editor of The Sailplane was unable to go, much to his regret, but was able to arrange for Mr. Sebert Humphries to go for him. Mr. Humphries' somewhat melancholy reflections are not to be taken as aspersions on the excellence of the dinner, nor of the after-effects of its conviviality, even if his remarks were written at 2 a.m. the following morning. They must be taken as a stricture on the general trend of many Clubs within the Movement, and have been made in the hope that they will promote much probing into the body politic.

Mr. Humphries after explaining how the initial shove down The Sailplane office staircase kept him going until he reached Charing Cross begins: So I dined with the Kent Gliding Club, the oldest in the Country, which built the first British Glider of the new era and has ever since been close handy to the British Aircraft Company. If therefore this Club cannot prosper, no other Club can.

And here I am with a nasty sinking feeling. What did we celebrate at the dinner? Was it a funeral? Why did a speaker bring in a funny story about a little boy in a cemetery? Is the 1930 type of Gliding Club going rapidly into the grave? Why did the Club Chairman refer to the need for great (or was it greater?) keenness in the members? Have things come unstuck? Did anybody refer to soaring already accomplished by the Club? Was there any mention of *Prafflings*, or *Falkes*, or *Wiens* or *Kobahns*, or *Austrias*? Or of British versions thereof?

Frankly one was forcibly struck by the appalling gap between the state of gliding as it is and as it ought to be, and by the equally huge gap between the main body of Club members and the inhabitants of the top table. They represented the state of "ought-to-be." We the plain "is" and between a great gulf fixed. How can we bridge it? Not by Zogling on Sunday afternoons (when fine) I swear. By auto-towing, well perhaps! By shear grim fixity of purpose backed with money and whole-heartedness, certainly. Are such things forthcoming?

At this dinner we had the phenomenon that is becoming far too common. The voices from the top table calling on the disciples to follow the lead, and the disciples too weak and faltering to do anything about it. The seers and prophets leap to their feet and describe a promised land of soaring machines which never come down, which wipe the eye of the Germans, which tell meteorologists all that has never been known about aerial upheavals. But we, the common crowd, *don't know how to get there.* We have Little money, little time and less skill. What can we do?

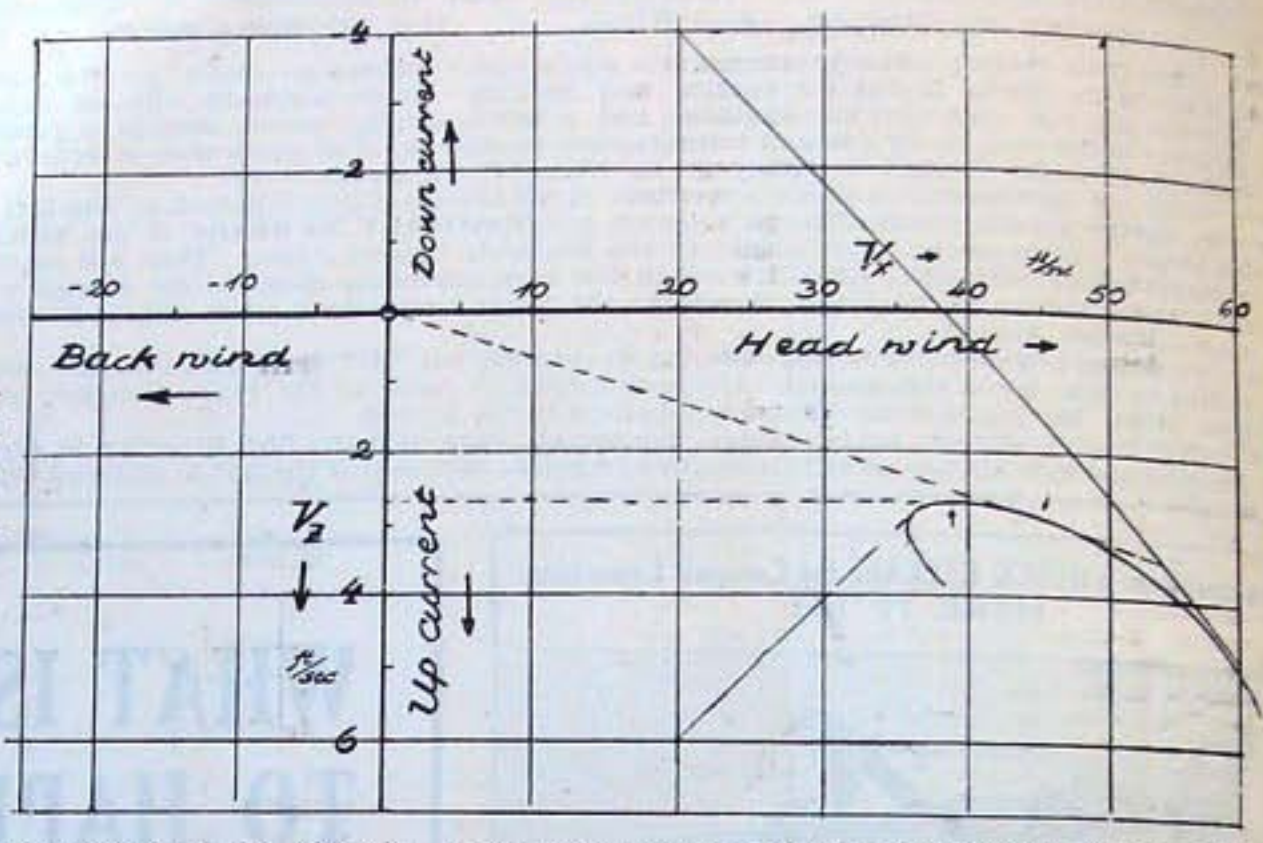
Gliding is not an amiable and inexpensive hobby. It is a dead-serious art calling for real teachers and a real substantial backing of hard cash and of what C. G. G. terms "*interfinal fortitude.*"

Lowe be it spoke: I have a Wylde idea. What about a spot of Auto-Towing administered by such a good hard-boiled concern as an established flying-school or the N.F.S.? This to be followed by the owner-piloting of real sailplanes. What about putting gliding exactly on all fours with power-flying, car-driving or even of horse-riding?—S. H.

SAILPLANE TECHNOLOGY

THE SPEED DIAGRAM.

BY "KENTIGERN."



The so-called "Speed Diagram" may appear confusing at first, owing to the naming of the axes. For a first inspection, therefore, consider the words "Head Wind" replaced by "Forward Speed" Vx, and "Up Current" by "Sinking Speed" Vz. The scale of the Vx axis is one-fifth of the vertical scale, so that later, when actual angles are wanted, it will be necessary to redraw the diagram with both axes to the same scale. At the small angles being considered, horizontal forward speed is nearly the path speed of the aircraft, and the difference may be neglected.

The diagram refers to one particular sailplane. In this case it shows a minimum sinking speed of about 2.7 ft./secs. at forward speeds between 38 and 42 ft./secs.; it shows signs of stalling at 38 ft./secs. and stalls completely at 36 ft./secs.; and with increase of forward speed, the sinking speed progressively increases. At 38 ft./secs. forward speed, the sinking speed may be either 2.7 ft./secs. or 3.8 ft./secs. This is because the lift coefficient of the wing decreases at an angle beyond the stalling angle and the drag increases so that both the sinking speed (considerably) and the forward speed (slightly) are increased. (It need hardly be said that attempts in light wind conditions to soar at the higher sinking speed are foredoomed to failure; apart from the dangerous decrease of the effectiveness of the controls.)

To return now to the original naming of the axes. We may first consider the dotted line drawn from the origin where Vx=0 and Vz=0, to touch the curve as a tangent at about 2.9 ft./secs. and 44 ft./secs. Working from the origin (which represents still air) we can see that the aircraft sinks 2.9 ft. and goes forward 44 ft. in one second, which is a gliding "angle" of about 1 in 15. Now draw a line from the point -2 on the Vz axis to the same point on the curve (thus adding 2 ft./secs. to the original sinking speed) and we get a gliding angle of 4.9 in 44, or 1 in 9, relative to the ground, but it is clear from the diagram that by drawing the new line as a tangent to the curve (which it touches where Vx= 50 ft./secs), the gliding angle is improved to 5.1 in 50, i.e., 1 in 9¾.

We may sum this up by saying that the angle made by a line (drawn in this way) with the Vx axis is the gliding angle; which we normally refer to by its tangent 1 in 10, for instance. If the conditions of any area are known (e.g. 2 ft./sec. down current) a tangent may be drawn to the curve, and the point on the curve where it touches will be the speed (read on the Vx axis) at which the craft should be flown for the best possible gliding angle relative to the earth.

An interesting sidelight on the severity of the adverse areas to be traversed on a distance flight is that the wing section Göttingen 652 was not considered suitable for the *Austria* because its efficiency falls off above (if memory serves) 80 ft./secs., at which pace high efficiency was still required. From the diagram one can see that the curve should remain near to the "gliding angle in still air" dotted line as long as possible to give a large efficient speed range for cross-country work.

A line drawn from 6 on the Vz axis as tangent to the curve touches it near stalling speed. This, as before, gives the best gliding angle (here, the steepest climb), but if the line is drawn to cut the curve where Vz=41 the climbing angle is slightly worse, but the rising speed is better.

Without any experience of using a diagram like this, one might make up the following tentative set of rules for the pilot of the aircraft represented:—

Requirement.	*Speed to Fly.*	*Gliding Angle Relative to earth.*
To gain height in an up current.	Lowest sinking speed =40-41 ft/secs	Unimportant
Distance in still air.	Best gliding speed = 44 ft/secs.	1 : 15
Distance in tail wind.	42 ft/secs, magnitude of tail wind unimportant owing to flatness of curve.	Tail wind 5ft/secs 1 : 17 Tail wind 10 ft/secs 1 : 18½ Tail wind 20 ft/secs 1 : 22
Distance in head wind or down current.	Vz= -2 or Vx=18 fly at 50 ft/secs Vz= -4 or Vx=28 fly at 54 ft/secs (interpolate between these values.)	1 : 9 1 : 7

I do not think it will be difficult for pilots to carry their diagrams and use them when necessary.

SOME OBSERVATIONS ON HERR LIPPISCH'S LECTURE

By L. C. WILLIAMS.

These notes must be regarded as supplementary to Herr Lippisch's lecture which was reported in THE SAILPLANE for Feb. 6 and 13. Anyone who intends to design a sailplane should make a point of reading up the lecture whether he attended it or not. The formulæ for estimating the weight have been published in THE SAILPLANE in their revised form as authorised by Herr Lippisch.

The tangent of the gliding angle of a sailplane is given by the total lift over the total drag and to improve performance lift must be a maximum with drag as a minimum. Some performance has to be sacrificed to ensure manœuvrability. Some lift may be obtained from the fuselage if the latter is given a good shape,—a Göttingen wing section could be used. Obviously, the fuselage must be designed to have its thickest section at the pilot. The cross-sectional or frontal area must be the smallest obtainable.

From the formula for sinking speed on page 181 of THE SAILPLANE one can see that the sinking speed varies as the square root of the wing loading. Now the main factor in the total weight is the span, as may be seen from the formulæ on page 184, Col. 1. At high values of span the machine develops a high sinking speed. By reducing the span and keeping the wing area constant the weight comes down more rapidly than the span. The wing loading and the sinking speed squared are reduced as the weight

Therefore, for a low sinking speed too high an aspect ratio is not required.

[*On the other hand, aspect ratio affects the gliding angle, and a high value here is a necessity for cross-country journeys.*—Ed.]

A point upon which emphasis should be laid is the difference between a sailplane and an aeroplane in the sense that the wing of a sailplane takes the place of an engine in an aeroplane. In designing an aeroplane one considers the engine and fuselage as the main structure; the wing is a necessary evil to hold it up. In designing a sailplane the wing should be considered the most important and the fuselage as something to enclose the pilot.

The wing must be made stiff enough to resist vertical deflection. Beyond a certain value of semi-span to maximum thickness at the root-chord the wing deflects so much as to turn the sailplane in flight into a different machine from that designed, quite apart from loosening the internal fittings.

The German practice is to take a value of semi-span to maximum thickness of root-chord of 32 to 35. A value of, say, 50, would possibly give a deflection of 19 in. either way. With suitable tapering and choice of a wing section at the root this value can be obtained. A camber at the root of 17 per cent. and 10 or 12 at the tip is about right.

The drag system of a sailplane is worth considering. For the sailplane to move forward in steady flight it must be descending through the air. That is, the flight path is inclined downward. The main part of the weight of the sailplane is in the wings.

Let W_w = Antidrag component of wing weight.
W_b = Antidrag component of body weight (including pilot, equipment and empennage).
D_w = Air drag in wing.
D_b = Air body drag.

In steady flight positive direction is taken as antidrag.

Total antidrag component of weight = total airdrag, i.e.:

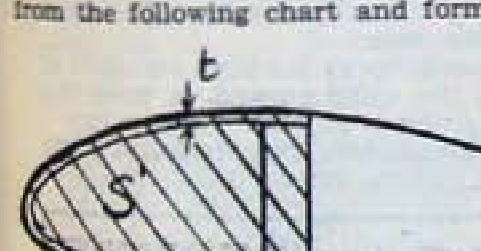
$$W_w + W_b = -(D_w + D_b)$$

i.e. $W_w + D_w = -(W_b + D_b)$

That is at any speed the antidrag in the wing is equal to the difference between the body drag and the forward component of the body weight. The maximum value of antidrag will occur at the C.P. Forward condition. From there to terminal velocity the antidrag load will become smaller until at a terminal velocity the antidrag will be very small. This means that drag bracing in a sailplane is unnecessary. The antidrag is taken in bending on the leading edge.

Torsion is also taken in the leading edge. This idea was first used in the *Vampyr*, and the plywood torsion-resisting nose has been popular ever since. It is designed for maximum torsional load at the angle of no lift.

The thickness of the plywood required can be obtained from the following chart and formula:—



$$Tq = \frac{Mkl = 0}{2S't}$$

Where Tq= 1420 lbs/sq.in.
S'= Cross sectional area of nosepiece
t= Thickness of plywood
(Mkl=0)= Maximum torsion

For the purposes of this calculation the plywood must be used with the run of the grain set at 45 deg. to the line of flight, as researches have shown this to be by far the strongest method of application.

The fuselage is designed to hold the pilot and to transmit bending as well as torsion from the empennage. The three longeron type is most popular, although a four longeron type completely braced is very little heavier.

The best section for a torsion-carrying system is one with the best possible ratio of cross-sectional area to circumference. The ideal is a circle, but an ellipse is strong enough and fits the three longeron type better.

The main thing in wing to fuselage attachment is to give a good flow of air over and under the wing section close to the fuselage. Sharp corners should be avoided. This was shown clearly by the experience with the *Fafnir* shoulder joint when interrupted air-flow played havoc with the streamlines and rendered the tail unit ineffective through "buffeting."

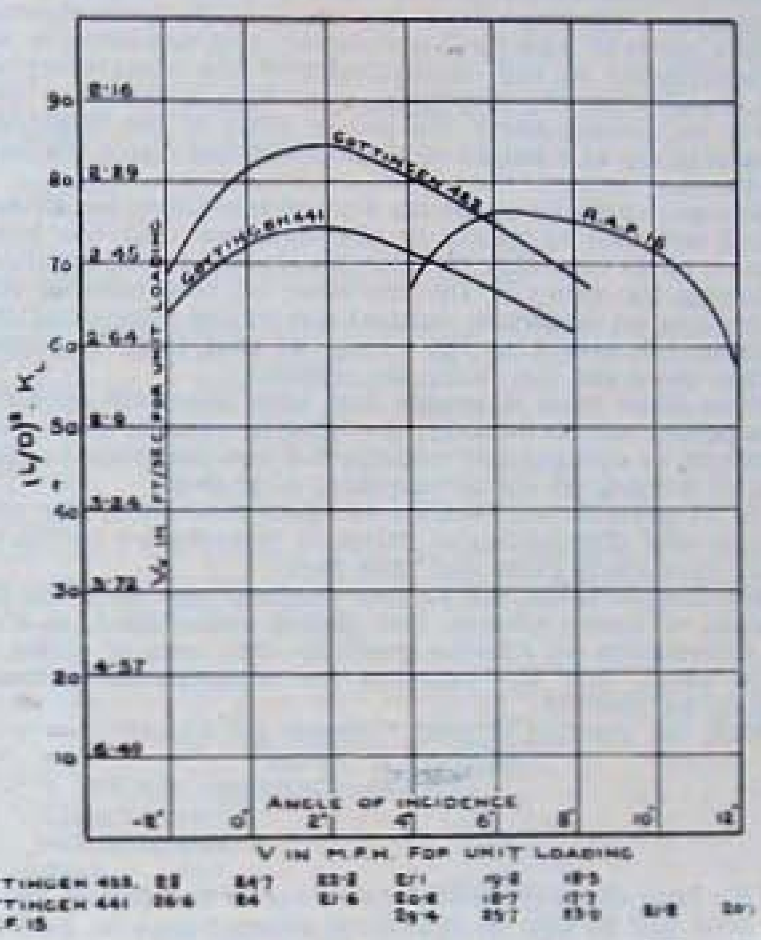
Although there are three main methods of attachment of wing to fuselage [*always excepting the parasol method used in the Brant "Scud"*—Ed.] the best is when the wing merges into the top of the fuselage. For very large spans it is necessary to mount the wing on a neck to assure adequate ground clearance. A low wing cannot be used without an undercarriage which adds enormously to the drag.

A sprung skid is essential, as although a factor of six is normally used, a factor of eight has to be used if the undercarriage is made rigid.

In a sailplane all the loads are so small that any great movement of the pilot will cause a considerable change in the position of the C.G. Therefore the controls should be geared and that of the elevator should not be less than 3:1.

A good finish on the outer surface of the machine will definitely improve the performance. The leading edge of the wing is most important and a stiff construction, together with a good finish, are especially necessary for high efficiency.

THE COMPARISON OF GLIDER WINGS.



The criterion of efficiency of wing sections for gliders is that the rate of descent shall be as low as possible, which means that the gliding speed and the gliding angle shall both be small, or in other words, the coefficient of lift and the L/D ratio shall both be large. For every aerofoil section there will be some angle of incidence for which K_L and L/D are together a maximum and from the aerodynamic viewpoint that section which gives the highest maximum value will be the best for use as a glider wing.

If it be assumed that the rate of vertical descent, $V_v = V\frac{K_D}{K_L}$ (where V is the air speed) which is nearly exact for the small angles within the flight range, then

$$V_v = \sqrt{\frac{W}{\frac{\rho}{g}A}} \; \frac{1}{\frac{K_L^{3/2}}{K_D}}$$

which can be arranged conveniently as

$$V_v = \frac{1}{\sqrt{(L/D)^2 K_L}} \sqrt{\frac{W}{A}} \sqrt{\frac{1}{\frac{\rho}{g}}}$$

from which it will be seen that V_v is a minimum when $(L/D)^2K_L$ is a maximum.

The graph shows curves, on a base of angle of incidence, for three aerofoils, of $(L/D)^2K_L$ and $\frac{1}{\sqrt{(L/D)^2K_L}} \; \frac{1}{\sqrt{.00237}}$ which last expression gives the vertical velocity in feet per second for unit wing loading, also on the abcissa are given the corresponding gliding speeds, in miles per hour for unit wing loading, of the three sections.

It will be seen that of the three sections treated, Gottingen 422 is the best, while although RAF 15 gives the next best value of $(L/D)^2K_L$ its rate of change of V_v with angle of incidence is comparatively high and the gliding speeds are also high, therefore Gottingen 441 would appear to be the next best section; it also has the advantage in being a much thicker section.—Norman H. Warren.

CORRESPONDENCE.

An Invitation to Austria.

Next May the Erste Alpine Segelfluggruppe Lermoos (First Alpine Gliding Association of Lermoos, Tyrol), will perform, for the first time in Austria, an *International Gliding Competition*, at Lermoos, and Innsbruck (the capital of the federal land Tyrol) in co-operation with the municipality of Innsbruck, and with the federal travelling board of Tyrol.

The surroundings of Lermoos (region of the Zugspitze-mountain) proved to be especially suitable for gliding. At the first performance of motorless flights here on the 18th 19th, and 20th October, 1930, a height of 1,507 feet *above the starting point* was obtained *at absolute calm*, even with a glider of middling efficiency (we refer the report of the Berliner Zeitung am Mittag (B.Z.) of the 6-11-30).

From observations and measurements made with pilot-balloons, there were found to exist thermic currents of air vertically ascending above the basin of Lermoos-Ehrwald with a speed of 2-2.8 yards per second, and, according to the measurements of the meteorologist of the observatory on the summit of the Zugspitze, even with a speed of 3-3.2 yards per second above the glacier Platt of the Zugspitze, that is to say at a height of about 10,000 feet above the level of the sea.

The meteorologist of the Air Port of Innsbruck, Dr. Ebster, found out, also by means of pilot-balloons, that the wind, when it blows from east (that occurs always at good weather), following the valley of the Inn river, on both sides of this valley has an important vertical component because of the considerable ascent of the valley, so that large motorless flights along the Inn-valley are possible.

From these facts it results that here there are excellent possibilities of performing new gliding records never yet obtained, of opening new regions and new problems to gliding, of working on the development of gliding.

As, at present, negotiations are held concerning the conditions and distribution of prizes, it is necessary for us to know how many clubs will take part.

We, therefore, ask the English Gliding, who have the intention of taking part in this gliding competition, to give us information as soon as possible. The sum of prizes is is so great, that the expenses are compensated as completely as possible.

With our greeting of pilot, "Immer gut Land!"

(Signed) E. Banzo
(Technical Manager, E.A.S.),
Lermoos-Tyrol,
Zugspitzgebiet,
Austria.

[We hope that representatives of one or two British Clubs at least will be able to visit these Competitions in Austria. Perhaps they could extend their Easter holidays for the purpose. We understand there are to be prizes for sailplanes, intermediate and primary machines as well as power gliders. —Ed.]

A New "Soaring" Club.

Sir,—In the advertisement of the Southern Gliders Social Club appearing in another column, an invitation is extended to all those practising soaring (and finding difficulty in doing "C" Test work on their own grounds), to make use of the magnificent ground now at our disposal. This ground lies between Lewes and Rottingdean, and includes the Newmarket Barn about which statements have recently been made, both verbally and in the Press, which appear to need some correction, in justification of, at least, the Occupier.

Early last Autumn the Tenant Farmer of the ground (now our Vice-President), voluntarily offered to a friend of his (now our Flight Secretary) private gliding rights over his entire estate. Some time later he was approached by certain persons whom he believed to have come from, and with the consent of, his friend above-mentioned; and he accordingly gave permission for the temporary use of Newmarket Barn, but subsequently withdrew it on learning otherwise.

The percentage of truth, therefore, in any statement to the effect that the ground had been secured by the efforts of any other person or club may be gauged from the fact that in reply to an inquiry, recently received from a well-known member of the Council of the B.G.A., the Tenant Farmer wrote such as confirms what has been said above, adding that all arrangements for the use of the ground must be made through our present Flight Secretary, and that he has never made any similar or definite arrangement with any other Club.

Our Flight Secretary, whose interest in furthering the Gliding Movement in this country dates from the Itford Meeting of 1922, believes that he can best serve such interests by extending his privileges in the use of the ground to the B.G.A. for inter-Club meetings (as he has done); and to such B.G.A. affiliated clubs as are unable to do much soaring on their own grounds

Application for the necessary permits should be made to him at the New Yorke Hotel, Bedford Square, Brighton; but it should be noted that Affiliated Members of our Club are Honorary Members of our Flying Branch, and, as such, require no permits.

(Signed) F. White
(General Secretary, S.G.S.C.),
(44a, Norton Road, Hove).

He Wants to Soar.

Sir,—I am in possession of three things: a fortnight's holiday; a B Certificate; and an intense desire to get in some concentrated soaring practice. I am willing to go anywhere, within reason, in Europe, and, of course, to pay for being allowed to practise. My holiday comes, unfortunately, in the middle of March—too early for any of the Rossitten Courses. Is there any hope of my getting what I am looking for? And, if so, would you please earn my sincerest gratitude by putting me into touch with it?

(Signed) Glissandum.

THE FIRST GLIDING YEAR BOOK.

One of the most interesting features of the Year Book "Gliding," which the Dorset Club are bringing out and which will be published within a few days, is a double-page chart on which are analysed particulars of fifty clubs. The remaining 30 or so did not reply to the questionnaire which was broadcast. The analyses make interesting reading, though it must be remembered, especially with regard to figures for "A," "B," and "C" Certificates, that Clubs are adding to their laurels all the time.

If the rest of the book comes up to the high standard of the chart and has entailed the same amount of work the Dorset Club are to be congratulated on a herculean effort.

The Year Book can be ordered from The Aeroplane Book Department, Cannon House, Pilgrim Street, E.C.4.

NEWS FROM THE CLUBS.

WHERE GLIDING CAN BE SEEN.

Beds.—The Bedford Gliding and Flying Club. Week-ends at Wilstead Hill, 5 miles from Bedford on Bedford—Luton road.
—The London Gliding Club. Meeting place, Turveys Farm, near Totternhoe, on Saturdays and Sundays.

Dorset.—See under Somerset.

Edinburgh.—The Edinburgh Gliding Club. Sundays, at West Craigs Farm, between Corstorphine and Turnhouse Aerodrome.

Glam.—Merthyr and District Gliding Club. Sundays, 10 a.m. to sunset. ½-mile left Dynevor Arms, Merthyr Tydfil—Swansea Road.

Hants.—The Southampton Gliding Club. Every week-end at Red Lodge Farm, Bassett.
—Surrey Gliding Club. Sundays from 10 a.m., weather permitting, at Stocks Farm, Meonstoke (Old Winchester Hill).

Hereford.—The South Shropshire and North Herefordshire Gliding Club at Dinmore, ½-mile from main Hereford-Ludlow Rd. Every Sunday, and Thursday from 2 p.m.

Herts.—Herts. and Essex Gliding Club. Sunday afternoons, Eastern Roadways Garage, one mile north of Stortford.

I.O.W.—The Isle of Wight Gliding Club. Whiteley Bank, near Godshill. Every Sunday from 11 a.m.

Kent.—Channel Gliding Club. Adjoining Hawkinge R.A.F. Aerodrome, 2 miles from Folkestone, on main Canterbury road. Every Wednesday and Saturday afternoon and all Sunday.
—North Kent Gliding Club. Saturdays 1 p.m., Sundays 10 a.m. Joyce Green Aerodrome, near Dartford.
—Kent Gliding Club. Week-ends above Lenham, on the Maidstone—Ashford road.
—The Isle of Thanet Gliding Club. Saturdays and Sundays from 2 p.m. Manston Aerodrome, Thanet.

Lanark.—The Glasgow Gliding Club. Barrance Farm, Easter Whitecraigs, near Glasgow. Every Sunday from 11.15 a.m.

Lancs.—The Furness Gliding Club, at Gleaston Park Farm, Gleaston, near Ulverston (midway between Gleaston and the Coast road), Sundays 10.30 a.m., by arrangement and weather permitting.
—The Stockport Gliding Club. Every Sunday afternoon at Woodford Aerodrome, Manchester.
—The Preston and District Glider Club. Week-ends at Butler's Farm, Beacon Fell, 2 miles from Inglewhite and 7 miles from Preston.

Notts.—The Nottingham Gliding Club, Mr. Ellis's Farm, Kneeton Road, East Bridgford, Notts. Every Sunday, weather permitting.

Somerset.—The Dorset Gliding Club, Westland Aerodrome, Yeovil.

Staffs.—The North Staffs. Gliding Club. Week-ends at The Downs Banks, Barlaston Downs, near Stone, Staffs.

Sussex.—The Southdown Skysailing Club. Sundays from 10.30 a.m. High Barn, Rottingdean.

Warwick.—Rugby District Gliding Club. Cote Hill Aerodrome, Husbands Bosworth, Rugby.

Wilts.—The Wiltshire Light Aeroplane and Glider Club at Easton Hill, Alton Priors Range, Bishops Cannings, near Devizes.

Worcs.—North Cotswold Gliding Club. Every Sunday at Fish Hill, above Broadway Village, from 10 a.m. to sunset. Saturdays and Wednesdays from 2 p.m.

Yorks.—The Bradford Gliding Club, at The Pastures, Apperley Bridge. Saturday 1.30 p.m., Sunday 9 a.m.
—The Huddersfield Gliding Club. All day every Sunday at Bradley Lar, Huddersfield.
—The Leeds Gliding Club. Week-ends at Warfedale with the Harrogate Club.
—The Scarborough Gliding Club. Every week-end at Flixton.

[Clubs are invited to send in full details as to where and when they can be seen at work. This feature should help Clubs considerably as readers who are not members can go to look at the nearest local Clubs and see which they like.—Ed.]

THE ACCRINGTON AND DISTRICT GLIDING CLUB.

We have had five flying meetings up to Feb. 21. At our first meeting, Jan. 31, the wind being too strong, eleven members used the machine for lateral stability and control practice. On Feb. 7, five members each had four slides along the ground, being pulled off by four men on elastic rope without the machine being anchored.

On Feb. 8, eleven members each had two flips off the ground against a ten to twelve miles an hour wind. The machine not held back. On Feb. 14, seven members each had two flips off. No wind. The elevator badly damaged on Feb. 15 before any flights could be made. The construction section immediately set to work and through the generosity of Mr. Hughes, of P. Hughes and Sons, who placed his works at our disposal, we had a new tail and elevator cut out in sections ready to assemble. The assembling was carried out in our shed, loaned by Mr. Ashworth.

The machine was rigged on Feb. 21 in a snowstorm and five members managed to get one flip each, the last member stalled and smashed the skid and one strut. A new skid, better than the first, finished by Sunday tea time. The construction section is the liveliest of the Club and deserve all the credit possible.

We expect to be on the war-path this week-end.

THE BEDFORD GLIDING AND FLYING CLUB.

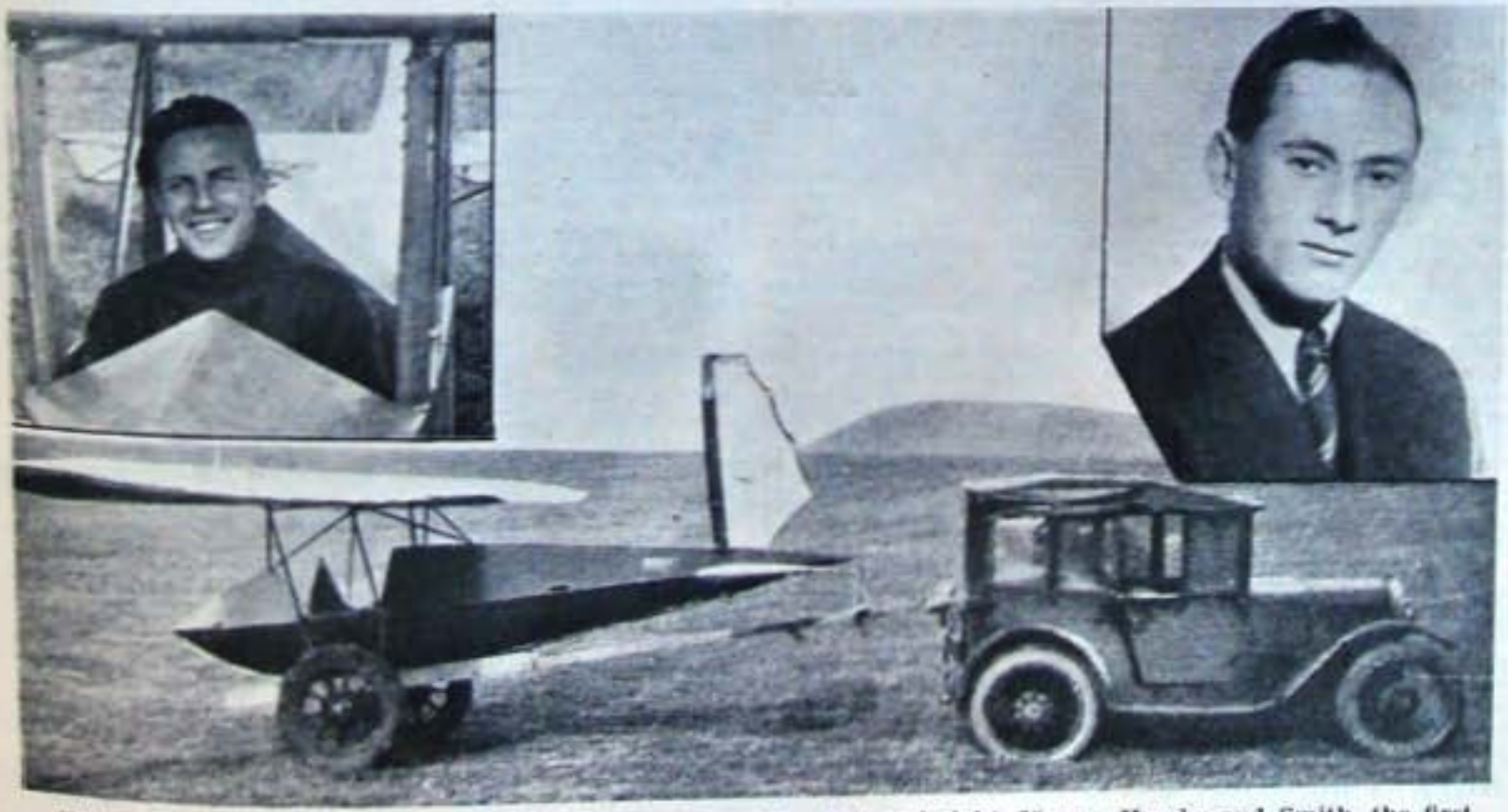
During last week-end, it was good to see plenty of work being done at Wilstead, by the large number of members and friends who turned up. Work was completed on the "Dagling," which has now been reconditioned throughout for the season, and with the redesigned fuselage our Engineers are confident it will stand up to much more rough usage. We were glad to welcome five new Gliding Members this week, and judging by the number of inquiries, we look like having a busy year.

Most of our new members turned out for instruction on Sunday, when, after a short and simple lecture, the pupils were given downhill runs on our patent test-trolley. This is a light wood frame on four wheels with a seat and dummy "joy-stick," the *rear* wheels being on a swivel and coupled to a rudder bar on which the pupil places his feet and steers. It has been found invaluable in teaching rudder control, which seems to be the main difficulty with beginners. The truck gathers a good speed down hill, and having *no brakes*, any error in rudder bar correction quickly ends in a spill.

Members please note that our instructors will be in attendance at Wilstead every Saturday and Sunday from now onwards, and soon we hope to continue operations every evening. Visitors are always welcome, and we would remind inquirers that our entrance fee is £1 (one pound) with an annual subscription of 15s., tuition free, no charge or liability for use of machines.

THE CHANNEL GLIDING CLUB.

On Feb. 21 *Minnie* (the Minerva) was tried out for towing the R.F.D. In spite of the fact that chains were fitted difficulty was at first experienced in getting a start owing to wheelspin, the aero-



THREE ACHIEVEMENTS OF THE LONDON CLUB.—Top left and right, Messrs. Humby and Smith, the first two "ab initio" "C" pilots, both trained by the London Club. Bottom, the "Scud" designed by Mr. Baynes and flown by Mr. Mole for over an hour recently, both the latter are also members of the Club.

drome being in parts practically under water. A dry spot was however found and all members present made good flights. Mr. R. Cann made his first attempt and did remarkably well, mastering lateral control immediately.

Cases of this kind have taught us that, in the very early stages, towing is infinitely superior to the catapult as a means of instruction. The gradual acceleration gives the pupil a chance to think what he is about. The longer duration of the slide (anything up to a minute) enables him to grasp what happens when the stick is moved, and allows him to get plenty of practice. All the time he is under the control of the instructor, who can adjust the speed of the car to the velocity of the wind and the weight of the pupil and can cast him off at any moment. The pupil himself is also provided with a release, so that if he feels that things are getting a bit beyond him he can get free. This we find is seldom used, but it appears to give confidence to some.

On Feb. 22 a visit to the Elham site was made and with considerable local help some good gliding resulted. The site is however too small, even a 20 sec. flight necessitating a right-angle turn. It had been hoped that an "A" would be got, but it was found that the only possibility of a 30 sec. flight was to be launched off a high ridge, cross a belt of tree and land in a pasture below, from which it was impossible to recover the machine without derigging.

To make the flight of as long duration as possible, the machine was taken well back from the ridge. The flying instructions were, "If you find after the launch that you can't clear the edge, land this side and we'll try again." A good launch was made. The pilot thought that he could clear the edge, and in fact *he* actually did, but the rear portion of the fuselage touched, tipping the nose down the precipitous side of a sunken road. An attempt was made to clear a large and unpleasantly thick holly tree by diving and "zooming" and this was partly successful in that the holly tree was cleared, but other trees were beyond which caught the port wing. The machine crashed into the gully, the pilot showing good road sense by landing in the middle of the road and leaving the wings to argue with the trees, he himself escaping without even a scratch. Damage: One wing and the elevator completely written off, and a broken king-post.

Following our policy of honesty on the part of the individual for the benefit of the mass, we state the result of the Inquiry.

It was unwise to make an attempt with so small a margin of safety. Its success depended entirely on clearing the edge of the ridge. Having regard to the fact that the pilot weighed 14 stone, and that by that time in the afternoon the wind had dropped to almost dead calm, it would have been wiser, if the attempt was made at all, to have started the flight nearer the edge and chanced the 30 secs.' duration. Had the attempt been made earlier in the day when there was a brisk breeze, the story would probably have been different.

The pilot made an error of judgment in clearing the edge by not allowing for what comes behind. After that one mistake, it was well nigh impossible to fly out of the gully. It is fortunate that more damage was not done. Our advice to Club members who are impatient to get their "A" and whose Clubs find it difficult to provide them with a suitable straightforward site for the purpose, is:—WAIT.—C. C.

THE LONDON GLIDING CLUB.

Feb. 21 will undoubtedly go down in the records of the Club as a red letter day, as although conditions were by no means exceptionally favourable, two *ab initio* pilots, both trained exclusively by the Club, qualified for their P.A.L. "C" Certificates. This is the first occasion when *ab initio* pilots have been trained to this high standard in this country.

The first flight of the day was made by Mr. Graham Humby on the Prufling. He soared for 8¼ minutes and ended the flight with an excellent voluntary landing, owing to having misinterpreted signals of congratulation from the ground. The average wind speed during Mr. Humby's excellent flight was 14 m.p.h.. Capt. Needham then took over the machine and made a flight of about 1½ miles along the ridge, but then on looking down he saw a herd of bison at large in the enclosure of the country branch of the Zoo at Whipsnade, and not fancying the idea of a forced landing in that neighbourhood, returned at high speed to the starting point and concluded a flight of 31 mins. with an excellent landing at the starting point.

Mr. M. L. McCulloch, whose recent qualifying flight of 14 mins. for a "C" Certificate the writer unfortunately omitted to report, took-off next and soared for 17 minutes. Several other members then made their first trial flights in the Prufling from lower altitudes and Mr. D. C. Smith, another *ab initio* member, whose previous experience was limited to Club Zoglings, showed such particular promise that he was given the opportunity to take-off from the top of the hill, and although the wind had now dropped still further to 11 m.p.h., put up one of the best Prufling flights ever seen, and completed the flight with an excellent landing 7 minutes 18 seconds later. Mr. Humby also made a further soaring flight of 13 mins.

On Feb. 22 conditions were far from favourable owing to almost negligible wind speed, and the day was almost entirely devoted to training, though a number of prolonged glides were made on the Prufling by Messrs. Smith, Morland, Needham, Donovan, Culver and Robertson.

THE NORTH COTSWOLD GLIDING CLUB.

The variable weather conditions which have prevailed during the last few weeks has given all the flying members of the North Cotswold Club an opportunity to revel in their own particular element. Some like it rough, some like it smooth, and some are prepared to take the rough with the smooth, which state of affairs, if taken in the truly literal sense, is essential to such a new and as yet undeveloped pastime as Gliding.

For eight months the Club has carried out its regular week-end fixtures with only two breaks—one Sunday during last September on account of settled rain, and one recent Sunday when the chance to get out in a high wind blowing in a geographically favourable direction had to be missed because of settled drizzling rain. This was a great disappointment, as a good muster of visitors had turned up from Gliding Clubs as far away as Kent, Eastchurch, London, Buckingham, Swindon and Nottingham, all anxious to compare the standards and methods of the North Cotswold Club with their own.

Last week-end Messrs. Ballard, Bent, Green, Noble and Williams, all of whom should soon qualify for their certificates, made practice flights, while test and tuitional demonstration flights were made by Miss Evelyn Moore and Mr. Horace Wright.

THE NORTH KENT GLIDING CLUB.

We carried on with our "Sliding Policy" again this week, using a car in place of crew as reported last week. During an actual operating time of five hours we achieved 76 slides. The way in which members maintained control of the machine on the ground was extremely good, and definitely showed that the time being spent in sliding is not being wasted.

We should much like to hear from any Club which is using the single rope method of launching as to the effect on the rope so far as wear, etc., is concerned. We have carried out about 140 launches up to the present by this method and it does not appear to resent the treatment.

THE SAILPLANE CLUB OF T.M.A.C.

The Sailplane Club's new hangar which is now nearing completion is shown in the accompanying photograph—[*which was received too late for reproduction this week.*—ED.]—tucked away under the highest run of the Smalldole basin. It is hoped to complete the building by Sunday, Mar. 8, when flying will recommence.

Will intending patrons of the Sailplane Club Dance on Saturday, Mar. 7, please note that no money can be taken at the door of the Suffolk Galleries and tickets (2s. 6d. dance only, refreshments buffet extra) should be obtained at once from the Hon. Secretary, E. G. Smetten, 2, Wine Office Court, Fleet Street, E.C.4. A lively evening is promised, during which spot prizes will be given. Music is being provided by Mr. Harry Gentle and his band.

It is being arranged to exhibit a series of photographs showing the activities of the Sailplane Club, whilst the Model Aircraft Club will have some models on view.

The Sailplane Club Membership Subscription for 1931 is £2 2s.

THE SOUTHDOWN SKYSAILING CLUB.

Members met at Newmarket Farm at the usual time on Feb. 22, proceeding at once to assemble the machine in order to move it, at the request of our landlord, Mr. Woodman, to High Barn, Ramsdean. This will be our H.Q. for the present. High Barn site is not as spectacular as our old site, but in practice it proved very satisfactory for the work we are doing at present.

As the roadway from one ground to the other was too narrow to allow the machine to be moved normally on its trolley, we lifted it so that the fuselage rested across the Trojan car. In this position it travelled easily. At one point while considering a move over a fence into a field we were stopped by an irate yokel who told us to "take the dratted thing away; it wasn't safe anyway and he'd rather fly a kite!" Which touch of unconscious humour materially helped to dispel a sense of gloom and the rest of the transport was made in high spirits.

Flying started about 12.30 with a test flight of about 40 secs. Then Mr. Lawson made a good flight of 48 secs. This is the Club record on the R.F.D. and the first 45 Mr. Lawson requires of the three B certificate qualifying flights.

We congratulate our indefatigable Mr. W. H. Wood on a 35 second flight which gives him his "A". Likewise Mr. Parker, who also qualified for his "A." Long flights were also made by Messrs. Lawford and Tulley and every one present showed considerably more ability than they did last week.

The first general meeting takes place on Feb. 27 at the New Yorke Hotel, Brighton, when we hope to have a full attendance.

Though Flt. Lt. Brown is still unable to walk, we are glad to see that he is fit to get about in his car and we hope to have him with us again next week.

We are sorry to confirm, with unanimous regret, the announcement that Lt. W. Wood has resigned on account of ill-health.

THE SOUTHAMPTON GLIDING CLUB.

The Club had its first mishap on Feb. 22. The machine was landed heavily and the rear spar broke close to the landing wire attachment. The repairs were done by the members during the week.

The Club has acquired a quick release gear which saves three men on the tail as it is operated from the wing-tip. Several members have now made flights, including one lady member, and many are making rapid progress.

THE SURREY GLIDING CLUB.

A highly successful dance was held on Feb. 20 at the Merrow Grange Hotel, near Guildford, when about 120 members and friends spent a most enjoyable evening. As many of those present were not well acquainted with our Movement, the "Gospel of the Glide" has been widely preached in new realms. The Club is deeply indebted to the small committee who so ably organised the event.

The fine weather at the week-end did much to restore the health of the merrymakers, but the usual abundance of energy was lacking, even the wind was content to "loaf" around the hillside. The Dagling was in constant use on Sunday, but the Prufling made only two demonstration flights as its full complement of crew was not available.

Will members please note that, as the pasture on the gliding ground is so damp, cars must be parked in the lane near the cottage until further notice.—F. P.

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