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THE SAILPLANE AND GLIDER

(Founded in September, 1930, by THURSTAN JAMES)

The only Journal in the World devoted solely to Motorless Flight.
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HOW CLUBS ARE ASSISTED

The British Gliding Association's Part

By E. C. GORDON ENGLAND

(Chairman of Council)

There is a fascination in New Year resolutions which remains as attractive with each New Year as ever. Such is the frailty of humanity that few of these good resolutions have more than a fleeting existence.

Those that do come to maturity and fruition are sometimes far reaching in their effect; who of us cannot call such cases to mind? There is a strange Magic in the New Year!

With this issue of THE SAILPLANE you see a New Year's resolution taking shape, and with me you will surely feel certain that it is going to be one of those that succeed and have a lasting impression upon the whole Gliding Movement.

What better moment could be taken to suggest to you just one more new resolution in addition to those you have already made?

This resolution is an easy one to carry into effect. Just make up your mind to read this short article carefully, remember its main points and put this number of THE SAILPLANE away somewhere where it may be easily found so that the next time someone says, "What is the use of the B.G.A.?" you may, to your lasting credit as having done a real service to Gliding, be able to answer, instructively and convincingly.

With some amazement I heard a well-known Member of the B.G.A. Council who has served upon it since it was formed, and who is an energetic worker on Committees too, state at the last Council Meeting that he was often at

a loss to explain what the B.G.A. does for the Gliding Movement.

That decided me to make a resolution that the first issue of THE SAILPLANE in the New Year should carry a short statement of the functions of the B.G.A. and its importance and value to every Club and every member of those Clubs.

The objects of the B.G.A. as set out in its book of rules are: "to promote, encourage and control Gliding in all its forms."

If one wants to promote and encourage anything it must be controlled. If you are building a business you control it so that you encourage and promote its growth as easily and as economically as possible, and everybody expects you to take just that line of action.

So it is with the B.G.A.; its Council and several Committees are endeavouring all the while to promote and encourage Gliding all over the country, and to this end they attempt to remove all unnecessary snags, restrictions and difficulties from the path of those wishing to take part in Gliding. The control exercised is to avoid harmful things being done which are in nobody's real interests and calculated to hurt the Movement. The Council are at great pains to avoid rushing into this or that regulation just because someone thinks a regulation should be issued.

They realise fully that caution and experience are required when setting up any form of control, or unnecessary and vexatious restrictions may become, quite unintentionally, the undesirable result.

There is another most important consideration; too many regulations and rules mean inevitably increased cost to those engaged in the Movement, and nothing is more certain than the importance of keeping Gliding as cheap as possible.

As long as I am entrusted by the Council with the duty of Chairman I shall continue to make that the centre point of all our efforts. There is nothing easier than to get involved in a lot of activities that would tend to make the cost of Gliding rise considerably.

The main purpose of those forming the B.G.A. was to avoid the Gliding Movement being burdened with the severe handicap of the cost of control by a Government Department. The late Sir Sefton Brancker saw this clearly and it was due to his efforts that the B.G.A. was entrusted by the Air Ministry with the responsibility of controlling the safety of Gliders and Gliding.

The cost of a Certificate of Airworthiness for a new type of aeroplane is more than £25, and a renewal fee not less than £5. These Certificates are issued where machines are approved by the A.I.D. as being built of materials and in a manner conforming to their required standards. This adds substantially to the cost of aircraft but this is not the occasion to consider the merits of the system.

In the case of Gliders the B.G.A. charges £5 for approving a new design, and between £1 and £1 10s., according to the type, for renewals of Certificates of Airworthiness. The construction is under the observation of approved B.G.A. Inspectors and no unnecessarily high standards of materials or workmanship are demanded. It has been estimated by Glider Manufacturers that were they expected to conform to Air Ministry regulations for certification of aircraft, the cost of gliders would be increased by at least 25 per cent.

If the B.G.A. did nothing else but this one thing it will be apparent to everyone that its function is invaluable to the Gliding Movement. But the B.G.A. does many other things as well and unless they are catalogued I am afraid the Editor will be unmerciful with his blue pencil.

It watches the interests of the Movement when the latter is attacked either in Parliament or in the Press, by organisations or individuals. Its endeavours are unceasing in obtaining new advantages for Clubs and the Movement generally.

It issues such rules and regulations regarding launching methods and auto- and aeroplane-towing methods, as are necessary for the well-being of all concerned.

The Royal Aero Club entrusts the Association with the control of all the sporting events connected with Gliding, and issues Glider Pilots' Certificates on the recommendations of the official observers appointed by the Association, and in accordance with the rules and regulations of the F.A.I.

The B.G.A. is ever sending forth propaganda to spread the gospel of Gliding. It is in constant touch with people in Australia, New Zealand, South Africa, Tasmania, Canada, America, France, Italy, Spain, Greece, Hungary, Belgium, Denmark, and Germany. The New South Wales Gliding Association and The Indian Gliding Association are affiliated to the B.G.A.

The Association's Office acts as a Bureau for the reception and dissemination of information useful to Clubs and not otherwise available to them.

The B.G.A. is a democratic body governed by a Council consisting of properly elected representatives of Affiliated Clubs and other organisations, and therefore, being a democratic body, its policy and field of operations is controlled by the Club Movement throughout the country. It does not usurp the authority or functions of the Clubs.

There is one other good and important work that can be placed to the lasting credit of the B.G.A. At the time when this paper was threatened with extinction by its late owners, the B.G.A. took it over and so saved the whole Movement from what would have been a major disaster, because it may be said with truth that the loss of our own paper would have had a most depressing and demoralising effect on those in the Movement. As it is, with justice we can claim that THE SAILPLANE has expanded in influence and scope under the ownership of the B.G.A. and at no cost to its finances. Surely this number is a good proof of its progressive policy.

So I finish as I started with a major function of the B.G.A., and I hope that you will feel at last that you really do appreciate the true value of the Association and its vital importance as the co-ordinating centre of the whole Gliding Movement. There are numerous minor activities I have not detailed and as experience and funds make it possible, others will be added.

There is no doubt that with the loyal support of every Club and every Club Member, the B.G.A. will carry the Movement from strength to strength.

A Happy, Prosperous and successful New Year to you, and to all in the Gliding Movement, is my most sincere wish.

DUAL INSTRUCTION

By C. H. LOWE WYLDE.

A practical demonstration of the utility of auto-towed dual-control instruction was given at Balsdean on Nov. 29.

Mr. Yorke Bramble, of the Southern Soarers' Club, who, though in such intimate contact with gliding, has never done more than an odd hop of a few yards, was taken up for four instructional flights. In the air he showed excellent promise; he appeared to have accurate ideas of what to do and on three occasions succeeded in landing the machine unaided. His flying was also consistent so it was considered safe to advise Mr. Little, acting as "Day Captain," to allow him to take their DAGLING off from the top of the hill. Later in the day this was done and Mr. Yorke Bramble made a perfect flight of 45 seconds duration.

Here was an instance of a beginner who, as a result of some elementary tuition and a certain amount of observation, had acquired the rudiments of flight, but his further progress was held up pending his obtaining experience by actual time in the air. With single-seater equipment the only means of finding this out is a rather drastic way as if the pupil lacks any idea at all a bad crash is possible. Certainly no human being should ever attempt to fly any type of machine until he has first of all demonstrated his ability to control it safely, and the only means of finding this out is dual control in a two-seater.

If every Member of a Gliding Club was up to the "B" standard, even with primary training only, Club life and Club operation would be very much more interesting and progressive than they are at present. Since beginners have to be trained, it is safe to say that every Club ought to have a two-seater machine, not necessarily for everyone to fly solo, but to ensure that before a pupil ventures into the air alone, he has some idea of what to do. Bad crashes would then happen rarely and Club operation would seldom be held up.

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SAILPLANE FLYING

By "KENTIGERN"

III.—HILL SOARING

A hill running at right-angles to the wind gives the easiest conditions for first attempts to soar. The higher the ridge of hills, the greater will be the horizontal width of up-wind, and the up-wind will also extend higher above the hill. With a normal steep hill about 250 ft. high, one can say that a Professor should be turned as quickly as is economically possible (without a steep bank) to remain in the best up-current and must be flown as near the hill as is reasonably safe. This does not mean the nearer the better, for the up-current within, say, 20 ft. of the ground is weak.

The glider is launched far enough behind the crest of the hill to be able to turn as it reaches the best up-current. As height is gained it pays to work back towards the hill a little. Fig. 1 shows the best position of the glider when low down in this position, a useful precaution is to fly with slight bank away from the hill. (A pilot as low as this should keep his eye on a landing place).

Fig. 2 shows the glider when soaring comfortably over the hill. It is not profitable to fly further back than is indicated above the flat top of the hill.

For the turn it may be possible to use a fold in the ground which causes a bigger up-wind area. In any case it is best to turn in a vigorous up-wind area. If possible, first turn back slightly over the hill and then, after the turn, the glider will not be so far from the hill.

Sometimes beginners can be seen making great efforts to soar. The right method is to substitute passive for active. Beyond flying the glider in the best place and at the best speed, the pilot can do nothing, and stalling, heavy banks or uneven flying all lead to loss of height.

Nevertheless the best course needs study. All flying grounds are irregular and the irregularities cause variations in the flow of the wind which seem disproportionate to their size. The pilot must watch the ground in front, underneath and behind him to find the explanation of the flow of the air and it is the ability to judge wind flow from the shape of the ground which distinguishes the soaring pilot. A PROFLING or SCUB, owing to their small span, react to changes of airflow in small areas so that endurance flights in them are useful from the point of view of learning the distribution of lift.

If the glider has a span of 50 ft. or more, it sometimes happens that one wing is in rising air when the other wing is not. It is then difficult to turn away from the lower wing. If this is the one in the air retarded by the surface of the hill, the position is an awkward one and should be avoided.

An article like the present one, which attempts to show how to soar, is unsatisfactory because, when one can fly, soaring consists of flying in the right place. The first attempt is easier if preceded by a detailed description of where to go over a ground that is well known.

On first attempts pilots are so busy that they become tired after a few minutes. This indicates that it is important to be able to keep the speed accurately constant by ear so that one can watch the hill. With practice the eye becomes more skilful at noticing changes of height.

When birds are soaring on a thermal up-current, it is interesting to see how they watch each other, so that

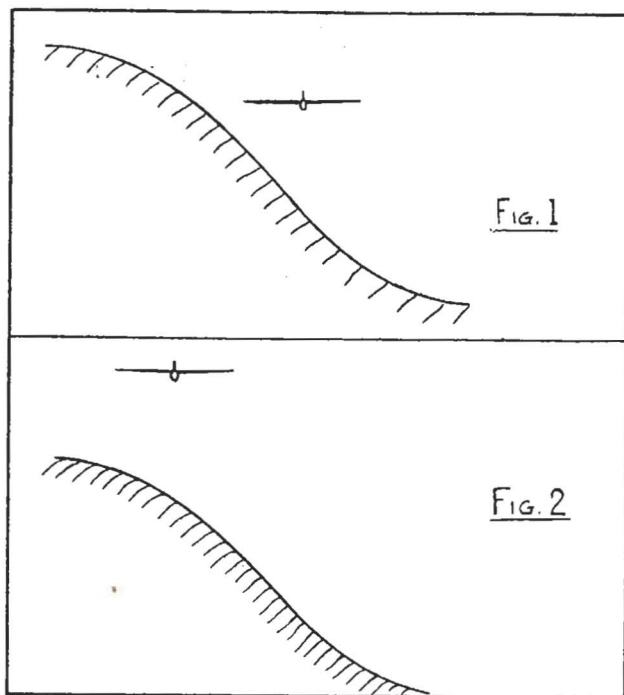
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"SAILPLANE" COMPETITION

Until further notice a year's subscription to THE SAILPLANE will be presented for the best photograph received during any one month, illustrating any feature of the Gliding Movement such as the activities of Clubs, etc.

Photographs, which must be original, should be addressed, "The Editor of THE SAILPLANE, British Gliding Association, 44a Dover Street, London, W.1." Envelopes should be marked "Competition" in the top left-hand corner. The competitor's name and address, and Club (if any) should be written on the back of the photograph. Descriptive matter, which should be brief, should be written on the back of the photograph or on a separate sheet of paper.

The Editor reserves the right to publish any photograph submitted whether a winning photograph or otherwise. The Editor's decision on all matters will be final.



when one rises the rest make for the same spot and all go up together. This illustrates my opinion that birds have no special soaring sense but fly by experience and the use of senses such as the eye and the force on the wing muscles which probably gives a sensitive indication of vertical acceleration. For the human pilot it is most important to be able to observe vertical acceleration and the best instrument for that, the seat of the soaring sense, is the seat.

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THE BIRD'S WING AS BASIS FOR THE THEORY OF THE "Z" WING

By JULIUS F. ZIEGLER.

(Translated from "Flugsport," No. 19, December 16, 1931)

From the time of Lilienthal and Kress our wing-sections have been based on those of birds' wings, although they have only found practical use as membranous wings with unbroken surfaces. But I have been interested in feathered wings, which I have studied and on which I have built my observations. At this point, before going further, I should like to mention the excellent co-operation of Herr Ladislaus Grafen Hoyos, whose personal interest in the matter and whose large collection of birds helped my work considerably.

As is known, considering the vertical projection of our wings in an air-stream, a drag is produced, which, according to the division of the medium into a suction and a pressure zone, realises some of the resultant pressure difference (in the horizontal projection of the wing) as lift. A pressure difference which under the effects of normal pressure tends to become neutralised or lose lift is, up to the present, only overcome by the air-speed.

The already discussed bird's wing is the most suitable means of using the lift-work of the air and is used, except for the concavity behind the leading-edge, universally in aviation. Although in our adaptation of the bird-wing it has been attempted to achieve as smooth a flow as possible, especially the off-flow, the real bird-wing has, by using this concavity on the underside a resistance which causes an eddy, which has been proven to exert positive thrust by Lilienthal, and which has recently been tested for this effect. However, practical experiments with such wings were failures since the general use of such wings in aviation due to the great drag is out of the question.

If one pictures the aerodynamic work on such wings in an air-stream, one comes to the conclusion that the vacuum effect in the concave fore-part of the wing forces the air-stream to reverse direction. However, since these air-streams for lack of a suitable path for them to flow away, find insufficient renewal, they must lead to a greater friction and drag when the air has been "piled up" as far as the trailing edge. The gain in thrust in such reverse air-streams is much lower than the spoiling effect of the frictional drag caused by the piling-up of the eddies and are therefore of only negative value. A method which in the light of our present experience necessitates extra forces to overcome these drags can therefore not be practically considered to have gained any advantages.

The accuracy of the above argument on this "wider-eddy" in the bird-wing is proven as a result of my experiments and derivations, which led to the following results:—

Firstly we have the well-known bird-wing, which from upper-arm to wrist consists of an elastic skin as lifting part, which by means of a muscular structure (curving downward) forms the leading-edge and behind it, the thrust-pocket. As against this type of wing, to which the researches up to the present have been confined, the actual bird-wing has purposely laid out **connecting paths** from the under side to the top side (from pressure side to vacuum side). Through the effect of the low-pressure zone the lifting stream is retained (or in landing forced in place), reversed and led through the connecting path in the flight direction, i.e., opposite to that of the normal flow, into the vacuum zone. The amount passed through depends on the form and strength of the pressure difference and is limited by the size of the connecting passages through the wing, so that the air masses passing through are fully used.

The action (see Fig. 1) causes, with the aid of the vacuum zone, a considerable retention of the lifting air, which, on collision with newly entering air forces increases the eddy stream for thrust effect. The boundary layer of the under-side is broken through by the flow to the vacuum zone, strong air forces are brought to play on the wing, which on their way to the vacuum zone, give up extra thrust and lift force. The outflow of this well-used air-stream follows under the outer covering of the wing, which not only prevents a disturbance of the vacuum zone, but the harmful effect of breaking the boundary layer on the top side is prevented to a considerable extent, which seems to diminish the eddies at the wing-tips. If we examine the structure of a bird-wing, we find the equipment for the above-described action con-

firmed. Firstly, through the streamlined form of even the smallest detail of the wing, and on closer examination, the arrangement explained above.

The wing consists of a keel of feathers growing out of the upper and lower arm, on which, after suitable free space for the passage through (Fig. 2) to the vacuum zone, the actual feathers are attached in their peculiar design and order.

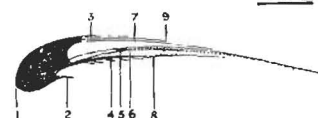
The porous (pervious) part of the feathers is covered with cover-feathers on the under-side, which grow out of the keel at a sharp angle and are considerably narrower in order to let the air through. These cover-feathers are connected by an impervious skin which just reached beyond the porous part of the main feathers and therefore forms a pressure zone between the main and under-feathers, in which the life-air penetrates, and after giving up-lift and thrust forces, flows away in the vacuum zone. This pressure zone is lined with light down in order to raise the resistance of the flow-through. The upper side of the wing is covered by several layers of cover-feathers which form the upper side of the wing to their roots. Thus between them is passage room (vacuum zone) through which the used air is led into the outer vacuum zone.

A limited porosity of the feathers prevents the formation of an isolated boundary layer, so that the above-described action always remains active in flight. How-

Fig. 1.

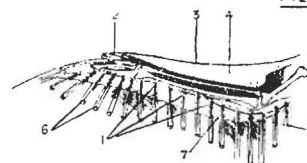


Fig. 2



(1) Membranous nose. (2) Thrust pocket. (3) Framework, free, light down-covering. (4) Nonporous wall. (5) Beginning of main feathers. (6) Pressure zone. (7) Low pressure or vacuum zone. (8) Lower cover feathers. (9) Upper cover feathers.

Fig. 3.



(1) Wall. (2) Front pocket. (3) Membranous skin. (4) Thrust pocket. (5) Feather framework. (6) Cover-feather framework. (7) Commencement of feathers.

ever, limitation on the removal of the air-stream results in a further thrust effect with the damming-up of the air at the entrances. This is favoured by the special shape of the leading-edge of the bird-wing, forming the well-known "wider-eddy" and the claw-pockets aid its utilisation in the cambered part of the wing-nose. Frictional drag through pushing off this eddy in the direction of the trailing-edge is avoided in the above action and the wider-eddy is continually renewed by fresh air, made possible by the removal of used air to the upper surface.

QUERIES V

Q.—What is the position of the centre of gravity for a tandem monoplane, such as the glider flown by M. Maneyrol in 1922?—A.H.K.

A.—This brings up the whole question of tandem monoplane design. Some experiments have been carried out on tandem aerofoils, but the available knowledge is somewhat scanty and the conclusions cannot be considered final.

All gliders, except those which are tailless, have tandem wings. The rear wing, or tail, is generally small, but nevertheless it is an aerofoil.

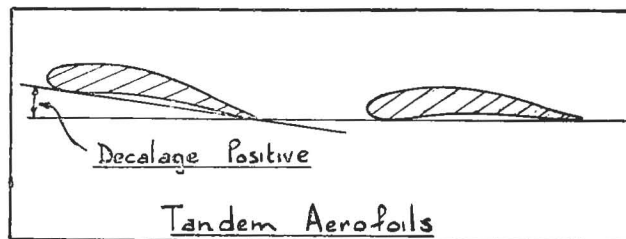
The tail-plane can be set either to take a part of the weight of the whole machine, or, as is more usual, it can be "non-lifting," that is to say, it "trails" behind in normal flight. If the tail is "non-lifting" then the C.G. is arranged to be approximately below the centre of pressure for the C.P.F. condition, that is about $1/3$ chord from the leading-edge for most aerofoils, but if the tail is made to support some of the load then the C.G. is moved back proportionately.

Now consider the true tandem machine. If both wings were of equal area and similar shape, and if the **effective** incidence of both were the same, then the C.G. would be placed half-way between the C.P. positions of the two aerofoils.

The word "effective" is emphasised since the front wing causes the air to be deflected downwards, so that for equal effective incidences the rear aerofoil would have to be set at a greater angle, depending on the chord of the front wing and the distance between the two aerofoils.

Tests so far carried out seem to have been confined to tandem aerofoils with either no decalage or positive decalage, which means that, owing to the front wing downwash, the effective decalage has been positive in all cases. Some

interesting results might be obtained in the neighbourhood of no effective decalage. (Decalage is the angle between



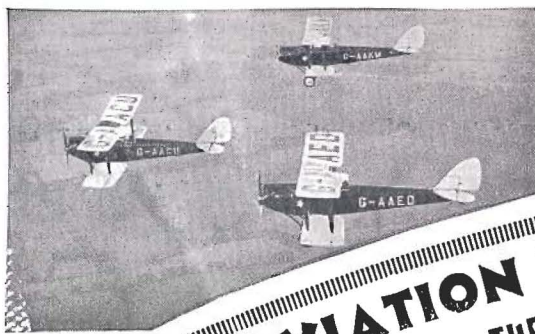
the chords of the two planes, and can be considered as positive when the incidence of the rear plane is less than that of the front plane.)

The tests have shown that tandem aerofoils give very good longitudinal stability and that the total C.P. tends to move backward as the angle of attack is increased, this being the opposite to the C.P. movement of a single aerofoil. The explanation of this is that the rear plane tends to take a larger share of the load as the angle of attack increases. This is only for positive effective decalage and is likely to be reversed if no effective decalage is present.

Apart from the above, tests on wings with positive effective decalage have shown reduction in the values of K_L and L/D , but, as mentioned before, these tests need not necessarily be regarded as conclusive.

Mr. D. W. GENGE

Everyone associated with the Gliding Movement will be sorry to hear that Mr. D. W. Genge is suffering from a severe nervous breakdown, and will join with us in wishing him a rapid recovery.



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THE AUTO-TOWED LAUNCHING OF GLIDERS

By WOLF HIRTH.

(Translated by Dr. A. E. Slater)

The history of towed flight is almost as old as that of flight itself. Towed flight with motor-boats and horses was known in France, England and America before 1910.

The first auto-towed flight was seen by the writer at the Wasserkuppe in 1922, when A. H. J. Fokker launched his biplane school glider on its maiden flight behind his Cadillac. In the following years also one heard of attempts being made, in one place or another, to tow up gliders with a motor-cycle or a car, though without any lasting results.

It was left to the U.S.A., the land of the automobile, to establish gliding flight following an auto-tow as a recognised type of flight.

In this connection it was, in particular, W. Hawley Bow-lus, of San Diego in California, who developed auto-towed flight and brought it into use for the training of beginners. It was also in his successful school in San Diego that Lind-bergh and his wife obtained their gliders' certificates after being trained by the auto-towing method.

In the year 1929, when this development was intro-duced, and in fact as the unintended outcome of a Ger-man mission, there were many accidents. They were occasioned by methods typical of American flying.

In the U.S.A. there are over 10,000 aeroplane pilots; only a small percentage of these, however, understand anything more of flying than just how to work the con-trols in order to fly with a certain amount of assurance. On the other hand machines of the ZOGLING type are turned out by 15 or 20 different firms, some with inferior workmanship.

With these gliders "business" was done. On every aerodrome at least one could be found. They were, how-ever, hardly ever used for the purposes for which they were built; no, the power pilots, who stand about in crowds at such places, made a sport of trying to see who could perform the most daring evolutions with the poor ZOGLING, often still tied to the tow-rope.

The seven fatal crashes which are known to have oc-curred in 1929, as well as numerous less serious accidents, happened, almost without exception, to power-pilots.

The sharp reaction which now set in threatened the whole American gliding movement with extinction. It was then that Professor Franklin, of Ypsilanti, Detroit, and Franz Gross (constructor of the "Darmstadt II") evol-ved a new type of glider adapted to American conditions: the UTILITY GLIDER. This is a strutted high-wing mono-plane with a single wheel and an enclosed fuselage of steel tubing; the Franklin machine has a skid as well. The machine is intended for auto- and aeroplane-towing, and will stand up to aerobatics.

Furthermore, the UTILITY GLIDER is quite a good sail-plane. Specially tuned-up for a low sinking rate, its soar-ing performance over a slope is only a little below that of a high-performance machine.

A special feature in addition, or rather, in particular, is its suitability for instruction, in which case, however, its single-wheeled chassis is often exchanged for a two-wheeled one.

At the present day three chief uses of auto-towed flight can be enumerated:—

- (a) for teaching beginners and for a first introduction of power pilots to gliding;
- (b) towing up as high as possible for flying practice and advancement;
- (c) the auto-launch for commencement of a soaring flight.

I. PROCEDURE FOR INSTRUCTION BY AUTO-TOWING.

1. Special Advantages of this Method.

(a) Two to four persons are sufficient for the purpose; the pupil in the aircraft, the instructor in the car, an observer in the car and an extra helper.

(b) In a given time considerably more flights can be carried out than by the method of learning on a slope; in fact about three times as many.

(c) It is true that more flights are required to reach the "B" certificate stage than when learning on a slope,

say 40 to 50 as against 20 to 30; but in case of a crash the shock is considerably less, and the confidence of the pupil in flight is greater with this method of learning, so that his further progress towards becoming a soaring pilot is more rapid.

(d) Instruction is possible on level ground. In northerly countries frozen expanses of water can be used.

2. Disadvantages of Auto-towing for Instructional Purposes.

(a) Comparing the average cost per pupil of teaching on a slope with the running expenses of a car in Germany, the towing method costs about one-third more. But the matter appears in a different light if a regular school organisation exists and a car is used solely for towing. Then the latter does not need to be registered, taxed or insured, not being driven along a public highway. The costs of the two methods then become about equal, especially when, with the slope method, horses are used for recovering the gliders.

(b) For rational towing instruction a ground of at least 900 to 1,100 yards in length is required, and its surface must not be too soft or too undulating.

(c) The car used must not be too low-powered. On this account the cheap light cars are hardly suitable.

Fig. 1.

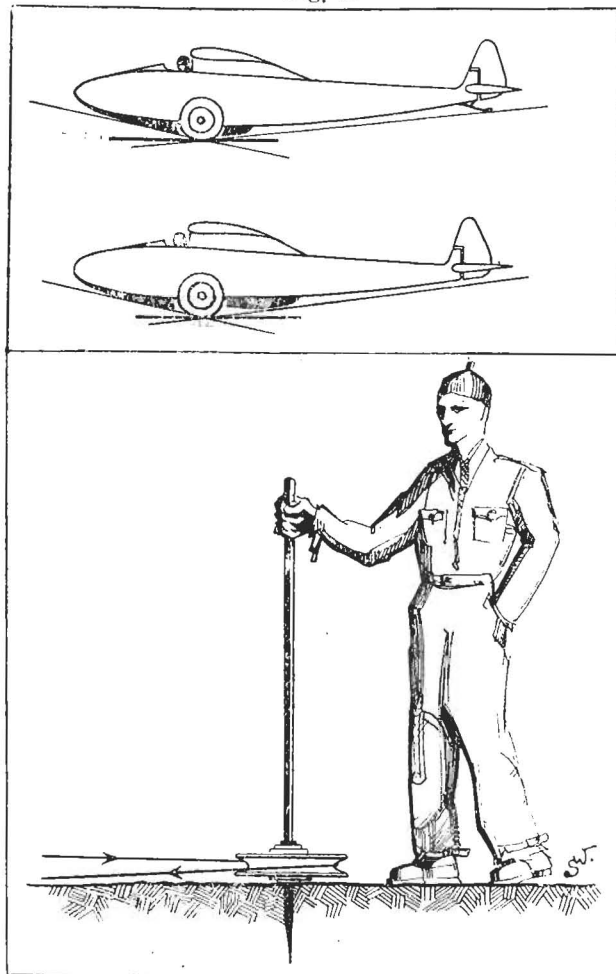


Fig. 2.

3. Teaching Methods.

Here the following 10 commandments are of value:—
(a) A hemp rope of 10 mm. (0.4in.) thickness and 80 m. (260ft) length should be used. For the first two to five taxiing trials this rope need only be 50 m. (155ft.) long. The rope must not be too strong, so that it can break if it gets caught up anywhere or fails to fall off when required. If thin steel cable is used it is imperative to tie several pieces of rag securely to the cable at intervals of 100 to

150 ft., so as to render it visible under all conditions of seeing. Otherwise it may happen that a tuft of grass, which has got caught up in the cable, falls off during the towing and gives the impression that the cable has been cast off. The ring which is attached to the end of the cable must not be too heavy, otherwise the ring, falling more quickly than the cable, may cause it to form a loop, which can then get caught up on some part of the glider if the latter is nosed down too much after the release. The releasing mechanism itself must be enclosed as far as possible, so that the cable, as in the aforementioned case, cannot get hung up on it. Size of ring found most suitable:—50 mm. (2ins.) diameter, made of iron of circular section 8 mm. (5-16in.) thick. Weight about 100 g. (3½oz.).

(b) It is absolutely essential to have a release mechanism on the towing vehicle, in case the pilot forgets to cast off, or the cable fails to release at his end. Much to be recommended are the devices which not only release, but throw away the cable. This is important if at the moment of releasing, the car has already been overtaken by the aircraft.

(c) During the first taxiing trials the pupil has first to learn the use of the rudder, in order to be able to maintain a straight course behind the car. During the next few tows the speed must again be kept so low that the machine does not leave the ground. From the third tow onwards the pupil tries to hold the machine horizontal with the elevator.

(d) If possible one should use at first a two-wheeled undercarriage situated at the centre of gravity. Further, the machine must be able to rest on its skid in front of the wheels as well as behind, so that it cannot overturn (see Fig. 1). The two-wheeled chassis has the advantage that no assistant is required at the wing-tip, and that the return down wind can proceed more quickly.

(e) One should use if possible machines with an enclosed fuselage, which give the pupil greater confidence. Nevertheless open (Zogling type) machines can also be used, though of course they must be sufficiently stoutly built and free from defect. It should be noted that the more advanced pilots, when being auto-towed, can be launched with less speed and a greater angle of incidence. In that case the undercarriage can be rather high in front.

(f) If possible the car should have a cylinder capacity of not less than 2,500 c.c. The 6-cylinder "Wanderer" has proved itself well. If a less powerful car is used, one must work with machines of lower wing-loading, such as light-wind soarers, or else instruction is only carried out in winds of 4 to 8 m. per sec. (9 to 18 m.p.h.). In the latter case one should beware that the wind is not too gusty. Apart from that, the most suitable weather is a dead calm, when instruction can be carried out in any direction, as well as out and back on the same course.

(g) A normal course of training for a beginner involves flights somewhat as follows:—

Five to eight tows without taking off, practising with the rudder and elevator control.

Ten flights at a height of 3 to 6 ft. without releasing. Landing by reduction of speed.

Five flights up to 16 ft. high with casting-off.

Five flights up to 90 ft. with casting-off and wide 45° turns.

Five flights up to 160 ft. high with casting-off and S-turns.

A further 5 or 10 flights with a cable 500 ft. long, at a height of 160 to 260 ft. and with right and left-handed circles round the landing ground.

As soon as the pilot is sure of himself (after about the 60th to 70th flight) the cable can be lengthened up to 350 m. (1,150ft.) according to the size of the ground. It is more suitable then to use a steel cable of 2.5 to 3 mm. (0.1 to 0.12in.) diameter, though hemp rope (Manila) can equally well be used.

(h) By suitable organisation 10 to 12 flights can be carried out in an hour. The duration of each flight varies

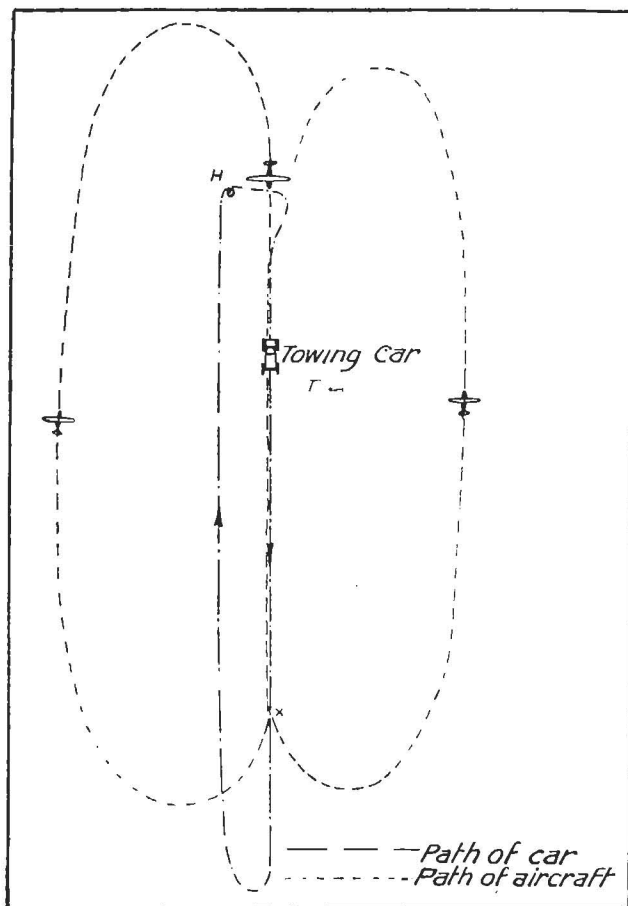


Fig. 3.

between 45 secs. and 5 minutes, according to the length of the cable and the efficiency of the glider. For retrieving the cable it is of advantage to use a staff with a pulley, as in Fig. 2.

How the procedure is adapted to advanced pupils and to beginners is shown in Figs. 3 and 4 respectively. It is of advantage to have an observer in the car as well as the pilot.

(i) Turns should be avoided while attached to the cable. As soon as a pupil is confident enough, the cable should serve merely to tow him up to a height. The pilot must sit in such a way that he can look down at the car over the side of the fuselage and so assure himself that the cable has fallen off. If, in spite of all precautions, the cable remains hanging from the aircraft, it is possible, if it has caught up in anything below, to break it by going into a dive and flattening out just above the ground. This evolution has already been performed several times, and with success; among others, by Martin Schempp, in Pittsburgh (see Fig. 5). Therefore never turn unless you have seen the cable fall off. **Hearing** the click is not enough!

(k) Be cautious, circumspect and not frivolous when dealing with auto-towing. Also, strap yourself in well. Ten fatal accidents in the U.S.A. were entirely due to carelessness. Judiciously carried out, flying behind a car is no more dangerous than flying off a slope. While we have, however, many hundreds of comrades accustomed to the launch off a slope and its preliminaries, there are so far very few who are familiar with all the features of auto-towing.

(To be concluded)

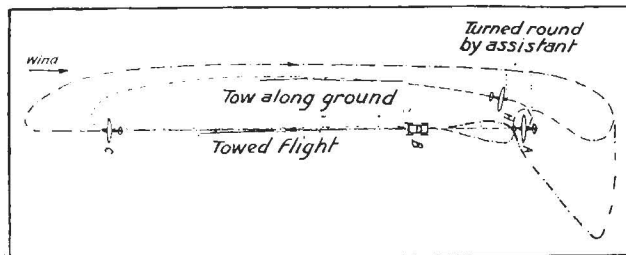


Fig. 4.

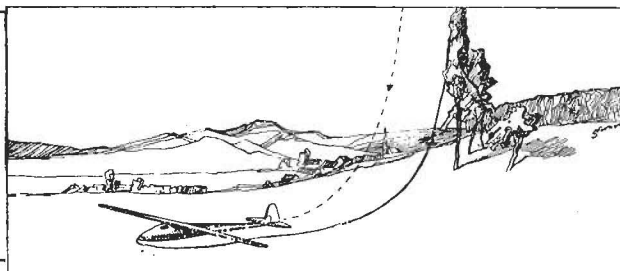


Fig. 5.

CLUB CONSTRUCTED MACHINES

By "SEGELFLIEGER"

III.—METHODS OF MAKING RIBS

In all primary machines, in nearly all secondary types, and in not a few advanced sailplanes, the wings are generally of the square design. In most machines of Continental designs the ribs are divided into two types:—

- (1) The ordinary wing rib;
- (2) The aileron rib.

The latter is of exactly the same design as the main wing rib, except that space is allowed for the rear spar, the clearance between the wing spar and aileron spar, and the aileron spar itself. This is done so that the aileron and wing can be built up in one, and when the whole wing is finished, the aileron is simply cut off from the rest of the wing. I have found that this is an extremely satisfactory way of ensuring a really good fit, and is, incidentally, much quicker than making the aileron separate. Clubs who are building machines are advised to try the method out for themselves.

Where the English method of construction is adopted (this method was explained in the last issue of THE SAILPLANE) each rib must have its three-ply gussets tacked and glued on each side of the rib. For this purpose it is the general practice to build a jig just deep enough to hold one rib, so that the latter can be taken out and turned over for the completion of the other side away from the jig.

The Continental firms and schools have devised a method whereby as many as 15 ribs can be built at once in one jig, in about a fifth of the time taken by the old method.

Naturally a great deal depends on the construction of the jig. The three sketches which are reproduced show how it is built. Every design of rib must have a special jig built for it, but as there are generally about 36 to 40 ribs in each machine of the same design, it is obviously worth while spending the time on building such a jig. The cost is negligible, and the jig can often be built up of scrap material picked up in any large wood-working shop.

The first important point is that the base-board, on which the jig is going to be built up, should be a good heavy board, and even then it may need to have battens placed across the base to prevent it from warping.

After the base board has been prepared the steps shown in the sketches should be followed.

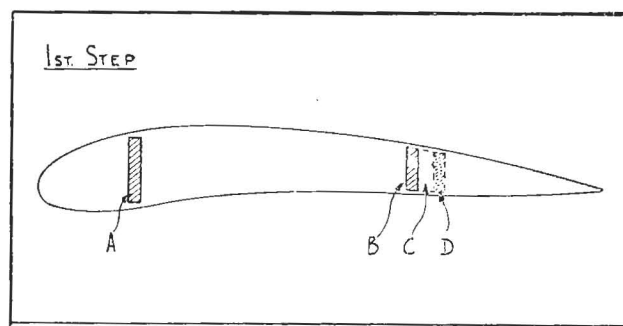
When the jig is completed and the bolts have been fitted for the cramping down of the top batten, the ribs should be built up as follows.

First, a layer of three-ply gussets is arranged on the base board, the gussets being laid in their correct places; their upper faces are then smeared with a light covering of cold water glue. The rib flanges and internal bracing members are placed firmly in position inside the jig for one rib, so that the outside blocks of the jig and the flanges make a tight fit. Cross-bracing members should also be securely fitted round the spars. When this has been done satisfactorily the top layer of gussets is glued on to the rib, thus completing the first rib. Work does not stop here, but proceeds straight on with the next rib, the gussets for which are laid above the top layer of gussets of the last rib, followed by the flanges and internal rib bracing. This goes on until the required number of ribs has been built, when the cramping boards are placed on top, the bolts threaded through and the nuts tightened down, so that a fair pressure is placed on the whole pile of ribs.

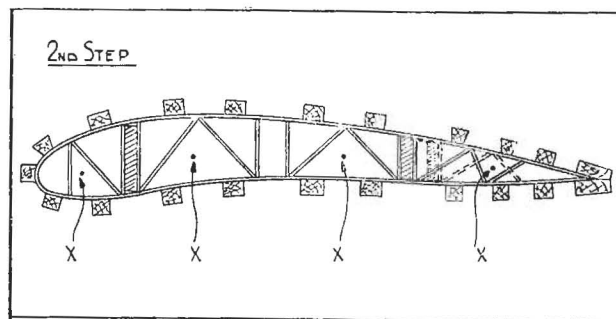
An important point to remember when working with cold water glue is that a good joint depends to a large extent on the amount of **even pressure** which it received while the glue was setting. This point applies particularly to the rib-making method described above.

When the ribs are removed, the overlapping edges of the three-ply gussets are most easily cleaned up by means of a sharp knife.

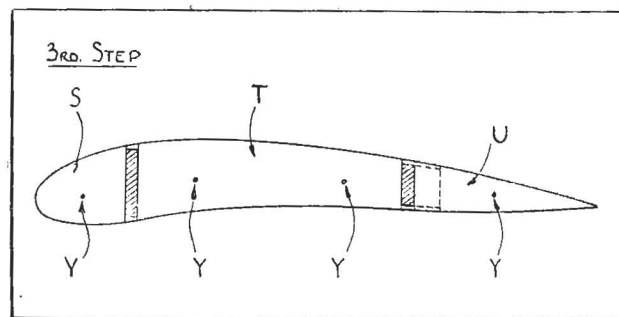
It is the general practice, when making the type of rib described, to make all the three-ply gussets, where possible, of the same shape, as this helps when building up the ribs.



Having obtained a stout board, large enough to take the rib, and leaving clearance for the uprights, the first step is to accurately mark out the profile of the ribs. Having done this, the spar positions must be marked. "A" is the front spar, "B" the rear spar, "C" the clearance between the rear and aileron spars and "D" the space where the aileron spar will come on the aileron ribs. Blocks of wood, being exact replicas of the spars are then placed at "A" and "B," and a moveable block, representing the space and the aileron spar, is cut to size and is attached to the block "B," when aileron ribs are being constructed. The blocks "A" and "B" should be screwed on to the board as firmly as possible. Care should be taken to see that they are at right angles to the main board.



The next step is to mark the positions of the interior cross-bracing as shown in the sketch. Having done this, blocks are fitted as shown, and are screwed on from the underside as were the blocks "A" and "B" in the first step. These blocks should all be fitted absolutely rigid, and at right angles to the board. Great care must be taken to ensure that these uprights will not bend outwards when the ribs are placed in position. The dotted lines in the rear bay represent the cross bracing for the aileron ribs. No block should be placed at any position where cross-bracing meets the flanges, as this makes the extraction of the ribs from the jig difficult. Holes, marked "X," should be drilled in the base board to take the bolts for tightening up the whole.



Three boards, made out of commercial five-ply, should be cut to the shape of the profile, and holes drilled to coincide with the holes in the base board. Quarter inch bolts ought to be used as the tightening bolts. The rear bay board "U" will have to have two made, one for the full rib, and one to fit when aileron ribs are being made.

CORRESPONDENCE

The Editor and Publisher accept no responsibility for the opinions of correspondents

More Time in the Air

Sir,—I have read with great interest your editorial in the issue of *THE SAILPLANE* dated Dec. 18, 1931, where you have discussed very fully the questions of sites and competitions from the aspects of soaring, of prevalent winds, of publicity and of finance. It may be that there is another aspect of the subject which has an equal importance with those mentioned and that is simply "More Time in the Air."

I am only expressing a personal view when I say that I think Gliding is coming rapidly to the stage when it is no longer a casual sport. I visited the International Competition at Balsdean and was surprised at the number of people trying to find this somewhat inaccessible spot. I was still more surprised at the short time that most persons stopped to watch the flying. In fact, I was left with the impression that the public came to learn, or be amused, and went away disappointed. There was so little time spent in the air compared with that on the ground.

The reply to this criticism may be that no reasonable person can expect anything more at the present state of the art of gliding in England. I venture to differ from this view. One saving factor at the Balsdean meeting was the flying of the "DAILY MAIL" two-seater machine which for long periods was in the air for a high percentage of the time that it was available. It was put into the air by towing from a car, and was returned to its starting point again also by car.

What now is the objection to the continuous steady towing of such a two-seater glider? I know of none. The stability of a towed glider can be quite satisfactory and the mathematics has been worked out. It should be tried at first with care, but I would remind readers of *THE SAILPLANE* that gliders have been towed behind aeroplanes for distances up to 100 miles.

Auto-towing is independent of the weather. It could be used for the quicker training of pilots in two-seater dual-control aircraft and would give them an air sense that has at present to be first gained in snatches of about 20 to 40 seconds duration. There are also some manœuvres which can be undertaken during steady towing, a feature that would interest the paying public in the same way as aerobatics of aeroplanes during the intervals between competitions.

When considering therefore sites and competitions I suggest that in addition to seeking contours of the country facing prevalent winds, some attention might be paid to the near proximity of a site, say one mile in diameter, where continuous auto-towing could be practised, first by the expert to find its limitations, next by the instructor for the training of new pilots and later, again by the expert to ascertain whether, thereby some modified form of aerobatics cannot be developed on days of low winds. This would lead both to the improvement of the science of gliding and to the amusement of the public who find gliding meetings dull and who are not a wholly negligible factor, since they provide funds by payment of entrance fees to the ground and thus aid the movement in which we are all interested. "More time in the Air" seems to me to be necessary if gliding is to become a popular sport in this country.—J. L. NAYLER.

Home-Made Air-Speed Indicator

Sir,—I am grateful to Mr. Hiscox for the information contained in the last issue of *THE SAILPLANE* but, unfortunately, I find myself in very much the same position as formerly.

The instruments described in "Gliding and Sailplaning" are not of the tube type and, secondly, sizes, materials, gauge of spring, etc., are not given. Although I am the designer and constructor of three gliders I find it extremely difficult to tackle the standard Moth type of indicator which, Mr. Hiscox states, should be "easily constructed."

Since first writing to *THE SAILPLANE* I have obtained an air-speed indicator for my own use but I am sure other readers would welcome an authoritative article on "How to construct the standard Moth type of indicator" with diagrams, dimensions and materials to be used.

A. H. KNOTT.

"A Beginner" Replies to Dr. Slater.

Sir,—Doctor Slater cannot be altogether serious; the following facts are well-known by him.

In an attempt to turn such machines as a ZOGLING, bank appears to be appreciably more important than rudder. That is to say, if literally no bank is applied, application of the rudder has practically no effect whatever, even at full flying-speed.

If the left wing is depressed at full flying speed and if then **top** rudder is applied, two conflicting forces seem to act; a turn to the right caused by ordinary rudder action, and a turn to the left caused by side pressure on the excess vertical surface aft, which pushes the nose to the left into the side-slip. The nett result is a glorious slither to the left.

If, then, the machine is **partially stalled** near the ground and the left wing drops, application of top rudder will be more futile than ever. At best it will merely emphasise the side-slip by holding up the nose.

On the other hand, application of bottom rudder will help the side-slip pressure aft to twirl the machine round, using the lower (and grounding) wing-tip as a pivot. Whether or not the wind will then get under the upraised wing, and blow the whole machine to kingdom-come, depends upon the ferocity of the wind. If the wind is so strong, then only decent pilots will be flying—and a decent pilot is one who would avoid such a ridiculous situation as is now being discussed.

In any case a violent twirl round on landing is definitely less likely to write off an elementary machine than a side-slip. A side-slip landing, as I know very well, breaks auto-towing undercarriages, dog-ears wing-tips, cracks ribs, and splits struts.—"A BEGINNER."

Training Sailplane Pilots

Sir,—In reply to "D.C.'s" letter in defence of the ZOGLING, I hasten to claim exoneration from any inference on my part that the London Gliding Club is turning out inefficient sailplane pilots. On the contrary, all praise to that Club's worthy instructors for turning out such proficient pilots by such (as I still maintain) an inefficient method.

Please note that my criticism of inefficiency was levelled at the method of training and not the resultant trained pupil.

Proficiency may be obtained albeit inefficiently. "D.C." appears to be confusing efficiency with proficiency. The former is a ratio—and in this case I took it to be that between the proficiency of the pupil trained to the amount of effort required in the form of manhandling and general work on the ground.

Secondly, the fact that instruction by shouting upwind through a megaphone is the order of the day, bears out my point about the shortness of range of the flights.

Thirdly, an ab initio pupil, with the knowledge that a capable instructor sat immediately behind him, would never become so panic-stricken as to be sufficiently ham-fisted to endanger both their lives. Woe betide such an one flying solo! Dual instruction in a sailplane would be no more dangerous than dual in a power-plane where one is really going fast enough to hurt oneself.

Fourthly, many sailplane pilots regard flying "from the top" as much more dangerous than skimming over the surface of the ground and obstacles thereon at a "safe" height, and such pupils may be perfectly safe until they see a vast emptiness beneath them.

One understands that Mr. Longmore is launching out on dual instruction and it will be interesting to hear his comparison. The success of dual instruction would depend upon the sailplane's definite ability to soar in anything from a light breeze upwards. Without that—and so time-in-air advantage—dual would be no advance on the present ZOGLING methods.

When our sailplane manufacturers can provide our Clubs with a two-seater of PROFESSOR-like performance, CRESTED-WREN-like dimensions, and at KASSEL-like price, I do not doubt that ZOGLING days will be practically over.

L.P.M.

A "C" Pilot's Grievance

Sir,—Having been given:—(a) by the club instructors, patient instruction ad libitum; (b) by the club, the use of an efficient machine; (c) by Providence, a steady and cheese-like wind; (d) by Heredity and/or environment, a sense of opportunism; (e) by the club oracle, the exact course and air-speed; I have inadvertently, miraculously, prematurely and, to my eventual grief, stumbled through my "C."

According to the tenets of gliding etiquette I am now condemned (quite rightly) to leave the ground only once in a blue moon, so that other and less lucky members may be left unimpeded in their struggles to cross the official Rubicon.

Prior to the fatal "C" flight, my flying-time was about ten minutes, excluding ground hops; my reliability and ability are proportionately negligible. But, in the absence of excessive importunity and egotism, I get no more flying so long as there is a "B" pilot ready to use the machine. Conversely, if I were asked to use any machine, I should be so embarrassed by stony looks that I should undoubtedly stall and crash.

In return for this horrible state of affairs I am entitled to wear three birds, volant, on an azure ground, in my button-hole. Apart from the comic side of it, this is no better than the fate of the Ancient Mariner, who, having shot the albatross, was condemned to wear the corpse round his neck night and day, and to be a social outcast.

Here we have the full curse of the "C." Here, also, we have the reason why three-quarters of the club members who have struggled through, non-stop, to their "C," suddenly or gradually fade out of the movement and return to their unrestrained sailing, equestrianism, skittles, or other form of moutons.

In a better world all the certificates would be matters for mild interest only, and would **not** be the entire raison-d'être of gliding. "B" pilots and "C" pilots, like the lion and the lamb, would lie down peacefully together, would ignore the surplus bird (volant), and would share and share alike in whatever launches and in whatever

machines that were going.

The results of the present inflated status of ticket-hunting are:—

- (a) Club members are frozen out just at a time when they are becoming soundly interested in soaring flight;
- (b) Apart from the occasional performances of the handful of skilled club aristocrats, the average standard of club-flying is kept down to "B" level;
- (c) The Clubs have to rely upon a stream of newcomers sufficient to replace those members who fade away after going through the official mill.

The remedy is **not** private ownership. The remedy lies solely in the deflation in the importance of these wretched certificates.

Private ownership can be an excellent thing if made semi-public; but normally it is altogether cramped by lack of hangar-accommodation, by the need for so much assistance in handling and launching, and by the fact that club-work must not be obstructed by the machines and machinations of individual aeronautical fanatics.

Briefly, sir, if you take up gliding under existing circumstances, retain your friends and your normal share of the launches, without embarrassment, by carrying a stopwatch and by returning to earth punctually at 4 minutes 59 seconds.—"C" PILOT.

TWO QUESTIONS FOR CLUBS

- 1.—Do you send your Club News regularly to THE SAILPLANE?
- 2.—Is every Member of your Club a subscriber to THE SAILPLANE?

SOLID ACHIEVEMENT

On August 24th, the 'Tern' set up an official British Distance Record of 8.3 miles, flown by Herr Magersuppe.

On September 27th the 'Tern' set up an official British altitude Record of 780 feet above the starting point, flown by Major H. Petre.

On October 4th the 'Tern' won the Rig and Fly contest at the International Gliding meeting in 3 minutes 36 seconds with a crew of five men. No previous practice had been made for this event.

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FROM HERE and THERE

THOSE POWER WIRES

The sight of high-tension wires within PRUFLING distance is familiar to more than one gliding club, but so far no one seems to covet the honour of being the first to try conclusions with them, least of all those who assert that anyone who did so could come to no harm. Rather than put the matter to the test, a pilot at the recent Elmira meeting chose the lesser evil of zooming up so violently as to break off one of his wings.

The question has now been put to the proof, and Sidney Carlson, aged 14, of Sea Cliff, N.Y., has lived to tell the tale. Sidney borrowed a friend's primary and stalled it into a mixed assortment of telephone wires and power-cables. The photograph published in "Popular Science" shows him clasping the skid in fond embrace, while the machine dangles from its left aileron, round which the wires have caught. His rescuers, however, remained unconvinced, for they waited half an hour for the "juice" to be cut off before they went up after him with a ladder.

* * *

POLES ASUNDER

From the same journal comes the latest in fool-proof teaching devices. It is a light aeroplane suspended from a cable 1,000 ft. long stretched between two 50 ft. masts. A second cable prevents it crashing into the pole at either end. A photograph shows the machine doing a lap, well away on its journey from pole to pole.

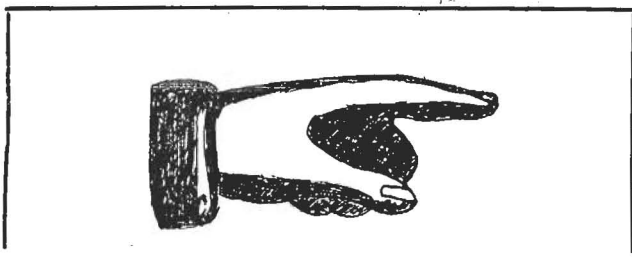
Why not adapt the scheme for gliding? Ah! that is necessary is to lower the cable at one end and then, before the glider has got there, haul it up the mast again and let down the opposite end (high tension cables should **not** be used, even if available!). With the apparatus in full swing (literally), any child could do its stuff; nor need its anxious parents turn a hair as they watch their fledgling's efforts to "find its wings." Sir Gilbert Walker's theory, that we might fly as well as the birds if we only began young enough, could then be put to the proof at last.

* * *

HIRTH FLIES BACKWARDS

The pilot who, as reported in THE SAILPLANE, kited up his glider on a cable without outside assistance, will have to look to his laurels, for Wolf Hirth, at Grunau, has gone one better and dispensed with even the cable. On Nov. 7 last, with the wind blowing between 36 and 45 m.p.h. (gale force), he zoomed up his D-STANAVO from a standing start, entirely without help. He then rose 300 ft. and proceeded to fly backwards for about 200 yards, after which he gave chase to his rapidly receding starting-point and got back within 10 yards of it, coming down vertically without a landing run, in the best Autogiro manner. A large gathering of newly-arrived pupils was duly impressed.

FLUGSPORT, in reporting the incident, points out that this style of take-off has been done many times before, even on primary machines; Hirth himself did it on a HARTH-MESSERSCHMITT glider in 1922. It is not, of course, unknown for a glider to perform the feat without the assistance of a pilot at all.—A.E.S.



NEWS FROM THE CLUBS

(Club News will always be welcome, but owing to the limited space available, contributions should be confined to items of outstanding interest and irrelevant matter should be excluded. News items should reach the Editor not later than the first post on the Monday preceding the date of publication.)

PORTSMOUTH AND SOUTHSEA GLIDING CLUB.

Having been through good times and bad, the Club is now in the enviable position of being crowded with safe and efficient pilots. We feel, therefore, that we should spare a hand from the Repair and Construction Department to take up the pen in lieu of the glue brush.

Sunday, Nov. 29.

In order to encourage the reading of THE SAILPLANE, one of our members offered to give a prize of a year's subscription to the paper for the adjudged best flight of the day. This was won by R. E. Clear, the "baby" of the Club (who recently obtained his "A" Certificate) with two very good steady flights of 25 secs. each. Wind—nil. Total launches, 12. Another good flight was also made by Allen.

Sunday, Dec. 6.

In spite of a favourable forecast, the wind refused to play, and blew due East so nothing startling occurred. Nevertheless, good flights were accomplished by G. Lympany and Cooper. An attempt on a 45 failed by 2 secs.

The chief topic of conversation was the B.A.C. IX about which we cannot find out too much, or shall we say enough. Wind—nil to light, East. Total launches, 12.

PRIVATELY OWNED SAILPLANES.

Provided that it does not entail any liability and that normal club activity is not interfered with, the Portsmouth and Southsea Gliding Club wish to extend an invitation to private owners who would like to try their site on Portsdown Hill any Sunday afternoon. It is a very excellent site, Herr Kronfeld having remained up at will for over 1½ hours on his visit to Portsmouth last year.

There is always a crowd of spectators on the Hill in the afternoon, from whom willing launching teams can be recruited. Also, there are usually three or four members on the site from 1 p.m. to 2 p.m. who would willingly help to assemble and rig a machine. Choose a day with a Southerly wind, and if possible warn our Mr. R. Yates, "Falkland," Sandford, Bordon, Hants, who is dealing with this matter.

SOUTHERN COUNTIES SOARING CLUB.

Sunday, Dec. 20, 1931.

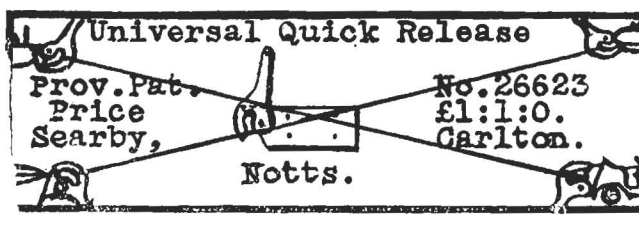
What ought to have been a real "bumper" day developed into something of a fiasco.

It was decided to send off two ab initios to try for their "C's." The first one got too far out on his turn after launching, overshot on his way back, got clear again, but then didn't go far enough up the ridge before turning, so when he arrived back at the home end with too much air-speed and not enough height, he decided that discretion was the better part of valour, and retired into the bottom.

The second made his first leg satisfactorily, but on his way back got too much over the crest of the hill, was caught in the "burbles" and hit the deck sideways, with disastrous results. The machine being beyond immediate repair with the resources at our disposal, we put it away, and set to work on the PRUFLING, which has been unused for some time owing to failure of the rubber blocks

PATENTS.

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on the skid. Repairs were effected and the machine assembled. We had just got the wing on when a black kitten emerged from one of them. On further investigation we found three more. Do what we would, nothing would shift them and eventually the machine was dismantled and put away with the kittens still in situ.

While this was in progress, the B.A.C. team arrived, after many wayside troubles, and set to work to rig the VII, which had been advertised locally as going to perform another loop. Considering the weather, there was a distinctly good turn-out of spectators and the Club's effort with the kittens provided no small amount of amusement.

The B.A.C. VII was now ready and Longmore took off, but the towing cable broke, and he had to land straight away. The second attempt was better, everybody declaring they had never seen a cleaner or "tighter" loop by anyone or anything. This time he was easily able to land on the top. His flight was timed, from the dropping of the cable to landing at 41 seconds!—G.A.L.

LONDON GLIDING CLUB.

Dec. 20, 1931.

The day was cold, muddy and misty; also there was a flat calm.

Hand-launched ground hops were given, many members being introduced to machines which they had never flown before. ZOGLING, DAGLING, PRUFLING and PROFESSOR were used. Several new members made a start. Just before dark the DAGLING was taken up to the top of the hill and Miss Churchill obtained her "A" with a steady straight flight of 35 secs., and a neat landing up-hill.

Dec. 26, 1931.

Wind conditions were excellent, but possibly owing to "that Boxing Day feeling" there was rather a poor attendance. The PROFESSOR was soared by Symmons, Morland and Needham and the KASSEL 20 by Dent and Buxton. In attempting his "C," Grice tried to hold up the PRUFLING after he had lost the rising current with the result that he landed on the hill side and broke two struts.

Dec. 27, 1931.

The wind was, if anything more perfect than on Saturday. Buxton led off by sailing the KASSEL 20, but in landing on the top of the hill, damaged a leading edge against a thorn bush; a temporary repair was quickly made. Dr. Hall, of Watford, did a nice qualifying flight of 56 secs. in the DAGLING, and this he followed later in the day by a "B" flight of 15½ minutes in the KASSEL, with a voluntary landing on the top (He may be taking his "C" any day now!). The PROFESSOR was soared by Symmons and Morland. The latter damaged a skid in landing across wind to avoid some earth works. After a temporary repair, Buxton took it off and after wandering around in his well-known manner landed it at the hangar door at dusk. Miss Nicol made two flights in the KASSEL, and finally Dent took it off in a truly hair-raising manner, made a perfectly good flight and damaged the machine by landing across wind. Meanwhile, Dr. Slater ("B") and Hedges ("B") each made flights of over a minute in the DAGLING, and Miss Churchill ("A") went off with it, lost her hat, forgot how to turn and landed many fields away after a flight of one minute. In attempting to fly the DAGLING back to the Club ground, Smith roosted in a hedge so it was carried back by hand.—D.M.

ROYAL AERONAUTICAL SOCIETY

MEETING OF THE YEOVIL BRANCH

On Dec. 10 some 45 Members of the above Society listened with interest to a lecture given by Mr. Ashwell-Cooke, Chairman of the London Gliding Club, on the "Gliding Movement in England and Germany."

Mr. Ashwell-Cooke had recently visited the Wasserkuppe and was therefore able to describe from first-hand knowledge the 1931 competitions.

He also showed interesting slides of the different machines taking part, and touched upon the differences between the organisations in Germany and in England, expressing the opinion that we ought to have a similar

OFFICIAL NOTICES

DIARY OF FORTHCOMING EVENTS.

Monday, Jan. 18, at 6.30 p.m.—Council Meeting, British Gliding Association.

Monday, Feb. 22.—Annual General Meeting, British Gliding Association.

THE IMPERIAL COLLEGE GLIDING CLUB.

The following Lectures will be held jointly with The British Gliding Association, in Room 15, The City and Guilds (Eng.) College, Exhibition Road, South Kensington, at 6 o'clock. Visitors will be welcome.

Thursday, Jan. 28.—Mr. C. H. Barnes, "Indoor Flying Models." Chairman—Professor F. T. Hill. (Joint Lecture with T.M.A.C.).

Wednesday, Feb. 10.—Mr. F. Entwistle, B.Sc., "Some Aspects of Meteorology in Relation to Gliding and Soaring Flight." Chairman—Col. H. T. Tizard, C.B. (Joint Lecture with City and Guilds Engineering Soc.).

Monday, Feb. 29.—Mr. C. H. Jackson, "Flying Boats on Commercial Air Routes." Chairman—Capt. G. T. R. Hill.

EXTRACTS FROM PROCEEDINGS OF COUNCIL MEETING OF THE BRITISH GLIDING ASSOCIATION, HELD ON DECEMBER 21, 1931.

Present:—E. C. Gordon England (in the Chair), P. Adorjan, J. R. Ashwell-Cooke, Lee Roy L. Brown, D. E. Culver, F. Entwistle, R. L. Howard-Flanders, A. F. Houlberg, L. O. Kekwick, C. H. Latimer Needham, G. R. Paling, A. N. Stratton, H. Ward, S. Whitborne (Hon. Treasurer) and the Secretary.

Technical Committee's Recommendations. The recommendations regarding power launching were approved.

Constitution of the B.G.A. The proposed Rules of the Association and also the Rules for Clubs were referred back to the Rules Committee for further consideration and for submission to the Registrar before being brought before the Council for ratification.

Finance. The Balsdean accounts were approved and the Secretary instructed to pay money due to Clubs subject to any debts due to the Association being deducted therefrom.

Glider Pilots' Certificates. Pending further consideration of the minimum age of candidates qualifying for Glider Pilots' Certificates it was decided to ask the Royal Aero Club to grant Certificates to persons over 14 years of age.

It was decided that, on and after Jan. 1, 1932, Official Observers shall send a copy of their reports on successful qualifying flights for Glider Pilots' Certificates to the Secretary of the B.G.A. within eight days of the date of such flights.

Membership of the B.G.A. Mrs. F. C. Shelmerdine and Mr. F. Tynms were elected.

centralised school of Gliding in this country where Members of the various Clubs could meet, at least once a year, for concentrated fixing, and where those who have time at their disposal could spend the necessary time for studying Motorless Flight, both from the actual flying and the constructional and theoretical points of view.

At the conclusion of the lecture a film was shown dealing with the German competitions of 1930—1931 and, in addition, a further film (which had been borrowed for the occasion) dealing with "Gliding Activities in America." This latter film was kindly lent by P.D.C. Ltd., 12 Great Newport Street, W.C.2., and any Clubs interested would be well advised to get in touch with the owners with a view to showing it in connection with any other films or lectures which they may be arranging.—V. S. GAUNT.