November 11th, 1932. Vol. 3, No. 20.

THE SAILPLANE & GLIDER

Official Organ of the
British Gliding Association

6D



BOOKS ON MOTORLESS FLYING.

Kronfeld on Gliding and Soaring

by Robert Kronfeld.

The most interesting and informative book on the subject that has yet appeared in English. In addition to detailed accounts of famous flights, including those by the author, it contains chapters on elementary schooling; high performance flights; distance, cloud and thunderstorm soaring; auto- and aero-towing; and the design and construction of high efficiency sailplanes. A book that will appeal alike to beginners and to the advanced. 21/9 post free.

Sailplanes

By C. H. Latimer Needham.

A comprehensive treatise dealing with the design, construction and pilotage of Sailplanes. Indispensable to everyone who intends to take up gliding seriously. 15/9 post free.

Motorless Flying

Edited by J. R. Ashwell-Cooke.

A comprehensive handbook written by authors well qualified to deal with their respective subjects. It includes chapters on elementary and advanced flight instruction; construction, repair and maintenance; auto- and aero-towing; elementary aerodynamics; and meteorology. 8/- post free.

Gliding and Sailplaning

By F. Stamer and A. Lippisch.

An excellent handbook for the beginner. It represents the collective results of the writers' experiences since 1921, related in a clear and simple manner, and is admirably illustrated.

5/6 post free.

Gliding and Motorless Flight

By L. Howard-Flanders and C. F. Carr.

A practical up-to-date handbook giving expert information regarding training of pilots, organization of gliding clubs, construction and repairs, meteorology, etc.; with interesting facts regarding past achievements and pilots, and official information regarding Certificates. Second edition.

8/- post free.

Henley's A.B.C. of Gliding and Sailflying

By Major Victor W. Page.

A simple and practical treatise on modern Gliding. It describes the construction, launching and control of the leading types of gliders and sailplanes and gives instructions for building a strong, yet simple, primary glider, including working drawings. 11/- post free.

Obtainable from the SAILPLANE OFFICES: 43, Chancery Lane, London, W.C.2.

THE SAILPLANE & GLIDER

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

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

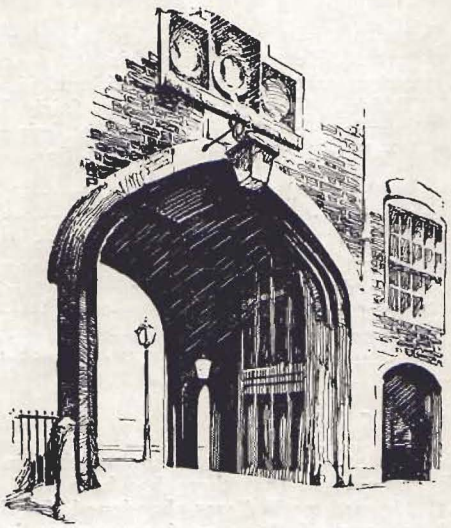
OFFICIAL ORGAN OF THE BRITISH GLIDING ASSOCIATION.

Editor: F. ENTWISTLE.

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

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

Vol. 3. No. 20. November 11. 1932. **Published on the 2nd and 4th Friday in each month. Price 6d.**



The offices of "The Sailplane & Glider" overlook this famous old gateway, the Chancery Lane entrance to Lincoln's Inn.

CONTENTS.

	PAGE
Editorial: On Hibernating	229
Motorless Flying Training over Level Country: *Georges Abriat*	230
A Trailer for the *Scud II*	232
A few Constructional Details: *V. S. Gaunt*	233
Bird Flight II: *Capt. C. H. Latimer Needham*	234
News from Overseas	235
Sailplanes and Parachutes: *Robert Kronfeld*	236
A Note on Rain: *S.H.*	238
Correspondence	238
News from the Clubs	239
Official Notice	240

ON HIBERNATING.

The last two issues of THE SAILPLANE have seen a regrettable falling off in the amount of Club News. So much so that in the last number, for the first time in the journal's history, we had to take down the usual heading, "News from the Clubs," and replace it by "London Gliding Club News." Such an early indication of the approach of winter conditions is by no means encouraging. Last year emphasis was laid, in these columns, on the fact that gliding is an all-the-year-round sport, and during the winter of 1931-32 a sufficient number of clubs continued their activities without a break to ensure that the Club News section was never empty.

The London Gliding Club is now sufficiently established and has sufficient members to ensure its continuation, and we look forward to seeing the recent performances which have been put up at Dunstable exceeded, even during the winter. We know that several other clubs, who are less fortunate, are severely handicapped by lack of funds and, until the future of the British Gliding Movement is assured by a subsidy or other financial support, uncertainty must prevail and tend to curtail activities. It is to be hoped, however, that these Clubs will not be discouraged during the time of waiting, but that they will use such resources as they possess to keep in practice during the winter. The long evenings may be spent profitably in constructing machines ready for the more favourable season and, during the next few months, THE SAILPLANE will endeavour to assist these activities by publishing suitable articles on construction.

The present time is one of difficulty for everybody. But the Gliding Movement will not be helped by people becoming discouraged and giving up. We now know enough about the problem to realise what we are up against, and the only helpful spirit is to pull ourselves together and show our determination to carry on. If hibernating has to be, let it be profitable.

MOTORLESS FLYING TRAINING OVER LEVEL COUNTRY.

By GEORGES ABRIAL.
(President of the private Gliding Group *l'Air*.)

When, in 1928, the intensive development of motorless flying in Germany became known in France, it produced a feeling of astonishment that, apart from certain isolated experiments, nothing of a co-ordinated nature existed in our country. It was the function of *l'Avia*, which was founded shortly afterwards, to develop and distribute a type of primary training glider. Under the impulse of this organisation numerous groups were formed with enthusiasm, mostly at the centres of the regional aero clubs. Every Sunday, on the French sites, a II. A was launched (shock cord launching) to land again after a short hop in the case of pupils, or after a flight of a 1,000 feet for those who were progressing towards their "A"'s. This primitive shock cord launching did not, however, carry one as far as the "A" certificate (since we had rightly adopted the German regulations). Further, it necessitated a launching crew of from ten to fifteen persons, often difficult to assemble. Apart from the effort associated with this method of launching, it tended to empty the coffers of the clubs, and, a more serious matter, gave such an acceleration to the glider at the start that beginners' training in these abnormal conditions became an impossibility.

It will be understood that the above remarks refer to flights over level country, which is the general case in France, for at the summit of a slope, the shock cord, which serves only to launch the glider, retains all its simple qualities, while on a limited slope it is still the only practical means of securing a free take-off. The present article is concerned with the means of carrying out motorless flying, not in mountainous centres which are necessarily limited in number, and where only a few weeks of annual holidays can be spent, but on the outskirts of towns, on any site (flat for preference), where, every Sunday and public holidays, training can be pursued to the highest degree. The establishment during the last year or two of flights with a winch on the one hand and aeroplane towing on the other, has now enabled us to establish a programme in which every club which is sufficiently organised to construct or purchase the necessary equipment can instruct its members from the first beginner's hops right up to performance flights.

The programme consists of two stages, which will be dealt with separately.

I. Beginners up to and including the "B" Certificate.

The equipment consists of a winch adapted for use with a car of 15 h.p., and a primary training machine of the type in current use. It is necessary, however, to adapt the glider to this type of flight, duplicating the wing bracing wires, add wheels to facilitate taking off and regulate the clutch of the car winch; fix the cable hook, no longer at the front, but at the side of the structure, as near as possible to the centre of gravity, in order to avoid the critical moment, when the glider approaches the winch and, above all, to take all possible precautions, so that the cable cannot catch on any part of the glider; this is accomplished by enclosing the cable in a casing, with an opening to permit the passage of the ring at the end of the cable. Finally—an indispensable precaution—it is necessary that, at any time during the flight, and particularly during the pull, the hook can be opened voluntarily to release the cable.

All these small improvements are the result of experience, and *l'Air* has found for each of them a solution which, though it may not be perfect, gives in practice every satisfaction. *L'Air* will be pleased to answer any questions as to details. Another necessary precaution is to strap the pilot to his seat, not by a simple school belt, but by an instaneous release belt *with straps securing the body*. Such a belt is easy to make and only costs a few shillings. So much, then, for the equipment.

The method of procedure consists in making the pupil accomplish short glides of the order of 300 to 500 yards. At the start one instructor advises him while a second qualified instructor operates the winch. At the launch the pupil must hold the stick neutral in order not to risk an excessive speed, look straight in front of him and only make very small movements after due reflection. This advice should be repeated continually by the instructors.

From flight to flight the pupil makes progress and gains confidence. He can obtain his "A" certificate from the moment when he attains, without difficulty, a height of 300 feet. This necessitates a fairly long site (about 1,000 yards), for the pupil, not yet being able to turn, must climb and glide in a straight line.

As soon as the "A" certificate is obtained, the instructor continues the pupil's flights, but introduces slight turns to right and left, so as to describe an "S," the turns being at first open but afterwards more accentuated. Then, on a fine day, the cable is extended further, and the pupil is sent to 500 or 600 feet, and is instructed to make a complete circle, so as to land at the starting point. From that moment the 3 "B" tests can be easily carried out.

Second Stage: "C" Certificate.

This is the point which we have now reached in France. It must be recognised that there has been real progress since the shock cord method was abandoned, for the winch only needs a crew of three or four persons instead of fifteen, while the flights have increased ten-fold in importance. If the "C" Certificate is desired it is necessary to seek the ascending currents associated with hills, to instal oneself near a suitable site for some weeks, in order to secure a few days with the wind in the right direction and of a suitable speed. Let us state our opinion at once. This solution is the best one when the

SCUD II SAILPLANES £135
complete with C. of A. & A.S.I.
TRAILER Complete with waterproof cover and brakes £31 10s.
Detailed drawings & licence for one machine £8 8s.
Sets of finished parts . . £67 10s.
E. D. ABBOTT LTD. FARNHAM, SURREY.

HANGARS For SAILPLANES and GLIDERS
(As supplied to the London Gliding Club).
In Complete sections for easy erection or removal. Size 50 x 30 x 8ft. : £107 10s. Any size to order.
G. ELLIS & Co., GAINSBORO ROAD, HACKNEY WICK, LONDON, E.9
Telephone : Amherst 1091 (4 lines).

"MALLITE" or "APPCO" WATERPROOF
SPECIAL GLIDER- **PLYWOOD**
Manufactured by the
AERONAUTICAL & PANEL PLYWOOD, Co.,Ltd.
218-226, Kingsland Road, London, E.2.
Telephone: BISHOPSGATE 5641.

group is situated in proximity to mountainous country, where those who combine usefulness with pleasure can go with their equipment during the holidays (although, in practice, it is difficult to arrange that 10 or 15 members of a group can take their holiday at the same time). Hill flying is the oldest form of motorless flying; it seems to be reserved for groups either privileged by reason of residence or having money and leisure to await the good will of Eole (the god of winds).

Have we, then, reached a dead-lock? It would appear not if we consider the latest discoveries regarding cloud and thermal up-currents. "But," you will say, "this is only reserved for the aces for motorless flying, Kronfeld, Hirth. . . ." That is true, but, nevertheless, we are not debarred from seeking a practical application from the point of view of advanced training in motorless flying. This is how at *l'Air* we have established a future programme which, in our view, is capable of realisation in the near future.

After the "B" certificate has been obtained, as described above, on an ordinary machine, training would be carried out on a two-seat intermediate machine, constructed specially to stand the stresses imposed by the winch; in this way the young pilot would learn how to handle a machine having an L/D ratio of 15 or 16, first with an instructor, then flying solo. Landing with such a machine could thus be accomplished without risk with the winch, which permits of altitudes of 1,000-2,000 feet being obtained, according to site and wind.

After this, the same glider, towed by an aeroplane, would enable the pupil to become trained in this type of flying, the instructor accompanying him to teach him the use of clouds after reaching 3,000 or 3,500 feet. Then, one fine day, the pupil would be launched solo in towed flight, and, following the instruction previously received, would make his way under a cumulus cloud, whither the pilot of the aeroplane would lead him, and, apart from mishap, he would remain in the air for at least five minutes at a height above the point of release in order to obtain his "C" certificate. Contrary to what one might think (and this has been my own opinion till recently), flight under the clouds is easily accomplished. Indeed, in suitable weather, the result is semi-automatic and demands less manœuvring and decision than hill flying. Further, the risk of crashing on landing is very much reduced since it would be easy to land at the aerodrome of departure.

The sequel to this accomplishment, as regards carrying out distance or altitude flights, would depend on the quality of the individuals, but it is certain that by leading the majority of a club's pupils up to the "C" Certificate in the manner indicated, facility in the use of equipment and emulation can give us, in a very short time, a number of good pilots such that we shall have no cause to envy foreigners

But, it may be argued, the main thing is lacking: equipment would be fairly costly. We have thought of this aspect of the question and *l'Air* has developed a two-seater endowed with all the improvements that our experience in winch flying and aeroplane towing has indicated Its flying qualities would be sufficient for instructional purposes and, with one person only on board, it is developed to soar easily under the clouds. The constructional details are practically completed and can be communicated as soon as an experimental machine has been built and tested.

As to the towing aeroplane, this can be one of the training machines of the Aero Club to which the group is attached. But the more general case will be that in which a club carries out its training at the base of a military unit. Orders have already been issued to facilitate the training of groups on these aerodromes. We believe that it will not be impossible to arrange with the Air Force for certain training aircraft at these centres to be fitted with towing equipment (which is not costly nor complicated, and can be dismantled in a few minutes) and placed, together with the services of a military pilot, at the disposal of the local group. It would be understood, of course, that in each case the Commanding Officer of the unit would satisfy himself as to the airworthiness of the club's gliders, the seriousness of the management and the capacity of its pilots. Such State asistance would only cost some gallons of fuel, while it would open up for French motorless flying considerable possibilities. We think that this assistance can reasonably be sought in the near future for towed flight, it may be stated, offers no special difficulty; to follow the towing aircraft is only a matter of attention and for the pupil trained at the winch this type of flying would form a relaxation especially if he made the first towed flights dual.

Of course, the two-seater developed for these flights could also be used on slopes or mountains. If it is agreed that such a machine is well adapted to the various stages of our training programme, all financial efforts of the group can be concentrated on this single machine. It may be observed that if winch flights present certain risks, especially when the pupil commences to fly at a good altitude and attempts his first turns, the same two-seater could be used in the early stages of the training, which could be carried out usefully with an instructor, the duration of the flights being normally four to five minutes with the glider contemplated. Experience alone will show whether this method of dual control with a performance machine is more rapid than on a VEAU single-seater. It appears, in any case, that there would be a gain in security.

Such is the programme that *l'Air* wishes to see realised in France, for performance flights which have hitherto been exceptional would become more general. We are approached too often with being at the era of the hops of domestic crickets. We are indicating a means of emerging from this state without being faced by the necessity of obtaining numerous or costly gliders. The combination of dual control with winch launching, followed by towed flight, presents the possibility of effecting important flights in safety and without anxiety as to the relief of the ground and the direction of the wind, at the same time diminishing the risk of accidents Towed flight permits us to make a graceful *rendezvous* with the cumulus clouds: let us be gallant enough to profit by it!

CELLON DOPE

FOR

SAILPLANES and GLIDERS

Cellon Ltd., Upper Ham Road, Kingston-on-Thames

'Phone No.: KINGSTON 6061. Telegrams: "AJAWB, PHONE, KINGSTON-ON-THAMES."



The "Scud II" in flight at Dunstable on Sunday, October 30th. The flight was carried out in a gale and Mr. G. M. Buxton, the owner-pilot, attained a height of 1,500 feet.

A TRAILER FOR THE "SCUD II."

A very ingenious and really excellent trailer has just been designed by Mr. Baynes and constructed by Messrs. E. D. Abbott, Ltd., for the SCUD II. to replace the temporary one that was made prior to the flight trials.

The framework, of triangular section, forms a rigidly braced structure: the result is an exceptionally strong and light body, 5 ft. wide by 5 ft. 6 ins. high by 17 ft. 6 ins. long, roughly of triangular shape when viewed from the end, giving extremely low frontal area and thus reducing wind resistance. At the same time it is light enough to be towed by a Morris Minor.

The fuselage is carried in its normal position; each wing supported on padded shaped rests; elevators and centre section are all carried in padded rests rather than on metal fittings, to minimise time when erecting and loading.

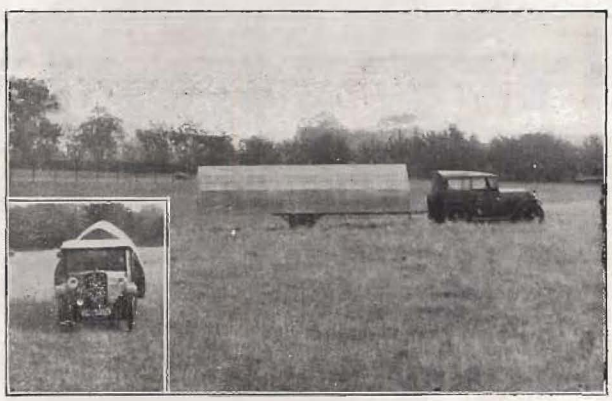
The trailer has just been finished, but it already shows that it runs very smoothly when towing and that the automatic brake works satisfactorily, while the climate has not failed to make a test of waterproofness, through which it came with flying colours. In fact, it is all that a glider trailer should be.

The price of these trailers, with waterproof cover and automatic brake, is £35 each.

SCUD II Sailplanes.

Attention is drawn to the advertisement in this issue of SCUD II Sailplanes. Messrs. E. D. Abbott, Ltd., the enterprising manufacturers of this fine machine, ask us to point out that substantial reductions have been effected in prices owing to the fact that they have manufactured a number of them for stock instead of building to order as at first intended.

It is hoped that many aspiring glider-owners will be able to take advantage of this practical effort to help them to the speedy realisation of their desires. Detailed drawings are supplied for those who wish to build their own sailplanes, or sets of finished parts may be had by those with lesser ambition or ability who may like to erect them. For the busy man the complete machine is offered at a very attractive price.



The new "Scud II" trailer in tow behind Mr. Buxton's Morris Minor

A FEW CONSTRUCTIONAL DETAILS.

In the issue of THE SAILPLANE of September 23rd, a letter appeared from Mr. Godfrey, enquiring for information regarding the sizes of pilot holes that should be drilled for certain sizes of screws, and as I have not yet seen any reply to this letter, I thought it might be of interest to give you my views, as I do not know of any hard and fast rules, such matters being left usually to the discretion of the experienced workman.

In the case quoted, where it is desired to screw through ⅜-inch of spruce, and 3/16-inch of plywood into ⅜-inch of spruce, I would propose to drill through the top layer of spruce and ply with a ⅛-inch drill to give the necessary clear hole for the screw shank No. 4, but not to drill the bottom layer of spruce at all.

Spruce is a very soft timber, and in many cases where the depth does not exceed ⅜-inch there would be no need to drill a pilot hole for the screws normally used in aircraft and glider construction.

Theoretically it is, of course, very desirable to have exact sizes of drills, but it is very difficult to ensure that the workman will always use them, and, after all, the main thing is to ensure a good glued joint, treating the screws as quite secondary from the point of view of strength, their use being mainly required for their clamping effect until the glue sets.

In the case of hard wood, the following is a suggested table of drill sizes for different sizes of screws: (a) gives the size for the clearance hole in the top one, or two members, and (b) the size of the pilot hole into which the screw taps itself, but the depth of the hole (b) need only be half the depth of the screw engagement.

Size of screw.	*Hole (a).*	*Hole (b).*
1.	1/16″	1/32″
2.	3/32″	1/16″
3.	7/64″	5/64″
4.	1/8″	7/64
6.	5/32″	1/8″

If duralumin screws are being used, then in that case it would be advisable to drill the bottom layer of spruce as these screws are liable to break otherwise.

The ideal arrangement is, of course, to drill the pilot hole in spruce very slightly smaller than the dimensions given in Column (b), but this involves the use of a special number drill, and I really do not see that it is necessary on glider and sailplane construction.

Instead of using a drill for the 1/32nd-inch size of pilot hole, woodworkers usually take a piece of piano wire, flatten the end with a hammer and file it to a point, so making a miniature flat drill, whilst others use a fine pricker for giving a start to the screw in spruce and do not trouble to drill a pilot hole at all.

Everything depends on the timber being worked and the diameter and length of screw, but for most aircraft purposes the above range of sizes should suffice, and I do not know of any case where the length of screw need exceed 1 inch; the amount of engagement in the lower member will hardly ever need to exceed ½-inch for a No. 6 screw.

For very accurate work it would, of course, be desirable to have shoulder drills such as those to which your correspondent refers, and if a large number of holes have to be drilled to a definite depth, it would certainly pay to slip and sweat a collar on to the particular drill being used so that the drilling is carried out to the correct depth.

With reference to the enquiry regarding copper rivets, nails and roves. From my experience in flying boat construction, I would recommend that the holes are drilled to the same diameter as the siding of the square copper nail, as follows:—

Size of Nail.	*Diameter of drill.*
20 gauge	1/32″
18 gauge	3/64″
16 gauge	1/16″
14 gauge	5/64″

Round copper rivets can, of course, be used, but the square bolt nails are considered better as the driving into the drilled hole gives a snug, tight job, which is important to ensure a watertight joint.

As regards "clenching" or "crimping," I should say that this is quite satisfactory in all cases where the point of the nail can be clenched on to hard wood such as three-ply, but in cases of soft wood then roves should be used and the end of the nail cut short and rivetted over.

The following tables, taken from Pippard and screws, together with strengths in tension and shear.

(a) Shear Strength.

Pritchard's *Aeroplane Structures,* give sizes of wood

Size of screw.	*number of screws.*	*Breaking pull.*	*Wood.*	*Load per lbs. screw.*
⅜″ No. 2	5	615	Mahogany	123
,,	5	620	Mahogany	124
⅜″ No. 1	6	595	Mahogany	99
,,	6	630	Walnut	105
⅜″ No. 0	6	605	Mahogany	101
,,	6	545	Walnut	91
¼″ No. 2	6	535	Mahogany	89
,,	6	495	Walnut	82
¼″ No. 00	8	565	Mahogany	71
,,	8	545	Walnut	68

(b) Tension Tests.

Size.	*Length.*	*Safe load in lbs.*
No. 4	⅝″	120
No. 4	¾″	142
No. 6	¾″	160
No. 6	1″	200

S. V. GAUNT.

IMPORTANT NOTICE.

THE SAILPLANE AND GLIDER is published on the 2nd and 4th Fridays in each month.

Club News and Copy intended for a particular issue must reach the Editor not later than the first post on Thursday morning of the week preceding publication.

Subscriptions and renewals should in future be sent to THE SAILPLANE AND GLIDER, 43, Chancery Lane. London, W.C.2.

Copy and instructions for advertisements are required at least ten days prior to date of publication of the issue for which they are intended.

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?

BIRD FLIGHT. II

By C. H. LATIMER-NEEDHAM, M.Sc., F.R.Ae.S.

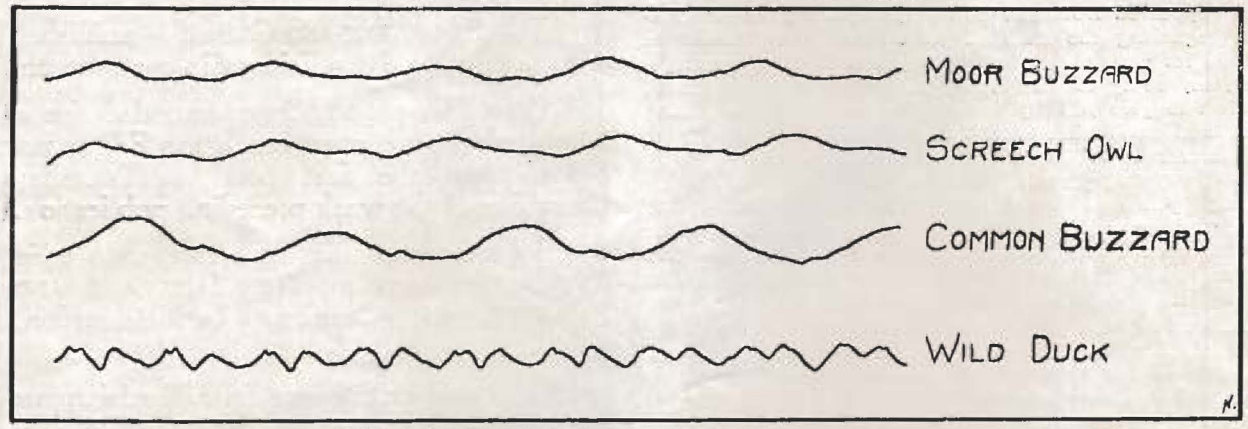


Fig. 4. Vertical Oscillations of Various Birds During Flight.

It has been seen that in order to fly forwards a bird raises and lowers its wings, and that the air forces acting on the wings cause them to deflect or rotate about the main member (formed by the humerus and radius, or fore-arm bones), and thus a forwards and backwards movement is induced, giving the wing a circular motion. Restraining forces in the form of check ligaments and minor muscles prevent over-twisting and limit the lateral travel.

Before proceeding further with the analysis of wing movement, it may be as well to consider what happens to the body during flight. It would be anticipated that as the wings are pushed downwards so the body must rise, and vice versa, and the curve traced by the body might be expected to approximate closely to the form of a sine curve, but actually it is found that matters are not quite so simple as this.

Path Traced by Body.

Again, we are indebted to Marey for his experiments in which the vertical oscillations of birds' bodies during flight were measured. Fig. 4 shows the curves as recorded by four different species, from which it becomes immediately apparent that the path of the body is not quite the simple movement expected, and, furthermore, the tracings of no two types are the same; in fact, it may be assumed that each bird describes its own particular flight-path through the air, dependent on several factors, such as wing shape, area and loading.

The curves for the moor-buzzard, screech-owl and common buzzard can be seen to have some resemblance to sine curves, except for the small undulations at the base of the main trough, but the wild duck has a very different shape for its flight-path, since two undulations of nearly similar shape and height are made in each complete wing-beat. Closer examination reveals that the second undulation is really the small crest of the other curves previously referred to but greatly pronounced.

Method of Flight.

Generally speaking, the greater part of the sustaining and propelling force is gained in the down-stroke, during which the large pectoral, or depressor, muscle comes into play, whilst the wing is raised by the minor pectoral, or elevator, muscle. Measurements of the dilation and contraction of the pectoral muscles during flight were also obtained by Marey, with recording apparatus, in the form of curves. These show, in general, a large undulation caused by the depressor followed by a smaller undulation due to the elevator.

The muscle curves were then set out together with the curves representing the path followed by the bird's body in order to show how the latter is dependent on the former. The next figure, Fig. 5, shows the set of curves for the buzzard. In order to make them easier to understand, the body curve has been modified, to approach more nearly to a sine curve, by means of dotted lines; that is to say, the small undulation has been removed. Likewise, the undulation due to the elevator of the muscle curve may be neglected for the time being by observing instead the dotted lines. The curve representing the depressor muscle now remains and for clearness is shown shaded.

It is noticed that the body commences to fall at (a), but at (b), before having reached the bottom of the fair curve, the elevator muscle comes into action and thus retains the body at a fairly constant height. At (c) the depressor muscle commences to act and thus raises the body to its highest point, (a), again.

The purpose of the elevator muscle, then, appears almost solely for returning the wing to the top position in readiness for the down-stroke, but this does not necessarily mean that the muscle *directly* lifts the wing. Writers have often stated that the wing is returned to misleading since it is obvious that the wing, by merely the top of the stroke by allowing the airstream to do the work, but this statement in itself is insufficient and

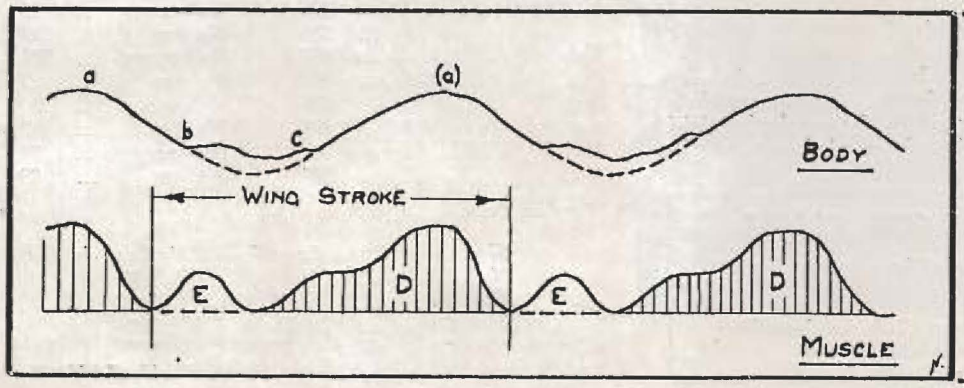


Fig 5. Path of Buzzard's Body and Curve of Muscular Movement.

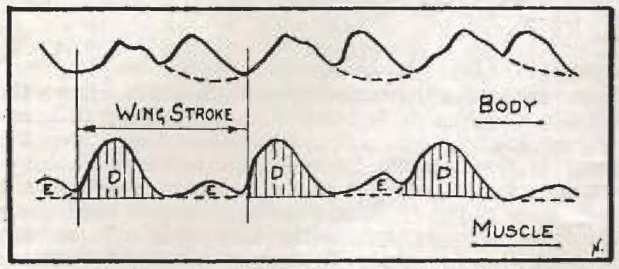


Fig. 6. Curves for Body Path and Muscle of Wild Duck.

trailing, could only be lifted to roughly the mid-height position and could not be moved *forward* and upwards through the next quadrant. But if, instead the elevator muscle governs the angle of attack of the wing, i.e., constrains the wing so that it presents a small angle of incidence to the relative air-flow throughout the upward stroke, then the wing must be lifted by the air-flow.

Marey suspected something of this sort because, in describing his experiments on the muscular actions, he wrote, "We cannot attach great importance to the form of the tracings (curves) in order to deduce from them the precise nature of the movement performed by the muscle."

Obviously the method of raising the wing in the manner outlined would result in a slowing up of the forward velocity of the bird during this period, and this fact was observed by Marey.

In order to understand better the true meaning of the double undulation of the wild duck's flight path, referred to earlier, a similar set of curves has been prepared, Fig. 6. From this it is seen that the depressor muscle accounts for the first rise and the elevator for the second, and it therefore becomes obvious that, as the wing reaches its lowest position, it is twisted so as to present a fairly large angle to the relative air-flow and thus obtains a second amount of lift, almost equal to that gained on the down-stroke. It must, of course, be realised that this can only be done at the expense of the loss of forward velocity which has to be made good during the down-beat.

It appears, then, that there are two distinct methods of flapping flight employed by birds. In the one, the lift and velocity are generated on the down-stroke, with little or no work done on the return, whilst in the other, lift is obtained equally on both strokes, and it would seem that all species of birds employ a method somewhere between these limits.

The duck posseses very small wings and is, in consequence, heavily loaded, which accounts for the high rate of wing beats. The loading of the buzzard, on the other hand, is roughly one-third that of the duck.

It seems likely that those birds with a large expanse of well-shaped wing employ the former manner of flight and that where wings have been reduced to the absolute minimum, for flight amongst reeds, trees, and other obstacles, the second method has been evolved as more suitable to their needs.

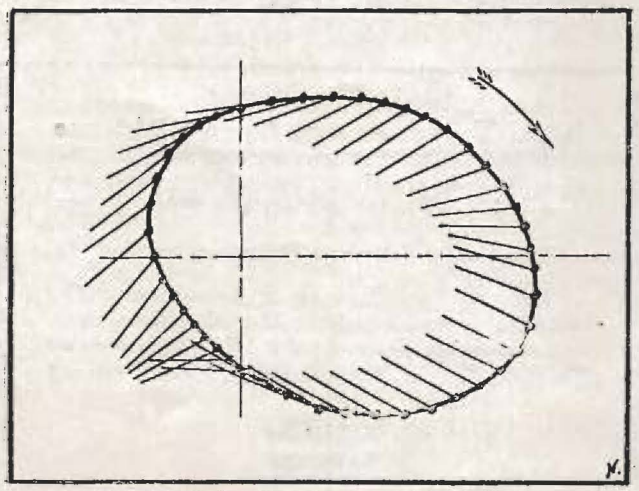


Fig.3. Path and Inclination of Buzzard's Wing (Marey)

A 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, 43, Chancery Lane, London, W.C.2." Envelopes should be marked "Competition" in the top left-hand corner. The competitors 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 mattes will be final.

It is regretted that the block for Fig. 3, in Part I., contained in the last issue, was inadvertently printed upside down. If this was not recognised, the reading matter connected with this figure must have presented some difficulty to the reader. In view of this Fig. 3 is reproduced here.

NEWS FROM OVERSEAS

FRANCE.

In the last number (October 28th) reference was made to a report that M. Alfred Duprat had carried out a distance flight of 30 miles near Bordeaux. This is now stated to be incorrect. It appears that what actually happened was that M. Duprat carried out three flights in the course of testing an experimental machine designed and constructed by M. Pierre Bonnet. On the first flight Duprat gained 250 feet in height, but, owing to the controls having become stiff during the time the machine was stored, he was forced to land after 28 minutes. On the second occasion, the pilot was forced to land after 14 minutes owing to a squall. The third flight, which was carried out at night-fall, was more successful. The total time in the air on these three flights exceeded three-quarters of an hour and Duprat soared along the dunes over a course, which was more than a mile long, at least 30 times.

A new gliding group known as the Nord-Avia has been formed at Lille by the students of the University, who will use the aerodrome at Ronchin for training purposes.

GERMANY.

On the 5th October, Peter Riedel attempted a soaring flight over the Alps on his RHONADLER. Towed by an aeroplane, he took off from Munich aerodrome and made for Trient. He released at 5,000 feet, but a strong Föhn wind prevented him from making any progress in the desired direction and both machines landed at Innsbruck aerodrome.

TUITION.

LIVE AND LEARN AT PHILLIPS & POWIS, SCHOOL OF FLYING, Reading Aerodrome. Comfortable residential accommodation at economical rates. The very highest standard of instruction by late instructors of the R.A.F. Take a 15s. trial lesson at the country's most up-to-date school.
Reading Aerodrome. Sonning 114.

SAILPLANES AND PARACHUTES.

By ROBERT KRONFELD.

On the occasion of my thunderstorm flight during the Rhön competition of 1929, I, for the first time, took a parachute with me. Up to that time soaring pilots had not been in the habit of carrying parachutes, and those who did not know that I had systematically made preparations for a thunderstorm flight looked at my parachute belt with a smile that generally greets anyone who recommends careful procedure.

The description of Max Kegel's thunderstorm flight in 1926 had induced me to do this, and the stressing of my machine during the first voluntary thunderstorm flight proved my preparations to be correct. The gustiness before thunderstorm fronts, together with the sudden forming of clouds, makes it impossible to prevent heavy stressing even if the flight is carried out correctly, i.e., in front of the thunderstorm.

The necessity of taking a parachute with me seemed even greater on the occasion of my blind flight in the competition of 1929. This flight, in which I was forced to fly blind without any instruments for about half an hour in a large cumulus cloud, incidentally climbing from the base to the peak of the same is, as far as I know, the only one in which this has been possible without the aid of instruments. At that time already I clearly foresaw that although this flight won me the still existing international record for altitude, such flights would not be repeated without appropriate instruments.

The experiences of Groenhoff, Bedau and others in the same and in the next year proved that in longer flights through clouds, without a blind flying outfit, unexpected situations, if not involuntary spins and spirals, followed by the occasionally very abrupt levelling out of the plane, occur, due to gustiness or eddies.

Undoubtedly, the boldest flight in the history of soaring —Groenhoff's singular thunderstorm and hail flight from Munich into Czecho-Slovakia, covering a distance of 265 kilometers—in 1931, as well as the narrow escape of the soaring pilot Paetz of Aachen shortly before the Rhön competition 1932, confirmed this. Groenhoff was the first to use a blind-flying set of instruments, after the unfortunately frequent financial difficulties of soaring pilots which make the purchase of expensive instruments impossible had been overcome in his case by Hauptmann Köhl's lending him an Askania Turn and Bank Indicator. Groenhoff described how, in spite of the help of his instruments, the wings of his plane were often bent violently upwards and downwards and velocities far out of the normal were reached. Paetz, on the other hand, has given us an impression of the energies existent in thunderstorm clouds. During a thunderstorm flight without instruments Paetz was actually pushed through the side of his plane, the parachute saving his life.

During the past competition I endeavoured to solve this by no means easy problem of high performance soaring. I was convinced that the present performances could only be bettered by blind-flying, by aid of first-class instruments. By systematic training and using my AUSTRIA, which had been built with far greater stability than other sailplanes, I thought I had made my preparations thoroughly enough.

As to instruments, I had fitted my plane with a turn and bank indicator, an air-speed indicator (from 20 to 100 kilometers), an extremely fine altimeter (5,000 metres), a variometer and a longitudinal inclinometer. Thanks to the Deutsche Verkehrsfliegerschule in Braunschweig, I had been able to practise blind-flying with the same turn and bank indicator for several hours on transport power planes. In addition to that, my blind flight without instruments on the WIEN had shown that in soaring planes blind-flying can be carried out occasionally, owing to the position of the rudder and a fine feeling for the wind in the face of the pilot. This latter possibility, however, was not available with my AUSTRIA, as I had closed in the pilot seat almost completely owing to the experience Groenhoff had in the hailstorm.

Before entering the competition of 1932 I had flown the AUSTRIA for a total flying time of approximately 15 hours. During the first days of the competition I had flown her along the slopes of the Rhön for five hours and had also carried out a blind-flight of five minutes in the clouds. On the day of the accident I could, therefore, confidently take off for a longer systematic blind flight. I was fully aware of the far greater difficulties compared to blind-flying in power planes. Modern transport machines, by means of their larger wing loading, have considerable aeronautical advantages over soaring planes which make blind-flying easier. Furthermore, blind flights in transport planes are mostly carried out in the fog or in stratus, i.e., clouds which only form in comparatively still air. Also the main problem of blind flight in power planes is to fly *straight ahead*.

The new task of the soaring pilot is to constantly circle in the notoriously bumpy cumulus clouds, which can easily be avoided in power flight. Thus only can a soaring pilot remain in the area of the strongest upwind.

On the 22nd July I left the slope, as no clouds were to be seen above the Wasserkuppe, and made for a huge cumulus tower standing above Gersfeld. I began to circle beneath the base of the cloud and, already flying by use of instruments, disappeared in the same. After having circled for several minutes, my instruments indicated an involuntary change in the position of my plane. I did not consider this alarming as I had noticed before that the instruments always indicated the slow turning of the sailplane and the changes of direction much too abruptly. The air-speed indicator could only provide an insufficient warning when the speed of the plane went up to more than 100 kilometers. The wind screen and the comparatively large distance of the pilot's seat from the wing lessened the possibility of my judging the speed by the sound of the air rushing over the wing. In addition to this, there is the fact that a high-performance sailplane with extremely low resistance does not need to lose 100 meters, and not even five seconds, to change its normal velocity of 50 or 80 kilometers into a dangerous one, the latter being, according to the position of the wing aileron of the AUSTRIA, 180 kilometers or more.

Although I had not climbed very high at all in the cloud, I came out of it with a very high velocity and then carefully endeavoured to bring the machine out of a not at all too steep bank. At the same moment the left outer wind, owing to the torsion caused by the unusual speed, broke off 12 to 15 ft. from the tip. This was proved to be correct by the technical committee of the Rhön competition and also confirmed by witnesses. (According to the design of the machine, this should only happen at a speed of more than 210 kilometers, if the construction of the machine has been carried out correctly.) The

MANY spares for most types of BAC machines offered at knockout prices. List 3d. Also Two-seater Bat Boat Hull, practically, new, complete with controls and Tail, . . £25.

Two-Seater Sailplane Drawings, per set £3.

Trailers, Aero Tow Gear, Auto-Towing Car with cable and winch. Also all rights, drawings, assembly jigs, etc., of BAC VII Two-seater Dual Control Sailplane for sale. What offers?

BAC Limited
MAIDSTONE

AUSTRIA then executed a half roll, so that I found myself flying upside down. The base of the cloud had been approximately 1,100 meters above sea level. I had already lost about 250 meters below the cloud, so that I still had 350 meters above the valley of Gersfeld which lies at 500 meters above sea level. There only remained a few seconds to free myself of the straps. At the same time I put my shoulder through the lid and the right side of the pilot's seat, which had been specially built with weak points to be used in case of need. This came to pass in very short time, and I immediately afterwards saw my faithful Heinecke parachute open above me, whereas the machine barely missed hitting the parachute in her dive towards the earth. The sailplane, the second outer wing of which had now also broken off, then zoomed with immense speed, almost hitting the rapidly descending parachute again, made a turn just above it and once again dived, almost grazing me. Whilst the parachute rapidly approached the earth the machine once more came within 10 meters of myself, after which she directly nose-dived into the earth, where I watched her crash. I reached the earth safely, making a normal parachute landing.

Laymen tried to connect the crash of the AUSTRIA with her large span. Pertinent investigation and examination, however, have proved that this accident might have happened with any other machine. Wolf Hirth stated during this competition that flying in circles in blind flight is not possible for a greater length of time in cumulus clouds, even with machines of a smaller span, as, for instance, his MUSTERLE. Some of the most experienced transport pilots absolutely deny the possibility of flying in curves in bumpy clouds with the instruments available to-day. Others state that even in calm weather, holding a straight course in blind flight over a greater length of time, very nasty situations may occur. The marvellous flight of Mayer during the past competition, during which he reached a height of 6,600 ft. by constantly circling in a cloud, as well as my flight on the WIEN in 1929, by no means prove the contrary. Mayer's machine, the same as the WIEN, by reason of its greater resistance and subsequently poorer gliding angle of incidence, takes longer to arrive at dangerous diving velocities.

In consequence, in order to be able to solve this new problem of soaring flight, namely, constant blind flying in curves in extremely bumpy clouds, for security's sake it will be essential to demand a higher maximum speed A completely automatic device for diving security, as already existent on the Junkers 52 for example, seems absolutely necessary in future when using a changeable wing aileron. Everything possible regarding the training of pilots and the reckoning of the flying qualities of sailplanes should be done in order to prevent the reaching of too great velocities in circling flight. Above all, however, it will be a problem for the instrument designer to adapt the damping of the perpendicular or the water level in the instruments for blind flight, as well as the indications of the turn and bank indicator itself to the qualities of turning of sailplanes regarding the longitudinal and vertical axis which differ to so great an extent from the above-mentioned qualities of power planes.

The loss of a machine, however precious the same may be, and the subsequent danger for the pilot is insignificant compared with the deep sorrow which the Rhön competition of 1932 caused us through the loss of two comrades, among them our best soaring pilot, our audacious and merry comrade Günther Groenhoff. The parachute could not save him when he jumped from his machine, the control of which had jammed, after having lost too much altitude. If we seek an answer to this being and passing away, to life and death, it can only be that we must follow the example of the brave comrades we lost with still greater care, still better preparations, still more self-control.

WHY NOT TRY POWERED FLYING?

When you have flown in a glider, why not pass on and try a powered aeroplane?

Trial Lessons, entitling you to fifteen minutes' dual instruction in a standard School machine, are always available at the Brooklands School of Flying at a fee of £1 only. To take one would put you under not the slightest obligation to join the School — even if you do not wish to take a licence, why not have one lesson just for interest?

Write for illustrated particulars of our "A" and "B" Licence courses, post free on request. Please mention "The Sailplane and Glider."

BROOKLANDS SCHOOL OF FLYING LIMITED

BROOKLANDS AERODROME, BYFLEET
SURREY :: :: Byfleet: 436–437

A NOTE ON RAIN

What is the normal behaviour of the air that travels immediately in front of a deluge of rain?

The pedestrian sees a sheet of low grey clouds which come lower and lower. Then a sudden short squall of wind blows up dust and dead leaves. Then there is an equally well-defined lull, during which large spots of rain splash down here and there, leaving wet marks as large as a five-shilling piece.

Then the wind freshens again; whereupon, down comes the rain.

Consider the case of a sailplane soaring during these well-defined periods.

The pilot sees a murky mass of rain advancing upon him. Overhead the clouds come down until the wisps of vapour hanging from them are almost on a level with his eye. The lift is still steady.

Then the machine suddenly begins to drift violently down-wind, so that it has to be swung into the wind. The pilot is so far only bothered by a desire to keep below the clouds.

But after half a minute or so something rather alarming happens. The machine is given a motion which can better be described as a violent joggle rather than as a bump. Presumably this marks the arrival of the lull.

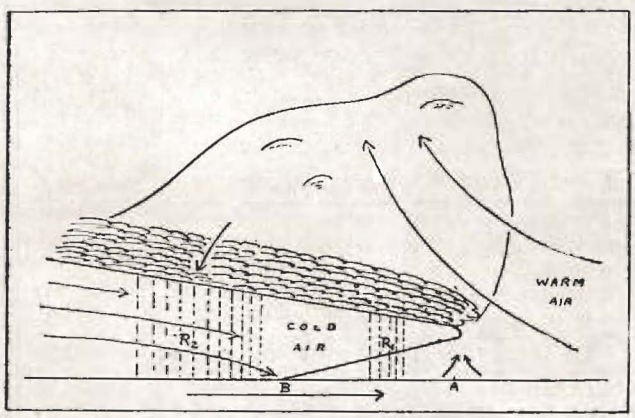
Passing quickly out of the squall into the lull, the machine's aid-speed instantaneously drops; i.e., the machine stalls, partially or wholly. The pilot's heart hops up into his mouth and misses two beats. Down goes the nose immediately, and one or two hundred feet of height are run off.

The machine is eased out of the dive, and the pilot looks round to see how he now stands relative to the ridge. With luck, and with a good machine, he still has a chance to run back to the ridge and pick up his height.

But great splashes of rain begin to cut his face, and he makes a bolt for the hangars, where he arrives just as the rain pounces upon him.

From a meteorological point of view is this a sufficiently accurate observation of the arrival of a storm of rain? If so, what is the exact explanation of the well-defined stages? It must be borne in mind that we are not considering anything so dramatic as a line-squall, but merely the downpour that seems to be described (for instance) as "the arrival of a secondary, associated with a depression travelling S.S.E. from the Faroes." S. H.

[Like everything else connected with the weather there are *degrees* of line-squalls. The phenomenon described by "S.H." is definitely of the line-squall or "cold-front" type, though not of the most intense form. The accompanying diagram illustrates the sequence of events which occur.



Owing to the friction between the moving air and the ground, the advancing mass of cold air assumes the shape of a wedge. In advance of this wedge the relatively warmer air is drawn up as indicated and if it is sufficiently moist cumulus or cumulo-nimbus clouds are formed.

At the point A, where the tip of the wedge comes overhead, strong convergence takes place owing to the increasing pressure gradient. The motion of the air is thus checked or even reversed, producing a squall. Beyond this point, that is, between A and B, there is a definite lull. Here the warm, moist air, which is lifted above the cold wedge, condenses, forming a dense sheet of cloud. Owing, however, to the strong convectional circulation above this area any rain which falls (B) is in the form of large drops as described by "S.H."

At the point B, the cold air reaches the ground, and behind it a definite freshening of the wind occurs (also a drop in temperature). Behind this point there is a downward circulation, more gradual than the violent convection at A and spread over a much larger area. There is now nothing to stop the precipitation of the water which has accumulated in the cloud, held by the ascending current, and heavy rainfalls (R2).

The sequence of events described occurs in any line-squall. The intensity of the phenomenon, however, depends on the actual conditions prevailing, e.g., the relative temperatures of the two air masses, their humidity, etc.—Ed.]

CORRESPONDENCE

"POWER GLIDING" THE KEY TO SUCCESS?

Sir,—It might be of interest to you to look back and see what a provincial club has done, and to look forward to see what it might do.

Having been chairman of this club since its inception, and having done, I am satisfied, a fair share, I feel that I can speak with some little authority.

Of course, we get the ever-present finance question, although that is an old story worn threadbare, and, in my opinion, a secondary consideration, since, if interest can be maintained, so can cash. But how can interest be maintained under present conditions?

In the first year we had a rush of members and a Kronfeld demonstration. Funds throughout this time were good, but interest waned the second year, seeing us with less than half the original members. The third year saw us with less than half again, but we had got down to hard facts; that is, plenty of hard work and little cash.

Why so much hard work? There are two primary reasons. One, that crashes and training are inseparable, and two, that repairing crashes and retrieving machines took the greater part of one's time

In spite of these disadvantages, we eventually got a few "C's," and some good ones, too, and all the remaining members passed an "A" and "B." It has been hard work, but we have done it. However, we all hope to have our "C," and then what?

Since we have been at the "C" stage, it is seldom such flights can be made, perhaps once in six weeks, so that those who are qualified take turns with *ab initios*. They, of course, hinder training, but no one grudges them their turn. One cannot expect them to go on for ever having one decent flight once in six weeks, nor can *ab initios* be expected to wait three years to become efficient. How can we improve matters?

It seems ridiculous to ask members—new ones—to work hard for six months, perhaps years, and then stand in a queue once in six weeks with the hope of a flight. I am afraid that this is what is killing the Movement, for I am sure that this is how outsiders see us.

My suggestion is that the time has come when we must have "power" gliding, that is, that a club would have to have its quarters at the most suitable soaring site available and would possess a secondary and a power-driven two-seat glider.

The method of training would be that instruction would be given in the power machines from *ab initio* to proficiency. Then the member would take over the second-

Continued on p.p. 240, col 2.

NEWS FROM THE CLUBS.



The "Radlock" Trainer on a test flight at Hull

THE CHANNEL GLIDING CLUB.

A meeting was held at Folkestone on Sunday, October 16th, to decide the fate of the "Kentish Express" Cup, open to Kent Clubs for Primaries. Unfortunately, North Kent and Thanet were, for various reasons, unable to compete, so that the Channel and the Kent Club had to fly it off between them.

As the Channel Club had, a few weeks back, put a nacelle on their primary, the two Clubs agreed that the pilots should, in order to level up the matter of the alleged improvement, glide first their own machine and then that of their opponents, thus making it a test of piloting.

The three pilots chosen by the Channel were Corporal W. Manuel, R.A.F., Pat. Whitnall, and D. Francis, who emerged from the contest with "flying" colours, winning by a margin of 15 seconds.

The gliders used were: Channel—R. F. D. Primary; the Kent Club—B.A.C. Primary. The longest flight of the day was one of 26 seconds by Mr. Lowe-Wylde, on his B.A.C.

The Channel have now won the Cup for the third year running, and, needless to state, the event was duly celebrated in fitting fashion, the younger generation being properly "blooded" from the Cup which now held something more cheerful than air.

The Club is pushing ahead with the building of the two-seater, which we hope to have ready shortly, as we must, if we are to attract new "bloods." Manuel is, too, preparing plans for a second CRESTED WREN.

LONDON GLIDING CLUB.

On Saturday, October 22nd, the CRESTED WREN grabbed twenty minutes of soaring before nightfall, the sight of her causing two new members to join; but on Sunday many million tons of rain fell (see daily Press), taking all day to do it.

On Saturday, October 29th, there was no flying, except in the morning, a flight in the PROFESSOR, which faded away after three minutes.

Sunday's weather was foul. A Monday paper commenced a lurid column with: "One of the fiercest gales in living memory—for a few seconds it touched 110 m.p.h.—swept over Britain." Apparently a deep depression stamped down from the Hebrides to the North Sea. At Dunstable it blew at the hill at an average speed of 40 m.p.h., full of gusts and bringing occasional sheets of rain. Three machines were flown and none broken.

In the SCUD the air-speed indicator swung to and fro over a range of 10 m.p.h. during what was intended to be straight and level flying. A particularly horrid phenomenon in the aerial uproar was the involuntary conversion of a gentle turn into a wildly overbanked twirl, compared with which the general bucketing was "vieux jeu."

At 12 o'clock Dewsbery took off in the big KASSEL, with Slater, of Derby, for passenger. Neither of them was sea-sick, but when the rain came on after twenty minutes they cordially agreed that it would be nice to land, which they did forthwith on the top of the hill, dropping in the down-draught like a brick to within six feet of the ground.

The weather then became so filthy that it looked as if the three machines on the hill would have to be brought down in trailers. But the rain let up for a short period and the CRESTED WREN took off, survived five minutes on the up-wind edge of the lift, and landed in an orthodox manner, the *ab initio* pilot uttering devout remarks.

The SCUD was launched by one man pulling her along by a short piece of hemp rope, thus entertaining Mr. Baynes and the pilot, and proceeded to put up what one can only describe as an unparalleled display of virtuosity combined with ordinary intestinal fortitude. The flight, which lasted an hour, and was mostly in a rain-storm, included high-speed hovering at a height of at least one thousand feet above the hill, dives and vertical side-slips on to the designer's photographer, and antics which may or may not have been entirely voluntary. The landing was on the hill-top and, low be it spoke, rather sideways, even if scatheless.

Meanwhile, Major Petre had taken off in the KASSEL, with Robertson as passenger. It seems to be rather a good idea to practice flying for twenty-two years; the machine and the wind grow so respectful; you soar five hundred feet above the hill; after half an hour, you gently slip off your height and land without heat or passion, the gale meanwhile howling round the hangars, the rain streaming down in torrents. But it takes nearly a quarter of a century to get that way.

Visitors from India and Germany were suitably amused. The machines, though kicking and struggling, were towed home and bedded down; and the bar was suitably propped up.

The farmer-landlord of our ground has ploughed up many acres where the weaker brethren have often chosen to land in the past; if he keeps at it persistently we shall only have to dig a few earthworks, and build some stone walls, and we shall have a landing-ground on which these Northern clubs would feel properly at home.

Once upon a time there were some men in the North, either Picts or Scots, who said that soaring was easy and that the real art was to master landings. Believe me, brothers, there are occasions when soaring is almost overwhelmingly difficult and a landing in Piccadilly Circus itself would be merely the happy final fade-out in a Hollywood talkie.

SOUTHDOWN GLIDING CLUB.

Oh, Yes! We're still doing the odd spot of aviation on the South Downs. The enquiries of many old friends and the solicitations of our kindly Editor have at last prevailed upon us to say something of what we have been doing. In some other column, perhaps, and at some other time, the whole history of this club from the days of the 1922 Itford Meeting might prove of general interest; but for the present we would just say that the original Southdown Skysailing Club and the subsequent contemporary Southern Counties' Soaring Club combined, last Spring, to form a new Club, as we are to-day. Our Secretary has held this office in both of the other two clubs in turn, and has seen many changes in personnel, in methods of management, and in the mode of instruction in Gliding.

If this Club has enjoyed many advantages, it has suffered, too, as many disadvantages as any other club; and the story of these, coupled with the Club's present-day optimism, might prove a source of encouragement to some of the pessimists who, not content with the moribund condition of their own group, seek to dissuade others from what they would characterise as a "hopeless flight" for the Movement. But we who remain active in this Club *know* that the Movement is not dead, or anything like it! It is merely gathering impetus, quietly, for its next big "drive"; but there is no place in the Movement to-day for the "half-hearteds"!

From the day when we had only pictures of a glider, to the present time when, recently, we could count nine machines as *club* property (not privately-owned or "syndicate" machines), seems a far cry; but it merely illustrates what sticking to it can do Never was the old Air Force motto more applicable than to the gliding clubs of to-day. We are all badly in need of funds. Here is a way to raise money. We have just held our second highly successful Ball. Such a function gives publicity of the right kind to the Movement in general and the Club in particular, and provides (if organised properly) a very handsome profit for the club funds.

Here is another suggestion for clubs finding enthusiasm on the wane, in proportion as the need for renovations to club property becomes more obvious to the members. Suspend, as we have just done, all flying operations for a few weeks, and get down to repairs and renovations—weather wet or fine! With as many as nine machines in all, stacked in a couple of odd barns, this provided us with a pretty problem. But we have solved it; and in the solution we must recognise, with gratitude, the generosity of Mr. R. F. Dagnall, whose practical interest in the Movement is too well-known to need introduction. Mr. Dagnall has lent us one of his magnificent workshops, where several machines are being thoroughly overhauled by the keen and competent few! Other machines—and transport and launching cars—are being overhauled on the sites. Yes! Sites! For some of us have been busy looking round and making arrangements to do specific work in spots most suitable for each branch—training, autotowing, certificate work, and, of course, soaring.

We have come to the conclusion that in this country, at any rate, we cannot hope to find terrain suitable for all branches of club work in one locality. We shall not attempt any foolish prophesying, but we are glad to be able to say that we hope to begin our winter programme of work in a fortnight's time, and that we hope to progress on sounder, if steadier, lines, born of the hard experiences of the last two or three years' work. We have a class of membership which we think all clubs would do well to include—Associate—for such members help to keep alive the social spirit and to spread propaganda; (yes, we have a club bar and club room, for we are registered with the local Justices!); and we shall welcome all, whether members of a gliding club or not, who may be interested in gliding, both to the club itself and to the gliding grounds,—Ditchling Beacon and Balsdean, and shortly, we hope, Shoreham. Finally we would advise clubs to take advantage of the arrangements made by the B.G.A. and to register as of Limited Liability. This will become the more obvious in the near future!

Meanwhile our Secretary (A. York Bramble) will be pleased to give any further particulars of the Club and its doings and to welcome old friends and new members, and arrange for passenger flights in the Club's two-seater dual instruction machine, letters regarding any of which matters should be addressed to him, c/o the Vice-Chairman of the Club, Dr. V. C. Hackworth, Two Gables, Pembroke Gardens, Hove, Sussex.

THAMES VALLEY GLIDING CLUB.

A Dance will be held at the Town Hall, Staines, on Friday, November 18th, 1932, from 8 p.m. till 2 a.m. Admission 8/-, Double.

PATENTS.

A P. THURSTON & CO., Patents, Trade Marks and designs.—Bank Chambers, 329, High Holborn, W.1. Holborn 2542.

OFFICIAL NOTICE

DIARY OF FORTHCOMING EVENTS.

Monday, November 21st, at 6.30 p.m. in the Library of the Royal Aeronautical Society, Albemarle Street, W. 1. — Council Meeting, British Gliding Association.

BLUE PRINTS.

Complete Sets of Working Drawings of the **R.F.D.** primary type, and the **FALKE** secondary type machines, and the **GRUNAN BABY** Sailplane, with schedules of parts, are now available.

PRICES:

R.F.D.	£2	0	0	post free
FALKE	£7	10	0	post free
GRUNAN BABY ...	£8	8	0	post free

(*Special reduction to Members of the B.G.A. or affiliated Clubs*)

THE BRITISH GLIDING ASSOCIATION
19 BERKERLEY STREET, LONDON, W.1

HOW TO GET YOUR "SAILPLANE" FREE.

It has been decided that in order to encourage Members of the Association and subscribers in obtaining new subscribers to THE SAILPLANE, free issue of the journal will be awarded as follows until further notice:—

To Members of the Association.

Free issue for 6 months to a member obtaining 1 new yearly subscriber.

Free issue for 1 year to a member obtaining 2 new yearly subscribers.

Free issue for 1 year and renewal of Membership of the Association on obtaining 4 new subscribers for 1 year.

To Subscribers.

Free issue for 1 year on obtaining 2 new yearly subscribers.

Continued from p.p. 238, col. 2.

ary and qualify, and, if a sailplane were available, he could soar, all in, shall we say, six months, because crashes of a serious nature would have been nil.

I mean that, whatever the wind, flying would take place and it would be proper flying that could be charged for. It would train more quickly and keep up an intense interest, since all the time could be given to flying instead of to retrieving and repairing a broken-down primary. These facts would automatically keep funds on the right side.

Now as to the machine; it would be a two-seater with "X" wing loading as a maximum; a stalling speed of 25-27 miles per hour, a landing speed of 30 m.p.h. and dual control. The maximum speed is, of course, nothing to worry about. The engine would be, say, 950 c.c. maximum.

Here one would have a fine weather machine capable of being handled quite safely by a "C" pilot who would give much time to instructing his passengers.

Again, the odds are against us if it is power-driven, since the Air Ministry would have a lot to say, but I do suggest that the B.G.A. should define what would constitute a power glider, and approach the powers that be to make its use legal for gliding clubs, to save their lives; and, further, for their own benefit design such a machine and have available drawings at, say, £5 per set, where clubs, such as ours, that have come through all the stages of growth can at last reap a little reward for the tremendous effort put forward.

It would be interesting to have other views on this question, but, of course, better still, to see the B.G.A. turn to, define designs, and approach the Air Ministry.

These views are personal and do not necessarily represent the views of the Club.

NORMAN W. WRIGHT,
Chairman, Dorset Gliding Club.

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

IMPORTANT NOTICE TO ADVERTISERS.

Many advertisers have supported the "Sailplane & Glider" as a gesture of friendliness to a publication unique in the worlds of pioneering effort and sport, without calculating with too great a nicety the immediate and tangible benefits that might accrue from their investment.

The following letter from the President of the Central Scotland Air Yachting Club indicates that readers appreciate this fact, and that they are acting in that spirit which places business dealings on the right plane—a level free from depressions and adverse conditions, economic and otherwise.

Glasgow,

September 12, 1932.

The Editor, "The Sailplane."

Dear Sir,

It has been on my mind for a couple of months to let you know that I was able to put some business of a friend of mine in Glasgow in the way of your Advertisers, Messrs. Austin, Reed & Co., purely because they support the "Sailplane."

I naturally propose to follow suit myself as soon as occasion arises.

Messrs. Reed might like to know that their advertisements have been worth at least £11 to them which otherwise would have gone elsewhere.

Yours faithfully,

(Signed) E. T. H. GODFREY.

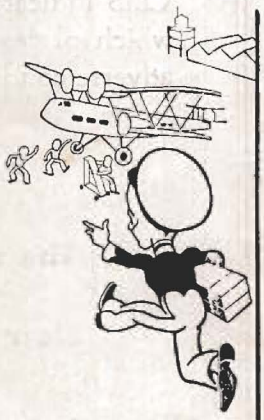
The "Sailplane & Glider" circulates in every country in Europe (except Russia and Scandinavia), Canada, Australia, New Zealand, South Africa, British East Africa, Egypt, Palestine, the United States of America and South America.

The nature of its circulation is such that each issue has at least 5000 readers, all of whom are equipped with Purchasing Power and the desire to apply it in any direction that will help the Gliding Movement.

Copy and instructions for advertisements should be sent to the Advertisement Manager, *The Sailplane & Glider*, 43 Chancery Lane. London, W.C.2., at least ten days prior to the date of publication of the issue in which the advertisements are to appear. Rates on application.

Telephone—HOLborn 0309.

TIME and TIES



There are few conferences at which we are not represented. We may be uncertain as to whether a customer is famous for his knowledge of economics or his elocution, but we always know how he feels about ties.

The other day we had an urgent order from a customer about to travel to Switzerland to speak at an important conference. It appeared that he liked to wear a special sort of tie when making his pronouncements, and by some dreadful mischance he had on this occasion mislaid his entire stock.

His ideal tie had to be made to special design from a certain material and had to be delivered at his hotel the following morning. Even in our vast stock of ties we had nothing that struck the exact note, so we promised to search London and to deliver the tie before twelve next day if we were successful.

It was a most exciting race against time, and unfortunately time won. Our messenger arrived at the hotel with the tie but very little breath, ten minutes after our customer had gone.

By this time, however, we were quite worried about our customer's speech, and we began to make rapid inquiries for the address of the hotel in Switzerland to which he was going. We knew that he was travelling by boat and train, so we realised that his tie could catch an air liner and reach Switzerland before him. It did—and the speech was a great success.



We would not like to assert that if all delegates to all future conferences wore Austin Reed ties the results would be Utopian, but in view of this little experience we feel that it might be worth trying. Anyway, we present the idea to the nation.

AUSTIN REED
of REGENT STREET