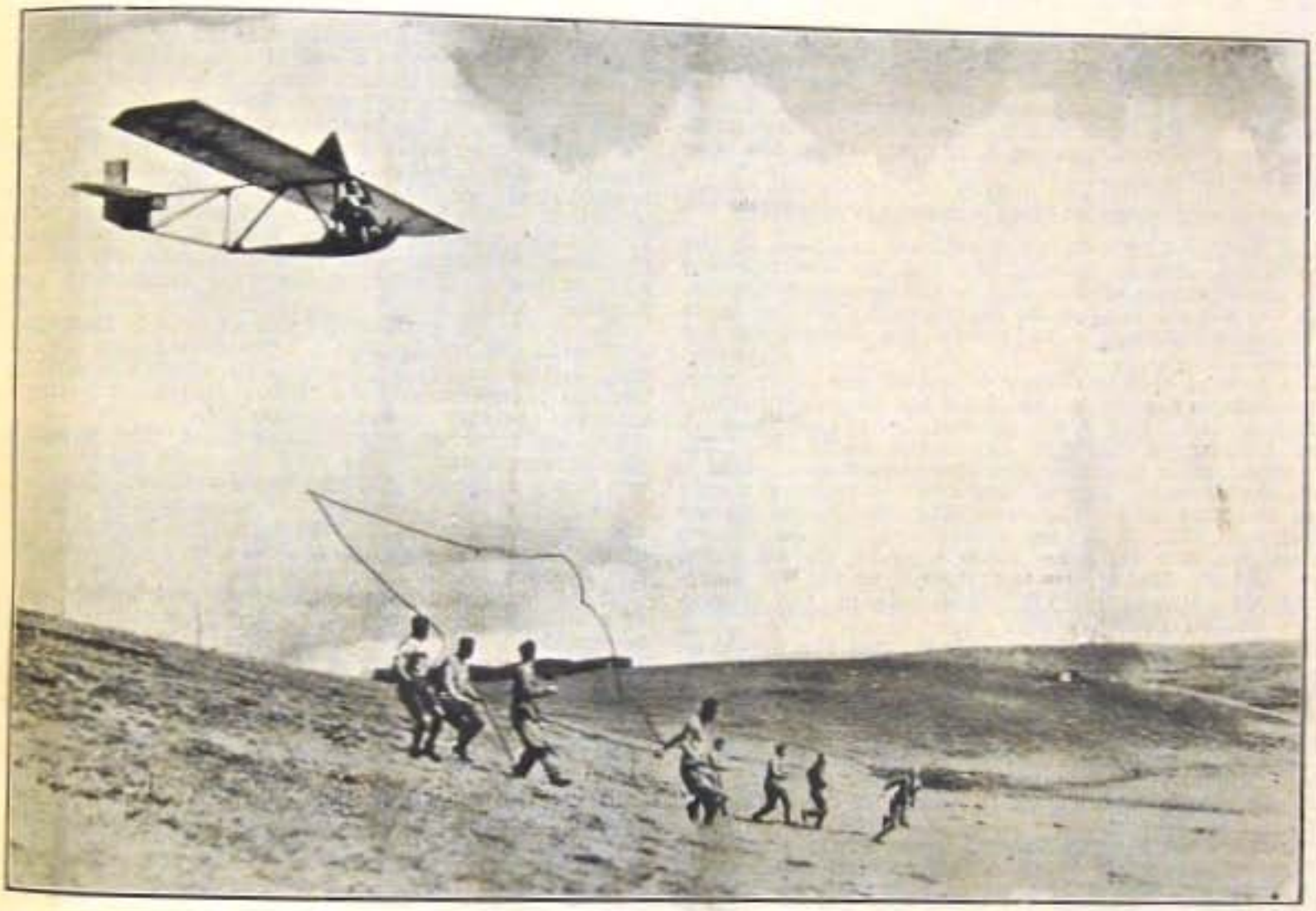
Jan. 2, 1931. Vol. 1. No. 17.

THE SAILPLANE AND GLIDER

Price 3d.

AT THE WASSERKUPPE.



One of Sir Gilbert Walker's slides which shows the launch of a Zogling. He drew attention to the cumulous clouds in the background. Club members should note the German habit of making the pupil hold a strap above his head with the left hand.

CELLON DOPE

FOR

SAILPLANES and GLIDERS.

CELLON LTD., UPPER HAM ROAD, KINGSTON-ON-THAMES.

'Phone No.: KINGSTON 6061. Telegrams: AJAWS, Phone, Kingston-on-Thames.

A FEW OBSERVATIONS.

First we will wish all the readers of THE SAILPLANE a year full of hard work (that is bound to come to glider enthusiasts, anyway). Next we wish with them that our efforts will result in soaring flights hitherto unequalled in this Island,—and elsewhere. As for the mere additions of prosperity and happiness they will come with the hard work or so people say.

We would like to thank all those Club Secretaries, Club Captains and individuals who although hitherto unknown to us sent Christmas Cards, a courtesy we much appreciated. The array of these greetings on the editorial mantelpiece is quite imposing.

There was no SAILPLANE last week as we had a brief holiday. In spite of the fact that we announced our intention of going away various people inquired quite wistfully about their missing copy. Apparently it is not yet understood that when we go away, all the staff goes too, for we form a harried trinity of editor, staff, and office boy.

The manufacturers of gliders have formed an association which had its first meeting on Monday of this week. The title is remarkable for the fact that it is quite unexpected and quite unlike anything that had been suggested. It is *The Motorless Aircraft Constructors Association*. The administration and secretariat is for the nonce lodged with Mr. E. D. Abbott, of Farnham, Surrey. Other manufacturers who would like to join should write to Mr. Abbott at that address. We think that the new association has much power for good, but whether it is used well or not time will alone show.

WEATHER SPOILS SCARBOROUGH MEETING.

The Rally and Inter-Club Competitions organised by the Scarborough Club for Boxing Day and the two following days was unfortunately curtailed by bad weather conditions. This was a great pity, as the Scarborough Club had made extensive arrangements to ensure the success of the Meeting.

The services of Herr Gunter Groenhoff, one of the most noted German experts and an official test pilot of the Rhon-Rossitten Ges., had been secured in the absence of Herr Magersuppe (home for Christmas) to fly the Club's two-seater; other machines had been requistioned; about a score of visiting members of other Clubs had arrived chiefly from Bradford and Ilkley, including Mr. N. H. Sharpe (Chairman), Mr. S. Young (Secretary), Mr. E. Craven (Treasurer), Mr. H. Jones (Instructor) of the Bradford Club, and Mr. Hedley Crabtree (Ilkley), who it will be remembered obtained his "C" Certificate at the Wasserkuppe Central School recently.

The snow came down, however, so the first two days were spent at the Club's Headquarters, The Royal Hotel, discussing matters of interest, meeting Herr Groenhoff (whose successes at the Rhon Competitions with the *Fafnir* need no recounting here), inspecting the various machines—Zogling, Prufling, Farnham, Dopple-Sitzer, etc., viewing the various trophies and the Scarborough Club's kinema film and attending a Dance given in honour of the visitors on Boxing Day evening.

Weather improving on Sunday, it was finally possible to get out of doors, but owing to adverse wind direction, an alternative site had to be obtained. Herr Groenhoff made an excellent flight in the two-seater with Mr. H. Jones of the Bradford Club as passenger, soaring to and fro at varying altitudes above Scalby Nabs for about 30 mins. and finally making an excellent landing precisely on his launching point. The light was getting very poor, but a further flight was made, with Mr. A. E. Matthews of the Scarborough Club as passenger, of about 10 mins.' duration. This time Herr Groenhoff "looked at" his landing point, and then swooped away and went down wind to a more convenient landing at the foot of the slopes towards the village of Scalby.

The postponement of the scheduled events of this meeting was a pity, but there is no doubt that the visiting members found plenty to interest them, and evidences of the great enthusiasm which exists in Scarborough for the Gliding Movement. They were well entertained, and I think the best was made of a bad job.—E. C. T.

THE "RAPACE."

We have already reported the flight of 28 min. made by the French sailplane *Le Rapace*. We are now able through the courtesy of Mr. Welding and *Sports et Tourisme Aéronautiques*, a new French monthly, to give some details of this machine.

The machine, which is a cantilever monoplane of high aspect ratio, was built in 1928 for a competition at Vauville, but was not finished in time. M. Georges Abrial is responsible for the aerodynamic conception (which is definitely Germanic), and M. Louis Peyret is responsible for the design of the structure. Older readers will recall that the machine flown by M. Maneyrol at Itford in 1922, which put the British record up to 3 hrs. 21 min. 7 sec., was built by M. Peyret. It was a curious tandem machine on wheels.

The *Rapace* has a very short fuselage, and although the French paper says the machine can be flown "hands off," we wonder what would happen should it get into a spin. Another unusual feature is the mounting of the wing at a marked angle to the fuselage. This means that for the wing to be at its best angle the tail must be kept well up. Presumably this increases the drag of the fuselage and, therefore, the gliding angle of the machine will not be as good as the L/D ratio of the wing would lead one to suppose.

The reason for so mounting the wing is to have the advantage of the maximum lift when close to the ground to keep the landing speed down. This is quite a good idea, but the expedient, adopted on the *Austria*, of having air-brakes is probably much more effective.

The cantilever wing is in three parts. The middle portion is rectangular in plan form, the ends sharply tapered, and so the whole forms a very narrow ellipse. The ailerons extend along the whole of these extensions. A plano-convex Abrial wing-section is used with a depth of 17 per cent. of the chord. There is no wash-out or wash-in, the wing-section being maintained to the tips.

The construction, with a single-spar and forward portion of the wing covered with plywood, appears to be quite conventional.

The fuselage is of very small elliptical cross-section. The structure has three longerons with cross-frames of plywood. The covering is built up with long panels of three-ply fixed to longitudinal stringers. The landing-gear is the conventional skid on rubber-blocks. To reduce drag it is faired-in with fabric.

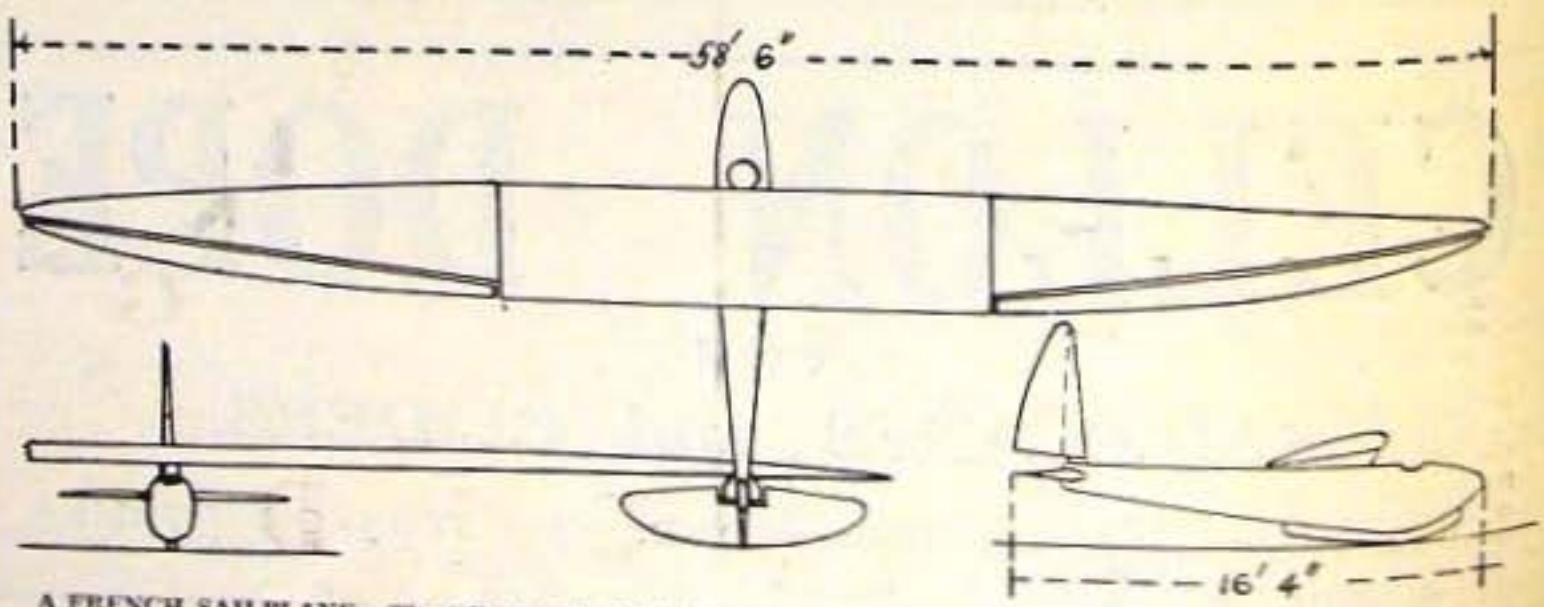
The cantilever tail-unit is conventional. There are no fixed surfaces, nor can the elevators or rudder be spoken of as "balanced."

DIMENSIONS.—Span 16 m. (52 ft. 6 in.). Length 5 m. (16 ft. 5 in.). Aspect ratio 1 : 16.

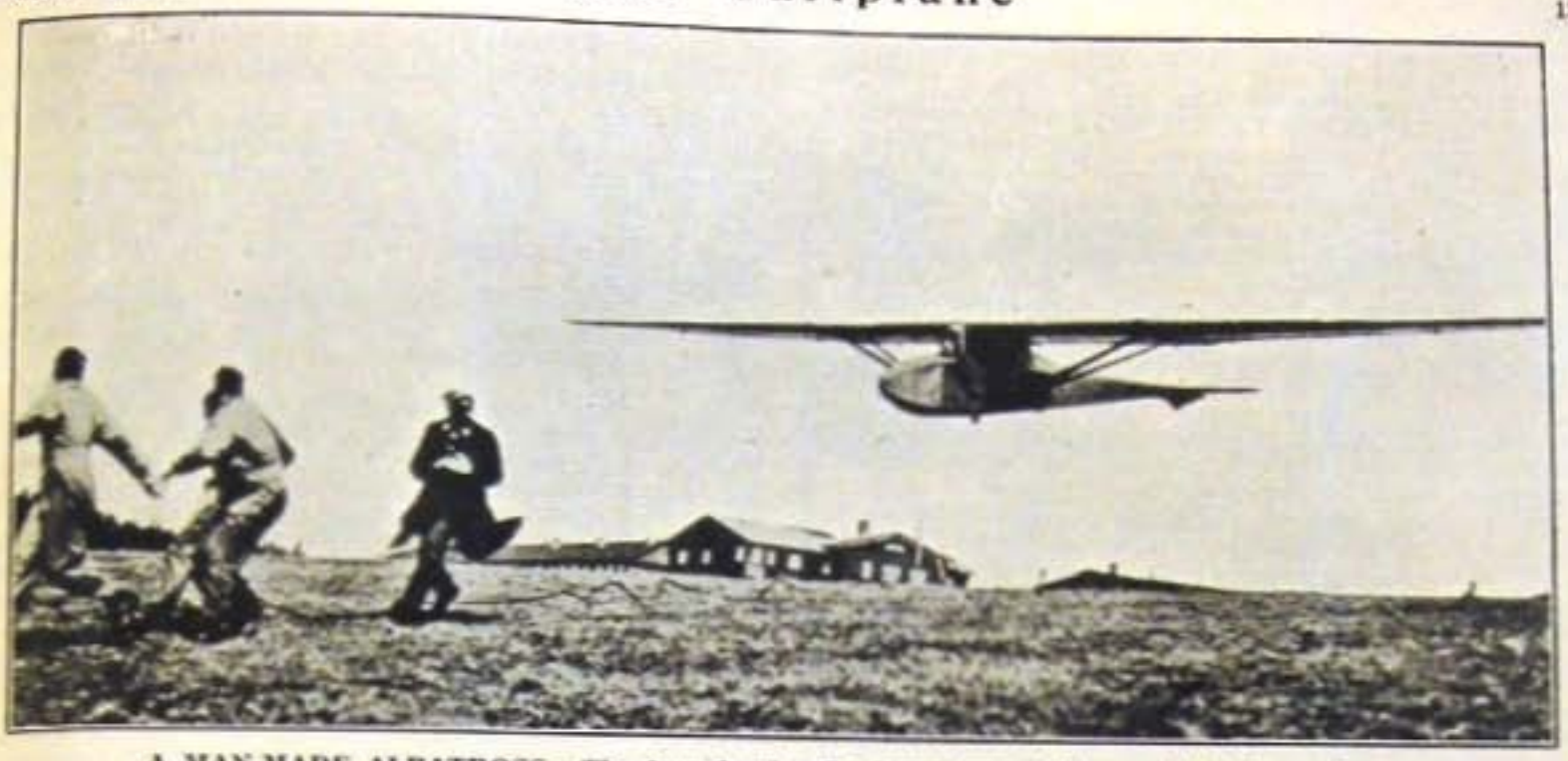
AREAS.—Wing area 16 sq. m. (172 sq. ft.). Aileron area 2 × 1.223 sq. m. (26.4 sq. ft.). Tailplane area 1.40 sq. m. (15.1 sq. ft.). Rudder area .85 sq. m. (9.15 sq. ft.).

WEIGHTS.—Weight empty 115 kg. (254 lbs.). Weight loaded 190 kg. (420 lbs.). Wing loading 11.9 kg./sq. m. (2.44 lbs./sq. ft.).

PERFORMANCE.—Speed at base gliding angle 12.55 m./sec. (41.2 ft./sec. =28 m.p.h.). Sinking speed .56 m./sec. (1.84 ft./sec.).



A FRENCH SAILPLANE.—The "Rapace," which has soared for over 20 minutes. The dimensions should be checked with those given above.



A MAN-MADE ALBATROSS.—The launch of a Professor type sailplane at the Wasserkuppe.

THE FLIGHT OF BIRDS (II).

[As announced in THE SAILPLANE for Dec. 19, the report of the lecture by Sir Gilbert Walker on Soaring Bird Flight before the London Gliding Club will be concluded in this number. We have had inquiries as to whether a full report of this lecture can be obtained. As Sir Gilbert lectured *extempore*, and as no verbatim report was taken, we are afraid that no such report can be obtained.—ED.]

Referring to the question of heated air rising, Sir Gilbert said that in Egypt pilots of power-machines have felt "bumps" at 10,000 ft. Such bumps are due to rising currents of hot air.

He said that birds get to know where such currents are: when conditions are unstable as before a thunderstorm and there are scattered columns of rising air, you can see half a dozen birds gliding in a spiral with other birds flapping in a line towards such a column of air to take advantage of it. The birds fly in spirals because the diameter of the column is limited. That birds know about rising currents was graphically illustrated by a kite which Sir Gilbert saw spiral round in the puffs of rising smoke and steam from a locomotive moving out from an Indian railway station.

Sir Gilbert next explained the way in which a bird moves its wings. When it is diving, or gliding down very swiftly, the wings are folded back, though not shut. For a slow glide they are held slackly forward. When the bird is soaring, the wings are held right forward with the tip-feathers widely separated. A kite's feather, and the wing of a partridge, were used by Sir Gilbert to demonstrate the way in which the feathers are shaped to get this slot effect. He showed a slide of an eagle soaring [or should it be gliding?] in Scotland, where the separated feathers could be clearly seen.

Sir Gilbert mentioned that a committee which recently sat to investigate control at the stall advocated slotted wing-tips and large control surfaces at the tail, which was what the birds had.

There are two main types of bird-wing. The short, broad, highly-cambered wing for slow-speed flying and the long, narrow-pointed wing for high-speed flight.

Sir Gilbert then went on to explain soaring flight. When one is flying only the relative movement of the wind over the wing matters, and although when in an ascending mass of air you appear to gain height you only do so relative to the ground and actually you are gliding down in the column of air all the time.

With the aid of the black-board he then illustrated how a bird has a best gliding angle which gives constant speed of descent and which in the case of a vulture might be taken as 1:12. At a forward speed of 18 m.p.h. this would give a sinking speed of 1½ m.p.h. There are plenty of places in India where, as shown by smoke, the currents rise at 4 to 5 m.p.h., so there is available an ample excess of upward speed.

Rising currents are also due to winds being deflected upwards by a slope, thus a wind blowing up a slope of 1:5 at 20 m.p.h. would supply an upward component of 4 m.p.h.

After explaining how the up-currents were formed by the deflection of the wind upwards, Sir Gilbert showed some very clear slides of a Zogling in flight at the Wasserkuppe and a picture of the *Storch* (Stork), which is a small tailless aeroplane with a 4 h.p. engine developed as the result of extensive experiments made at the Rhon-Rossitten Gesellschaft with models and gliders before putting a power plant into the completed glider.

The picture of the Zogling had a fine background of cumulous clouds and Sir Gilbert explained how useful these clouds were to the sailflyer in that they were formed on rising currents of which the latter could take advantage. More pictures followed of gliders and sailplanes.

Sir Gilbert explained that the wings of the sailplane with their high aspect ratio could be likened to the narrow wings of the fast-flying birds whereas the wings of the Zogling with their low aspect ratio were like the wings of vultures.

After this we were shown some fine pictures of swans, one of which looked exactly like a sailplane. If one photographs a flock of birds, one can follow and analyse the motions of a wing which is being flapped. This method is a very valuable aid to study and one which Sir Gilbert incited his listeners to adopt.

The albatross glides quite differently from the vulture and soars only over water where there are no ascending currents. This bird can remain in the air all day and travel

A GLIDE A DAY KEEPS THE DOCTOR AWAY!!

THEREFORE GLIDE ON

DON'T
ARGUE
GLIDE
LONGER
IN
NOBIBUS
GRATIS
SINE DIE

AND BE

RELEASED **F**ROM **D**OCTOR'S **C**OMPANY

GUILDFORD, SURREY

very fast. Its average speed has been measured as 49 m.p.h. but it can only glide in a strong wind.

To illustrate how the albatross maintained its soaring or gliding flight Sir Gilbert took the example of someone gliding and reaching such a point that he had almost lost flying speed. If at this instant a giant blew a strong blast over the machine, it would regain flying speed because of the increased velocity in which it was flying.

When he was quite sure that his listeners understood this analogy, Sir Gilbert went on to the case where one could soar by having gusts from alternate sides of the machine, always provided that the glider or sailplane could be turned quickly enough to face them. From this understandable but extremely unlikely case he passed to what was really a similar case where there were two belts of air one of which, the upper, was travelling faster than the lower.

This is exactly what happens over the surface of the sea. Due to skin-friction the layer of wind nearest to the surface of the water goes much more slowly than that higher up and so in a narrow belt of air say some 50 ft. thick above the water there is a big difference of speed. At the top of the belt the air may be moving at 50 m.p.h., whereas at sea-level the wind may only be moving at 10 m.p.h. The albatross having once gained the upper level glides down-wind from the fast-moving air into the slow-moving belt, the bird then turns upwind and starts to climb up, back to whence it started. This it is able to do as a result of the excess of speed which it gained while gliding through the fast-moving air.

This is not easy to grasp, and we ourselves had a lengthy argument with several doubting Thomases, which persisted for a long time after the lecture, but as the albatross does indubitably soar, there seems but little reason for mis-trusting this explanation. The doubters put forward the plea that the solution was equivalent to a form of perpetual motion which could not obtain because of the inefficiency of the machine or bird. They wished to liken the case to that of the bouncing ball which slows down. Actually the bird would only be like a bouncing ball if it were gliding in a homogeneous belt of air.

After the lecture, and as the result of many sixpences spent when young on a delightful side-show at the White City and similiar amusement places, an example came to us. This side show used to be an affair called The Witching Waves. The essential was an oval track of sheet-iron which was made to undulate by subterranean machinery. One took one's seat in a small trolley, quite without power but with a steering wheel. By steering a diagonal course over the waves and timing the turns properly it was possible to negotiate the track in triumph. There were periods in the novitiate stage when one wallowed hopelessly in the trough of the wave. It seems to us that as this contrivance gave one's trolley forward motion, so the albatross soars and we have obtruded it into the lecture in the hope that it may assist readers to understand the phenomenon.

Flapping flight is only a particular case of gliding flight. The down-beat takes twice as long as the up-beat. The body of a bird can be noticed rising as the wing goes down. Another point is that the wing on the down-beat appears to be at a negative angle of incidence. This is not so as although the wing is at a negative angle to the path of the bird it is at a positive angle to the relative wind due to the downward motion of the wing and forward movement of the bird.

The quick up-beat is used to draw the bird forward through the air. Additional evidence as to this is the presence of the very large muscles on the chest of a bird whose function is to lift the wing. To obtain the forward motion from the upward stroke the wing is inclined at a negative angle which gives the resultant lift force in a forward direction.

A series of cinema photographs were then shown, and from them it could be seen that the downward flap took eight exposures whereas the upward movement only took four.

Sir Gilbert showed a slide of the Brustmann flapping wing machine (described in THE SAILPLANE for Nov. 21), which has been tried out at the Wasserkuppe and has definitely shown that a man-powered machine of this type can increase its gliding speed and duration.

Finally Sir Gilbert concluded his remarks with a plea that we should develop gliding along the same sound and careful lines as it has been developed in Germany where nothing is ever done without very careful experiment.

THE DISCUSSION.

After the Chairman, Mr. ASHWELL-COOKE, had said a few words of appreciation, he called upon Mr. GORDON ENGLAND, who referred to three things which had struck him very forcibly.

First he wondered whether a sufficiently large area of disturbance could be found of which a sailplane could take advantage like an albatross. Second he noticed that Sir Gilbert said there were no ascending currents over the sea. There was a German view that ascending currents did exist over the sea and Herr Kronfeld was one of those who subscribed to this view, but thought that such currents were very limited in area, and only 50 to 100 ft. above sea level.

Thirdly, referring to Sir Gilbert's reference to models, he would like to pay a tribute to the late José Weiss, all of whose early work was done with models which were either launched from a kite or the top of Amberley Mount in Sussex. All the models with over 4 ft. span had a ticket attached which offered 5s. reward to the finder and models would come back after a fortnight and had been found as far away as six miles from the Mount.

He thought that Sir Gilbert was doing a great service when he suggested that we must not make any wild experiments. We must expand a little at a time. Referring to flapping wing machines he said that José Weiss had a machine which would flap in 1914, but the experiments were terminated by his death in 1916.

SIR GILBERT WALKER replying, said that he only knew of ascending currents over the sea from books. As a meteorologist he would not expect them.

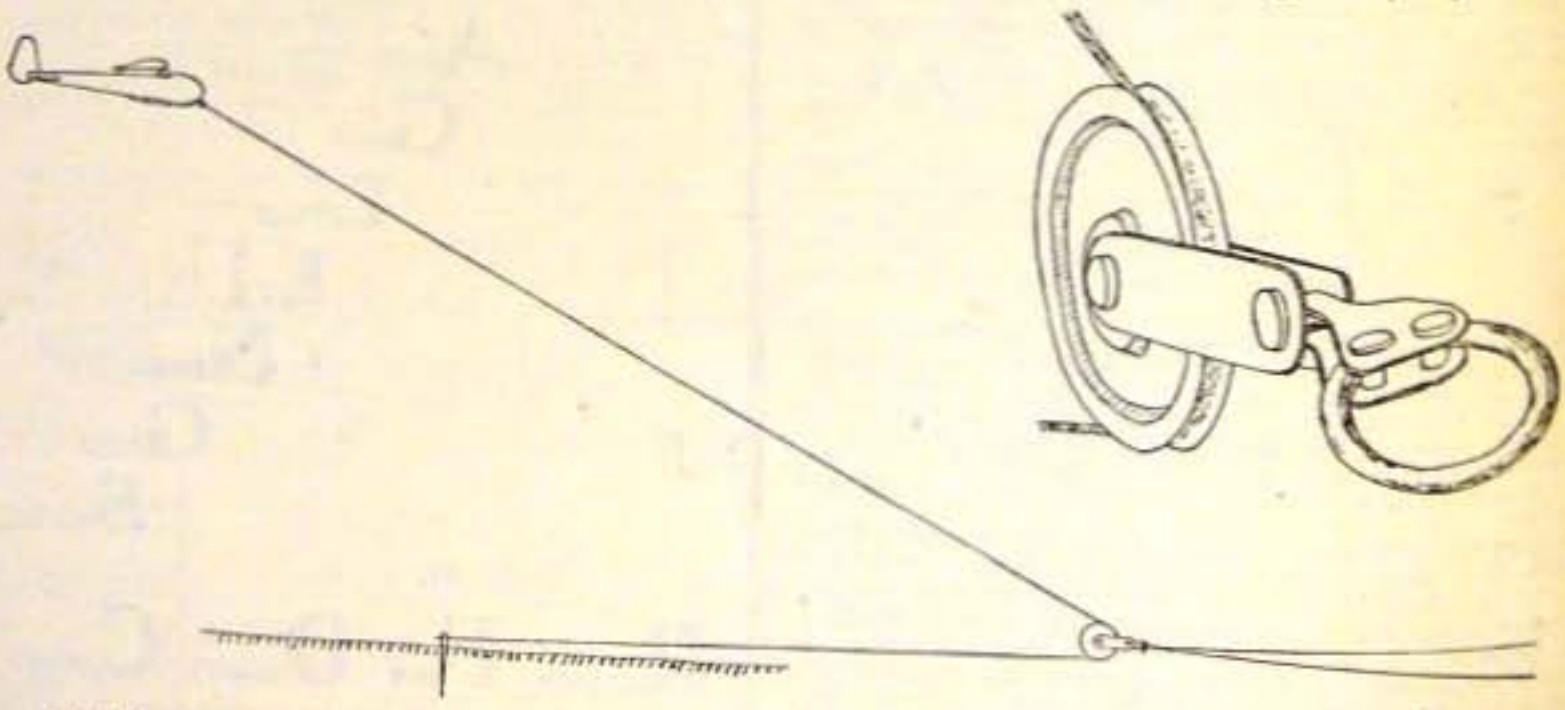
After this other speakers asked questions and propounded theories, to all of which Sir Gilbert replied lucidly and patiently.

A NOVEL LAUNCHING METHOD.

An interesting method of launching, which enables a considerable altitude to be gained, even from level ground, is described in the issue of the German aeronautical publication *Flugsport* for Dec. 10. This method is being successfully employed by the Breslau Model and Sailplane Club, a member of which contributed the descriptive article.

The apparatus required is quite simple. A 6 in. block is attached to the ring of the elastic starting rope, and through it is passed a steel-wire cable, about 3-4 mm. in diameter and 100 yds. long. At each end of this a ring is fastened. One ring is attached by means of a quick-release device to a stake driven into the ground, and the other is hooked on to the glider, which should be launched from a point nearly 100 yards from the stake.

Owing to the energy lost through the pulley, the stake



A sketch of the novel "high-start" method used by the Breslau Model and Sailplane Club. Very considerable heights can be gained on level ground by the use of this arrangement.

and the friction in the block, it is necessary to have a stronger team than usual for the start. A man must also be stationed at the stake to operate the quick-release, if necessary. The pilot-operated release used in auto-towing is not used in this method. It is felt that complications of this sort are likely to distract the pilot and so create more risks than they avoid.

The launch then proceeds in the ordinary way; but owing to the effect of the pulley the team can only move half as fast as the glider. With a head wind the glider will reach a height of 100 to 130 feet by the time it passes over the stake, and at this point the release operator may let go his end of the cable to make the other end unhook more quickly from the glider. Strictly speaking, this release is only necessary in emergency, if the pilot, for example, is steering erratically and is being pulled sideways, or if, when altitude has been gained, the ring appears to be sticking to the hook and the cable is already at a steep angle and pulling the nose down.

But this release is also a useful means of preventing inexperienced pilots from making stunt attempts at altitude records; such attempts are dangerous, not only to the pilot but also to the launching crew, as the ring is liable to be catapulted from the hook when the cable approaches the vertical. The release operator should always wear a crash or trench helmet.

When there is no wind the apparatus does not work so efficiently; the glider overhauls the rope crew much more rapidly, the tension on the cable relaxes, and the hook falls off too soon. Under these conditions a 100-yard cable is long enough, whereas with a head wind up to 200 yards of cable can be used, and with this the more advanced pilots may be permitted to attain much greater altitudes.

The Breslau Club recommends the "high start" as a safe, simple and effective substitute for auto-towing, for both training and propaganda purposes. They state that flights of thirty seconds can easily be achieved on level ground with this method of launching, which they use for the training of "B" and "C" pilots and for practice in mark landings. In addition, it may also be used to give extra height, when it is desired to launch the glider from a point some distance behind the brow of a hill.—A. L. I.

[This method is particularly interesting and appears to make possible quite long flights from a level site. Mr. Lander, writing in THE AEROPLANE some time ago, suggested the possibility of kiting gliders off the ground. The Breslau Club have managed to combine the advantages of a kited-launch for the gaining of height and those of the catapult launch for a clean take-off.—ED.]

JOY-RIDING IN AUSTRALIA.

The activities of Mr. P. J. Pratt have been mentioned in THE SAILPLANE quite a lot, and on Oct. 31 we chronicled Mr. Pratt's gaining the Australian duration record of 95 min., which was achieved on a Zögling built by Mr. Pratt. During this flight he reached a height of 1,000 ft.

What we have only just discovered, through the courtesy of *Air Travel News*, the Australian flying paper, is that Mr. Pratt took up a passenger the same day and stayed up for five minutes,—on a Zögling!

OCCASIONS HIGH-BROW AND LOW-BROW.

There are three dates which glider enthusiasts, interested persons and the mere seeker after entertainment should note. We will give them chronologically as that will be the order in which they will go into the diary.

On Jan. 29 Herr A. Lippisch, who is the well-known designer of the Rhon-Rossitten Gesellschaft, is to lecture before The Royal Aeronautical Society on the Development of Sailplanes and Gliders.

On Feb. 6 the Students of the De Havilland Technical School are giving a Ball in the Portman Rooms. The Reception is at 8 p.m. Tickets (4s. single, 7s. 6d double) may be obtained from Capt. Eadon, The De Havilland Aircraft Co. Ltd., Stag Lane Aerodrome, Edgware.

On Feb. 26 Captain F. Entwistle, B.Sc., who was prominent at the Itford Meeting in 1922 and is the Superintendent (Aviation) in the Meteorological Office, is to lecture before the Royal Aeronautical Society on the Meteorological Aspects of Gliding and Soaring.

FOR SALE.

£45.—Second-hand Dagnall A.T.1, in first-class condition. C. of A.—R.F.D. Co., 17, Stoke Road, Guildford.

MALLITE PLYWOOD

Telephone: Bishopsgate 3647 (4 lines)

FOR **SAILPLANES AND GLIDERS**

Manufactured by the
AERONAUTICAL & PANEL PLYWOOD CO., LTD.,
218-225 KINGSLAND ROAD, LONDON, E.2.

B.A.C. Machines are designed and built by people with Gliding Club operational experience.

We can, therefore, best cater for your needs now and in the future.

Our interchangeable unit system covers all phases of motorless flight with the minimum of capital outlay.

The British Aircraft Co., MAIDSTONE.

General Manager:—C. H. LOWE-WYLDE.

JUST PUBLISHED

GLIDING AND MOTORLESS FLIGHT

A HANDBOOK FOR PILOTS, INSTRUCTORS, DESIGNERS, AND FOR ALL INTERESTED IN GLIDING.

By L. Howard-Flanders, A.F.R.Ae.S., M.I.E.E., A.M.I.Mech.E., *Member of the Council of the British Gliding Association*, and C. V. Carr.

Shows how a pilot is trained, gives practical information for handling, deals with meteorology, choice of ground, construction, care and repair of gliders, and contains details regarding associations, pilot tests, flights, etc. Illustrated, 124 pp., 7s. 6d. net.

Of a Bookseller, or
SIR ISAAC PITMAN & SONS, Ltd., Parker St., Kingsway, W.C.2.

REYNARD GLIDERS

Aylestone, Leicester,

SUPPLY ANYTHING for GLIDING

SETS OF PARTS, FITTINGS, ETC.

LISTS.

SEND US YOUR REQUIREMENTS

TRAINING TYPE, £45, DELIVERED FREE

CORRESPONDENCE.

One Club Looks Ahead.

Sir,—In reply to your correspondent C. H. L. W. in The Sailplane for Dec. 12, I should like to take up the cudgels on behalf of at least one club, namely, The Cononley and District Aero Club. Your correspondent should remember that the majority of gliding clubs have only been in existence a few months and are naturally still in the primary training stages.

He goes on to say "Entire absence of definite and progressive policy, etc." I say that for this club, at least, that is not true. Let me outline our policy.

We have a Cloudcraft Dixon, delivered about three months ago, and in that time, in spite of crashes, weather and difficulties with landowners, we have about eight members ready to take their "A" certificates. We have under construction another Dixon, to which will be fitted a detachable fuselage. This machine will be "cleaned up" considerably, and will be made to serve as a secondary. Also, we have under construction a two-seater which will be used for dual and also for advanced flying solo. Finally, we have a machine which we have every reason to believe will prove a sailplane of an advanced type.

The only thing we have left over is the question of a sailplane of the Professor type, and we feel that it will be time to think of that when we have exhausted the possibilities of all the others (which will take about three years at least).

Finally, we have explored and mapped the surrounding country and have located sites and arranged a scheme whereby it will be possible for *ab initio* and advanced pilots to receive training on the same day.

In conclusion, I must apologise for the number of "We"s in the foregoing, but I feel that we have the right to defend ourselves from this charge, and I will close by congratulating you on the very excellent work you have done with your paper.

(Signed) H. M. Sellers
(Secretary, The Cononley and District Aero Club).

The B.G.A. Acts.

Sir,—The point raised in Mr. Rice's letter in your issue of Dec. 19 is undoubtedly one with a bearing on the transport side of the Gliding Movement.

I have accordingly forwarded a copy of The Sailplane both to the Minister of Transport and to the Secretary of the Society of Motor Manufacturers and Traders, asking them to give the matter their sympathetic attention.

(Signed) J. L. R. Waplington
(Secretary, British Gliding Association).

More Troubles in Store.

Sir,—I have just struck a snag in connection with the new Motoring Laws and Gliding, and would like to warn glider-motorists.

As it is now *criminal* to take out your car unless insured, and drawing a trailer will automatically make your insurance void, make sure to have your policy endorsed by the insurers. To cover this contingency in most cases it will cost nothing.

Don't forget, or it might stop your gliding for six months while you are a guest of H.M. the King.

(Signed) Norman W. Wright
(Chairman, The Dorset Gliding Club).

A Reply to Dr. Hackworth.

Sir,—I read with interest Dr. V. C. Hackworth's opinions as to the expenditure of human energy needed for gliding. Unfortunately, his remarks are all too true, especially when it comes to 20 to 40 seconds flights.

In The Dorset Club we have found that the longer the glide the less willing are the members to retrieve the machine; in fact, a slope good enough for "A" tickets needs a fair amount of energy to retrieve oneself without machine, but with machine is enough to damp, if not kill, the enthusiasm of the stoutest heart. We have largely overcome this by using a car as described in a recent issue, and it is possible to negotiate the steepest hill with ease, with only three or four handling the glider. The effort needed is less than that required to get to the hilltop oneself, as the crew can hang onto the machine and be helped up the hill. By this method we consistently make four glides per hour, just over a quarter of a mile in length and a drop of 150 feet, and do not unduly tire the crew.

As for "Grasshopping," I am of the opinion that this is merely normal exercise, and is a great part of gliding's health-giving properties; it is no strain, such as the method depicted in your picture on page 127. [This picture showed the North Cotswold Club hauling their glider up the hill.—Ed.] I could have been photographed often wasting energy in that fashion, and know the difference.

May I pass comment on the "chance to soar"? I note it is intended to get a German machine; with all due respect to our original tutors, I think that it should be British, as we have much ground to make, and from the manufacturers' point of view, research is necessary; therefore I urge these enthusiasts, "Buy British." If they have any difficulty in obtaining "British," I can put them in touch with at least one firm who have high-performance sailplanes on the "stocks."

(Signed) Norman W. Wright
(Chairman, The Dorset Gliding Club).

Saving Time.

Sir,—An objection to the method of pulling back by hand is the time it takes. On flat and gently sloping ground the following method is quick and has been used with success.

A car is fitted with a tow rope and one member is stationed at the bottom of the slope where the glider is expected to land. The glider is pulled off by a launching team in the ordinary way and the trolley follows it to the bottom. On landing, the pilot, and the assistant stationed there, turn the glider round and hook on the tow rope. The pilot takes one wing tip and trots back to the top.

This method was used with a crew well accustomed to handling gliders; with a raw lot, an experienced member in the passenger seat of the car might be advisable.

Yours faithfully,

(Signed) "Kentigern."

"Those German Certificates."

Sir,—Under this heading in your issue of Dec. 19 I notice that you are asking for information regarding Mr. C. M. C. Turner whose name appears in the latest list received from Germany as having gained his "C" at the Wasserkuppe.

I hasten to advise you that Mr. Turner is the chief Instructor of The Channel Gliding Club; he joined the Club at the inaugural meeting held during the Kronfeld demonstration in June 1930 and as such is one of the founder-members. Mr. Turner may also be numbered among the select band of private owners in this country; it was in Mr. Turner's Prufling that Flt. Lt. Read made the fine flight of 55 mins. at Folkestone on Aug. 24.

It is of interest to note that Mr. Turner gained his Certificate after a stay of two months at the Wasserkuppe during August and September, and also that the only "B" Certificate reported from Rossitten is also granted to a Channel Club member in the person of Mr. Norman Derham, who made such excellent flights at the Inter-Club rally at Lenham, when the Channel Club won the *Kentish Express* Challenge Cup for the first year.

The Club owes a great debt to Mr. Turner, whose enthusiasm knows no bounds, and it is due to Mr. Turner's generosity that the Club now owns an R.F.D. AT 1 in addition to the Zogling.

(Signed) Eric D. Palmer
(Press Secretary, The Channel Gliding Club).

A Wandering Club.

Sir,—I should like to correct an announcement which has appeared in The Sailplane under the heading of "News from the Clubs."

This refers to the gliding site as being at Ibstone, near Stokenchurch. Although we have an option on this site, we have, in fact, only been there once.

We have no settled site at present, preferring to move about the county, with the idea of advertising the Gliding Movement and getting new members.

The only way of finding out where we are gliding on any Sunday is from the local paper, which gives us some space every Saturday.

(Signed) V. C. Davis
(The Oxford and County Gliding Club).

[We venture to suggest that if Mr. Davis can tell the local paper as to the movements of his Club, he can tell The Sailplane, which is read by people who are interested in gliding.—Ed.]

An Explanation.

Sir,—Regarding your somewhat sarcastic note at the end of my report of the Isle of Thanet Club's activities, for your information, may I say that I am in the journalistic line, and that the *Thanet Advertiser's* report was actually written by me, as their correspondent was ill.

As secretary of the Club, and with full authority to use same, I forwarded you the report, *not for you to re-write, and certainly not to waste your valuable time.* The report was my own work, and it was to save my time, which is also of a certain value, that you received the printed effort.

With all good wishes.

(Signed) J. T. Huddlestone
(Hon. Secretary, The Isle of Thanet Gliding Club).

P.S.—I hope you have time, and also the goodwill, to accept and publish this explanation, and rectify an impression likely to be created by your caustic footnote.

[We added the footnote to explain to Club members why news which they presumably had already read was reprinted. We quite understand Mr. Huddlestone's action, but would reiterate our desire not to publish matter which has already appeared.—Ed.]

NEWS FROM THE CLUBS.

WHERE GLIDING CAN BE SEEN.

Beds.—The Bedford Gliding and Flying Club. Week-ends at Willstead Hill, 3 miles from Bedford on Bedford—Luton road.

—The London Gliding Club. Meeting place, Turveys Farm, near Tottenhoe, on Sundays.

Dorset.—The Dorset Gliding Club, at Chickerell, Weymouth.

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

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

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

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

Kent.—Channel Gliding Club. Adjoining Hawkinge R.A.F. Aerodrome, 2 miles from Folkestone, on main Canterbury road. Every Wednesday and Saturday afternoon and all Sunday.

—Kent Gliding Club. Week-ends above Lenham, on the Maidstone—Ashford road.

—The Isle of Thanet Gliding Club. Saturdays and Sundays from 2 p.m. Manston Aerodrome, Thanet.

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

Lancs.—The Furness Gliding Club, at Gleaston Park Farm, Gleaston, near Ulverston (midway between Gleaston and the Coast road), every week-end.

—The Preston and District Glider Club. Week-ends at Beacon Fell, 2 miles froom Inglewhite and 7 miles from Preston.

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

Surrey.—Surrey Gliding Club. Every Sunday, if weather permits, at Lockner Farm, Chilworth, near Guildford. 10 a.m. to sunset.

Sussex.—Sailplane Club of T.M.A.C. Horton Farm, Smalldole, near Steyning.

—Southdown Skysailing Club at Ditchling Beacon. Sundays, 10.30 a.m. till dark.

—The Worthing and District Gliding Club, Wednesdays, Saturdays, and Sundays, at High Titton, second turning to left going from Washington to Storrington.

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

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

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

Yorks.—The Bradford Gliding Club, at The Pastures, Apperley Bridge. Saturday 1.30 p.m., Sunday 9 a.m.

—The Huddersfield Gliding Club. All day every Sunday at Bradley Bar, Huddersfield.

—The Leeds Gliding Club. Week-ends at Gildersome, near Leeds.

—The Scarborough Gliding Club. Every week-end at Flixton, weather permitting.

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

[*Some Club news is unavoidably crowded out this week, but will appear next week.*—Ed.]

THE BEDFORD GLIDING AND FLYING CLUB.

Last week-end (Dec. 21), although the weather was perfect for outdoor work, it is regretted that through force of circumstances we had to remain under cover of the Hangar. The damage to the wing as mentioned in a previous report, was found to be more serious than had been anticipated, and we had to replace four ribs in the main plane.

Good luck to THE SAILPLANE for 1931!

Christmas has come and gone, and as regards outdoor operations and the weather, we can only say that we were beaten but not dismayed.

During the holidays, the Club machine was taken over to the Sharpenhoe Hills, where members assembled on Boxing Day, Saturday and Sunday, but unfortunately owing to heavy rains and adverse winds, no gliding was possible with the exception of a few ground hops on one afternoon.

Nevertheless, the Committee would like to express their thanks to Mr. Lander by whose kind invitation we visited the ground, and hope that soon again a more successful Show can be arranged.

In view of several inquiries re Membership, please note the Club address is 80a, High Street, Bedford, and Membership is still open as £1 entrance and 15s. per annum subscription. Gliding takes place every Sunday, and as soon as the days lengthen operations will be extended to Saturdays and week-evenings.

THE CHANNEL GLIDING CLUB.

On Dec. 19 there was no wind and a thick fog covered our training ground; however, five fanatics turned up, including one of the Club Instructors, Mr. C. M. C. Turner, whose motor-car, being of the powerful type, was used for towed flights on the R.F.D. A member eventually became air-borne and considering the "avoirdupois" was 14 stone this was considered satisfactory. It is suggested that tables be made keeping record of the results of flights on different machines for pilots of different weights, giving the necessary speed for proper control. These tables would be valuable data for Clubs contemplating towed-flight and thus save hours of experiment of the Austin 7, 20-stone pilot and 9 m.p.h. order.

The First Annual Ball, held at the Leas Cliff Hall on Dec. 12, proved an unqualified success, there being an attendance of approximately 170 dancers. The Professor sailplane belonging to Miss Suzi Lippens was exhibited in the foyer, together with a selection of pictures taken on the Club ground.

It was hoped that a batch of "A" Certificates would be taken on Dec. 14, but the wind again failed. Several members made exceedingly good attempts, resulting in over 20 secs." flights and which, with the requisite wind, would undoubtedly have resulted in "A" tickets for the members.

The site at Cox's field was used in the morning, but it was felt that a site about 1½ miles as the crow flies would give better results. Accordingly, a few stalwart members set off with the glider on their shoulders over a cross-country route. After surmounting many fences, a quarry, two roads and a farmyard, which proved a good substitute for a stretch of sinking sands, the alternative site was reached only to find that no better results were obtainable. The afternoon was used giving instruction to members and, as mentioned, some promising flights were made.

THE CONONLEY AND DISTRICT AERO CLUB.

The Cononley and District Aero Club continues to make progress and in spite of bad weather flying continues. We now have eight members ready for their "A" Certificates and hope to obtain these at Scarborough.

Our Technical Committee have been studying our Dixon with a view to simplifying the rigging, and their results will shortly be available in blue-print form. We think that we shall be able to get the time down to about 10-15 minutes. Will Clubs who are interested please write the Secretary at 178, Skipton Road, Keighley.

THE GLASGOW GLIDING CLUB.

An extraordinary general meeting of the Club was held in the Smoke Room of Messrs. Rowans, Buchanan Street, Glasgow, on Dec. 12, at 8 p.m., Mr. Gregor Cameron in the Chair.

The Secretary outlined the work already accomplished by the Club and put before the meeting various plans suggested by the committee for the development of the Club. In view of the necessity to increase the Club's funds it was decided to institute a ground fee for flying practice—the sum agreed to being sixpence for two flips. Various schemes will be considered for increasing the Club funds as the importance of sound finance is fully appreciated.

Two films were shown to the members of gliders in action. One was taken on the first Sunday that our R.F.D. Primary machine was flown at Barrance Farm, considerable amusement being caused by the various members seeing themselves for the first time as others see them. The other film showed a B.A.C. machine at work and it was interesting to compare the two different types of gliders. The films were shown by courtesy of Pathescope.

A short lecture was given by Mr. J. K. Mackintosh on the "Theory of Flight," as it was felt that an appreciation of how the air forces acted on the wing would be useful to the *ab initio* pupils.

Later Mr. Houston Anderson dealt with the practical side of the question. He explained at length, with blackboard illustrations, how to fly the glider, his remarks being intended to supplement field instruction. Quite a discussion arose over several points and it was obvious that these lectures are of very considerable value.

Mr. Caplan outlined a scheme which he has invented to forward practical field work. Briefly the scheme aims at the maximum number of flights with the minimum amount of labour per member. Full details of this scheme will be available when it has been properly tried out, but the committee consider the scheme a "winner."

The Hon. Sec. is Mr. A. Y. Paton, 70, Exeter Drive, Glasgow, W.1.

THE ISLE OF WIGHT GLIDING CLUB.

On Dec. 21 the Club met at Whiteley Bank to begin instruction on slopes, and it was immediately apparent that our weeks spent in practising flights, and more especially landings, on the "flat" had not been wasted. Our proper site at Whiteley Bank unfortunately proved unsuitable on account of a moderately strong north wind, and owing to the extremely sodden condition of the ground some time was wasted in endeavouring to find a site.

Eventually permission was obtained to use a field with a slope of about 1 in 10 and the glider was thereupon hauled to the top and assembled. The site wasn't exactly ideal, a main road, complete with hedges and telegraph wires, being at the bottom of the slope, but as our instructor remarked, "It will teach you to get down in a limited space!" It did! The sight of a hedge and a mass of wires rushing up at one doesn't tend to improve the functioning of one's heart.

The first flight, as usual, was made by the Club Captain, who demonstrated how to bank away from an obstacle (in this case a barbed wire fence) and turn again into the wind to land. The necessary moves were done very neatly, and the glider landed at the bottom of the slope, a few yards from the hedge.

Flights by Members followed, and as a result of the practice done previously on the "flat," these were very successful and each finished with good landings, the average time of each flight being 15 seconds, which, allowing for the limited size of the site, was quite good. There was a distinct upward current, the glider having to be flown onto the ground and landed the right side of the hedge, as Members were definitely instructed not to attempt any steeplechasing. No accidents occurred to mar the meeting and at the close of the day the glider was returned to the hangar intact.

The meeting of The Isle of Wight Club at Whiteley Bank on Dec. 28 was abruptly concluded by a crash which will suspend further gliding on the part of the Club for at least three weeks to a month. Both wings of our B.A.C. II are more or less written off, and all members for the next week or so will be afforded the opportunity of acquiring a practical working knowledge of wing construction, as we shall be busy building a fresh pair of wings for the machine.

An early start was made in the morning on our proper site, the wind being S.W. fairly strong but steady. As usual the first flight was made by the Club instructor, Capt. F. W. Merriam, and this was followed with successful flights by Messrs. Thompson, Hess, and Stagg. The next member to be launched was Mr. Hurst, who took off well, but in clearing the brow of the slope was struck by a heavy gust of wind which carried him up to thirty odd feet, and getting under the starboard wing, put the machine into an absolute vertical bank. The port wing hit a hedge, and glider and pilot "cart-wheeled" into a ploughed field, both finishing up in a very undignified manner,

upside down. Fortunately Mr. Hurst, except for an extremely muddy face, due to contact with the field, with quite unhurt. We wish we could say the same of our poor B.A.C. II!

The port wing is a "write-off" with the exception of the aileron and metal fittings. The starboard wing has all ribs broken, but we were able to salvage the main spar and aileron. In addition the rear centre section strut is broken at the base. It is interesting to note, however, that our struts did not break or buckle, neither did they cause any damage to the wing spars. The main spar of the port wing is broken at the spot of impact with the hedge. The fuselage and complete tail unit are undamaged.

This is the first real crash the Club has had since its formation last July, and now members will have the opportunity of studying the constructional side of gliding in earnest. We hope to be flying again by the end of January.

Several people witnessed the crash and two new members were enrolled subsequently! It's an ill wind, etc.!!

Until further notice meetings will be held on Thursday evenings and Sundays from 10.30 a.m. at the workshop kindly lent by Messrs. Saunders-Roe Ltd. at East Cowes, where the necessary repairs are being done.

THE KENT GLIDING CLUB.

On Dec. 26 a party of Club members visited the R.A.F. Station at Eastchurch. Although the weather was of the worst, the party had a very enjoyable and instructive morning, inspecting the various types of Service aircraft in the hangars.

Flt. Lts. Crawford and Graham Nichols kindly explained the various details and conducted the party through the Gunnery School and Museum.

After an excellent lunch at the Manor House Hotel, members returned to the aerodrome, and the rain having ceased some experiments in auto-towing were carried out; however, the ground was too saturated for the car wheels to get a grip and attempts had to be given up.

On Dec. 28 a successful meeting was held at Lenham, but towards the end of the afternoon some slight damage was done to the tail plane and further gliding was suspended.

Jan. 4, 1931, is the first anniversary of the Club's formation, but as this date falls on a Sunday the annual dinner is being held on Monday, Feb. 23, the anniversary of the first gliding meeting.

THE LONDON GLIDING CLUB: HARLINGTON GROUP.

On Boxing Day, owing to rain, our operations were confined to effecting one or two minor repairs under cover until after lunch. By 2 p.m. the weather had cleared and the wind had swung round from S.E. to W.S.W.

With the help of three or four members of the Bedford Club, who were making use of our ground by invitation, we got "Thistledown I" to the top of Streatley Hill about 3.30 p.m. With only two on each rope, a rather weak launch was effected, Mr. Lander piloting, resulting in a glide of about 40 seconds. Immediately after clearing the brow of the hill, the machine made a turn to the left and flew parallel with the face of the hill in the up-current towards the bowl. In the centre of the bowl the machine entered a very strong down draught and only just managed to clear the hedge into Martin's field, 150 ft. below. As the light was going this was the only flight attempted.

On Dec. 27 the Bedford visitors made some practice hops in their Dagnall A.T.I. from the lower slopes of Streatley Hill, and in Martin's field, but the wind was S.E. to S., which is not satisfactory on this ground.

On Dec. 28 the Bedford visitors turned up in force, and together with the London Club Group, took their respective machines to the top of Streatley Hill. Here, the wind was judged to be too strong for the Bedford machine and flights were confined to "Thistledown I." Some instructive attempts at launching, a few of which were successful, followed. We, the London Club Group, were all enthusiastic and convinced that, with so strong a wind blowing almost straight on to the W.S.W. slope, we were at last going to soar!

Though we have used this ground almost continuously since the end of August, we have so far been dogged with lack of wind and other adversities. We started with a car launch rather less than our usual distance from the edge. The machine took the air with scarcely any run, rose about twenty feet, cleared itself from the launching rope, and was as quickly brought down to earth in a down eddy, several yards short of the edge of the hill.

A second launch resulted in a bigger initial climb, but again the machine was caught in the eddy, curling over the lip of the hill. Mr. Lander held it off to try to clear the edge, which it did, but with so much loss of speed that the machine was practically at stalling point when an up gust caught it under the right wing, causing it to spin back on to the top of the hill, cart-wheeling with the left wing-tip on the ground. By good luck no damage was done beyond a tear in the extreme end of the three-ply wing-tip fairing.

The Bedford visitors then offered to hand-launch the machine. Two attempts were made from the same spot, but the down gust just short of the edge, held the machine on the ground each time.

Finally a move was made to a point nearer the bowl and a good launch was effected. The machine climbed well, but was caught again in a strong down draught just short of the lip. However, the machine cleared the lip with ten or fifteen feet to spare, and immediately entered the steep and narrow up-current, which seems characteristic of the site. Mr. Lander turned to the right and continued to soar for a few seconds, finally losing the up-current and becoming involved in the same strong down-draught as on the Boxing Day flight, again barely clearing the hedge into Martin's field.

Next followed three attempts to hand-launch Mr. Allan, and in no case did the machine leave the ground.

Finally, we reverted to car-launching, shortening our normal rope, with the result that a most satisfactory launch was made, Mr. Allan making a very steady thirty seconds' flight, in the first few seconds of which, in the up-draught just clear of the lip of the hill, he definitely gained height.

This flight was followed by an equally successful one by Mr. Elliott of thirty-three seconds, who, however, tried to fly a little too slow in the prevailing wind conditions, and only by doing the right thing at the right moment, just managed to avoid getting into difficulties.

Altogether we felt we had had a thoroughly interesting day, and gained quite a lot of useful knowledge about the ground and prevailing currents. Also, car launching showed up very favourably compared with hand launching, as no doubt our Bedford visitors will acknowledge. We were sorry that they had so little use of their own machine while at Harlington, and hope that they will honour us with another visit in the near future, when perhaps they will have better luck and more suitable weather conditions.

[As Mr. Lander tells us that all the group have made larger flights in less or no wind this interesting bulletin shows clearly the importance of studying air-currents. We suggest that Mr. Lander should light a few bonfires and see where the smoke goes.—Ed.]

THE PRESTON AND DISTRICT GLIDER CLUB.

On Dec. 6 and 7 there was a good muster of members and other interested people at the Flying Ground at Beacon Fell. Unfortunately weather conditions were bad as thick fog and heavy rain prevailed. Only two flights were made.

On Dec. 14 the elements were again unfavourable, but in spite of a gusty wind and several hail storms seven members made their first flights along the ground, and instruction ended at dusk with these members each having been launched three times.

Thick fog covered the Fell top on Dec. 21, so the afternoon was devoted to rigging the machine, general overhauling and greasing of wires and turnbuckles, and a discourse on the Theory of Flight.

We arrived at Beacon Fell on Dec. 22 with high hopes. The sky was cloudless, the sun shone brilliantly, and a steady wind of 3 m.p.h. spoke of ideal conditions for training. Mr. L. E. Falla made a test flight of 30 secs., pulled the machine up to 60 feet on taking the air, made an "S" turn and landed comfortably in the same field.

A launching spot was then selected lower down the hill and the Club's automatic release gear used in giving members ground slides and short hops. Altogether the machine was launched 20 times, and at the present rate of progress several *ab initios* will soon be qualifying for their "A" Certificates. Two of our lady members made successful flights, showing considerable confidence in their handling of the controls.

During the several meetings held by the Club the vast importance of beginners strictly obeying the Instructor's orders has become obvious, and for over-eager members who soon tire of slides and hops and want to take the air precipitantly, a firm hand is required. Members who take unnecessary risks and damage the machine should realise, if only from a sporting point of view, that it is unfair to the Club when by negligence the glider is put into "dock," thus depriving other members of valuable opportunities to fly.

We count ourselves fortunate in our landlord, Mr. Butler, at whose farm every assistance is offered. A room has been placed at our disposal and Mrs. Butler caters for the inner man as only a farmer's wife knows how. And after several launches and "pullings back." Gee! how those boys can eat!

The next Meeting will be on Jan. 3 and 4, 1931.

THE SOUTHDOWN SKYSAILING CLUB.

On Dec. 21 the Club got through a lot of useful preliminary training on their ground near Ditchling Beacon. Some long-distance flights were made during the day by Flt. Lt. Brown (Club Captain) and Messrs. Russell, Robins, Parker and W. Wood.

A feature of the Meeting was a splendid first performance put up by Miss Hackworth, daughter of Dr. Vivian Hackworth, the Club's Hon. Medical Officer (who also made a good glide last week). Miss Hackworth made two very straight and steady flights, earning the applause of the onlookers.

Another good effort by an *ab initio* was a steady glide made by Mr. D. M. Cannon, who should soon be ready to qualify for his "A" Certificate. Messrs. Ely, Tulley and King-Smith are also approaching Certificate standard.

Altogether nearly fifty launches were made and there was an increased attendance of interested spectators.

On Dec. 28, The Southdown Skysailing Club held their last Practice Meeting of the year, this being the ninth weekly meeting of the Club. Well over two hundred launches have been made and the R.F.D. primary training machine has stood up well to hard usage. With only two mishaps to record (and these were not really serious) a word of praise is due to the Instructor, Flt. Lt. Brown, D.F.C., and to his energetic team of Ground Engineers.

In nine actual flying days very considerable progress has been made and by next Summer the Club hopes to have trained a number of soaring pilots.

Owing to a very high and gusty wind blowing in the wrong direction on Dec. 24, at the Club's gliding ground near Ditchling Beacon, training flights were somewhat restricted. Mr. C. G. Lawson, however, succeeded in making a faultless glide of 35 secs., thus qualifying for his "A" Certificate, the fifth to be obtained by members in the last few weeks.

Other glides, varying in duration from 30 to 10 secs., were made by the following members: Flt. Lt. Brown and Messrs. Robins, S. Wood, W. Wood, Cannon, Ely and Tulley.

Secretary's address: New Yorke Hotel, Bedford Square, Brighton.

Printed for AERONAUTICS LTD., by BONNER & Co. LTD., The Chancery Lane Press, Rolls Passage, London, E.C.4: and Published by AERONAUTICS LTD., at Cannon House, Pilgrim Street, Ludgate Circus, E.C.4.

EDITORIAL AND ADVERTISEMENT OFFICES OF "THE SAILPLANE," 175, PICCADILLY, LONDON, W.1.
ACCOUNTS AND PUBLISHING OFFICES, CANNON HOUSE, PILGRIM STREET, LUDGATE CIRCUS, E.C.4.
Telephones: Editorial, Gerrard 5407; Advertising, Gerrard 6023; Publishing, Central 5822.