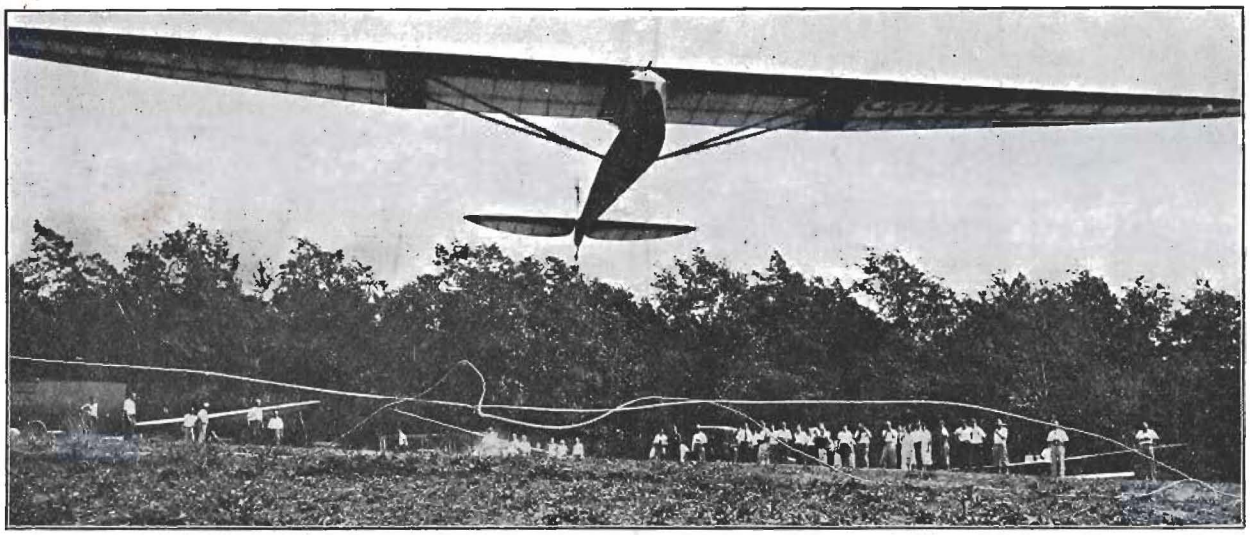
September 25, 1931 Vol. 2. No 6.

Price 6d.

THE SAILPLANE AND GLIDER

Edited by Thurstan James.

AN AMERICAN HAWK



AT ELMIRA.—The Haller-Hawk taking off during the National Gliding Meeting held at Elmira. On page 64 will be found a story of the meeting by Mr. Bulger.

THE INTERNATIONAL COMPETITION

On Oct. 3/4, at Balsdean, close to Rottingdean, are to be held the Second B.G.A. International Competitions. The events are listed on the next page of this issue and there as well, will be found illustrations of the four outstanding prizes, and maps of the site and the routes which lead to it.

The map of the site has already appeared in THE SAILPLANE and has been prepared by Mr. York Bramble to show the contours (dotted lines) at 100 feet differences of height and its suitability for glides into all wind directions. The arrows show the various start-points for winds as indicated in the squares at their tails and the names are those of pilots who have soared at such points.

Of the four magnificent trophies the first to be presented was the Wakefield Trophy, which is really a beautiful piece of work. It is open for an international entry for "B" and "C" machines only. The winner will be the pilot who makes the longest distance flight across country. This trophy is for annual competition.

The fine silver bowl presented by Madame Manio is in memory of her husband who was killed in the early days of aviation while flying in Portugal. It is also for international and annual competition. It will be awarded to the "C" machine which makes the fastest flight over a course of not less than one mile in length. The mean time of the flight both ways will be deemed the speed of the machine.

The M. H. Volk Cup is limited to British entries and pilots, although either "B" or "C" machines may be used. Entries must be nominated by Clubs. The prize will be won by the machine which completes the greatest number of circuits around two pylons figure-of-eight-wise.

The fine two-handled Cup presented by Captain de Havilland is open for annual international competition and will be awarded to the pilot of a "C" machine who makes the furthest distance flight and returns to within 150 yards of his start-point. As the pilot has to designate his own goal it will call for nice discrimination.

Besides these big trophies considerable money prizes are being offered, and through the sportsmanship of the famous firm of L. G. Sloan, Ltd., six of their famous Waterman combined pen and pencil presentation sets are available for prizes. Another super prize is a pair of Number Ten Luxor goggles which are being presented by Meyrowitz Ltd., of Bond Street, the firm who supply the High Speed Flight with their goggles, and practically all the other winners of speed events. The action of these two firms in helping forward the British Gliding Movement will not be forgotten.

For the purposes of the Competition gliders will be divided into three categories as follows:—

PRIMARY.—Machines with a span of 40 ft. or under; pilot completely exposed.

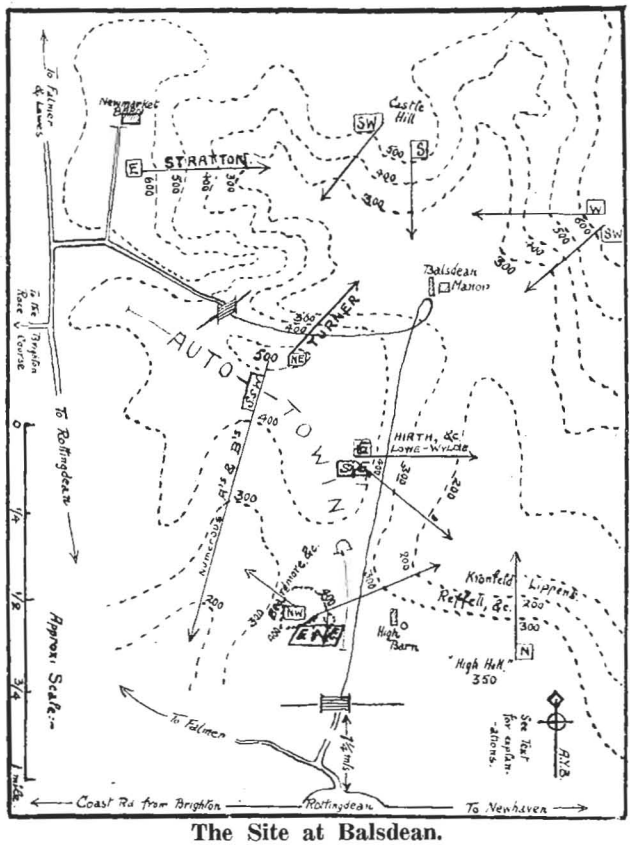
SECONDARY.—Machines with a span of 43 ft. or under; aspect ratio not greater than 10; pilot in fuselage, nacelle or partly streamlined.

HIGH EFFICIENCY.—Machines with a span greater than 40 ft.; aspect ratio greater than 10.

It is probably not necessary to remind the British Gliding Movement that the International Commission for the Study of Motorless Flight is holding its second conference in London in the first week of October. The Commission has deliberately chosen London so that its members may study the progress made in this country, a progress which has had a marked stimulus on gliding throughout the World.

It is therefore up to all of us to put our several shoulders to the wheel and push our hardest so that the delegates, representing as they do the Gliding Movements abroad, shall see with their own eyes what wonderful things have been and are continuing to be done in Great Britain, and that mark you, without Government help.

The Second B.G.A. Gliding Meeting



The Site at Balsdean.

EVENTS.

The Competition shall be divided into the following classifications :—A—Primary Training Machines. B.—Secondary Machines. C.—Sailplanes. (*See Leader, page* 61).

EVENTS OPEN TO "A" MACHINES—TO BE HAND-LAUNCHED

1. Rig and Fly Contest. Entries only accepted from Clubs. Machines having been dissembled before the start of the Contest; at a given signal the machines have to be rigged, passed by an observor and flown for not less than 30 seconds.
2. Spot Landing Competition.
3. Distance Flight.
4. Duration Flight.
5. Aggregate Flying Contest. During the time the Meeting is open any "A" machine may be flown and the winner of the Contest is the entrant whose machine aggregates the longest flying time. No flight of less than 30 seconds to count.
6. Distance Flight. Open to British Women Pilots only.

CONTESTS OPEN TO "B" MACHINES

7. Rig and Fly Contest. Conditions similar to Contest No. 1.
8. Duration Flight with return to within 150 yards of the point of departure. Machines must be hand-launched.
9. Distance Flight with return to within 150 yards of the point of departure. The pilot must indicate his goal and fly over the designated spot. Pilots must notify their goal in advance so that officials can be posted there. Machines must be hand-launched.
10. Altitude above starting point. Barographs to be carried.

CONTESTS OPEN TO "C" MACHINES ONLY

11. Rig and Fly Contest. Conditions similar to Contest No. 1.
12. Fastest Flight on a straight course of not less than 1 mile in length. The judges are to fix the distance according to the the meteorological conditions. The mean time of the flights both ways deemed the speed of the flight. The winner to hold the "Manio" Cup for one year.
13. Distance Flight with return to within 150 yards of point of departure. The pilot must indicate his goal and fly over the designated spot. Pilots must notify their goal in advance so that officials can be posted there. Machines must be hand-launched. The winner is to hold Capt. de Havilland's Cup for one year.
14. Altitude above starting point. Barographs to be carried.

CONTESTS OPEN TO ALL TYPES OF MACHINES

15. First machine in the air after the Meeting is declared open on Saturday. The winner must remain airborne at least 30 seconds.
16. First machine in the air after the Meeting is declared open on Sunday. The winner must remain airborne at least 30 seconds.

CONTESTS OPEN TO B. AND C. MACHINES ONLY

17. Distance Flight across country. The winner to hold the "Wakefield" Trophy for 1 year. The first British Pilot to fly not less than 50 miles may win the Cellon Prize of £50.
18. Duration Flight with return to within 150 yards of point of departure for passenger-carrying machines carrying a passenger. The point of departure to be the spot where the machine is at rest immediately before being launched.
19. Figure of eight Contest round two pylons. The machine flying the greatest number of times around the figure to win —only completed figures to count. Machines to be hand-launched. Entries only accepted from Clubs who have to nominate pilot and machine. No pilot or machine to be entered by more than one Club. The winner to hold the "M.H. Volk" Cup for one year.
20. Out and home contest for passenger-carrying machines carrying a passenger.

NOTE.—*Only British entries accepted for and British pilots allowed to compete in the events limited to "A" and "B" classes of machines and in event No.* 19.

All pilots must hold a Glider Pilot's Certificate. Only pilots with only "A" Certificates can enter for Class "A."

All pilots competing in "B" class machines must hold a "B" Glider Pilot's Certificate, and all pilots competing in "C" class machines must hold "C" Glider Pilot's Certificates.

On each day the Meeting shall be officially declared open and closed and an easily recognised signal shall be given.

No aeroplane-launching allowed.

Where auto-launching methods are used the length of the cable shall not exceed 500 *feet.*



THE PRIZES: Top left—**The Wakefield Trophy;** top middle—**The Manio Cup;** top right—**The Volk Cup;** bottom middle—**The de Havilland Cup.**



HOW TO GET THERE.—When one gets into Rottingdean, one goes straight up through the village and turns right up a steep chalk road, after leaving the village behind.

GLIDING IN HUNGARY

In the year 1931 motorless flying was being carried on in two places, Budaörs and Kapsovár. In Budaörs the "Movers," the "Mavaero" and the groups of "Hungarian Pathfinders" practise on Saturdays, Sundays and holidays, and in Kaposvár the "Sacaero" from April 15 to the end of September. The "Movero Gyöngyös" has already built two ZOGLINGS and is now erecting a hangar.

The terrain at Kaposvár is ideal for training up to the "B" test, but it is not possible to soar there; that of Gyöngyös is suitable for all purposes, as is also that at Budaörs, though the latter is small and very awkward, so that flying can only be done there by the experienced.

The following machines are available:—

Movero Bp., 1 PRUFLING, 1 HOLS DER TEUFEL (another under construction), 1 HANGWIND, 2 HUNGARIAN ZOGLINGS; flying since July, 1929.

Sacaero: 1 HANGWIND, 2 HUNGARIAN ZOGLINGS; flying since April, 1930.

The "Mavaero," "Pathfinders" and "Movero Gy" have 2 HUNGARIAN ZOGLINGS each, and have been flying or will fly, from October, 1930, February, 1931, and August, 1931, respectively.

Up to the present 52 "A" tests and 18 "B's" have been passed by the combined clubs, and 3 "C's" by the "Movero Bp."

The first gliding meeting was held in 1930. During the 11 days it was only possible to soar on one day, when two flights of 1 hour 21 mins., and 1 hour 18 mins., were made. Some excellent long glides and turns were carried out in the beginners' competition.

THE HANGAR PROBLEM

The first thing a Club wants after it has purchased its first machine, especially if that machine is a primary type with wire bracing, is a hangar. The time spent in assembling and dismantling is out of all proportion to the flying time obtained and if the machine is left in the open it very soon deteriorates.

The stumbling block in practically every case is the cost of a building of sufficient size to house the machine. The span of a primary machine is usually 33 feet and if a Club has 3 or 4 machines it would need a building of, say, 40 feet span by 60 feet. This should comfortably house up to 6 machines, some of which would be partially dismantled. A wood building of this sort would cost about £100 to £120 and would take a certain amount of skilled labour to erect. This is beyond the means of most Clubs.

[*The Ellis hangar as used by the London Club was erected by members in two days and cost £83 odd. It houses all their fleet.* —ED.]

If a Club has two machines, shall we say a primary and an intermediate, what is the smallest building that can house these and what is the cheapest form of construction? Two machines of this type will fit in to a hangar of 25 feet span by 40 feet. This admittedly entails a certain amount of overlapping and it does not give much spare space, but for the ordinary Club should be a useful size.

When taking into consideration the cost of erection one should consider the value after erection, in case the Club wanted to dispose of it to get a larger one or in the unhappy event of the Club closing down. The wooden building of this type would have to be placed on foundations which immediately render it a permanent fixture. Many readers will remember the Army Hospital Type Hut which was used during the late war, constructed of curved sheets of corrugated iron forming a semi-circle with wooden ends. This was supported on a very light steel framework and wooden purlins forming a very robust assembly, capable of withstanding high winds and free from the danger of collapsing under a heavy load of snow which would endanger the roof of a lightly-constructed wooden building. These were made in various sizes and if they were obtainable to-day would provide a very cheap accommodation. Unfortunately, the stock has been used up.

It is, however, possible to obtain copies of these which are easily erected, and have a good second-hand value, as they will always provide a useful shed for farmers and when erected are a tenant's fixture, thus obviating the necessity for the local Council's permission and also enabling one to remove it should the Clubs tenancy of the site cease. A shed of this sort and of the size mentioned would cost about £50 on site and could easily be erected by members themselves. If at any time the Club were in a position to extend their accommodation extra sections could be added. This form of construction would outlast for many years a wooden building of the same price.—

H. I. SECKER.

CELLON DOPE

FOR

SAILPLANES and GLIDERS

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

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

GLIDING AND SOARING CONTEST AT ELMIRA

By THOS. L. BULGER.

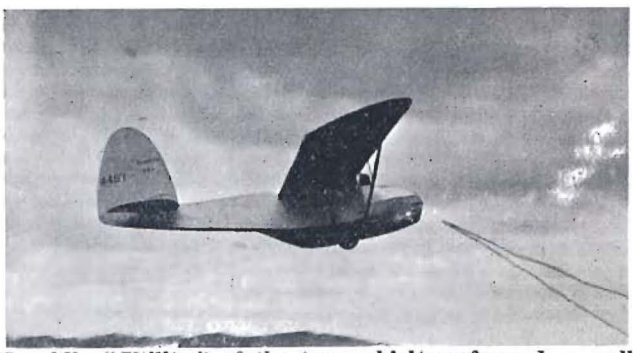
The Second Annual American Gliding and Soaring Contest was held from Aug. 2 to Aug 16, at Elmira, N.Y., commonly called the American Wasserkuppe.

The ridges that are used for soaring in this particular vicinity are located within a few miles of the city and all have excellent roads to the take-off points. When you have arrived at the take-off point on any of the ridges, the City of Elmira can be viewed below, stretched out in a beautiful wide valley. The most popular site is called South Mountain which has an altitude of 650 feet above the valley floor and most of the landings can be made at the local airport which is located about one mile from the base of the Mountain.

The East Ridge is another popular site and can be used for several days at a time once a west wind blows through the valley. The East Ridge is never used for student work as at times there are very bad swirls and eddies along this ridge that makes student soaring quite dangerous. It was along this ridge that Wolf Hirth soared for over seven hours during the 1930 contest.

The Contest this year brought out thirty-six soaring pilots and twenty-six machines, which were as follows:—15 Franklin PS2 Utility Gliders, 2 Haller-Hawk Sailplanes, 1 American Schloss-Mainberg Sailplane, 3 Baker-McMillen Cadets, 2 Bowlus Sailplanes, 1 Mead Challenger Soarer, 1 Detroit Gull Soarer and 1 Home Built Secondary.

The greatest disappointment of the Meet was the weather which resulted in qualified soaring flights in but 8 out of 15 days. There were only thirty-eight qualified soaring flights in all as against ninety-nine official flights during the 1930 meeting. This decrease in official flights was due to two factors. First, the weather averaged far below last year; by that I mean that while ectual qualified flights were made on eight days, conditions were far less favourable for the performance of the younger and less experienced pilots and for the lower performance ships than during the eleven days of 1930.



Franklin "Utility" of the type which performed so well at Elmira. Note the Airwheel.

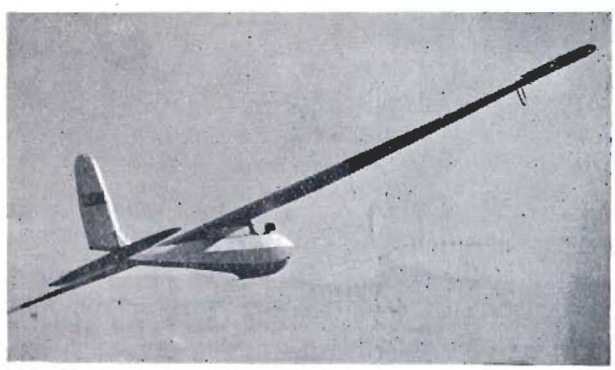
But an even greater factor was that the qualification rules for the 1931 Contest, taken directly from the F.A.I. record rules, were far more stringent than in 1930 and it took far more skill to qualify in this year's Contest than last. This is indicated by the fact that there were 145 trials in which soaring was actually engaged in, but resulted in only 38 qualified soaring flights.

OFFICIAL DURATION FLIGHTS.

Pilot	Type Ship	Time
Albert Hastings, Elmira, N.Y.	Franklin ...	7 hrs. 30 mins.
"Bud" Stickler, Washington D.C.	Franklin ...	7 hrs. 28 mins.
"Bud" Iszard, Elmira, N.Y.	Franklin ...	6 hrs. 3 mins.
A. B. Schultze, Detroit, Mich.	Franklin ...	5 hrs. 5 mins.
Warren Eaton, Norwich, N.Y.	Franklin ...	4 hrs. 50 mins.
W. H. Bowlus, LeRoy, N.Y. ...	Bowlus ...	4 hrs. 25 mins.
Robert Eaton, Norwich, N.Y. ...	Franklin ...	3 hrs. 57 mins.
Martin Schempp, Germany ...	Haller-Hawk	2 hrs. 55 mins.
B. W. Wilson, Detroit	Spec. Primary	2 hrs. 45 mins.
Lieut. Barnaby, U.S.N. ...	Cadet ...	2 hrs. 24 mins.
R. E. Franklin, Ypsilanti, Mich.	Spec. Franklin	2 hrs. 20 mins.
Wally Franklin, ,, ,,	Franklin ...	2 hrs. 16 mins.
Capt. Von Pippig, Germany ...	Franklin ...	2 hrs. 10 mins.
M. Stoughton, Detroit, Mich.	Spec. Primary	1 hr. 39 mins.
Allen Rocke, Providence, R.I.	Franklin ...	1 hr. 15 mins.
J. S. Fassett, Providence, R.I.	Franklin ...	1 hr. 13 mins.
Ed. Barton, Elmira, N.Y. ...	Franklin ...	1 hr. 12 mins.
R. H. Holderman, LeRoy, N.Y.	Franklin ...	1 hr. 3 mins.
Capt. Phillips, U.S. Army ...	Bowlus ...	1 hr.
Gus Haller, Pittsburgh, Pa. ...	Schloss-Mainberg	58 mins.
Mrs. Holderman, LeRoy, N.Y.	Franklin	49 mins.

During these flights, Mrs. R. H. Holderman, wife of Capt. R. H. Holderman, of LeRoy, N.Y., made a new official duration record for women.

Martin Schempp, Germany, with a Haller-Hawk sailplane, made two excellent distance flights; on Aug. 12, Schempp stayed aloft for 2 hours, 54 mins. 36 secs., and



A Bowlus sailplane takes off at Elmira. This type has movable wing-tips instead of the conventional ailerons.

flew a distance of 15 miles, his maximum altitude during this flight was 1,440 feet; his landing was at Greensland-ing, Pa. On Aug. 15, Schempp flew cross-country for 12.4 miles. Schempp won first prize for distance.

Second Prize for distance was won by the American Veteran, William Hawley Bowlus, with a distance of 10.95 miles, landing near Chemung, N.Y. Third Prize went to Albert Hastings, of Elmira, who flew a Franklin Utility Glider for a distance of 8 miles from East Ridge to Erin, N.Y. Fourth place went to Gus Haller, of Pittsburgh, who flew his Schloss-Mainberg sailplane for a distance of 3.8 miles, who last year won this event by flying 21 miles.

These were the only four qualified distance flights which passed the official rules although there were half-a-dozen others which would have been much better than third place and perhaps a few that would have been better than second place.

When a check-up was made of the barographs, the different pilots were found to have soared to the following heights:—Martin Schempp, 3,130 ft.; Al Hastings, 1,960.96 ft.; R. E. Franklin, 1,300 ft.; H. Bowlus, 1,280 ft.; Warren Eaton, 1,250 ft.; Gus Haller, 1,245 ft.; R. Barnaby, 1,063 ft.; Bud Stickler, 1,072 ft.; Robt. Eaton, 1,050 ft.; Bud Iszard, 906 ft.; A. L. Lawrence, 840 ft.; A. B. Schultze, 788 ft.; B. Wilson, 741 ft.; Wally Franklin, 728 ft.; and Capt. Pippig, 630 ft.

One of the events called for spot landings from the top of South Mountain to the Airport over one mile away and 650 feet below the take-off point. A small white flag stuck up in the middle of the airport was the designated spot. The following were the winners:—1st, Ed. Barton, 3 ins. from flag; 2nd, R. C. Holderman, 10 ins. from flag; 3rd, Robert Eaton, 13 ins. from flag; and 4th, Jim Weiberg, 14 ins. from flag. All of these pilots won their "C" soaring licenses at this meeting and therefore it gives the reader



A new "Utility" which has a body built round the usual primary fuselage.

IMPORTANT ANNOUNCEMENT

B. A. C. LIMITED have designed an ultra-simple **SAILPLANE,** capable of good performance, specifically intended for owner-pilots of "B" and "C" category.

IT is a simple high-wing monoplane, and will be supplied in the form of part finished materials which any amateur of reasonable skill will be able to assemble.

THE payment of a reasonable sum down will secure delivery of all raw and finished materials, together with all drawings and instructions.

OR the completion of a simple contract, agreeing to remit a small sum monthly will obtain the delivery of all material, etc., in batches as necessary for best progress. This will enable you to regulate your capital outlay as you proceed with the machine.

SPECIAL arrangements will be made, if required, for the routine inspection demanded under B. G. A. Airworthiness Regulations.

SEE the machine demonstrated during the **INTERNATIONAL MOTORLESS FLYING MEETING,** October the 3rd and 4th.

AUTO-TOWED GLIDING INSTRUCTION

IN RESPONSE to the wide demand for instruction in gliding by means of the BAC VII Dual Control Two-seater Sailplane —

B. A. C. LIMITED have pleasure in announcing that they are completing arrangements for the regular running of Instructional Courses and are now open to book pupils for "A" and "B" Gliding Instruction.

ENROL NOW!

B.A.C. LIMITED

Motorless Aircraft Constructors

General Manager:
C. H. LOWE-WYLDE

Telephone:
MAIDSTONE 4111

an idea of the excellent handling of these ships by these pilots.

Pilot Martin Schempp could hold an American Altitude Record and perhaps tie Albert Hastings for the American Championship, if someone would but plead his case before the International League of Nations. It seems that Schempp came from Germany with the Quota, and has taken out his First Papers toward becoming an American Citizen, but the National Gliding Association in this country will not recognise him as an American entry and from advice from the German branch of the F.A.I. it appears that he cannot be recognised as a German and that they will not recognise any of his records as German records. Otherwise Mr. Schempp is a man without a country until he completes his citizenship papers which will take five years. All records made in the meantime by Schempp will not count. The National Aeronautical Association is at present awaiting a decision on this case from the F.A.I. headquarters at Paris.

Three accidents occurred during the Meeting putting out of action three famous pilots; they were Major William L. Purcell, of New York, Captain Thos. Phillips, of the U.S. Army, who represented the Canal Zone Gliding Club, and Fritz Germershausen, of Germany. The most seriously injured of the three was perhaps Capt. Phillips, when a wing of his Bowlus sailplane collapsed while he was trying to zoom over some high tension electrical wires when landing.

SOARING FLIGHT AT BERLIN

[This article was written by Herr Otto Fuchs, the famous sailplane pilot for FLUGSPORT, *by whose courtesy we reproduce this translation by Dr. A. E. Slater.*—ED.].

The attempts made by the Darmstadt Academic Flying Group to soar over flat country have given such promising results that a desire has arisen to extend the results hitherto achieved by undertaking research on a new basis.

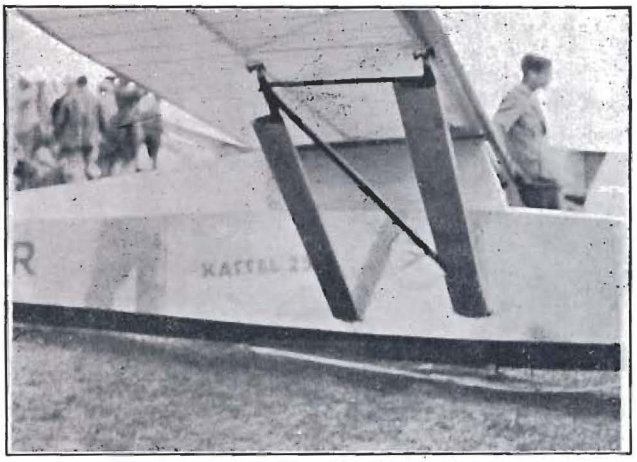
Berlin would seem to be specially suitable for the gathering of fresh data, owing to its situation. In the immediate neighbourhood there are sharp contrasts in the character of the earth's surface, due to the presence of the Havel lakes, the extensive sandy regions and the massed buildings of the city; the differences in their specific heats promised to give favourable thermal conditions. Up to the present the flights have confirmed such expectations.

The procedure has been to have the glider towed to a great height, then to cast off and proceed to make use of such air currents as are available; this policy has fully justified itself. Notwithstanding, it can never be too often pointed out that, though we have indeed come nearer to the solution of the problem, yet the art of soaring flight is still in its infancy. Above all, it is evident that we must bear in mind the results of these particular investigations when designing a new soaring machine. The comparatively narrow regions of thermal upwind place increased demands on the skill of the pilot in making turns, for which the high-performance sailplanes, designed for other purposes, are not fully suited.

It appears desirable to find some means of visibly marking the columns of rising air upon flying through them, so as to facilitate the return to them, during cloudless weather. For it is possible to soar even in cloudless weather and in the absence of wind. Further, the type of sailplane desired must possess the faculty of steepening its gliding angle, as much for facilitating landings on unsuitable ground, as for being able to put the machine into a steep dive during cloud flights when it is desired to escape from the more objectionable types of air currents.

These observations represent only a small part of what our researches have so far taught us. The meteorological significance of the soaring flights which have been undertaken in Darmstadt since the beginning of this year can hardly be perceived to-day. Hardly a flight takes place which does not show remarkable results. Moreover it can be shown that when soaring flight has been freed from the necessity of confining itself to particular types of country, new fields will be opened up for its possibilities as a sport.

For the first time the machines can now be fully utilised, since the towed start allows of training all the year round. Indeed it would be quite possible to cheapen considerably the carrying-on of practice flying. A tow up to the height of 1,000 metres (3,000 ft.) takes about 10 minutes with an Argus-Klemm; the undisturbed sinking-rate of high-performance sailplanes in calm air would allow of a descent lasting 20 minutes, in the absence of up-currents; from the point of view of economy these facts deserve consideration. But, as has been said, we are only at the beginning at present.



DRAG-PRODUCING.—The arrangement of triagulated wing-bracing struts on a Kassell 25 which Mr. Scott-Hall referred to in his article on new types at the 12th Rhön Competitions in "The Sailplane" for Sept. 11.

Flights that deserve mention, among those made up to now, are an hour's flight over the centre of the city and a cross-country flight of 80 km. (50 miles) to Frankfurt-on-the-Oder. The welcome given us and the interest taken in us by Berlin justifies us in hoping that the stimulus we have given has fallen upon fruitful ground. As yet there has been no closure of the purse-strings which enabled us to follow up our theories. It is entirely owing to the Aero-Club of Germany that we were able to undertake an expedition which involved considerable expenditure. But, as our programme is not yet concluded, we hope that a place will still be found for us, and one that will not leave us with nothing but our idealism for support.

SOLID SILVER CUPS



We are able to offer exceptional value in all solid silver articles at the present time

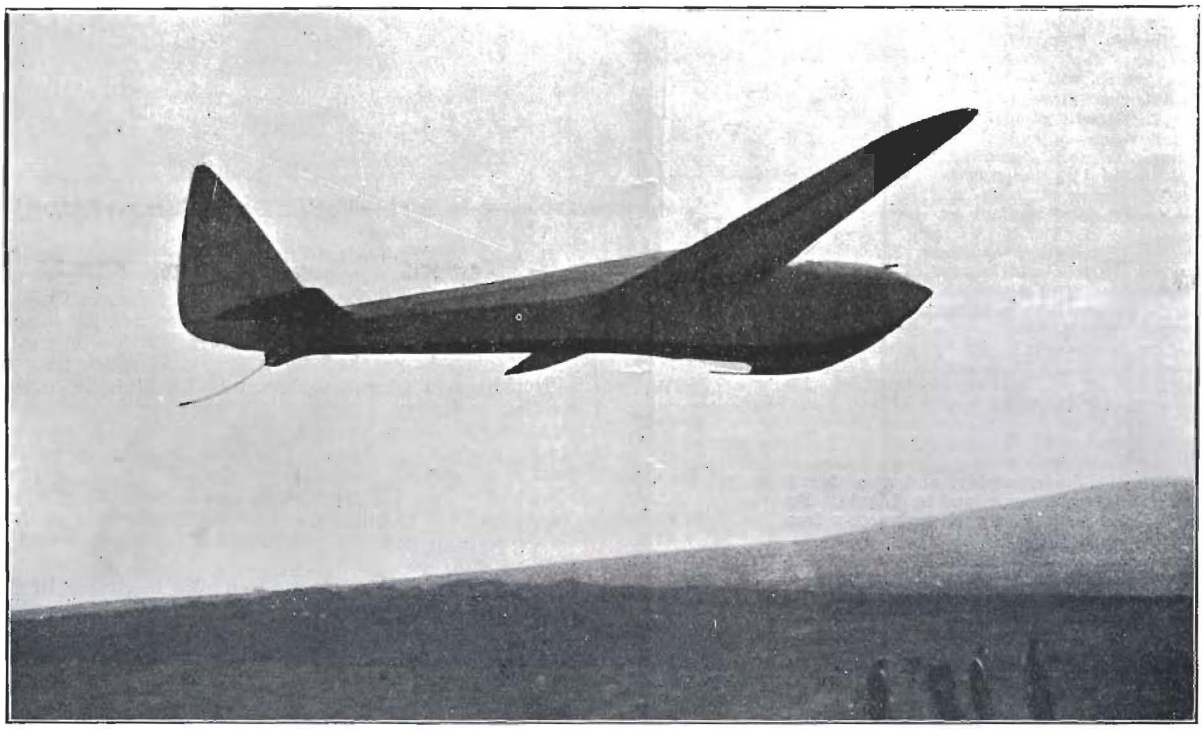
Catalogue gladly sent on request

The Sussex Goldsmiths' & Silversmiths' Co., Ltd.

CASTLE SQUARE

BRIGHTON

THE "TERN" SAILPLANE



The "Tern" is a cantilever monoplane, of straightforward and robust design. Span, 50 feet; wing area, 201 square feet; loading, 2.06 lbs., per square foot. The wings are of two spar construction, tapering in plan throughout their length. Ball-bearing controls are utilised throughout, in accordance with the most modern aircraft practice.

We claim that the "Tern" is the most easily erected and dismantled sailplane yet produced. Each wing is removed by withdrawing two large bolts, no attention whatsoever being necessary to the aileron control. Each tail plane is removed as a unit with the elevator by withdrawing two large bolts, no attention being necessary to the elevator control. It is very easily possible for three men to erect or dismantle the machine completely in ten minutes.

The "Tern" is fully equipped for auto-towing, and an airwheel undercarriage, with 7 feet track can be supplied if desired. The skid is sprung on rubber blocks and well faired to the body with leather. Owing to the absence of wing struts the "Tern" is aerodynamically very clean, and has a theoretical gliding angle of 1 in 25. The machine has a B.G.A. certificate of airworthiness, and has been stressed for aeroplane towing at 70 m.p.h.

Price £248. ex-Works

AIRSPEED LIMITED, PICCADILLY, YORK.

A FRENCH WASSERKUPPE?

The scheme brought out by the French Under-Secretary of State for Air for the organisation of motorless flying in France was published in the aeronautical weekly LES AILES on Aug. 20, when it was stated that:—

"Something like one million francs (£8,000) are to be devoted to the general organisation of motorless flying in France. If our information be correct, 100,000 francs (£800) will be granted to the Fédération Nationale Aeronautique for the purchase of machines, which will be allotted to its affiliated clubs; 550,000 francs (£4,400) will go to L'Avia which has been appointed the Movement's technical agency by the Minister of Air; the remaining 350,000 francs (£2,800) will be used to subsidise various experiments.

"The Under-Secretary of State, M. Etienne Riché, has made known his intentions with regard to the organisation of motorless flying. Moreover, it is within his province to lay down the general progress to be aimed at each year and to control the execution of the schemes which will be arranged. The latter duty will be delegated to the Inspector-General of Civil Aviation; the technical control of equipment will be left to the Technical-Director-General, and the financial side will be administered by the Secretary-General of the Air Ministry.

"M. Etienne Riché proposes that the Fédération Nationale Aéronautique should be the central authority on all questions relative to the provision of equipment intended for the clubs, and bought with the State subsidy, and also that it should circulate the technical information gained by L'Avia. Further, the F.N.Aé. will control the sending of pupil-instructors from the clubs to the Central School.

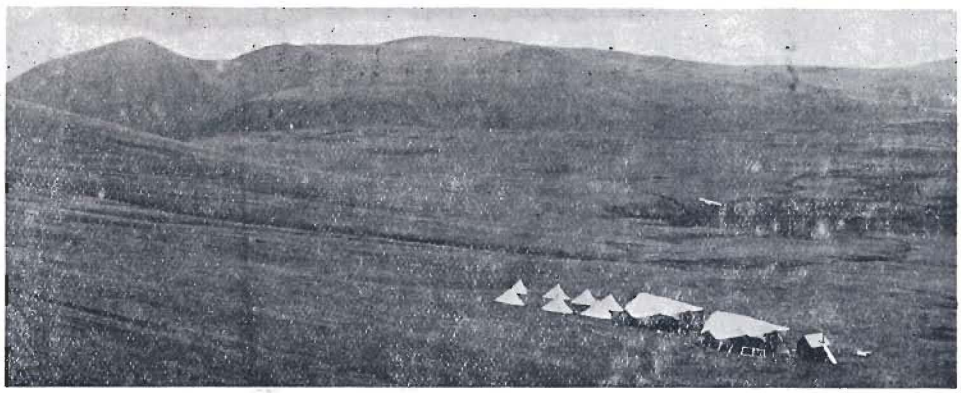
"The role of L'Avia, in M. Etienne Riché's scheme, is essentially technical and scientific. Its scope is very wide. It is expected that this organisation will study any aerodynamical and meteorological questions which the Minister of Air considers necessary; that it will issue plans of machines; that it will administer the National Centre of Motorless Flying which the Minister of Air intends to establish; that it will be the technical adviser to the clubs, public or private, and, finally, that it will organise national and international gliding meetings.

"The biggest part of this programme is evidently the National Centre of Motorless Flying. The organisation will be undertaken by the Under-Secretary of State, who proposes to install in this school sections devoted to meteorology and practical aerodynamics, as well as training facilities for both *ab initio* and advanced pupils. If the district chosen is suitable, a light aeroplane section will be added to the school. This section will be administered by a private association, which, if the site now under consideration is approved, will be the Aero-Club d' Auvergne."

Those are the main points of the French programme, according to LES AILES. Here are some further details.

Early in August a temporary camp, under the direction of M. Massenet of L'Avia, was pitched in an extensive bowl roughly in the centre of the Groupe de la Banne d'Ordanche, one of the three groups of mountains which form the Monts-Dore. La Banne d'Ordanche itself is 4,970 feet high, and overlooks La Bourboule and Le Mont-Dore, two of the most popular spas in Auvergne.

The bowl offers slopes of various gradients in all directions, and should therefore be suitable for both **ab initio** and advanced training. The Monts-Dore being practically in the centre of the Massif-Central, the site should also be suitable as a jumping-off place for cross-country flights. It is drained by two small streams which join to feed the Lac de Guéry, 1¾ miles to the east. Except in the immediate neighbourhood of these streams the ground is firm, and covered with thick, coarse, grass. There are no trees, bushes or hedges, and, considering the volcanic origin of the Monts-Dore, the bowl is remarkably clear of rocks. At a very rough estimate there are 2,000 acres of ground available. The bowl is from 700 to 300 feet deep.



The temporary camp in the bowl at La Banne d'Ordanche.

The camp is reached by a track 1¾ miles long which joins the main Clermont-Ferrand—Le Mont-Dore road at the Lac de Guéry. This track is unfit for any motor-transport except the Citroen-Kegresse tractors loaned by the Air Ministry. The Lac de Guéry is 25 miles by road from Clermont-Ferrand, capital of the department (Puy-de-Dôme), 10 from La Bourboule and 5 from Le Mont-Dore. The Aero-Club d'Auvergne has its headquarters in Clermont-Ferrand, and its aerodrome at Aulnat, 4 miles out of the town.

At present Captain Thoret, the pilot in charge of the experiments, has only a few school machines at his disposal. When I visited the camp on Aug. 19 he was giving instruction on a 2-seater AVIA-20-A. Besides this machine and a ZOGLING I saw nothing else erected. A Citroen-Kegresse tractor was used for towing the two-seater to the top of the slope chosen for the day's work, and also for tensioning the shock-cord. The tail of the machine was anchored to a stake and released by the withdrawal of a pin.

Some of the more important flights from La Banne d'Ordanche are given below. Throughout August the weather was very bad, flying being frequently impossible.

On Aug. 8, Capt. Thoret flew the 2-seater to La Bourboule, a straight glide of about 3 miles. Great excitement locally! Later he flew the 2-seater for 1 hour 30 mins., and on Aug. 14, flew the same machine for 4 hours 41 mins. 22 secs.

M. Alfred Auger, Secretary-General of the French Aero Club, flew the RAPACE (already described in THE SAILPLANE) for 3 hours 30 mins. 21 secs., in a wind of 25 m.p.h.

On Aug. 20, Capt. Thoret and M. Tourkia together flew the 2-seater for 1 hour 10 mins. 11 secs., which flight constitutes a French duration record for a passenger flight.

In addition to the above flights, several pupils have put up creditable performances, and numerous "baptêmes de l'air" have been given to aspiring soarers, including two women.—A.R.L.-M.

[*We understand that the proposed site is so isolated and so inclement in winter that informed French opinion questions whether it will be practicable during the greater portion of the year.*—ED.]



The Kegresse tractor tows the Avia two-seater which bears a marked resemblance to the familiar Poppenhausen. Behind the fuselage can be seen the canvas hangar.

A Luncheon to be attended

Nearly two years ago, the Editor of THE SAILPLANE aided and abetted Mr. Douglas Culver to organise a luncheon of gliding enthusiasts at the Comedy Restaurant, in Panton Street, off the Haymarket. We expected perhaps fifteen people, sixty or more arrived. From that occasion sprang the revived British Gliding Movement.

On Oct. 1, at 1.15 p.m. another luncheon is being held at the same restaurant when the President, Vice-President, and Chairman of THE BRITISH GLIDING ASSOCIATION are giving a luncheon to the Foreign Delegates attending the Conference of the International Commission for the Study of Motorless Flight.

How far the Movement has progressed from that first lunch may be gauged by the fact that the I.C.S.M.F. changed the venue of its meeting from the Continent to London in order that its members might attend the Second International Gliding Meeting organised by the B.G.A.

At the time of the first lunch there was not, so far as we know, a glider in England, to-day the British Distance Records for solo and two-seat sailplanes stand at over eight miles and Club machines have flown even further. The duration record stands at over 6 hours and there are probably half-a-dozen Club-trained **ab initio** "C" pilots.

This is indeed progress of which one may be proud, progress which justifies the formal festivity of a luncheon and progress which justifies the presence of an International Commission in our midst. Everybody in London and all who can get up to Town on that Thursday, should make a point of attending that luncheon. Tickets are only five shillings, and may be obtained from the Secretary of the B.G.A., 44a Dover Street, London, W.1.

THE CONFERENCE OF THE I.C.S.M.F.

To meet the delegates attending the Conference of the International Commission for the Study of Motorless Flight a reception has been arranged by the British Aviation Hospitality Association of which Viscountess Elibank is President. The reception will be held at Grosvenor House, on Thursday, Oct. 1, between 10 and 12 p.m. Guests will be received at 10 by Mrs. Shelmerdine, wife of the Director of Civil Aviation.

Some twenty-seven delegates representing eight Nations will be present and it is hoped that members of the B.G.A. and others interested in the Gliding Movement will take tickets. The price of the tickets is 10s. each, which includes buffet supper and wine. These can be obtained from Mrs. Bentley, 52 Queen's Gate, Kensington,

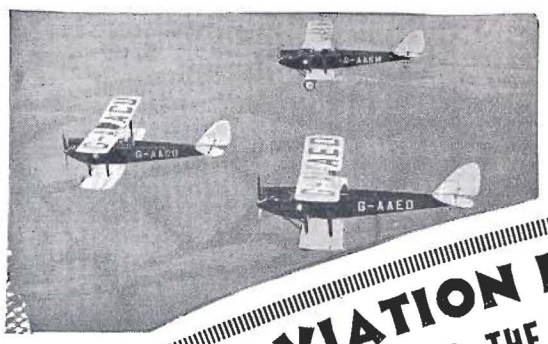
A SEA-CROSSING BY SAILPLANE

On Sept. 6, Mr. Lowe-Wylde after being aeroplane-towed up to 4,000 ft., cast off and crossed the Firth of Forth in a two-seat B.A.C. VII. The full story will be found under the Edinburgh Club News.

THE FIRST TWO-SEAT RECORD?

On Aug. 30, Herr Magersuppe with Mr. Slingsby as passenger, flew a straight line distance of eight miles. As the flight was officially observed and a sealed barograph carried this is, subject to homologation by the F.A.I., a British Distance Record for a two-seat machine. The machine used was the SCARBORO, the two-seat Kassel HERCULES type sailplane. Herr Magersuppe took off from Stoup Brow, Ravenscar, and landed at Sculby Nabs. During his flight he reached a height of 300 ft. above his start point.

The Editor would like to thank all those friends who have expressed their sympathy with him on the occasion of the sudden death of his father, Mr. Alfred James, in Johannesburg. Mr. James, who was an eminent mining engineer had grown greatly interested in the Movement and was fighting hard for its future in South Africa. The Editor would like to apologise for the scrappy effect of your paper during the last two issues but he believes that you will appreciate that this is due to the circumstances of his bereavement and the fact he felt you would rather have something than nothing.



BRITISH AVIATION INSURANCE CO., LTD.

EXCLUSIVELY DEVOTED TO THE INTERESTS OF CIVIL AVIATION

The BRITISH AVIATION INSURANCE CO. LTD., is one of the foundations on which British civil aviation has been developed. It remains to-day the only organisation in the Empire adequately staffed and fully trained to cater for manufacturer, operator or private owner. The Company offers to its clients unequalled service throughout the world.

Registered Office: Lloyd's Building, E.C.3. *Telephone: Monument* 1288, 1289 & 1120

Telegrams and Cables: "Aviacoy, Lime, London."

CORRESPONDENCE

Question . . .

Sir,—A sailplane cannot hover in still air. A dragon-fly can. How does it do it? Does it obtain a forward pull from its fore wings, a backward pull from the rear ones and lift from both pairs?

Apparently, in a very mild wind, a dragon-fly can hover, facing down wind. If this is so, a dragon-fly can fly backwards. Is this statement correct?

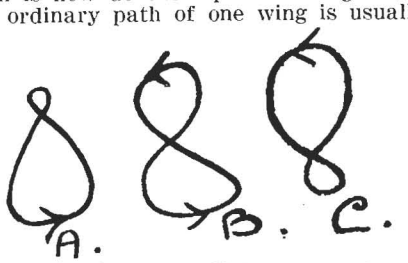
Can the movements of a dragon-fly's wings be reproduced by mechanical means, and so would it be possible to construct a machine to fly on the dragon-fly principle? If not, why not?

If you are unable to answer these questions, can you suggest how I might obtain the desired information? I have consulted, in vain, the Encyclopedia Britannica, and the entomological experts at the Natural History Museum are unable to help me.—(Signed) G. E. B. STEPHENSON.

. . . and Answer

Sir,—With reference to the questions asked by Mr. Stephenson:—

(a) I know nothing at first hand about the hovering (i.e., stationary flight) of dragon flies. But the syriftidæ or "hover-flies" which imitate bees and wasps and (being diptera) have a single pair of wings (Encycl. Brit. Vol. 7, page 413) can hover perfectly. Since hovering can be done in the one pair, it is not necessary to assume that in a dragon-fly the two pairs are used in opposition, and the real question is how do the diptera manage it. I guess that as the ordinary path of one wing is usually stated



to be something like B, faster flight to the right could be secured by C with a larger backward sweep of the wing, and slower flight by A. In other words given varying inclinations of the wings to the horizon, and a variable shape of path, an absence of forward thrust, when taken round a complete path, could be secured.

(b) I see no reason why, with an appropriate wing path, an insect should not fly backward, though I have not seen it.

(c) I feel sure that a machine could be made with wings to imitate the motion of a dragon-fly, or a "hover-fly" given sufficient slow motion pictures of the fly, and sufficient money. But I expect it would be too heavy to maintain itself in the air.—(Signed) G. T. WALKER.

[THE SAILPLANE *is very grateful to Sir Gilbert Walker for answering this query.*—ED.]

The Guinea Sub.

Sir,—May I call for more particulars from "Dorset Glider" as to how this guinea sub. works, and ask if it is his contention that a Club such as the one in question can, with reasonable management, expect to carry on satisfactorily with such a subscription as the base of its finance.

1. Are both machines primary training types?
2. What is the membership?
3. What donations have been made (a) in cash, (b) in kind?
4. What further sources of income are available or have been tapped, i.e., entrance fees, flying fees, profits from Demonstrations, etc.?
5. What has been spent on repairs and maintenance?
6. How many members have acquired "A," "B," and "C" Certificates?
7. How many members have resigned or failed to renew? and reasons if possible.
8. Are the two machines sufficient to deal with all the members wishing to glide?
9. Is there any reserve for purchase of new equipment?

I think it would be of interest to many if "Dorset Glider" would deal with the above questions (in round figures).—(Signed) S. WHIDBORNE (Hon. Treasurer, BRITISH GLIDING ASSOCIATION).

Where Honour is Due.

Sir,—In the article describing the TERN in your issue of Sept. 11, you mention that the machine was designed by the writer. As between partners it is difficult to assess responsibility, but I think your readers should know that the whole of the design of this machine was carried out by Mr. A. H. Tiltman, of this Company, and that the writer had only a very small finger in the pie.—(Signed) N. S. NORWAY.

Book Review.

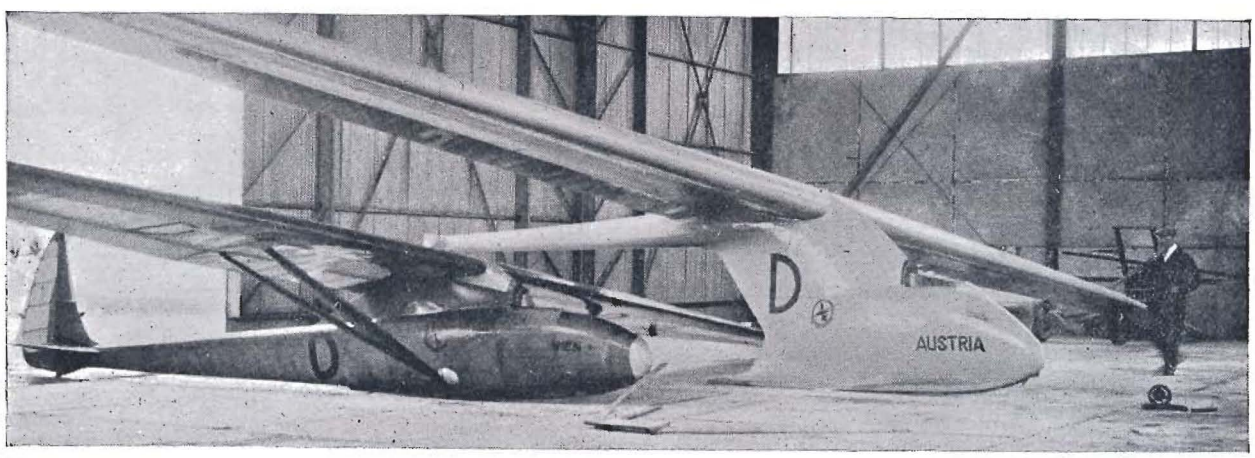
THE INTERNATIONAL AIR GUIDE, 1931 Edition. Publishers: Imprimerie Crété, Paris. London Office: International Air Guide, 6 Conduit Street, W.1. 1,200 pages, 10 by 12¾ins., 35/- nett.

For several years past, the development of air traffic has called for an authoritative and comprehensive work of reference, and various books of the kind have already appeared. The latest is very complete and of such wide scope that it would seem to justify its title of The International Air Guide, which has just been published by the Imprimerie Crété, of Paris.

This book should have a wide appeal for it is in English, French and German, and is not only full of information, but also gives practical descriptions of the various branches of aerial transport. Moreover, it is bound on a loose-leaf system to receive supplements, and a new edition will be published annually.

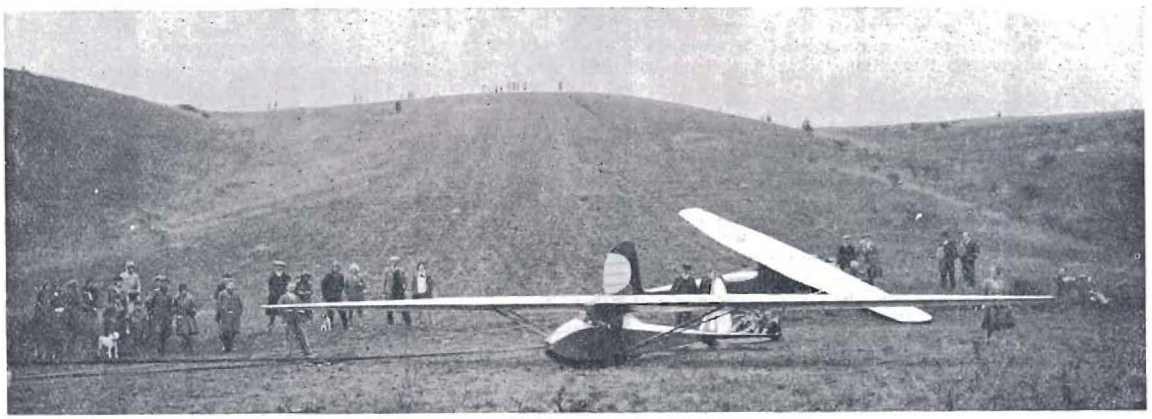
Undoubtedly, the task of classifying such a vast amount of varied information must have been extremely complex, but the system adopted is sound in principle and soon mastered, but we think it would be an advantage to amplify the rather brief headings on the sectional pages of the next edition.

In the 1,200 pages of text and maps, the fullest information is given about air mails, air services, companies, government and national organisations, legislations, statistics, private flying, training, the entire ground organisation of civil aviation, and descriptions of over 800 airports, including also innumerable plans and maps, the majority of which are coloured.



BEATEN BY THE DRAGON-FLY.—Two of the three most famous sailplanes and technically unsurpassed, these machines even when flown by Kronfeld cannot hover in still air, so Mr. Stephenson wants to build a mechanical dragon-fly.

NEWS FROM THE CLUBS



A CLUB SITE.—The "Professor" and Mr. Michelson's "Phantom," at the bottom of the London Club's site on Dunstable Downs.

THE ESSEX AERO CLUB.

Members of The Essex Aero Club who attended for Gliding instruction on Sept. 13, were introduced to the Wasserkuppe methods which have contributed in no small measure to the present success of the Germans as Glider pilots.

Mr. Wilson, holder of "A," "B" and "C" Certificates, the Club's Instructor, who has recently undergone a nine weeks' course of training in Germany, took the members in hand, and after a brief but interesting talk on his experiences over there proceeded to instruct members as to what they must do and what they must *not* do.

The instructions were made all the more interesting by explanations as to why this and that movement was necessary. No doubt some of the more advanced members thought that they were covering their previous training again but it became evident before long that they were proceeding on the right lines and—once they had mastered this really necessary preliminary stage of their training, then, they could anticipate a very enjoyable time in the near future and take the machine up with perfect confidence.

Apart from one or two flights by the more advanced members, short hops were the order of the day but when activities were brought to an end by the failing light we all felt that the day had been well spent and that we were surely heading in the right direction for efficiency.

Anyone interested in Gliding should attend one of the Club meetings at Havering Park Farm, Collier Row, or write to the Hon. Secretary, Essex Aero Club, 41 Hall Road, Chadwell Heath.

THE EDINBURGH GLIDING CLUB

On Sept. 6, Mr. Lowe-Wylde crossed the Firth of Forth in a two-seat B.A.C. VII. The flight according to the EVENING NEWS of Edinburgh, which took place in the early evening, provided thrills for thousands of spectators who attended the air pageant held by the Edinburgh Gliding Club at Silverknowes, Davidson's Mains. There were heavy showers of rain in the afternoon, but the conditions were perfect when Mr. Wylde set off on his venturesome trip.

The glider, the property of the Falkirk Aviation Club, was attached by a cable to a Moth machine flown by Flying Officer Lord Malcolm Douglas-Hamilton. After climbing to 4,000 ft. Mr. Lowe-Wylde found his release jammed and had a somewhat emotioning time until Lord Douglas-Hamilton released the cable from his end. The pendant cable adversely affected the flight of the glider and before the crossing began the machine had dropped almost 1,000 feet from the time it had parted from its escort, and, as Mr. Wylde remarked later, it was just 'touch and go" whether the crossing could be made.

Fortunately, however, some lost height was picked up in an air current over the water. Mr. Lowe-Wylde found a patch of sunlight and once in began to climb at an appreciable rate. Mr. Wylde began his flight with a view to landing at Donibristle, but, following a line about one mile east of the Forth Bridge, he had to descend in a field near Rosyth about half a mile from Donibristle. The trailing cable added difficulties to the landing.

There was an enthusiastic reception awaiting Mr. Wylde when he was towed back in the glider and made a spectacular landing after hovering for a minute or two over the heads of the spectators.

From the time the tow-rope was disengaged from the aeroplane until he landed, Mr. Lowe-Wylde was flying for some twelve minutes during which time he covered about four miles.

Remarkable interest was taken in the pageant. Proceedings lasted for over four hours and soon after the start there was a crowd of about 25,000 present. The enthusiasm displayed was described by one onlooker as reminiscent of the early pageants at Hendon. The programme included the demonstration of gliders launched by hand, auto-towed gliding, aeroplane-towed sailplaning, and aerobatics.

A parachute jump was made by Mr. A. W. Fairlie from a height of about 2,500 feet; there was a wing-walking exhibition; and Lord Malcolm Douglas-Hamilton thrilled the crowd with "stunt" flying in the red D.H. Moth machine which took part in the King's Cup air race round Britain. Many of those present took advantage of the opportunities for joy-riding, and amongst them was Bailie Wilson M'Laren, who was piloted by Lord Malcolm Douglas-Hamilton.

ADVERTISEMENTS.

THE SAILPLANE offers a particularly effective way of selling or obtaining those materials and things which are of peculiar interest to those interested in gliding. Actually no other medium in the World is solely devoted to Motorless Flight and therefore no other medium is quite so intimately connected with the Gliding Movement. For *one shilling* a line you can advertise your wants or the goods you have to sell.

All copy must reach Mr. J. L. R. Waplington by the morning of the Saturday which precedes the Friday on which THE SAILPLANE is published. The rates for display advertising are extremely reasonable and particulars will be gladly sent on request from 44a Dover Street, London, W.1.

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 8 ft.: £87/13/0 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.

THE ISLE OF WIGHT GLIDING CLUB.

The weather this year has been most provoking to say the least and never more so than on Aug. 22-23, when the I.O.W. Gliding Club meeting at Compton Down was held in conjunction with the Lyons' Tea Demonstration. The site which was very kindly loaned by the owners of Freshwater Bay Golf Course, Mr. W. F. Alexander and Mr. Phillips, of Compton Farm, is ideally situated for soaring, being nearly 450 feet high, facing due south, and is open to the sea.

The arrival of the Lyons' Tea outfit was the signal for half-a-gale which had been blowing all the week—much to the chagrin of those members who tried in vain to get in some practise on the new site—to petter out.

Owing to the conditions on Saturday—almost a flat calm prevailed—recourse had to be made to auto-towing and Herr Krause made two flights in the FALKE of three or four minutes duration, landing on the upper slopes of the down. The third flight was by hand catapult, an excellent launch being obtained, the pilot making several turns above the cliffs. The return to his selected landing place being obscructed by a section of the crowd, Herr Krause was forced to land on the steep slopes lower down, this he accomplished with great skill.

On Sunday a very large crowd gathered to view the demonstrations, much it is feared to the inconvenience of the gentlemen wielding niblicks who provided spectators with an additional thrill in dodging the little white balls, only two were not quick enough, one of these, a small boy, received skilful attention from the charming members of the West Wight Voluntary Aid Detachment, who were in attendance with their motor embulance.

A south-east wind blowing obliquely up the slope gave much better conditions than on the previous day and had the wind been more directly up the slope it is probable that soaring would have been possible. After some delay due to the last-minute discovery of a broken shock absorber on the skid of the FALKE, Herr Krause was towed into the air. Making skilful use of every available up-current the pilot was able to cruise up and down the cliffs for about five minutes, gradually losing height he was forced to return to the down, where he landed on the upper slopes. Herr Krause made two subsequent flights of rather less duration as the wind dropped during the afternoon.

The Isle of Wight Club then demonstrated auto-launching, the second flight giving the crowd all the thrill they wanted. Mr. Thompson, the Club captain, was launched towards the south-east down a fairly gentle slope but being unable to clear a wire fence he turned south to avoid it. The machine landed but skidded forward over the steep slope above Compton Farm and disappeared from view. Those who rushed to the edge saw the machine on its back in the meadow at the bottom with the inert figure of the pilot half underneath. Hundreds of spectators started to race down to the machine, when, to everyone's relief the pilot rose and walked away.

In slipping over the edge the machine had insufficient flying speed and Mr. Thompson had considerable difficulty in clearing the hedge and chalk pit at the bottom, he was then confronted by a number of hell tents dotted about the rather small field. In avoiding these the pilot landed with drift on, breaking the front part of the skid which caused the machine to nose over.

Keen disappointment was felt that Mr. Turner, of the Channel Club was unable to get his machine repaired in time to take part in the competitions, also that Flying-Officer Mole, who was to have flown the SCUD was unable to be present. It is hoped to be able to welcome them at some future meeting.

This is the first time that anything approaching soaring has been seen in the Island and judging from remarks heard, the large crowd of spectators was very much impressed with the ease and grace with which Herr Krause handled the FALKE and it is thought that the meeting has done much to rouse public interest in the Gliding Movement here.—L.A.H.

THE WILTSHIRE LIGHT AEROPLANE AND GLIDER CLUB

The section of the Wilts Club known as the "unquenchables," which had survived the deluge, mud and best Wiltshire slurrey representing the Harvest of the Summer of 1931, met at Easton Hill, 3 miles East of Devizes on Sept. 19, in dead calm weath with bad visibility. A breeze of 5 to 15 m.p.h. is required to learn the art of Gliding, and by evening the "unquenchables" with a burning desire to master the science of engineless flight were rewarded with ideal conditions, and excitement ran high at the prospects of obtaining their "A" pilots' Certificates, thus qualifying for entry for the Internatonal Competition at Balsdean, near Brighton, in October next.

The honour of making the first qualifying flight since the formation of the Club was Mr. Paul Bingham Elwell, of "The Quarry," Highworth, the flight being officially observed for *The British Gliding Association* by Mr. C. T. Cuss.

Shortly after this event there were indications that the fuel of the Club's motor which was used for auto-elastic-launching, was running low and on examination of the tank showed that unless one of the "unquenchables" could devise a carburettor quickly which would function on *tax alone,* three further "A" Certificates would be deferred till the next meeting.

An original method of "auto-elastic-launching" which was especially devised and experimented with in the autumn of 1930 was employed during the week-end. This enormously reduces the fatigue entailed by continuous hand-launching and enables members to acquire experience of flight in a fraction of the time otherwise occupied.—C.T.C.

The "Scud" can now be bought for £75.

Official Notices

NEXT COUNCIL MEETING

The next Council Meeting will be held in the Library of the Royal Aeronautical Society, 7, Albermarle Street, W.1, on Monday, October 19, at 6.30 p.m.

NEW MEMBERS OF THE B.G.A.

Mr. F. Edmondson, Mr. T. H. Naylor, and Mr. A. S. Norway.

AFFILIATED CLUBS

The Council has approved the affiliation of the following club and association:—Matlocks Gliding Club and Indian Gliding Association.

OBSERVERS

The Council has approved the following:-

Southern Counties' Soaring Club: Messrs. A. K. Bindloss; M. H. Thomson; and H. H. Reffell.

Border Gliding Club: Lt.-Commdr. J. G. H. Stedman; Messrs. E. Reid; and J. Inglis.

Worthing Gliding Club: Messrs. W. J. Parsons; and H. W. Stormant.

THE SECOND INTERNATIONAL COMPETITIONS

The Council has decided that with regard to Class "A" of the Competitions, that pilots possessing only an "A" Glider Pilot's Certificate will only be allowed to enter for any event in this class.

"Titanine" Glider Dopes

TRANSPARENT & COLOURS, FOR FABRIC OR PLYWOOD

CABLES:— "TETRAFREE," LONDON.

CODES:— A. B. C. 5th EDITION & BENTLEYS.

Manufacturers and Sole Proprietors

TITANINE-EMAILLITE LTD

HEAD OFFICE:—

166, PICCADILLY, LONDON, W.1

WORKS:— HENDON - LONDON, N.W.

and also at:

NEW JERSEY - - - U.S.A.
MILAN - - - - - ITALY
BREMEN - - - GERMANY

Printed for the BRITISH GLIDING ASSOCIATION by the Broadwater Press Limited, Welwyn Garden City, Herts, and Published by THE BRITISH GLIDING ASSOCIATION, at 44a Dover Street, London W.1. Telephone: REGENT 6145.