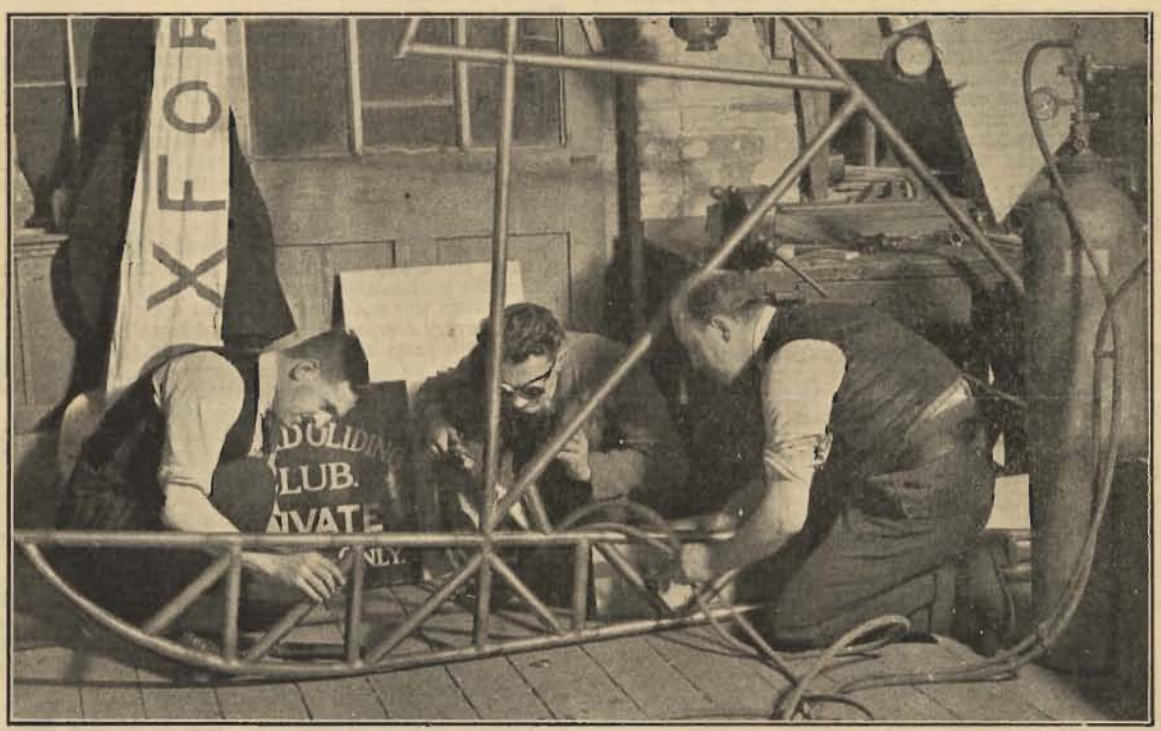
Nov. 28, 1930. Vol. 1. No. 13.

THE SAILPLANE AND GLIDER

Price 3d.

THE CONSPIRATORS.



The welded steel-tube fuselage of the primary machine which the Oxford Gliding Club are building. This is so far as we know the first welded glider yet built in this country. "THE SAILPLANE" suggests that from the photograph the junction between the skid and the king-post appears inadequate. Also the diagonal bracing struts are offset as is NOT done in aircraft.

A SOCIETY OF BRITISH GLIDER MANUFACTURERS.

When a Movement like the British Gliding Movement starts, certain people not ungifted with prevision form a body which shall in time become the governing body of the Movement. In time when things have developed, difficulties arise because the component parts of the Movement may not be properly represented, or because they are properly represented, they may have too great an advantage over new comers to that particular component part of the Movement.

Such a state is not unlikely to happen where sport and business are intertwined as they are in Gliding. Let us at once say that were it not for the Trade, such as it is, THE SAILPLANE could not carry on. Advertisements alone make possible the spreading of the policy which we strive to make known. Were only the sporting side existent the paper could not be produced, at any rate not at the present price of threepence.

At the moment *The British Gliding Association* is the body which controls British Gliding. It issues Certificates of Airworthiness, without which no glider can be used for acquiring F.A.I. Certificates; it recommends candidates for F.A.I. Gliding Certificates; it affiliates Clubs and organises Inter-Club Meetings; it collects prizes for such Meetings; it provides lectures; it sends out qualified persons to advise on sites; it negotiates with other representative bodies at home and abroad, and does all it can to further the Movement of which it is the head.

The British Gliding Association is composed of a number of individuals who are anxious to further the Gliding Movement, but who do not necessarily wish to glide. They are most altruistic and subscribe to its funds, in return for what it does for the Movement at large. But the policy of the B.G.A. is decided by its Council. Certain members of Council represent the members of the B.G.A., the other members of the Council are composed of delegates from the Clubs and also of co-opted representatives from other important aeronautical bodies like the Royal Aero Club and the Royal Aeronautical Society. All of which is perfectly right and proper, but there is no official representative of the manufacturers who are doing so much to make gliding a success by providing machines which are safe to fly.

Naturally the foremost glider manufacturers are represented because they were among the keenest of the early followers of the sport, and their early technical aid was invaluable. But the time may come when their positions as members of Council and manufacturers will be very difficult to reconcile. That they have been successfully reconciled so far is due to the fact that such members of the Council have always put the Movement before themselves, but THE SAILPLANE looks forward to the day when a Society of British Glider Manufacturers shall be formed wherein all the commercial aspects of Motorless Flight can be considered and the manufacturers as a whole be represented by one or more delegates from such a Society on the Council of *The British Gliding Association*.

THE THEORY OF FLIGHT.

On Nov. 19 an extremely instructive lecture was given by Captain F. T. Hill, F.R.Ae.S., M.I.Ae.E., B.Sc., before members of the London Gliding Club in the Library of the Royal Aeronautical Society which that august body had graciously lent for the occasion.

Opening his lecture, Captain Hill said he would devote himself to the Theory of Flight rather than the theory of the control of a machine in the air. He would try and explain how an aeroplane or a glider managed to get off the ground into the air although the machine was heavier than air.

He explained the structure of the air as being composed of a vast number of layers of elastic strings; and by means of this analogy was able to demonstrate quite convincingly to his audience how it was that when these strings were deflected too widely apart by a moving surface, such as an aerofoil, the strings broke and instead of more or less following the upper curved surface of the wing were all at sixes and sevens.

This analogy is an excellent one for people to remember as it serves to give a much better idea of the flow than can be obtained by thinking of the air as a fluid. The viscosity, or treacliness of the air, makes it behave much more like elastic than a fluid.

Captain Hill then went on to explain how the deflected air caused a suction over the upper surface by creating a partial vacuum and a pressure upon the under surface. The resultant force of these negative and positive pressures was a force acting on the top surface of the aerofoil at a slight backward inclination to the forward movement of the aerofoil. For the purpose of convenience this force was replaced by the two forces, Life and Drag (or Drift).

He explained how the slot and other devices by introducing fresh streams of air helped to prevent the breakdown of flow at high angles of incidence.

Then he dealt with the various classes of aerofoil and described the characteristics of the two types; the deep-section aerofoil does not stall as quickly as the thin aerofoil, but produces more drag. He mentioned the possibility of turning a thin-section wing into a thick-section by the use of cambering mechanism which increases the curvature of the upper surface.

He talked about the distribution of pressure or how the lift forces are distributed over the wing. He explained that the Centre of Pressure, which is the imaginary point through which these forces may be supposed to work, travels along the wing with alterations of incidence. He then explained the heavy loads which come upon the front spar.

Captain Hill next explained how the loss due to end-flow was generated. The rise in pressure on the under surface of the wings and the decrease on the upper surface naturally cause a passage of air round the tips of the wings, as when there is no dividing medium the air in the region of high pressure rises into the region of low pressure. As the wing is travelling forward all the time this circulation generates a tail of eddies which flow behind the wing tips like a twisted rope.

The lecturer explained how it was that the greater depth of the biplane structure allowed for the use of a much thinner wing section, for in such a case the spars do not have to be so deep as the interplane struts and wire bracing turned the biplane into a very deep girder structure.

Although wing-loading is generally talked of in terms of wing area, the lecturer explained that the greater part of the lift is obtained from the region of the aerofoil which lies between the nose and the front spar and that therefore there is every advantage to be had from having a very large span. The ratio of span to chord is generally defined as aspect ratio, so one might say an advantage is gained by having a very high aspect ratio. This is appreciated by glider designers who use a very high aspect ratio indeed.

As it is difficult to move models through the air for purposes of comparison and measurement, wind-tunnels are used. These are artificially built tunnels wherein the air is circulated at controllable speeds through special chambers where arrangements are made for mounting very carefully-built scale models and measuring the forces upon them.

In these tunnels the forces which are produced by the currents of air upon the models are very accurately measured and afterwards reduced to a standard form so that the results obtained from all over the country can be compared. These results are then put down as curves so that the general characteristics of a wing can be examined with the minimum of trouble.

The three curves as charted are those for change of lift at varying angles of incidence, change of drag against the same base and a ratio of lift to drag on the same base. The last is a general measure of the efficiency of wing and shows at which angle the best ratio is obtained. This ratio gives the gliding angle of the machine when taken in conjunction with additional drag which is caused by the rest of the machine such as the parasitic drag due to struts and projections.

The lecturer elaborated many of his points by commenting upon the excellent lantern slides which he had brought along with him.

There was an interesting point which the lecturer made in the discussion which followed after the lecture, and this was that the Gliding Movement was not unlikely to create a demand for sections which should have special characteristics at very slow speeds; so far all research has been devoted to aerofoils which shall have desirable characteristics for high speed craft.

TO FURTHER THE CAUSE.

Mr. Horace Wright, the Instructor to the North Cotswold Gliding Club, whose article in THE SAILPLANE for Nov. 7 on the Tracing of Air Currents, has aroused so much

interest, is to give a lecture. This will be early in the New Year and will be before the Local Scientific Society.

Mr. Wright will be speaking about gliding, and is anxious to borrow for the occasion some standard size or 16 mm. films of gliding. We have seen an excellent film of this year's Competitions at the Wasserkuppe, prepared by Messrs. Hiscox and Ashwell-Cooke, of the London Gliding Club, and believe that Mr. Cecil Rice, of Rice Caravans Ltd., Riverside Mill, Gargrave, via Leeds, Yorks., has one of the Ditchling Meeting. Perhaps these gentlemen would collaborate to further the cause we all have at heart.

THE PRINCIPLES OF FLIGHT.

By "Catapult."

These notes have been compiled to help the novice who is receiving practical gliding instruction, and also to assist Club Instructors to speed up the progress of their pupils. Theoretical and practical training should go hand in hand throughout the period of tuition, but an elementary knowledge of the Principles of Flight is essential before actual gliding is started.

The normal procedure, usually to save time,—for many want to glide, there is but one machine, and probably one available day a week,—is to precede the first glide with a few hasty words about the action of the controls, coupled with sundry warnings, the victim, as a result, is in a bewildered state of mind. This is obviously an undesirable condition in which to face the first launch, and the only remedy lies in the study of Aerodynamics as well as the Structure of Gliders at leisure before theory is put into practice. The keen pilot will continue the study of the theoretical side of Aeronautics throughout his flying career and will thus amass a fund of knowledge which will be of inestimable value to him when he graduates to piloting power-driven aeroplanes.

Names of Parts.

It should be assumed that enthusiasts will take the trouble to learn the names of the main parts of a Glider but to refresh peoples' memories and to have the relative positions of parts clearly in mind I have put the names on to a picture which has already appeared in The Sailplane. This is Fig. 1a where the names of the movable surfaces which are used for control have been underlined.

The Glider leaves the ground because of the lift which is obtained from the main-plane when this has a certain minimum speed and angle, relative to the air. In still air the Glider has to be propelled forward to get off the ground, but in strong winds the Glider may be stationary to the ground and still be air-borne.

How a Wing Produces Lift.

If we move an inclined flat plate against the air, or hold one at angle to a stream of air, such as a steady breeze, we shall find that there is force which tends to force the plate upwards and backwards. This is due to the fact that the air is deflected under and over the plate. The air which flows underneath tends to force the plate upwards and the air which is deflected over the top is forced away from the upper surface and creates a partial vacuum, or area of low pressure, which causes suction on lift on this upper surface. (In a properly shaped aerofoil, as a section of a wing is called, this suction is about 2/3 of the total lift.)

If the Angle of Incidence, or the angle of the plate to the air-stream is increased, both the upward and backward pressures increase to a certain extent. We call the upward pressure "Lift" and the backward pressure "Drift" (or "Drag"). For small Angles of Incidence, Lift is very much larger than Drift. If the Angle of Incidence "I" in Figs. 1, 2 and 3 is increased a certain position is found where the ratio of Lift to Drift is a maximum. Such an angle when found on a machine (where it is modified by the characteristics of the fuselage and other components) gives the best gliding angle of the machine.

Beyond this angle the ratio becomes less until the Stalling Angle is reached. This is the critical angle for any particular wing and, as shown in Fig. 2, the flow of air starts to break down, and instead of flowing smoothly over the upper surfaces, forms into eddies and becomes turbulent. If the angle is still further increased the Lift diminishes rapidly and Drift assumes alarming proportions until, at very large angles of incidence, a surface only produces Drift (Fig. 3).

In actual practice it has been found that a cambered wing section, that is, one with a curved upper surface, is more efficient. It has a better Lift Drift ratio, and by its use the maximum lift obtainable from a given surface area is also increased. The average training glider carries approximately 2 to 3 lbs. for each square foot of wing area. The Lift from any given wing also varies with the speed of the air over it.

Many of you who have flown kites know that the cord has to be attached in a definite position on the face of the kite, if steady flight is to be obtained. The string is fastened as near as possible to the Centre of Pressure. The wing of a Glider also has a Centre of Pressure.

This is a purely imaginary point (like the Centre of Gravity), at which the wing would have to be held to ensure equilibrium as the reaction of the wing passes through this point. The Centre of Pressure moves slightly from a normal position, at about 1/3 of the chord (which is the breadth of the wing) from the leading edge, with changes in the Angle of Incidence.

The Glider, in common with all solid bodies, has a Centre of Gravity. That is a point at which, if balanced, the Glider would be in complete equilibrium. In practice Gliders are so designed that the Centre of Pressure is vertically above the Centre of Gravity, so that there is no force tending to throw the Glider out of equilibrium. Actually, this is not quite possible, as there are small movements of the Centre of Pressure, but the tail-plane is used to restore balance.

Stability.

You will have noticed that with the controls centralised, i.e., the control column held vertical and the rudder bar straight, a glider will continue to fly on a reasonably straight and level path until disturbed by some external force, such as an eddy. This is because Gliders are designed to possess a certain amount of inherent stability.

There are three axes about which a Glider can be moved. They are all considered as passing through the Centre of Gravity, and are called Pitch, Roll and Yaw. The axis of Pitch is the one about which the Glider moves when it raises or drops its nose; the axis of Roll is that about which the Glider moves when one wing goes down and the other up; that of Yaw when it swings its nose to the right or left of its path in a straight line.

Stability about the Roll axis is obtained by setting the wings at a Dihedral Angle. As a matter of fact, in training types the C.G. is such a long way beneath the wing, and therefore exercises such a big pendulum effect, that not every training glider is rigged with a Dihedral Angle.

This Dihedral Angle is the angle which the leading edge of a wing makes with the horizontal. If both wings are set to some such small angle the lift of the downward moving wing becomes greater, and that of the upward moving wing less. Thus there is a force which tends to

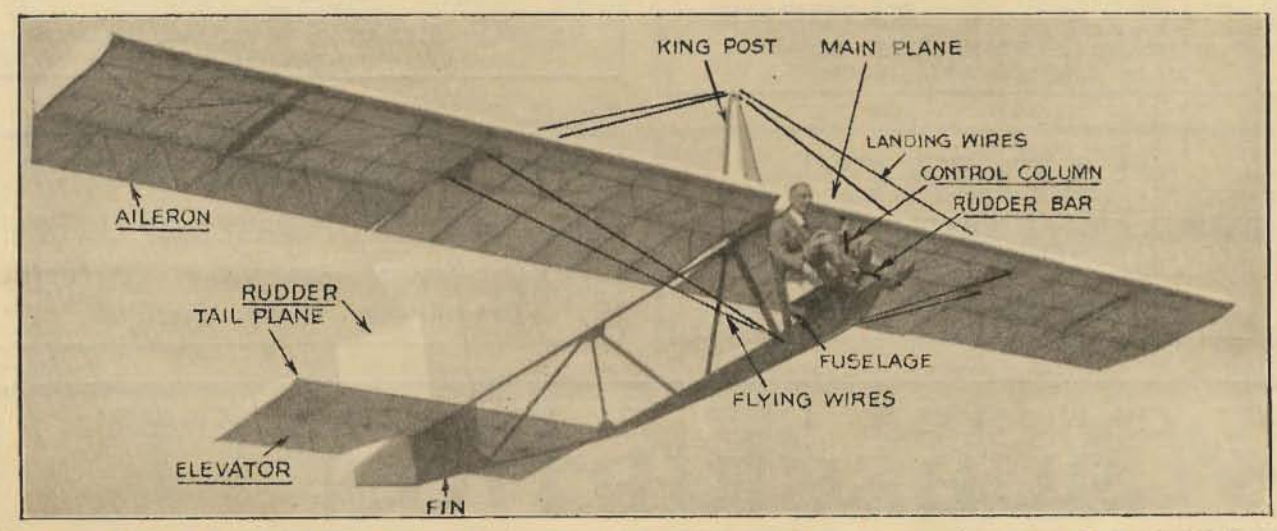


Fig. 1a.—The principal parts and the controls are shown here. The control surfaces and the means of operating them are underlined.

right the machine. The Dihedral Angle is kept as low as possible, as it reduces the Lift obtainable from the wing.

Stability about the axis of Pitch is obtained by Longitudinal Dihedral. Obviously, as the tail goes down the angle of incidence of the tailplane is increased its Lift is also increased, and a force is obtained which tends to right the machine. Similarly, if the tail goes up the position is reversed.

Stability about the axis of Yaw is obtained by the fin at the tail. This works in the same way that the vane of the ordinary weathercock keeps the pointer into the wind, in the same way as the tail-plane keeps the machine stable in Pitch.

You must remember that these righting forces are only effective for displacements from level flight when the controls are centralised. They do not apply when controls are being used for some manœuvre.

CONTROL.

The rudder, elevators and ailerons are the organs with which the pilot changes course, height and lateral position respectively. One might say changes his position about the axis of Yaw, axis of Pitch and axis of Roll. It will suffice perhaps if I explain the action of the elevators, as the underlying principles of the controls are the same, only the axis of reference being different.

In normal flight the elevators form a continuation of the tail-plane. If it is desired to drop the nose of the glider towards the ground the control column is pushed forward, and through the control wires pulls down the elevators. This increases the angle of incidence of the tail-plane, and so gives rise to a force, which, acting at the end of a long lever in the shape of the fuselage, is enough to alter the angle of the wing relative to the air.

The rudder, which works in much the same way, is actuated by the pilot from the rudder-bar. This is connected to the rudder in such a way that the pilot pushes his right leg forward to go right, and *vice-versâ*. This is the only control which gives the novice qualms, as it acts in the opposite way to its brother, the handle-bar of the cycle.

The ailerons are connected to the control column so as to roll the machine towards the left when the control column is moved that way. In this connection it is worth noting that if the wing-tip has been stalled, pulling down the aileron is only increasing the incidence of a stalled wing. As already explained, this decreases lift, and therefore instead of giving a righting force, merely tends to force the wing-tip down further still, which is why novices so often fail to right a machine after stalling.

All control actions will in time come quite naturally to the pupil, and when that stage has been reached the technique of using the controls in harmony has to be developed. For all normal purposes the controls should be handled gently and any tendency to over-control should be checked immediately. A slow definite action is necessary until the glider has answered to the extent desired, after that the control is again centralised.

FLYING.

Safe flying is largely a matter of common sense and requires considerable forethought, which is invaluable when one gets into tight corners, which always await the unwary. Judgment, which always invariably improves with practice, will normally save one from being drawn into unforeseen conditions. The pupil should beware of over-confidence, and remember that, particularly in flying, a pilot never leaves the *status pupillari*, which, being interpreted, means that the best pilots are still learning.

Actual flight can be divided into the three phases of Take-off, Flight and Landing. The first and last require the greatest judgment. Before taking-off the pupil should invariably satisfy himself that the glider is airworthy and should particularly test the controls. This gets him into good habits.

[One feels that this is the place to mention even machines for the Schneider Trophy Contest have been known to have their controls reversed. In one particular incident the pilot did escape with his life, although he was flung into the water. The amazing thing was that a number of independent inspectors had been over the machine. The lesson is that pupils should always test controls to satisfy themselves, and remember why they are doing it.—ED.]

During the launch the glider should be kept on a straight course, into wind and level laterally. Avoid a rapid climb during the initial high speed.

When in flight the pupil should concentrate on finding the best gliding angle. After that he should try and learn how to make gentle turns. It is again emphasised that all controls are invariably used together in harmony. Steep turns generally require a slightly higher air-speed.

The principle of landing is to maintain the glider as close as possible to the ground selected, and into wind, until the air-speed drops below the stalling speed. Once on the ground, keep the glider on a straight course as long as the controls are active. Do not get out of your seat until someone has arrived to hold the machine. Nearly every Club in the kingdom has had their gliders damaged by being blown over by the wind. It is surprising how small a gust will roll them over.

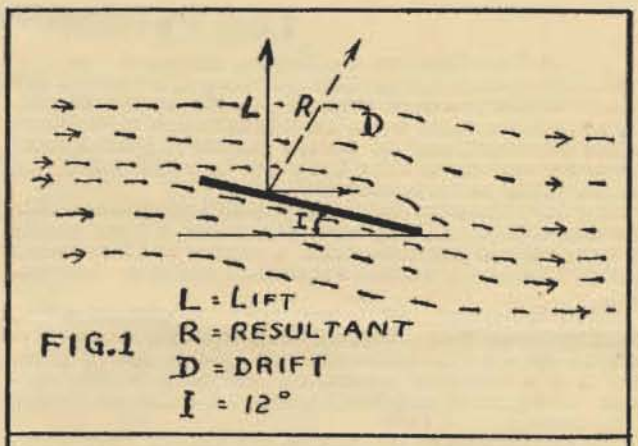


FIG.1

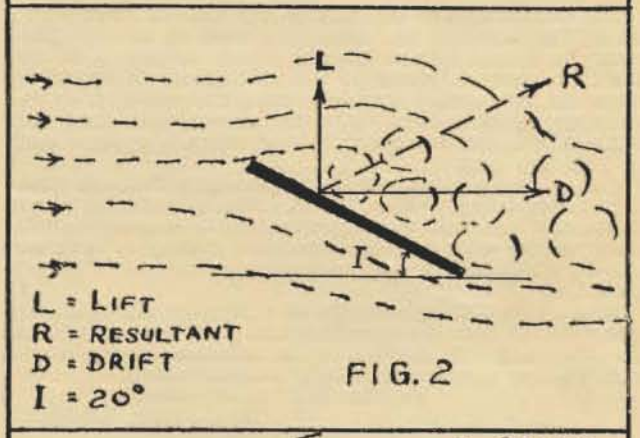


FIG. 2

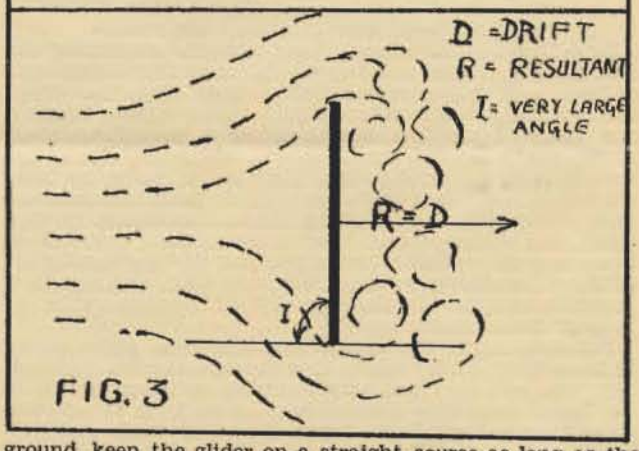


FIG. 3

In conclusion, the budding Glider Pilot is advised to work up a really intimate knowledge of his machine and the forces which act upon it. He should be fully conversant with the methods of rigging and trueing-up the Glider. He should get to know all the peculiarities of his gliding site and the action of the wind thereon. Progress is necessarily slow, but all flights should be logged in detail in a logbook to help the instructor estimate your capabilities.

AN IMPORTANT LECTURE.

On Tuesday, Dec. 2, The Winchester Gliding Club has arranged for a lecture on Glider Design to be read by Mr. Howard-Flanders, A.F.R.Ae.S., M.I.Ae.E., A.M.I.Mech.E. The title of the lecture is "The How and Why of Gliding."

The lecturer will explain in simple language the method of designing a glider, the use of aerodynamic data and the calculation of stresses. A series of lantern slides have been prepared to illustrate the problems peculiar to gliders and all redundant matter, or data, only applicable to power-driven aircraft has been omitted, to ensure that the treatment of the problem is as simple as possible. In fact it is ordinary arithmetic.

The lecture is at 5.45 p.m. Tickets may be obtained from The Hon. Secretary, The Winchester Gliding Club, Fordington Road, Winchester.

CORRESPONDENCE.

A Year-Book for the Gliding Movement.

Sir,—The Committee of Dorset Gliding Club are of the opinion that a year-book dealing with the subject of gliding and soaring flight would be of great value (a) to those in the movement, and (b) for the purpose of gaining more sympathy and support for the cause by enlightening the general public as to its work.

They have therefore decided to publish such a book under the title of *Gliding*. The work will contain a great variety of technical and general articles, a register of Clubs in the British Isles, and a wealth of statistical and other information.

Before embarking on this enterprise the committee took pains to ensure that they were not trespassing on any preserves. All work in connection with *Gliding*, except printing, is of a voluntary nature, and all proceeds (the year-book will be priced at 2s.) will be devoted to Dorset Gliding Club funds.

The compilation of the book is now well in hand, and I would like, through the invaluable medium of The Sailplane, to thank all who have so kindly helped us so far. We have been delighted at the enthusiasm evidenced by those we have approached concerning the year-book and at their eagerness to help. It is my sincere hope that they will not be disappointed with *Gliding* when it appears early in February next.

I have sent a questionnaire to some fifty Clubs in Great Britain regarding their activities. Hon. Secretaries of any Clubs who have not received this form I earnestly ask to communicate with me. We hope with *Gliding* to be of service to all Clubs, and suggestions for contents will be welcomed.

May I take this opportunity of expressing my Club's appreciation of The Sailplane and the great work it is doing for the cause. If *Gliding*, in its separate sphere, proves even half as useful it will be a success indeed.

(Signed) H. R. R. Goodyear,
(*Hon. Editor, Gliding*).

What about these German Certificates?

Sir,—I note with interest your remarks concerning the discrepancy in the number of Glider Pilots' Certificates claimed, and the number actually shown upon the official list issued by the Royal Aero Club. I note further that you say that in future, you intend as far as possible to avoid giving credit for Certificates not shown on the official list, but surely this procedure is a little unfair, as by so doing you overlook the fact that several Clubs have members who have qualified for their Glider Pilot's Certificates in Germany, and at the present time, so far as I am aware, there is no system available which provides for the ratification of these Certificates by the Royal Aero Club, although both countries comply with the normal F.A.I. regulations for the issue of these certificates.

For example, in the case of my own Club, which claims to have forty Glider Pilot's Certificates *issued* to its members, you will find that only thirty of these are shown on the Royal Aero Club Official list, but we have in addition, three members who have taken their "A," "B," and "C" Certificates at the Wasserkuppe, and one who took his "A" at Rossitten.

I entirely agree with you in your plea for greater accuracy in these matters, and therefore put forward the suggestion that pending any further action by the Royal Aero Club The Sailplane should step into the breach by endeavouring to obtain an official list of Glider Pilot's Certificates issued to foreigners in Germany, and from personal experience of the helpful co-operation of the Rhon-Rossitten Society, I feel sure that they would, upon request, supply the desired information. By publishing this periodically, The Sailplane would add still further to the already large amount of good work which it has done on behalf of the British Gliding Movement.

With best wishes for the continued success of your excellent paper,

(Signed) J. R. Ashwell-Cooke
(*Chairman, London Gliding Club*).

P.S.—I note that in last week's issue, we are shown as meeting at a gliding ground at *Tottenham* on Sundays, but beg to inform you that so far we have failed to find a suitable site in that delectable area of traffic blocks and football fans!!!

A Letter from J. E. M.

Sir,—The Aeroplane and The Sailplane of Oct. 29 and 31, respectively, have just arrived.

The experience of the Oxford Club is interesting, though the loose rope, dropping off the hook when the car slows down, seems to offer some difficulties, and would not appeal to me, as it robs the pilot of full control over the moment of cutting loose, a right which constitutes an important safety factor. In event the glider should be damaged in the take-off, which may happen if a flying wire strikes a stone and snaps under the strain, the pilot might want to get down in the quickest possible time, and not waste several seconds transmitting a signal to the car, having the observer pass it to the driver, the driver pass it along to his gas pedal foot, and the car do its stuff and slow down enough for the glider to gain ground and permit the rope to drop off.

The release gadget used over here is tripped by pulling a wire, the loose end of which is fastened beneath the seat.

The winch and brake suggested in The Sailplane seems unnecessarily complicated, and requires an extra man in the car. We had two ropes, one 300 ft. and the other 700 ft. The only purpose of the shorter rope was to speed up primary training by shortening the distance the car had to travel to return to the glider and to take out the rope before the next flight.

The driver watches the pilot with his head resting at ease on one shoulder while towing. We only stole an occasional glance ahead to gauge the distance to the fence. At all other times the driver watches the glider, judges the speed necessary, and is ready to speed up or slow down if the student shows signs of getting into trouble. Cutting out the middleman in the form of an observer reduces by just that much the chance of trouble.

Driving in an absolutely straight line proved unnecessary, in fact, the instructor sometimes found it convenient to change course to straighten up a student who got a wing down and started to slip off to one side. And on very windless days we sometimes ran the car the length of the field, then turned up the side and kept on until the glider had attained the maximum possible altitude. With a strong wind, of course, the air speed of the glider was so much greater that an appreciably shorter run was sufficient, provided the tow car had sufficient power to stand the increased drag of the higher climbing angle.

Finally, one of the two people engaged should be an expert glider pilot. A good pilot can be towed safely by a novice, but a novice should never tow a student or an inexperienced pilot.

(Signed) J. Earle Miller.

The Position in South Africa.

Sir,—After having read the first few issues of your paper, I feel I must let you know how much I appreciate it; to my mind it is just what is wanted, and I would like to join in wishing you every success.

So far as South Africa is concerned, not much Gliding has been done yet, but there is quite a lot of enthusiasm scattered about the country.

The fact that the Movement here is being crabbed by pilots of powered machines is proving a real drawback: I wonder if such a state of affairs exists in Great Britain.

One pilot here not content with ignoring the Movement actually went to quite a lot of trouble in getting an article published in the local press condemning the sport wholesale, and finished up by imploring the powers that be to stop it at once, and this was before any Glider had been launched in this part of the world.

Personally I fail to see how any airminded person possessing even the meanest of sporting instincts can fail to be thrilled by the performances of Kronfeld and Co., and desire to emulate them.

I have been interested in gliding for some years and took flying lessons mainly in order to be ready for gliding. My first solo left me cold beside my first hop in a Zogling—and from level ground at that!

In your last issue to hand you apologise for the inclusion of a further article from the Wasserkuppe; I hope to see plenty more of them, as news "straight from the horse's mouth" can't fail to be of the greatest interest.

Our Dickson was made by a local ground engineer, in his spare time—he was well paid for it too and used aircraft materials throughout—we paid £130 for the job! This state of affairs together with the aloofness of pilots of machines with cylinders and sparking plugs, doesn't do much toward helping the Movement here.

However, Captain Lindup, the Secretary of the Civil Air Board, has done much to make up for all; he has been to a great deal of trouble to help, and his thoughtfulness and kindness are much appreciated.

(Signed) H. G. Horrell
(*Hon. Sec. and Treasurer, Germiston Flying Club*).

[We are glad to learn that the Germiston Club is going ahead in spite of opposition. From the power pilot's point of view gliding is an invaluable way of creating air-mindedness at little or no expense, and we expect that this point of view will begin to gain a footing as the Club appears to be getting the support of responsible persons.

The cost of the locally-built glider seems excessive. However we have little doubt that our enterprising gliding manufacturers will at once cable Mr. Horrell offering him a much better price than that for gliders, c.i.f. Cape Town.—Ed.]

NEWS FROM THE CLUBS.

WHERE GLIDING CAN BE SEEN.

Beds.—The Bedford Gliding and Flying Club. Week-ends at Wilstead Hill, 5 miles from Bedford on Bedford—Luton road.

Bucks.—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 Coniston Farm, near Fairmilehead.

Glam.—Merthyr and District Gliding Club. Sundays, 10 a.m. to sunset. ¼-mile-left Dynevor Arms, Merthyr Tydfil—Swansea Road.

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

I.O.W.—The Isle of Wight Gliding Club. Saunders-Roe Aerodrome, at Cowes, every Sunday.

Kent.—Channel Gliding Club. Week-ends above Folkestone, close to Dover road, at the Valiant Sailor.

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

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

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.

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

Sussex.—The Worthing and District Gliding Club, Weds., Sats., and Suns., at High Titton, 2nd 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 Leeds Gliding Club. Week-ends at Gildersome near Leeds.

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 best.

THE BEDFORD GLIDING AND FLYING CLUB.

During the past week-end, although weather conditions made work impossible on Nov. 22, some of the best work was done on Nov. 23.

Our Captain had discovered a very promising miniature "Kuppe" further along the ridge, and to this, machine and members, trekked on Sunday morning. From the ledge on which the machine was started, the ground dropped immediately to a nice mossy landing place below, so that once the machine left its ledge, it was "in air" at once in a gentle breeze, giving pupils plenty of time to feel their controls and also a splendid opportunity to get used to altitude.

It was very pleasing to the hard-working instructors to see the fruits of their labours in watching how each pupil, without exception, showed faith in his judgment and maintained absolute control of the machine in air and in landing. It was easily possible to actually follow the thoughts of each pupil in flight by watching from above the movements of the controls during the flight of the machine.

The advantage of our "split" king-post with plate supports was once again seen when a pupil made a light cross wind landing, the plates being straightened and the machine in flight again inside 10 minutes. With a "solid" king-post this mishap would have completely finished the day's work.

Pretty glides were made by the Captain, Messrs. Bevan, Keens and Crummie, while Messrs. Ivan and Lampard in their first attempts from "aloft" did very well indeed.

Some of our ladies were also able to get in a number of ground hops, and showed good promise.

It is hoped in the next few weeks to put at least six of our members through the "A" test, and we have no doubt whatsoever but that every one will easily do it, weather permitting, of course.

Will members please make special efforts to be out very early on Sundays.

The Club Rooms are now in full swing and look very cosy indeed.

Associate membership has been opened, and the subscription is 10s. 6d. per year, no entrance fee.

Gliding subscription is 15s. per year with an entrance fee of £1, no extra charge for instruction or use of machines.

THE CHANNEL GLIDING CLUB.

The Channel Gliding Club Ball will be held at the Leas Cliff Hall, Folkestone, on Friday, Dec. 12. The daughter of the Belgian Minister for Transport, Mlle. Susi Lippens, who is a member of the C.G.C., will have her Professor sailplane on exhibition. Tickets for the C.G.C. Ball may be obtained from the Leas Cliff Hall, Messrs. Andrews, Sandgate Road, and Messrs. Turners, Jewellers, Rendezvous Street, Folkestone, and from all members.

Gliding takes place at Hawkinge on Wednesday and Saturday afternoons and Sundays, and several members are now ready to obtain their "A" certificates.

The C.G.C. is fortunate in having the services of such a capable instructor in Squadron Leader Probyn, Commanding Officer, R.A.F., Hawkinge, and also in having two "C" certificated glider pilots in Mlle. Susi Lippens and Mr. C. M. C. Turner. The Club offers hearty congratulations to the latter, who has just returned from a gliding and sailplaning course in Germany, where he secured a "C" certificate.

Auto-towing on the Club site at Hawkinge is a new feature for flight training for beginners, and is proving very satisfactory.

Inquiries for membership will be welcomed by the Hon. Secretary, Mr. F. H. Worrad, 42, Rendezvous Street, Folkestone.

THE DORSET GLIDING CLUB.

Mr. J. Laver (hon. secretary) and Lieut.-Commander Steedman, two founder-members of Dorset Gliding Club, qualified for their "A" certificates during the past week-end (Nov. 22-23), as did Mr. Thompson, a Yeovil member. For the next two or three weeks the centre of operations shifts from Maiden Newton to Chickerell, Weymouth, where by means of a session of flat field "hops" it is hoped to inspire South Dorset *ab initio* members with sufficient confidence to get their "A" tickets—or to make the attempt.

Mr. H. J. Penrose soared for nearly three minutes in the R.F.D. on Saturday. He is thirsting for the chance to qualify for his "C" certificate, and the Club hopes to have some more "B" pilots shortly.

The Club has produced an interesting film of its various activities, including the Kronfeld display at Askerswell, near Bridport, in July. A replica of this is being sent to Herr Kronfeld. In this connection the Club is anxious to compile a list of all available films connected with gliding, including details as to width of film. Anyone who has a film of this nature and would be willing to loan it for lectures, etc., is invited to communicate with the hon. publicity secretary, 10 Franklin Road, Weymouth.

THE ESSEX GLIDING CLUB.

Members are beginning to realise that the workshop can be as interesting as field work, if not so thrilling. Not the least interesting side of workshop affairs is the number of ideas which are born—some to thrive, some to perish, but nevertheless—ideas.

One idea which was put forward by a member, simply with the object of saving the undercarriage (primary type) in bad landings, seems worthy of a trial. Short lengths of wood are to be bolted to the undercarriage at close intervals along the whole length. These "fenders" would be fastened loosely so that in flight they would hang downwards for, say, three inches below the skid.

HOW IT'S DONE.—The giant B.A.C. trailer which holds an Armada of gliders or a whole Club. This is shown resting on its way to or from Edinburgh whither Mrs. Green, the wife of one of the B.A.C. directors, drove it in 17 hours.

They would swing quite freely fore and aft, so that in a straightforward landing the "fenders" would simply lie down and trail along the grass. In an awkward side-landing the "fenders" would, since they naturally hang perpendicularly in the air, take the force of the sideways blow and thus save the undercarriage and, possibly, the king-post. It would be a simple matter to replace a few "fenders" on the spot.

That is simply the idea, without going into details of measurements, etc. [Unless these "fenders" are attached to some strong longitudinal they will only transmit the load to the skid.—ED.]

The Essex Club is holding a Dance and Supper on Dec. 4 (Thursday) at "The Chestnut Tree," Lea Bridge Road, near Whipps Cross. Dancing will be from 7.30 to 11.30, with a break for supper at 9.30 p.m.

All members and non-members who would like tickets can obtain them from Mr. W. R. Bannister, Hon. Treasurer, 20, Badlis Road, Walthamstow, E.17, for 2s. 6d. each.

THE ILKLEY AND DISTRICT GLIDING CLUB.

The Ilkley Club spent a most enjoyable day on Nov. 16 at Bolton Abbey; weather conditions were very good. A ten-mile-an-hour S.W. wind was blowing in the morning, and some very nice flights were made. Lunch was provided by Mr. P. Fawcett, the Club's Hon. Sec., and was done full justice by hungry members. The wind fell considerably in the afternoon and gliding was not so good. Flights were made from a gentle slope and altogether some 40 flights were made.

We secured two new members from people who were looking on. We are fortunate in having as a Club member Mr. H. Crabtree, who has just returned from the Wasserkuppe, where he has obtained his "A," "B" and "C" certificates. Mr. Crabtree has, we are glad to say, consented to act as Instructor to the Club, and also to send news of the Club's activities each week to your very good paper.

The Primary type glider being made by one of our members is now in the final stages of completion and we hope to have it in the air in two weeks' time.

THE LEEDS GLIDING CLUB.

We have now taken delivery of our first machine and are very pleased with the way it flies. It arrived late on Nov. 23, being delayed owing to a large branch falling down onto it and smashing the cabane. It was taken to the Harrogate Aircraft Club site, rigged, and was all ready for flying about 6.15 p.m. Then with the aid of car head-lamps was flown down the slope by Mr. C. St. L. Jervis, the demonstrator.

It was a very queer sensation to see the now ghostly-looking machine glide out into the rays of the lamps, sail quietly down the slope and then suddenly vanish.

During this week the machine will be on view at the showrooms of Francis E. Cox, Albion Street, Leeds.

Prior to the arrival of our machine on Nov. 23 the Harrogate Club gave some of our members flips on their Dickson machine. This was greatly appreciated and clearly shows what good feeling prevails amongst the Northern Clubs.

We are hoping to have a second machine by next week-end, when we will be able to start in earnest. Both machines are Reynards and are very good fliers.

THE NORTH COTSWOLD GLIDING CLUB.

The pupils of the North Cotswold Gliding Club continue to make splendid progress and only the failure of the breeze to oblige with "ticket" speed and direction has prevented them getting another half-a-dozen "As" in the last fortnight. On the day when atmospherics were favourable, one of the rigging "fans" had a day all to himself to show one how the machine should be tuned up. One of the lady members just did the 30 seconds, but the inst-uctor will not make any application unless there is a reasonable margin. The instructor has now put the extra ten seconds on the "grid" again and we are once more on the track of Dagnall's tenner.

We hope to have an advanced-type sailplane designed and built by one of the members, who has 30 years' glider experience, ready for test before Christmas.

THE NORTH STAFFORDSHIRE GLIDING CLUB.

Thanks to the generosity of Mr. J. Ainsworth in granting the use of his land for future gliding meetings, a change of venue to The Downs Banks, Barlaston Downs, near Stone, Staffs, was made on Sunday last. Mr. Coles (Instructor) proceeded to demonstrate the benefits of the new site in exemplary manner by making quite the best glide performed to date. Proceedings terminated earlier than intended by slight damage to the glider on landing.

Further meetings will be held each Sunday until further notice.

Hon. Sec., Mr. C. Teeton, 3, Havelock Place, Shelton, Stoke-on-Trent.

THE NOTTINGHAM GLIDING CLUB.

In THE SAILPLANE of Nov. 15, a letter was published from one of our members, Mr. W. S. Bullivant, and it was stated that he was the Chairman of the Nottingham Gliding Club. This was due to a misunderstanding as The Nottingham Gliding Club has not a Chairman.

At a recent Council Meeting it was decided that gliding operations would be postponed for the next two or three months.

Owing to the fact that the Club do not possess a hangar in which they can store their machine fully rigged, on the gliding ground, they find that, by the time they have collected the glider in sections from their usual storing place, loaded it on to the trailer, and proceeded the seven miles to the gliding ground, the morning is considerably advanced.

The Club found that it was advisable to commence dissembling the machine before the light failed, so that, all together, there is very short time available for gliding and many members do not obtain a glide at all.

The Club, however, have arranged for a series of Lectures on Gliding and allied subjects, during the coming Winter months, to which the public will be invited. If there are any other Gliding Clubs in the neighbouring Counties, who would like to attend these Lectures, they are invited to write to the Secretary of the Nottingham Gliding Club, c/o Welbeck Hotel, Nottingham, when full particulars will be sent.

THE SOUTHDOWN SKYSAILING CLUB.

A good number of members attended the practice meeting on Nov. 16. The air was perfect for elementary instruction, and forty-two launches were made with our R.F.D. machine.

Flt. Lt. Brown, the Club Captain, made two good glides of 27 secs. each and one of 24 secs.; Capt. Russell 19 secs.; and Mr. E. K. Robins 18 secs. Good glides were also made by Mr. S. Wood and Mr. E. Parker.

The most thrilling incident of the day was a demonstration of how to fly into a tree and out again without damage to pilot or machine!

Relating his exciting experience, Flt. Lt. Brown said he should have easily cleared the top of the tree, but for an air pocket or down current on the lee side of the obstacle, which caused his machine to drop suddenly as he approached the tree, giving him no time to avoid it. His left wing went right through the branches, swinging the machine round at right angles to the path of flight. What looked like being a nasty crash was only avoided by the skill and presence of mind of the pilot, who did not lose control of the glider, but straightened up again immediately, maintained his flying speed, and continued to make a good glide of 24 secs.

About half-a-dozen members should be ready to take their "A" tickets as soon as a new launching rope is obtained—the present one being too weak to effect a really good take-off.

For particulars of membership apply to the Hon. Sec., Mr. A. York Bramble, New Yorke Hotel, Bedford Square, Brighton.

THE WORTHING AND DISTRICT GLIDING CLUB.

This Club was formed three months ago, and has adopted the motto "Slow but Sure." Its headquarters are at the Central Hotel, Worthing. The Club has purchased a B.A.C.II Primary Training Glider, which through the kindness of Messrs. Caffyns Ltd., the well-known South Coast Automobile Agents, was on view in their local showrooms, where it attracted a great deal of attention and became quite the "Talk of the Town."

A demonstration was given on Nov. 23 before quite a large gathering by Mr. Lowe Wylde, the well-known designer and constructor, on the Club's Gliding Ground at "High Titton." Mr. Lowe Wylde gave a short talk on the principles of launching a glider, after which he was successfully launched into a light west wind, making a short but very graceful flight and landing on a knoll opposite. He was again launched, this time with his hands held high above his head, thus giving a very adequate idea of the stability of the B.A.C.II.; he then turned down the valley, and after travelling some distance made a right-hand turn, coming to rest near his first landing place.

A Club member, Mr. Brian Thynne, through whose kind offices the Club secured their site, then came forward and volunteered for the first flight, and owing to his being an experienced aeroplane pilot was launched from the same point as Mr. Lowe Wylde had been. He made a remarkably good flight, covering within a few yards the same distance as the demonstrator's first flight. This was the first time Mr. Thynne had flown a glider and seemed to rather disprove Mr. Caldwell's views as published in THE SAILPLANE [Oct. 24.—ED.] a week or two ago.

Another member, a novice, owing to a misunderstanding, was then launched from the starting point of the previous flights, but, unfortunately, this effort ended in a damaged skid, but such is the enterprise of the British Aircraft Company that such a contingency has been catered for, and all that is required is to bolt on a new front section, thus ensuring that gliding can take place almost at once.

The Club have indeed been fortunate with regard to their site, which is in the heart of the South Downs, seven miles to the North-west of Worthing. It is totally enclosed by wire fencing, privately owned, and above all is suitable for gliding into any direction of the wind, except perhaps due North. [Surely with the wind in the North the South Downs form an ideal soaring site?—ED.] The main slope, which is South and faces the sea, has an even gradient which is not too steep and rises to 650 ft. above sea-level, with slight rises on its Eastern and Western boundaries. This property, which comprises some 250 acres, is fine grazing and pasture land with springy downland turf, free from mole hills, gorse or bushes, and fences. Mr. Lowe Wylde remarked that it was one of the best sites he had seen.

A great asset are the two vacant cottages standing at the head of a small valley which runs about half-way up the slope. For several week-ends members have been working hard on one of these sottages. The ground floor has been adapted as a hangar for the glider and a Club Room. One room on the first floor is used as a store-room for sundry odds and ends which are really essential to have on hand for a successful meeting; the other room has been redecorated and has been allotted for the use of lady members. There is also a large and airy attic which will be used temporarily for sleeping purposes by some of our more spartan members. The other cottage will eventually be used as a Club House when during inclement weather members can gather together to play cards, tell funny stories or criticise the B.G.A. [One supposes they read THE SAILPLANE at home.—ED.]

We hope at a later date to make a statement with reference to Gliding Clubs camping on our site during the Summer: terms have not yet been discussed with those concerned, but Club Secretaries who are interested should write and ask for information.

The entrance fee to the Club is One Guinea, together with an annual subscription of Two Guineas. Lady members will be welcomed; at the moment there are 12 and we hope at some future date to have one glider for the ladies' own use.

The Hon. Secretary is Mr. N. T. Whiteman, of 101, Rowlands Road, Worthing, to whom all inquiries should be addressed.

FORTHCOMING DATES.

Dec. 26—Jan. 2.—The Gliding Display and Inter-Club Contest organised by the Scarborough Gliding Club at Flixton Hill.

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 5407; Publishing, Central 5822.