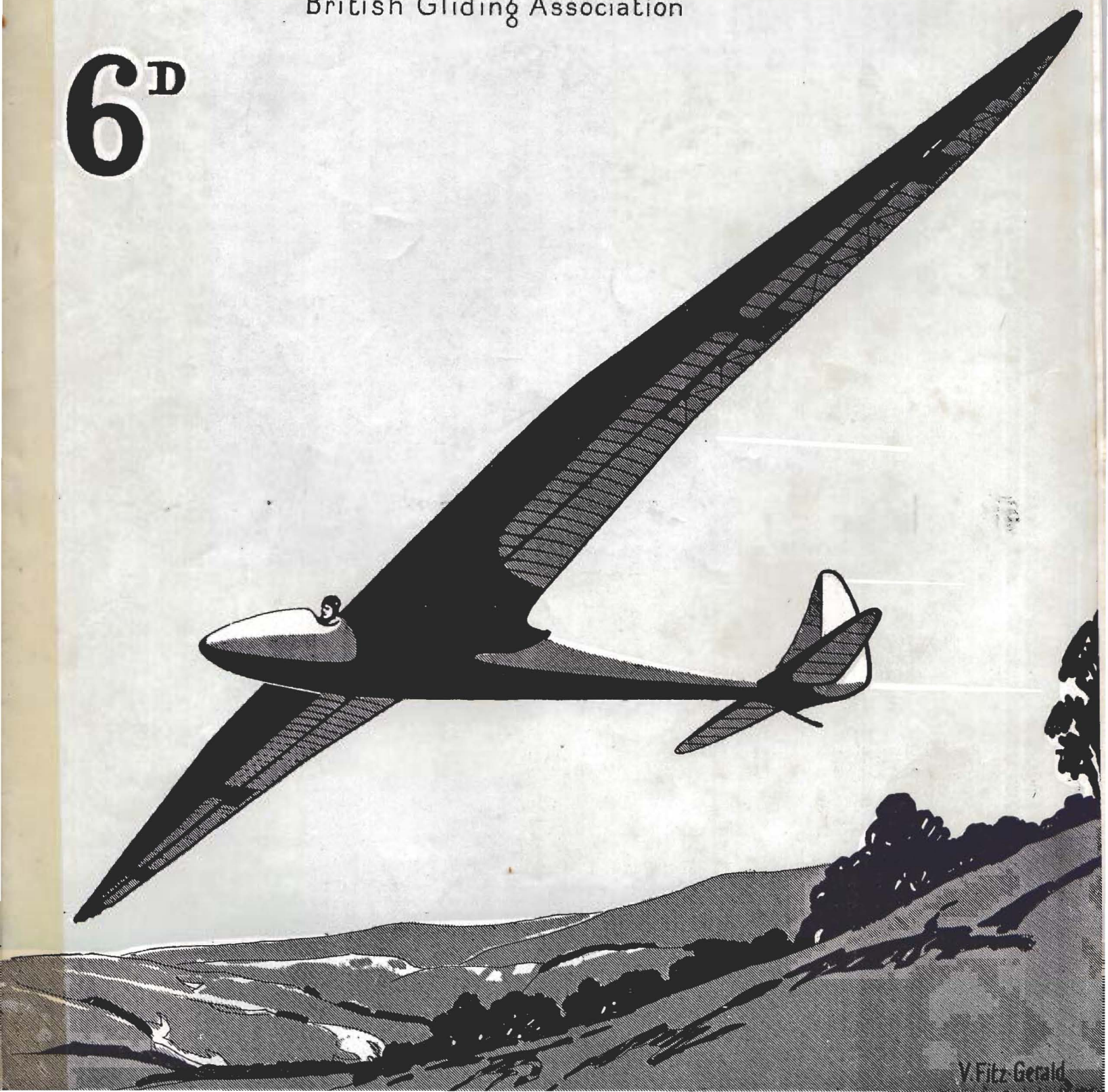
February 3rd, 1933. Vol. 4, No. 2.

THE SAILPLANE & GLIDER

Official Organ of the
British Gliding Association

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THE SAILPLANE & GLIDER

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

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

OFFICIAL ORGAN OF THE BRITISH GLIDING ASSOCIATION.

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The Offices of the SAILPLANE *viewed from the historic XVIIth Century gateway of Lincoln's Inn.*

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"Flying Proper."

One of our correspondents in this issue has, in what was perhaps an unguarded moment, made use of the astonishing phrase, "gliding and flying proper."

Why this distinction? Is there, then, such an air of impropriety about all that this paper has published on the subject of motorless flight? It is, indeed, only too true that the public has always regarded as something not quite "proper" the idea of flying without an engine; it is, unfortunately, equally true that we are all to some extent infected with the same point of view, and have really never yet shaken it off.

It should be the aim of THE SAILPLANE to change all that. Those who love the air are they who fly up into it by their own effort and skill rather than "gate-crash" into it behind a piece of mechanism. The purpose of THE SAILPLANE AND GLIDER is to help them to do so, to inform them who else is doing so, and to tell what is known of that element, the air, into which they would penetrate—its clouds and its winds, and the flying technique of its birds whom we are trying to honour with the sincerest form of flattery. Then will our flying be "proper" indeed, and its propriety will know no bounds.

Meteorology Without Stint.

In this connection we are delighted to be able to state that Captain F. Entwistle hopes to give us now and then some of those long-promised articles on Meteorology, which the duties of editorship, combined with his many other activities, have hitherto given him no time to write. A year ago he warned us of the possible development in this paper of a bias towards Meteorology. That warning is still in force, and our readers should be prepared to expect as much Meteorology as they are willing to stand for. And fly for.

To the Rhön at Last.

The principal item of news which we serve up in this issue is to be found on the final page among the proceedings of the Council of the British Gliding Association. There it will be seen that the B.G.A. proposes to send a team to represent Britain at the forthcoming ISTUS Competitions.

The ISTUS, or International Committee for the Study of Motorless Flight, had its beginning in a meeting of representatives at Darmstadt in March, 1930, at the time the British gliding movement was just beginning to get

under way. There it was decided to form the International Committee, which held its first meeting as such in the following June, when it elected Prof. Georgii as its President and the Master of Sempill Vice-President. Meeting again in Paris at the end of 1930, the ISTUS decided to organise an international gliding competition once a year. An attempt was made to hold the first of these competitions in 1932, immediately after the ordinary Rhön meeting, but it had to be abandoned owing to the economic situation in most of the countries concerned.

Now at last in 1933 there seems a good chance of such a competition being held. The art of soaring has made great strides in several European countries lately, and the various national organisations may well feel justified in sending teams along. The conditions provisionally decided upon stipulate that each country may send three machines and a team of fifteen, of whom six may be pilots, and that there shall be a minimum of three countries taking part, with at least eight machines in all; if these figures are not reached, the R.R.G. (the organising body for this year) may apply to have the meeting cancelled. The dates proposed are August 13th to 20th, at the Wasserkuppe, after the conclusion of the usual annual Rhön Competitions.

And the Reason Why.

The reasons for the B.G.A.'s desire to send a team are, we understand, twofold; first, that if many countries are going to be represented, Britain ought to be among them; and, secondly, that the sending of a team would provide the best possible publicity in Britain for the British gliding movement.

A twofold motive is also responsible for the decision to hold an eliminating contest for deciding upon the composition of the team. A certain amount of reflected publicity is bound to be centred in turn upon these trials, and hence the idea, which we believe has been put forward, of holding a few elementary instructional courses at the same time and place, in the hope that these will share in the glory, too.

The Eliminating Trials.

As regards these "eliminating trials," we hope the Contest Committee of the B.G.A. will not interpret their instructions too narrowly. To decide upon the composition of the proposed team solely upon the performances put up by various pilots under widely differing conditions of wind and weather would, in our view, be a mistake, as it is unlikely, though not impossible, that even on the best of sites a sufficiently long period of good soaring winds will be available for a true comparison between the merits of the various pilots.

Again, what if some of our best pilots are unable to come to these trials at all, or turn up at intervals only to find unsuitable weather or damaged machines? We may have "good" pilots in profusion, but the ability to challenge the "aces" of soaring flight on their own ground needs something more than ordinary high-class piloting skill, and it is absoloutely essential that, to make a good showing, our very best men should be chosen—those who are known to possess, or to be in process of developing, advanced soaring technique, quite apart from the luck and chance of the changing air conditions during an eliminating contest.

Variometers.

A variometer is so essential for any form of soaring other than slope flying, that we are glad to publish a description of one that can be made almost entirely by the amateur, and at a great saving of cost over the bought article. We have personally tested the instrument described (on the ground, not in the air), and found it to work admirably and to be as sensitive as anyone could desire.

But there is one snag about variometers, and that is, that, on Wolf Hirth's own admission, one has to spend 90 per cent. of the time looking at the wretched thing, leaving only 10 per cent. for admiring the passing scenery. The novice, when he first flies with an air-speed indicator, watches it the whole time. But by degrees he grows out of the habit until at last he can guess his speed solely by the sound of the wind whistling past. Surely a variometer could be designed to give an audible signal instead of a visual one. Nine hours' dial-reading on a ten hours' cross-country flight is too much of a good thing.

In Defence of "Professor."

Herr Hirth's remarks about the unsuitability of the PROFESSOR type for cloud-flying, reported elsewhere in this issue, should not be taken too much to heart by PROFESSOR pilots. For the PROFESSOR has some remarkable cloud flights to its credit. It was in the first PROFESSOR to be built, in 1928, that Kronfeld carried out the first cumulus cloud flight ever made. It is true that the flight, which we saw, included very little in the way of circling, and the same is true of Mr. Buxton's flight of August, 1931 (which still remains the only cross-country cloud flight performed by a British pilot), for he flew under a "cloud street," where circling is unnecessary.

But an outstanding example of what the PROFESSOR can do was the flight of Peter Riedel of about 100 miles from the Wasserkuppe to Plauen, on May 19th last year. Owing to the absence of wind he had an aero-towed start, at 4.20, and cast off at about 4,000 ft. According to a published report, "the weather was very warm—almost an absolute calm—and only small clouds were to be seen in the sky. Riedel was surprised to find up-currents up to about 300 ft. below these clouds. He soon went out of sight. Especially remarkable was the almost complete calm and the very small clouds which dissolved towards evening. What is more, Riedel flew in the CUMULUS, a type built specially for towed flights, which has a sinking rate of 1 to 1.1 m. (3½ ft.) per second, and does not allow itself to be turned so easily, as, for instance, the SUPERFALKE, which, however, is too slow for distance flights. From this flight the lesson is to be learnt that for cross-country flights the sinking rate is by no means so important, but the flying speed must be great enough to allow of flying quickly from one up-draught to another."

25 Years of "Flugsport."

We offer congratulations to our contemporary, *Flugsport*, which in its first issue of the present year is celebrating a quarter of a century of uninterrupted fortnightly publication. Though not, as we are, entirely devoted to motorless flight, *Flugsport* comes nearer to being so than any other journal in the world. This is not surprising, for its founder and editor, Oskar Ursinus, has been the chief moving spirit behind the German gliding movement, which has now grown to such vast proportions and spread round the earth.

One day, many years ago, Herr Ursinus was ordered by his doctor to the Rhön Mountains for complete rest and quiet. The sight of his children playing with kites and models reminded him of certain sporadic gliding activities that had taken place there many years before. Thereupon "rest and quiet" were thrown to the winds; Ursinus called together a band of enthusiasts, organised the first annual glider meeting, and that's how it all began.

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CAPTAIN F. ENTWISTLE.

AN APPRECIATION.

By E. C. GORDON ENGLAND

(Chairman of the British Gliding Association).

One of the most encouraging and inspiring experiences in our social life is the frequent contact one makes with those whose devotion to the interests of society at large is generously given heedless of personal reward or progress. The vast amount of voluntary work which the British undertake is, I believe, a matter of comment among other nations, for it is incredible to them that so large a volume of people can work for no personal gain. Probably this acceptance of the importance of social service is one of those fundamentals in the firm structure of British character and Empire.

Few, besides myself can, through lack of opportunity, appreciate the immense amount of energy, thought and devotion to an ideal which has been expended by Capt. Entwistle since in an already full life he undertook to carry forward the torch of THE SAILPLANE. His work has been carried out at immense personal sacrifice and far too often the only "reward" which has come his way has been ill-considered, captious criticism, but this has never changed his attitude towards his job.

Right up to the end he has been full of constructive ideas for the improvement of the paper. Unfortunately for the Gliding Movement, even the willing spirit of Capt. Entwistle has had to call "Halt!" as the load of his official duties has been increased, and it was with great reluctance on his part and on the side of his colleagues, and with a sense of deep regret at our impending loss, that it was agreed that he should be released from the arduous task.

Two rays of sunshine, however, were left us, one Capt. Entwistle's sporting undertaking to find an adequate successor, which undertaking he has most fully liquidated, and the other that he would be a regular contributor to THE SAILPLANE on his own special subject, which is one of such fundamental importance to the Movement.

A very sincere and heartfelt "Thank you" must be in the hearts of all of us, and will, we hope, be some gratification to Capt. Entwistle for all that he has done.

FOR STAMP COLLECTORS.

Special stamps are reported to have been issued for the first International glider post in the world, to be carried out by the Maribor (Marburg) Flying Club. It appears that the termini are in Austria and Yugo-Slavia respectively, and that the situation is specially favourable for such a service, and even for a passenger service, which is promised later.

It may be remembered that the first regular sailplane post in the world was established last year at the Wasserkuppe meeting. The stamps used, however, were the ordinary German Air Post stamps, though a special postmark was printed on the envelopes.

A QUOTATION.

"When one becomes accustomed to being immersed completely in the fluid air, one considers the ground as being a place entirely apart. When this attitude of mind is reached, there is no accompanying sense of timidity in the thought of flying. The aeroplane* in the air is one's complete and separate world of which one is master; the earth below belongs to other people and exists only to be used by oneself when desired."

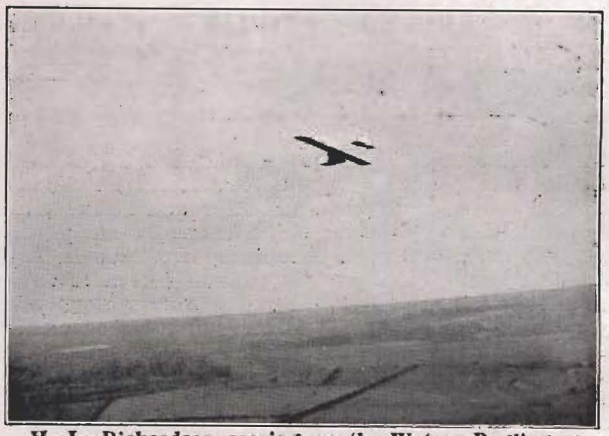
NORMAN M'CMILLAN *(The Art of Flying).*

*For "aeroplane" read "glider."

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H. L. Richardson soaring on the Watson-Dagling at Dunstable.

THE B.G.A. DANCE.

MRS. J. A. MOLLISON was the guest of honour at the Aviation Ball, which was organised by the British Gliding Association, held at the Portman Rooms, Baker Street, on Wednesday, January 11th. Mrs. Mollison's practical interest in every aspect of British aviation knows no bounds. As a Vice-President of the B.G.A. she has done much behind the scenes to foster the good work the Association is doing.

Six hundred and thirty-one guests attended the dance, and it was only due to the epidemic of influenza which was raging at that time that at least another 150 persons were prevented from attending. Mr. and Mrs. Mollison and Colonel F. C. Shelmerdine and Mrs. Shelmerdine received the guests, and among those who took tickets and were present were Baroness Toska von Bissing, Lady Brooke-Popham, Air-Commodore J. A. Chamier and Mrs. Chamier, Miss Diana Dickinson, Lady Malcolm Douglas-Hamilton, Kathleen, Countess of Drogheda, Mr. and Mrs. E. C. Gordon England, Lady Gage, Mr. and Mrs. Claude Grahame-White, the Hon. Mrs. Greenway, Mr. and Mrs. Felix Guepiera, the Master of Kinnaird, Mrs. J. B. Manio, the Hon. Joyce Montagu, Lady Patricia Moore, Lady Muskerry, Lady Nelson, Colonel the Master of Sempill, Flight-Lieut. G. H. Stainforth, Dowager Lady Swaythling, Mr. and Mrs. Lawrence Wingfield, and the Hon. R. Winn.

It is always unfortunate that, at such happy events, time goes too quickly—or so it seems. Bearing this in mind, the organisers determined not only to make everybody enjoy themselves *at the beginning*, but to maintain their enthusiasm right through. Shareman's band entered into the spirit of the thing and played with such determination that the floor was filled for every dance. At 10.30 a bright interlude took the form of exhibition dances by Miss Norma Cave and her partner, Mr. Arthur Milner. This brilliant pair of artists were the champions of 1931, and so beautiful was their exhibition that the organisers are to be congratulated for securing their services on this occasion.

The following were the winners of the various competitions: Mrs. Farmer (Bridge Set, presented by Austin Reed), Mrs. Green (No. 10 Luxor Goggles, presented by Meyrowitz, Ltd.), Mr. Moerau (Ronson Razor, presented by Ronson Products, Ltd.), Miss Ferand and Miss Howell (Pen and Pencil Set, each presented by Waterman's, Ltd.), Miss Aitken (Ladies' Bag, presented by Finnegan's, Ltd.), Miss Richardson (Luncheon for two and free flight, presented by National Flying Services, Hanworth; Permanent Wave, presented by Chez Eminée), Mrs. Brooke-Pike (one year's subscription to *The Bystander*, presented by the Proprietors of *The Bystander*). J. C. C.

"SAILPLANE" PHOTOGRAPHIC COMPETITION.

We regret that, owing to Capt. Entwistle having had unexpectedly to go abroad, we are unable yet to announce the winners of the Competition for the final months of 1932. The Competition is being continued in this year's SAILPLANE.

WOLF HIRTH ON THERMAL SOARING

By H. L. RICHARDSON.

(*Continued from* THE SAILPLANE *Vol. 4, No. 1, p.6.*)

The easiest way to practise thermal soaring is to be towed up behind an aeroplane: Hirth's Klemm is fitted with a special towing hook on its tail skid, and he has taken many sailplanes up. Over suitable *terrain* many thermals will be encountered; one morning over Breslau Hirth soared for hours, often without troubling even to circle, in a stream of thermal bubbles rising from various parts of the town—each "bubble" forming at the condensation base into a small cumulus cloud that drifted away like actual bubbles on a stream. The thermals begin to be effective about 10 a.m. in the summer, reaching their greatest strength about midday, and declining to practically zero by late afternoon.

It is, of course, quite possible to reach and ascend in thermal currents when slope soaring, but it is much more difficult and requires practice in slope soaring as well as thermal soaring if this has previously been done only from aero-towing. The pilot must be able to detect thermal lift among the hill upwind; he should first get as much height as possible by figure-of-eight soaring, and then lengthen the first arm of the "8" out over the plain to try to intercept thermals. These should be disregarded if below 6 ft./sec. in lifting power, since with weak lift the machine might be caught in the down-wind behind the hill during the early circles; in a sufficiently strong thermal, however, the sailplane is carried rapidly up while circling and the down-wind gives no trouble. The pilot should rise until "lift" has ceased, and perhaps remain in the same area with slow sinking speed a little longer while he decides on his next move; then, for a cross-country flight, he should set off down-wind so as to make maximum distance. He should be on the look-out for fresh thermals, and also for further slopes on which to gain height if he is unlucky in finding a good thermal current. In entering the thermal while hill-soaring, if the machine happens to be on a right-hand turn when lift is noticed, it should continue for the requisite time, and then the sharp turn should be right-hand and the circles in the same direction. Experience has shown that it is only confusing to change the direction of the circles once they are begun.

There are many aspects of thermal soaring, particularly in combination with slope upwinds, that can scarcely be mentioned here; lift in unexpected places along a ridge, or unexpected height with a low-efficiency machine, may be due to thermal currents; in ordinary ridge soaring, it is possible to make use of thermal lift by gliding very slowly—as near to stalling as can be done without sinking too rapidly—so long as one is in it, and then gliding rather rapidly until the next thermal is found. Lift is sometimes found where a down-current would be expected, behind a ridge or projecting hill, when there is a strong wind on a sunny day. The wind might be too strong for thermals to develop, but in the shelter of the hill the ground would become warm and thermal currents rise from the pocket of warm air formed.

In soaring over slopes of only moderate height, the amount of height gained from a single "bubble" has been found to be much more than could be accounted for if the bubble were entered merely at the height of the ridge. To account for this, it is assumed that the "bubble" while still forming, and much flattened, is blown towards the hill (Fig. 2), the sailplane entering it as shown. Then the bubble floats free from the crest of the ridge, elongating itself vertically as it does so, its base being carried forward more rapidly than its top by the rapid stream of somewhat compressed air flowing over the hill; in this way the plane finds itself in a bubble much taller than the height of the hill above the plain.

Other thermal upwinds may be used; for example, a pine wood on a steep slope is the source of a belt of rising warm air at the end of the day, when other surfaces are cool, and this belt, since it comes from a considerable, sloping area of woods may give sufficient lift for soaring until after dark.

Cross-country sailing involves every type of soaring, slope, thermal, cold-front, and cloud if sufficient height can be reached. With cumulus clouds it is found that small ones, where the "bubble" is just beginning to enter the condensation base, may give better lift below them than well-formed ones where the bubble has completely entered the cloud. The pilot may glide under these without being able to enter them. In cross-country soaring thermals might be detected by looking for soaring birds, or butterflies that had been carried high, or other pilots. Two pilots could soar better than one, each exploring a separate but parallel course, and one following the other whenever a thermal was found. Groenhoff and Hirth did this when the latter made his 120-mile flight westwards across the Rhine, in a cloudless sky.

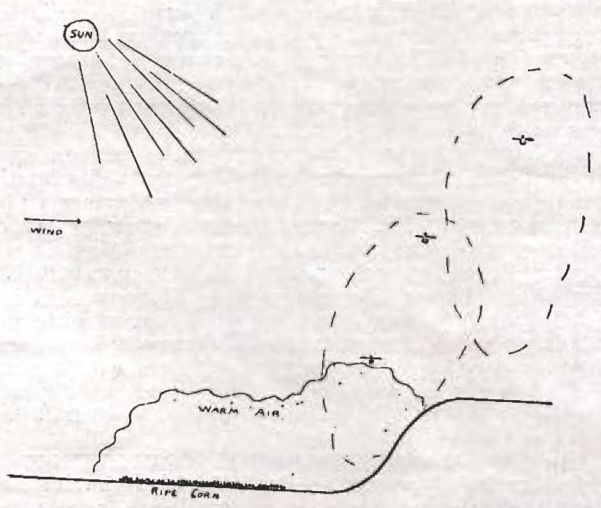


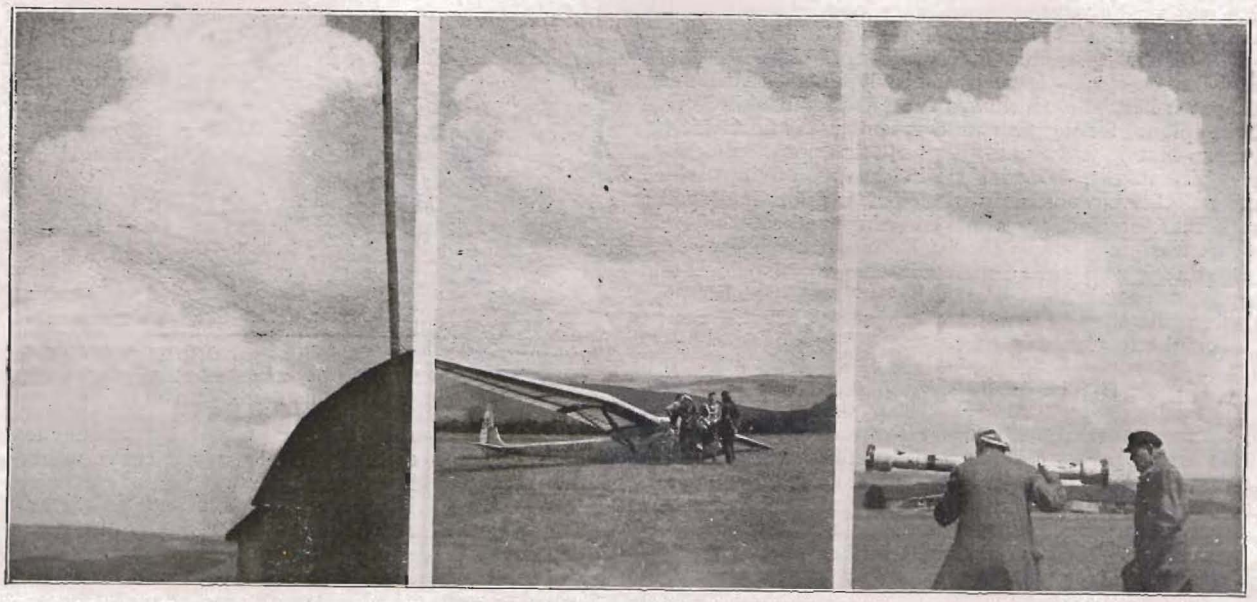
Fig. 2. Thermal soaring—diagrammatic. Subsequent positions of "bubble" dotted.

FURTHER NOTES FROM HIRTH'S TALKS.

[*In the above article an account has been given of the technique of soaring in thunderstorm and thermal currents, the material being brought together from talks given by Wolf Hirth during the London Gliding Club's Christmas Camp at Dunstable. Naturally Hirth spoke of many other things in gliding and soaring that did not come under the heading chosen; because of their practical value, some of these comments are here set down, more or less at random, by Mr. Richardson.*]

The Position of the Machine in Soaring Flights.—Of course, there could be no position that was always best, and one must be guided by circumstances; in ordinary slope soaring there was a sector from vertically above the brow of the hill to a little forward of it that was probably best, but with a slow machine in a strong wind one should keep well forward to avoid the danger of being carried so far back by the wind that it became impossible to regain the brow even by diving. Soaring above sand-dunes there was usually a very steady flow of air, and quite low dunes might be used; then with a sailplane the best position was with the centre of the down-wind wing just over the crest of the dune—it might be only a few feet above it. Soaring in a cloud was dangerous if more than one machine was using the cloud; with two machines, the pilots would take turns at entering the cloud and

CLOUDS FOR SOARING



These photographs show the actual clouds used by W. Hirth in getting away on his flight to Silbitz (99 miles) on July 28th last year, and are probably the first photographs of the kind ever published. According to Hirth, they have not been formed from thermal "bubbles," but are due to upward deflection of air by the Wasserkuppe to such a height that condensation results (see Mr. Richardson's article).

LEFT: 12.23 p.m. The cloud in which Hirth got away. The "Condor" is seen on the left; it tried the same cloud without success, and is returning. CENTRE: 12.28 p.m. Hirth's position is half-way from horizon to top of picture, directly above "Condor's" nose; but is too far off to show in the photograph. "Condor" has just landed. RIGHT: about 12.45. There are now three clouds in line. Hirth's machine could be seen outlined against the furthest cloud; possibly he was directly underneath the middle one. He is being observed through the range-finder.

emerging again; if it was a relatively small cloud—say, a good cumulus or condensation cloud—it was best to sail around it with the inner wing-tip just about touching it. In this way one kept in the narrow belt of rising air that ensheathed the cloud; fifty yards or more from it there might be down-currents, or at least absence of lift. There was usually a little lift to be found directly above a cloud, but not always underneath one, for the reason given in the above article.

The Formation of Clouds.—Many of the clouds one sees are simply visible signs of rising air, and it should be possible to get lift in them. When moist air is cooled so far that the vapour condenses, it liberates latent heat and so causes additional lift; the application of this to soaring in thermal "bubbles" has already been described, but it is true also of the ordinary condensation clouds that form over hills, where the surface airflow is deflected upwards to such a height that condensation results. If one can reach the cloud in the slope-upwind one then finds more lift and easier conditions for soaring. There may be a slight "indraught" or suction below the cloud as a result of the more rapid rise of air within it; but this, while it may be enough to counteract the machine's sinking speed and prevent loss of height, may not always be enough to carry one up into the cloud. The "wave" or "ripple" clouds that mark the approach of a depression are likewise a sign of local upcurrents, and they might be used along with other methods of gaining height.

In thermal soaring it was essential to have a sailplane that would turn in small circles; the PROFESSOR, which required perhaps 300 yards' diameter for a turn, was too unmanœuverable; circles of 90—110 yards should be possible. Practice would show the length in seconds of the smallest complete circle it was possible to make efficiently in one's machine, and from this time and the speed one reckoned the size of the circle.

Discussing the **design of sailplanes**, Hirth emphasised the need for stability in every direction (especially for cloud flying), so that dihedral angle alone was not important. An important factor in avoiding spinning was "wash-out" of the wings towards the tips; the STANAVO, built in this way, was practically spin-proof and would right itself from a stalled turn if given enough air-room. A high elevator was desirable, not necessarily for its effect on tendency to spin, but because it was out of the wake of the wing, and also was protected from structural damage on the ground, especially at launching. The low elevator had been a fault of the FAFNIR. Contrasting sinking speed and gliding angle, Hirth pointed out that a low sinking speed was enough for hill soaring, whether the gliding angle (or better "gradient") was good or bad. But for any other type of soaring, where it was important to be able to travel with minimum loss af height from one area of lift to another, the machine must have a good gliding gradient. For cross-country sailing, a fast, heavy machine has its advantages assuming it had a good gradient, even though it might have a relatively higher sinking speed than a slower machine, since given good conditions it would travel further before dark—which often limited a distance flight.

Referring to **parachutes**, Hirth said that in Germany they used second-hand ones from the aeroplane clubs; this was allowable because the stresses were less in jumping from a sailplane than from an aeroplane with its much greater speed.

Soaring over cliffs, as distinct from steep slopes, was quite possible, but it required special care. There was plenty of lift, but violent eddies existed just behind the lip as well as down the cliff face; a very powerful launch was necessary to send the machine through the eddies into the steady rising air. One club in Germany regularly operated above a high cliff. In this connection Hirth mentioned that he had once "blacked out" in the full physiological sense (see recent remarks in THE SAILPLANE'S correspondence columns) when being launched by shock-cord. Having been bumped down at the edge of the cliff after a launch with six-a-side on a single rope, he decided to make sure of his launch and had a team of sixteen men on a triple rope, with the skid travelling on a runway greased with soft soap. He did not see anything after the release until he was safely through the eddies and soaring!

With reference to steep slopes, Hirth mentioned that a surprising amount of lift might be secured over a really steep slope even if it was relatively low, and instanced how he gained several hundred feet over Riverside Drive, where the bank was only some 90 ft. high, in the course of his soaring flight over New York.

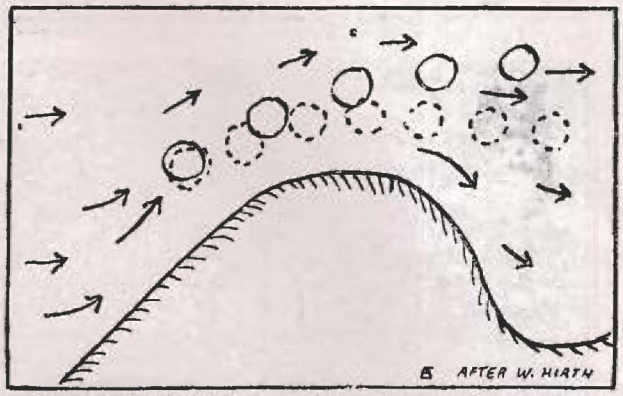
He spoke repeatedly of the wonder and exhilaration of cross-country sailing; of flying in silence around a cloud, or along its advancing front, and looking down to the earth. One wanted to draw a deep breath of pleasure, but —in a machine like his—one could not. His MUSTERLE fitted him so closely, even over his shoulders, that he flew without a belt; the result was that he felt absolutely part of the 'plane, feeling every movement, until finally it became so that he was flying "himself" and not the machine, as a bird might. Soaring flight was *real* flying, which power flight was not; only when power pilots had soared in thermal or cloud upwinds did they realise what real flying was—and once they felt this, they become enthusiasts for soaring. Soaring in this way, so high and quietly, or descending towards the earth and watching the people while they were unaware, must be almost the most wonderful experience in life.

W. HIRTH ELUCIDATES A POINT.

On reading No. 1 of THE SAILPLANE, I find in Mr. Richardson's article, 29 lines from the end, a passage which may give rise to misunderstanding: "These (i.e., patches of extra lift encountered when soaring above a slope or in gliding down from an auto- or aero-tow) should be disregarded unless the lift amounted to 6 ft./sec. or more," etc. That is only right for beginners, or when flying over a slope at a relatively low height (less than 600 ft.).

If I have height, for example when flying across country, I often circle in bubbles that just give me as much lift as my sinking speed, so that actually I fly without loss of height. And I certainly circle in all cases where my climb is only 1, 2 or 3 feet per second, while on my way, in order while drifting with the wind to gain distance in a down-wind direction, which is normally the direction of all competitive long-distance flights. But when flying above a ridge, e.g., the Wasserkuppe, I wait for a 6 ft./sec. thermal in order to climb safely fast enough to avoid the down-currents on the lee side.

WOLF HIRTH.



Illustrating Hirth's letter. Successive positions of fast-rising "bubble" shown by closed circles; of slow-rising "bubble," by dotted circles.

BIRD FLIGHT. VI

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

Wing Action During the Various Phases or Flight.

So far normal horizontal flight only has been considered, and even here little mention has been made of the flexure of the wing and the action of the feathers on the up-stroke. The different phases of flight, namely, during the period of initial acceleration, steady flight, and alighting will now receive detailed attention under their separate headings.

A great deal of confusion seems to exist regarding the exact action of a bird's wing during the return to the top position. The following statements have been made by various writers in explanation of this point:

(a) The wing feathers open on the up stroke to allow for the passage of air and thus reduce resistance.

(b) The wing is inclined upwards so as to cut the air like a knife, and

(c) The wing is bent or curved convexly upwards in order to present a rounded surface to the downward (relatively) air-stream.

The requirements of a wing are complex, and moreover, differ with each species of bird, and in consequence it is impossible to lay down one set of conditions that fully covers all the variations of flight. Each of the above theories is partially correct, but needs some amplification and qualification and, generally, a combination of the various actions is employed.

Steady Flight.

When dealing with normal steady flight, it is most important to remember that *the main movement of a wing is forward and not "up and down."* The general tendency to think of flapping flight as consisting of up-and-down strokes of the wing is entirely wrong. The motion is "up and down" relative to the bird only, but it is the movement relative to the air, the medium in which the bird is propelling itself, that is of main importance, and therefore the suggestion that the wing should be rounded so as to move upwards with decreased resistance is not quite correct. If the wing were to move in a vertical direction only it is true that a curved wing would meet with less resistance than a straight one, but nevertheless the resistance would be altogether excessive and would prevent the body from rising at all. This is not to say that the wing is not curved on the up-stroke, for it undoubtedly is, but the reasons for this are, firstly, that less muscular effort is required to lift the wing with the fore-arm hanging for the early part of the stroke and straightened later (a swimmer uses a somewhat similar style), and, secondly, that this bending, together with the sweep-back given to the wing, allows a smaller frontal area to be presented to the air and thus decreases resistance to forward movement. (Several of the smaller birds that fly by intermittent flapping make about half a dozen flaps followed by a prolonged glide with wings flexed for decreased head resistance.)

As the wing-loading of birds increases, so it becomes more important for lift to be gained on the up-stroke as well as on the down-stroke, as was illustrated in the case of the Wild Duck, Part II., p. 235, and hence the amount of bending is decreased with several of the larger birds, whilst some others merely twist their wings to the no-lift attitude for the return stroke, but it has been shown* that the amount of twist possible with big, bulky birds, of low span, is greatly restricted, and in order to compensate for this the wing feathers are able to open and twist individually. (It is probable that the ability of each feather to twist individually rendered the twisting of the whole wing unnecessary so that the cause and effect, set out above, are in reality reversed.)

Lilienthal† was the first to draw attention to this fact,

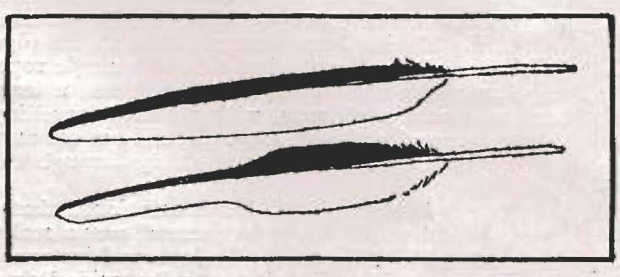


Fig. 13. Primary Feathers from Golden Plover and Buzzard.

* *The Flight of Birds*, F. W. Headley, London, 1912 (p. 52).

†*Der Vogelflug als Grundlage der Fliegkunst*, O. Lilienthal, Berlin, 1889.

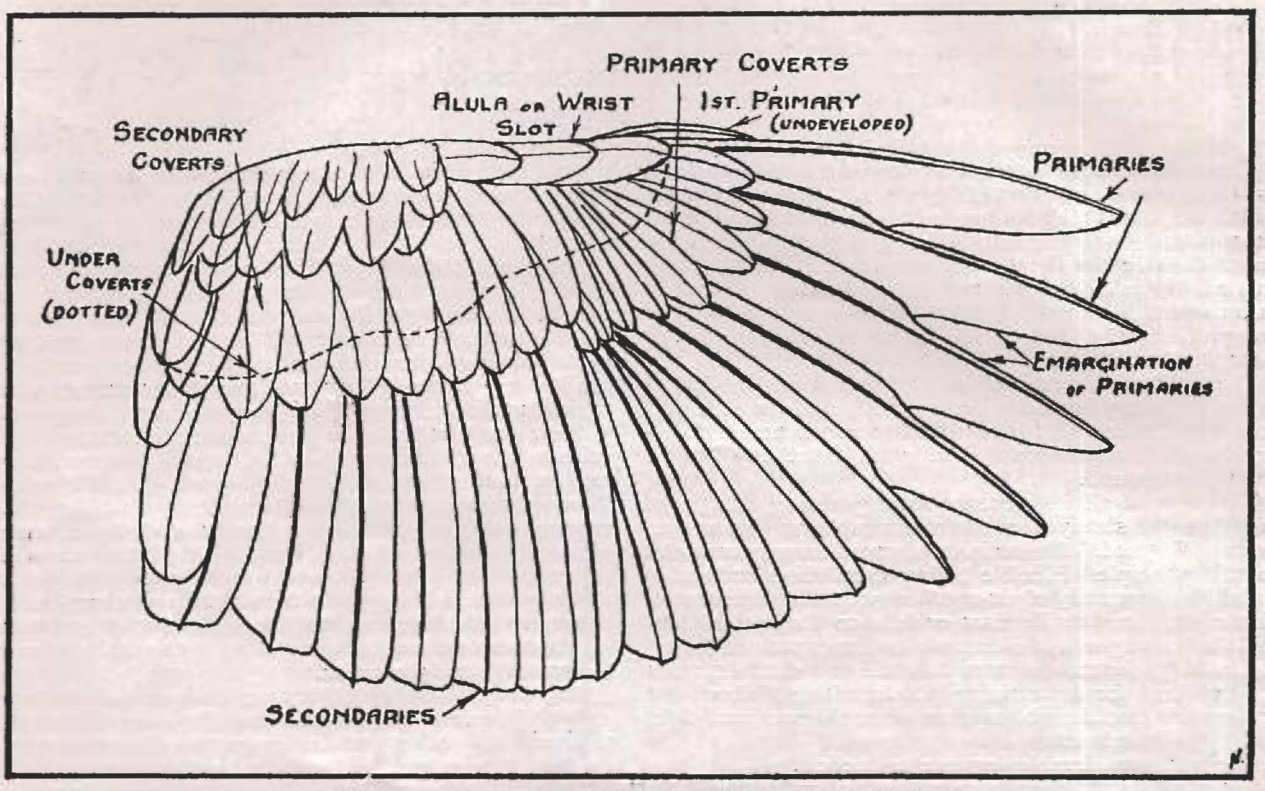


Fig. 14. Right wing of Blackbird (about 5/8ths full scale).

and in doing so he suggested that this explained the reason for the uneven length of the front and back barbs on the primary feathers. This introduces a point of great interest.

Fig. 13, which has been abstracted from *Safety Devices in Wings of Birds**, gives the shape of the primary feather from the Buzzard together with the corresponding feather in the wing of the Golden Plover. In the former case the wing-tip feathers separate in flight, but there is no opening of the Golden Plover's wing (a long-winged bird).

Examination will reveal that the quill of the Plover is situated at about one-third of the distance back, which may be taken as the position of the centre of pressure, whereas for the Buzzard this holds good for the wide part only, after which it is seen that the front barbs are more severely reduced than those at the back, so that the quill over this part is about one-quarter, or even less, of the distance back from the leading-edge. There will be no tendency to twist where the quill lies along the axis of pressure, but where the quill is forward of the axis twisting must take place.

Graham states that "It is quite probable that this 'doing away with the need for the whole wing to twist' is one of the most important duties of the wing-tip slots." The other purposes being, of course, to give the extra lift already referred to, and for the generation of thrust dealt with in Part V., this latter probably being of paramount importance in certain species.

So far the primary feathers only have received attention, but the action of the secondaries is also important. The primaries may be regarded as being, for the greater part, at right angles to the flight path, whilst the secondaries are roughly parallel to the line of flight (see Fig. 14). The air-flow over each secondary feather is along the axis, from root to tip, and if the barbs are of equal width on both sides there can be no tendency for the feather to twist. This means that in such cases either the whole wing must be twisted, or else the creation of lift is essential on the up-stroke, such as in the case of the Duck, which thus makes it undesirable for the feathers to open in flight.

An examination of certain birds shows that the position of the quill in the web, or barbs, varies from the centre for the Pheasant (a bird capable of twisting its wings through a large angle) to one-third of the distance from the outer edge in the Starling and Blackbird, and in the case of most small birds it is situated at one-third to one-quarter, or even less. Fig. 15 shows the secondary feathers of the Pheasant and Blackbird for comparison, from which it will be readily seen that when the wing is descending, with the relative air-flow directed at a positive angle of attack, i.e., from below, the feathers in

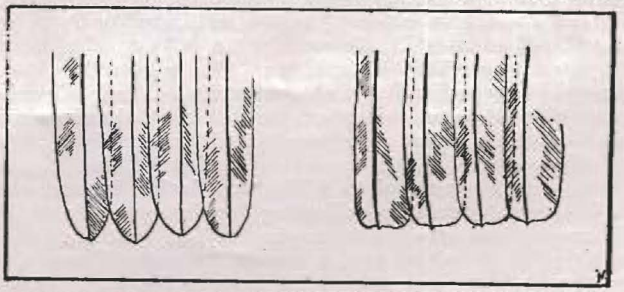


Fig. 15. Secondary feathers of Pheasant and Blackbird.

both cases must remain closed, but if, on the return stroke, the air-flow is from above, there will be no tendency for the Pheasant's feathers to open, whilst the reverse holds good in the case of the Blackbird, the action here being not unlike that of a Venetian blind.

(To be continued.)

*Safety Devices in Wings of Birds, R. R. Graham, *R.Ae.S. Journal*, January, 1932.

SPREADING THE GOSPEL.

"It is possible that we shall live to see the day when cross-country sailing flights are as common as power flying is to-day, and that people will use this pleasant method of transport for getting from place to place, both for business and for pleasure." With this prophecy, according to the *Manchester Guardian*, Captain C. H. Latimer-Needham concluded a lecture on "The Conquest of Soaring Flight" before the Manchester branch of the Royal Aeronautical Society on January 20th. The history and present-day technique of the art were described. Important as are its uses in scientific research, Captain Needham regarded as of more importance the improvements it would bring about in the aerodynamic design of aircraft generally.

UP AND DOWN.

SOME VARIOMETERS.

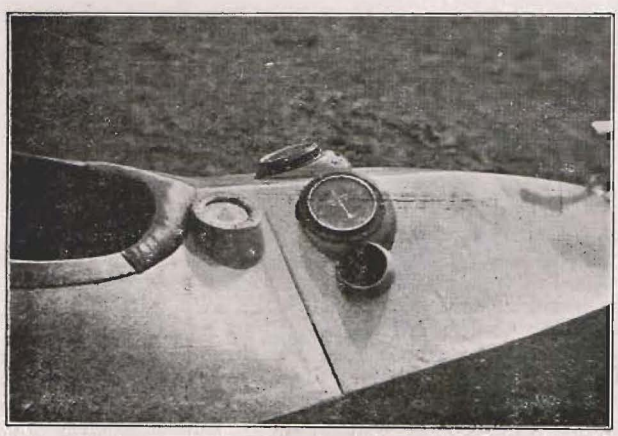
By VOL AU VENT.

The need of instruments for soaring is a vexed question, as there are—blind flying apart—few instruments for which the human senses are not, with practice, effective substitutes. Air speed can be judged by the feel of the air on the face and the general behaviour of the machine, particularly in lateral control; lateral balance, especially in turns, can be judged by the whole body, while the eyes are probably the best of all directional instruments in clear weather.

The only movements which the senses are unable to detect with any certainty are vertical, and for this purpose some instrument is essential to maximum performance, particularly when the sailplane is at any height above the ground.

The basis of all instruments for registering changes of height is the steady decrease of atmospheric pressure as height is gained. The ordinary aneroid barometer works on this principle. Flexible hollow metal discs are sealed with a fixed quantity of air or other gas, and as the atmospheric pressure outside rises or falls so the metal discs contract or expand, the contraction or expansion being indicated by the movement of a needle on a dial. Aneroids are excellent for determining absolute height above the ground, but for the observation of small rises and falls suffer the disadvantages of a very small travel of the needle and considerable lag due to friction.

A cheap substitute for an aneroid which overcomes both these disadvantages is a "Government surplus" air-speed indicator with the pressure tube connected to a litre Thermos flask (the Thermos prevents the large temperature errors which occur if an ordinary metal container is used). An air-speed indicator being simply an extremely sensitive aneroid, with such an instrument the travel of the needle is much increased and a gain in height of 200 ft. will take it half-way round the dial. The limitations of the instrument lie in the fact that the end of the scale is soon reached and the movement per foot becomes progressively less as the needle climbs the scale. These limitations can be obviated fairly satisfactorily by using a gas tap to re-establish equilibrium between the air in the Thermos and the atmosphere. The tap can be closed immediately and subsequent gain or loss of height can be observed. It is on this principle that the Askania variometer works. The instrument itself is simply a very sensitive aneroid, capable of registering heights of less than a foot, connected to a Thermos flask. Instead of a tap there is a small leak allowing the air to pass from the Thermos flask into the atmosphere. The leak is of such a size that it takes, say, a second for any difference in pressures inside and outside the flask to disappear by the entry or exit of air. The result is that, at any moment, the pressure inside the flask is that which it was a second ago in the outside atmosphere. If the instrument is kept constantly at the same height, the pressure inside and outside the metal discs will be the same, and the needle will register zero; but if the instrument is raised continuously at, say, a metre a second, the pressure outside the discs will be constantly lower than that inside the discs and the Thermos, which latter will be that of a second ago, corresponding to a metre less altitude, and the needle will register one metre. Thus we have an instrument which registers rate of change of height upwards and downwards.



The "instrument board" of a "Kassel 25," a similar machine to that in which the variometer described in this article is to be fitted.

There are few faults in the Askania instrument, and, price apart, it is almost ideal. It costs, however, allowing for the exchange and duty, about £20 in England. There is now being made experimentally, out of a "Government surplus" air-speed indicator, such a variometer, but as it is necessary to substitute jewelled bearings and to incorporate a sixty-to-one watch gearing to get the movement, this is only a job for a skilled watchsmith.

Various instruments have been designed and used which overcome the expense of a mechanical device by the use of liquids in tubes.

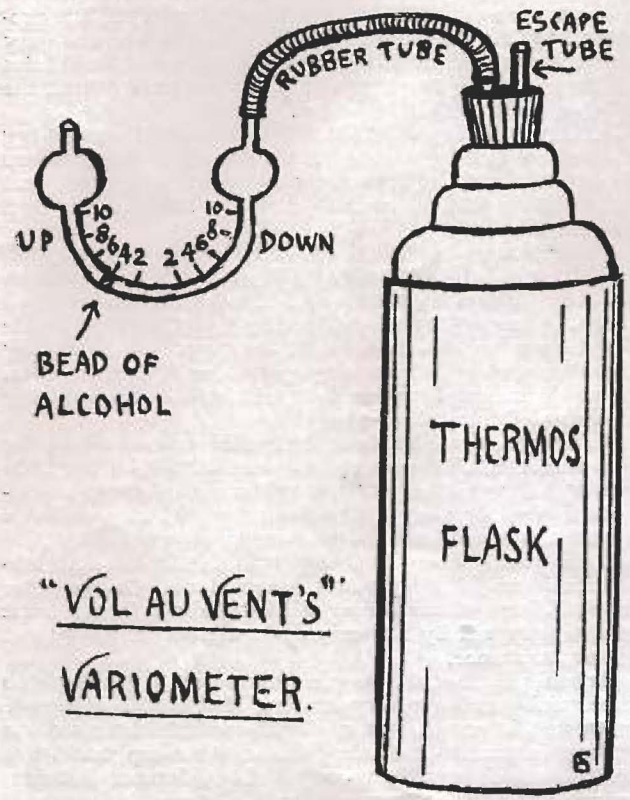
The first consists of a Thermos flask connected to one end of a U-tube at the bottom of which is a small quantity of liquid, the other end being open to the atmosphere. As height is gained by the pilot, so the pressure on the leg of the U-tube exposed to the atmosphere becomes less than that in the leg connected with the Thermos, and air bubbles out of the Thermos past and through the liquid, the direction of the bubbling indicating rise or, in the converse case, fall. Such an instrument, specially made in compact form for sailplanes, can be had from Stanley of Holborn.

There are, however, difficulties to be contended with in all these U-tube instruments. The liquid is apt to be sluggish, and at best only allows bubbling every 20 ft., so that the pilot has constantly to be watching it. If the quantity of liquid is reduced, or a less viscous fluid is used, evaporation has to be contended with.

The ideal liquid instrument must avoid these three handicaps—sluggishness due to the viscosity of the liquid, evaporation due to bubbling, and difficulty in reading at a glance.

An attempt has been made to overcome these difficulties in a new and extremely simple instrument. It consists of a Thermos flask with a double-opening rubber cork, a U-tube and a length of (clinical) thermometer tubing. The curve of the U-tube is semi-circular, of about 3 inches diameter, and the top of each leg widens out abruptly into a bulb, which narrows again into a tube. One end of the U-tube is connected by a rubber tube to one opening of the Thermos cork; into the other opening there is inserted the Thermometer tubing. A very small quantity of alcohol coloured with magenta, enough to form a bead 4 mm. long, is poured with a fountain pen filler into the tube and falls to the bottom. When the instrument is raised slowly the lag in the establishment of equilibrium between the Thermos and the atmosphere, caused by the fineness of the thermometer tubing, results in a greater pressure in the Thermos leg of the U-tube than in the other, and the bead of liquid in the bottom of the U-tube is forced along the tube until it reaches a slope where the head of liquid counterbalances the surplus pressure. If the instrument is raised more rapidly the bead of liquid has to travel further up the circumference in order that the head may counterbalance the pressure, and thus it is possible to see at a glance whether the sailplane is rising or falling and how fast.

Such an instrument will record plainly a rise or fall as small as 1 ft. per second, though this will depend on the length, and therefore weight, of the bead. Evaporation is almost non-existent if the exposed end of the tube is protected from eddies. The instrument already made



has a bore of 2 mm., but this is too big, as on the fineness of the bore depends the minimum possible length of the bead, and consequently the sensitivity of the instrument. Probably 1 mm. or even 0.5 mm. will be found better. The bead of alcohol should be kept as small as possible—consistent with rapid reforming at the bottom of the U if by any chance it should blow through into one of the bulbs.

The calibration should be done entirely by the size of the leak tube. Again, the thermometer tubing used in the present instrument is too small. Extreme sensitivity to small rates of rise results, but the bead tends to blow through at rates of rise of over 6 ft. per second. The bigger the escape tube, therefore, the better, as long as the instrument does not become too insensitive, particularly as a large escape tube means that equilibrium is more rapidly reached between the Thermos and the atmosphere, so that there is less lag in registering a rise after a fall or *vice versa*. The aim should be sensitivity by shortness of bead, which is easiest with a fine U-tube, combined with absence of lag produced by the coarsest leak tube possible without undue reduction of sensitivity.

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400 YEARS AGO.

In a rcent lecture to the Folk-Lore Society, reported in *Nature*, Prof. John Read has brought to light a forgotten page of gliding history from an old sixteenth century record. It appears that James IV. of Scotland kept a tame alchemist in the person of one John Damian, an Italian, whom he made Abbot of Tungland in Galloway in 1504, "so that he might have more leisure to carry on his experiments."

In the hope that our glider constructors may pick up a useful tip on the subject of choice of materials, we publish the following extract from this document:

"This Abbott tuik in hand to flie with wingis, and to be in France befoir the saidis ambassadouris; and to that effect he causet mak ane pair of wingis of fedderis, quilkis (which) beand fessinit apoun him, he flew of the castell wall of Striveling, bot shortlie he fell to the ground and brak his thee bane; bot the wyt theirof he ascryvit to that their was sum hen fedderis in the wingis, quhilk yarnit and covet (yearned and coveted) the mydding and not the skyis."

CORRESPONDENCE

THE MOTOR-ASSISTED GLIDER AGAIN.

Sir,—

Your leading article in last issue of THE SAILPLANE pleased me immensely. I am very glad to see that the B.G.A. is so thoroughly exploiting the question of the motor-assisted gliders.

I feel, however, that the B.G.A.'s fear of the motor machines ultimately eclipsing motorless flight is founded rather too much on the supposition that history will repeat itself. Surely we must remember that, in 1922, the great steps forward that motorless flying has taken were not in the least foreseen, that then there were only a very favoured few who had successfully soared, and that there was no such organisation as the B.G.A. to guide and help on the Movement.

Any man who has flown a plane in the ordinary way, and has then put his hand to soaring, will immediately agree to the great superiority for sheer enjoyment of the motorless variety of flight; and when he has gone so far as to make a cross-country flight by the same means, his natural instinct leads him to crave to do something still better.

The B.G.A. surely forgets, or does not know, that, beside the large and successful London Club, there are, for the first time in the history of gliding, a *few* clubs, especially in the North, who really are getting on their feet, and who, in my opinion, will very shortly put up some wonderful shows on their own grounds. This is what was to be expected of such a fine sport as sailplaning.

But, even then, I would not for a moment suggest that the B.G.A. ask the Air Ministry for the total control of these light machines to come under their organisation. I agree that the immediate result would be a flood of new members to the gliding clubs who sought only cheap flying, and who would soon grow tired of it. This type of man, we are fully aware, exists in his thousands, and it is amazing to us to see how little the Air Ministry and the aeroplane manufacturers have done towards roping them into flying by producing cheap machines and doing away with the more aggressive restrictions.

On the other hand, it must not be denied that these planettes would definitely be useful to the gliding clubs if used in the right way.

I would make so bold as to suggest that the B.G.A. sought the *co-operation* of the Air Ministry to the extent that they should be allowed to control these machines *legally*, for the exclusive use of the clubs, and that the Air Ministry should control the other machines of the same type which would be used by people who did not wish to soar.

This may appear difficult, but it could easily be got over by the Air Ministry laying it down that any glider club pilot could only fly them and teach others after he had done at least 30 minutes' observed soaring from a catapult or towed launch, and also done, say, one hour's dual with a certified light aeroplane instructor.

The planes could then be used by the clubs to give *ab initio* members their first training in the use of the controls, but it would be illegal for any member to qualify for an "A" licence on them; whereas he could join an aeroplane club and get his "A" on similar machines coming under the direct control of the Air Ministry.

As for the idea of "C" pilots giving up soaring for the planette, I doubt if there is a single "C" pilot in England who has flown for more than an hour in a sailplane, who really is prepared to admit that he would prefer to motor-bike about the air in preference to testing his skill in a sailplane, and thereby obtaining the finest thrill in the world. If there is such a man, I would like to meet him, and hear his reasons for such a change.

SEGELFLIEGER.

CORRESPONDENCE (*continued*).

Sir,—

If the leader published in your issue, dated January 20th, is the last to appear over Mr. Entwistle's signature, I think we should congratulate him on his swan song, sorry as we must be that he is giving up a duty which he has performed so well under very difficult circumstances.

(1) I feel that I should like to express a purely personal word on this subject of motor-assisted gliders. My right to speak is only that of an indifferent power-driven and motorless pilot who has also flown these so-called motor gliders for a short time.

Mr. Lowe-Wylde's motor-assisted gliders are very good flying machines within their limitations, but they are not gliders, and their gliding angle does not remotely resemble that of an ordinary good soarer.

(2) These small motor gliders may be very useful in teaching people to fly.

(3) They may also be useful for teaching people to glide, but this is perhaps rather more doubtful.

(4) Whatever their merits are, from the gliding pilot's point of view, and whatever assistance they may give to the gliding movement to encourage people to get into the air or to popularise gliding clubs, why should we wish to *control* their destinies? By all means let us use anything which any club feels is valuable as a source of encouragement, but do not let us depart from our own policy, which is gliding and soaring, and the control of the machine for gliding and soaring flight.

In short, do not let us argue as to the value, or otherwise, of these motor-assisted machines. They can find their own place. Still more, do not let us rush to control something else. The motor-assisted glider will make its way under any system of control, if it is sound, but do not let that control be ours.

J. A. CHAMIER (Air Commodore).

Sir,—

I have followed the progress of Mr. Lowe-Wylde's motor-assisted gliders with great interest, and have come to the conclusion that they will become indispensable to the gliding movement for the following reasons:

I estimate that about 80 per cent. of the members of gliding clubs are persons who want to fly but cannot afford to use an aeroplane. They want to fly for the sake of flying and certainly not for the prospect of immediately executing cross-country flights or making social calls.

The power-assisted glider will form the link between gliding and flying proper, and would come to be regarded in the light of a public school education preparatory to finishing off at a University.

As far as I can see, the success of the project in connection with the gliding movement lies in a well-defined regulation that no pilots, qualified or otherwise, should be allowed to use them until a soaring certificate has first been obtained. This would not debar dual instruction from being given on a two-seater within this "motor-assisted glider" category. What aeroplane clubs choose to do in the matter must be left to their own discretion. Learning to fly through a gliding club will undoubtedly remain the cheapest and most thorough means of achieving air-mindedness. We have all watched the progress and development of the baby car, and who shall say that the cheap light aeroplane shall not be evolved from gliding knowledge, more particularly obtained whilst the baby car has come into being?

History will repeat itself. Wilbur Wright was among the first to build gliders, but we are not starting where he left off in glider construction—we know a great deal more than he did about wing sections, streamlining and general efficiency.

I attended several of Herr Wolf Hirth's lectures, and, whilst they were particularly illuminating, I feel, as an ordinary interested member of the public, that I shall probably have a hearse and one foot in the grave before I get an opportunity of being an expert in "mucking about" in clouds and hunting around for hot air bubbles. In this I am not decrying his work; he is in his own way a kind of Columbus.

The point at stake is, that we all want to fly in the cheapest and safest possible manner; in this I regard the gliding movement as indispensable, and if power assistance is applied correctly it will prove the *sine qua non* for successful continuation on a much larger scale.

I feel that soaring has obtained too strong a hold to fall victim to a lightly powered aeroplane. On the other hand, if there is insufficient call for gliding, then it must of necessity fall by the wayside, whether or no we get power assistance.

Arguing further, 50 people cannot run a gliding club successfully and get very far, but if the ratio of people interested in some form of flight to those interested in gliding is four to one, then the membership would rise to 250, which would mean all the difference between failure and success in producing the goods, by virtue of the extra capital available.

To conclude: I personally consider that the gliding movement is under a very great obligation to Mr. Lowe-Wylde for his continued perseverance and initiative—I was going to say "guts"—under very difficult circumstances.

J. B. G. GRICE.

WHY NOT INDEED?

Sir,—

Rather than let THE SAILPLANE cease, why can't the London Gliding Club take it over as their magazine and make it and themselves into a national institution on a commercial basis? Let them turn themselves into an all-the-year-round school of soaring, with facilities for residents and campers. They could arrange a nominal fee to include training and practice, board and lodging. I think they would find the demand from people all over the British Isles, and abroad as well, willing to come to a central place safe in the knowledge of procuring the best training and practice. That probably is a factor why Germany is so successful with her schools at the Wasserkuppe and Rossitten.

A. DOUGLAS USHER.

[THE SAILPLANE isn't ceasing. There's life in the old bird yet!—ED.]

CELLON DOPE

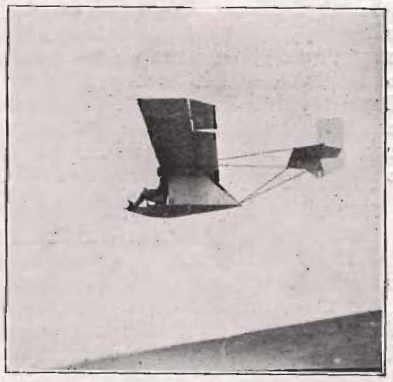
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NEWS FROM THE CLUBS.



P. Adorjan flying the Imperial College Club's "Dagling."

BRADFORD AND COUNTY GLIDING CLUB.

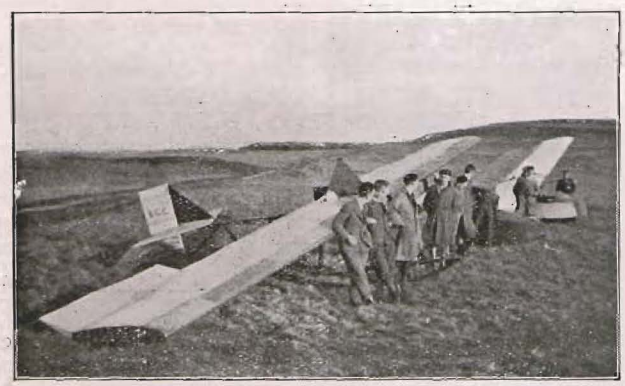
Sunday, Jan. 1st.—Wind S.W. by S., very light. Such members as had survived the previous evening's festivities were in attendance at a commendably early hour, but weather conditions made it impossible to do anything but elementary training.

REYNARD II. was therefore rigged, and launched repeatedly for the benefit of two new members, who did all that was expected of them and caused no damage or instructorial apoplexy. There seems to be no doubt that new members coming into the movement nowadays are of the right type—which is more than can be said of some of their predecessors of a couple of years ago.

Sunday, Jan. 8th.—Wind W.S.W., 15-20 m.p.h. The wind was blowing up our best slope at a slight angle and, early on, DICKSON Intermediate was rigged by a good attendance of members who were looking forward to a good day's soaring. No sooner was the machine rigged, however, than the proceedings were interrupted by heavy rain, which continued relentlessly till dark. One attempt only was made to fly; Stedman was launched into the driving rain over the West slope and sailed away along the ridge, steadily gaining height.

Conditions proving either too hot or too wet for him, however, he soon deserted the ridge and landed the machine intact, to the satisfaction of everyone present who by this time were pretty well soaked. He landed downwind on the top about 300 yards from his launching point —but quite near to the hangar. About this time a young gale sprang up from the S.W. and the rain became heavier, so we decided to call it a day, though, in the opinion of some of our members, such a description was unwarrantably polite.

Sunday, Jan. 15th.—"Rain" (with apologies to Somerset Maughan). Repeat performance. Very successful!



Bradford and County Gliding Club. "Reynard II.," Holdsworth Sailplane and Dickson Intermediate with rigging crews lined up for inspection.

Sunday, Jan. 22nd.—Wind S.S.E. The wintry landscape and bad winds were not conductive to flying training, so, while several of us did odd spots of repairing, the others took to their skates—they had anticipated correctly—up to our ponds, where they consoled themselves more or less adequately on several good surfaces. The chap who suggested removing skids from machines to provide him with skis was considerably abashed by the ensuing criticism.

EDINBURGH GLIDING CLUB.

We regret to read in the Press of the death from pneumonia, at 35, of Mr. J. C. Howden Ferns, captain of the Club, and tender our sympathy to his fellow-members.

AIRCRAFT CLUB, HARROGATE.

The constructional section is reported to be building a glider and sailplane, to be ready in March.

ILKLEY AND DISTRICT GLIDING CLUB.

The Annual Club Dinner was held in the Lister's Arms Hotel on December 20th, when we were pleased to entertain our good friends from the Bradford and Preston Clubs, Messrs. Sharpe, Verity and Falla. Unfortunately Mr. H. Price, our President, was unable to attend on account of business.

On Tuesday, the 10th of January, the Club held a Dance in The Annex Hall, which had been entirely organised by a Ladies' Committee. The Dance was a great success, there being a cabaret and also a conjuring turn, the latter being presented by "Signor Watteau Glidero," or none other than the efficient Mr. "Len" Falla of the Preston Club. His show was excellent, and members of the Ilkley Club are now wanting to know if there is anything that Mr. Falla can *not* do.

Mr. W. Dinsdale, Chairman of the Ilkley Club, made a short and very effective speech, pointing out that he had, at a similar affair last year, said that he expected to see some members fly from Beamsley Beacon over Ilkley, during the coming year, and that his forecast had come true, in so much as an Ilkley man had flown from Beamsley over Ilkley in a sailplane that had been totally built by Ilkley men in Ilkley. He hoped that during the coming year he would be able to see many more "C" pilots, and a great many hours' soaring done by Ilkley men.

There were over 160 people at the Dance, and the hall had been very tastefully decorated. The Bat (the Club's Hol's der Teufel) had also been slung up totally rigged, and lit up with various coloured lights. Indeed a very happy evening, and we were glad to see so many members of other clubs there.

There is a rumour that next year's activities will be started off with a week-end's soaring at Beamsley during Easter, at which we hope to see, if all the arrangements can be made, our friends from Preston and other clubs with their sailplanes.

KENT GLIDING CLUB.

As the club site was in perpetual fog, no flying was done during the Christmas holiday, so 1932 ended on December 18th, which was one of the best days for a long time.

Dugdale made another attack on the one minute flight for his "B" licence, having failed by a few seconds in his earlier attempts, because he tried to keep the machine inside the field. However, with the certainty of a large crew to retrieve COLUMBUS, he made a steady flight of 67 seconds, finishing the other side of the Pilgrim's Way.

Wood, an early pilot, who has not been much in the air lately, made a hair-raising flight, but landed intact in the next field, while Weekes made a perfect ending to a perfect day, with a long, slow flight in the twilight.

The New Year began with some good flights during the afternoon of January 1st, including a very steady one by Nightingale (a power pilot who has just joined the club),

which gained him his "A" licence.

Last year was fairly good on the whole, and 1933 promises to be better. Two new sites are in view, which may prove to be more suitable for soaring than the hill at Lenham, and it is hoped to get delivery soon of Mr. Lowe Wylde's B.A.C. IX. This will bring the number of machines available up to four—two club primaries and two privately-owned secondaries, while one member has a sailplane under construction.

More members are needed to fly these machines.

LONDON GLIDING CLUB.

Sunday, Jan. 15th.—"A trough of low pressure moved slowly across the British Isles, and by evening stretched from the Northern North Sea to the Channel Islands." And a score of wet hopefuls dripped slowly across the Club threshold, and by teatime stretched from the library bookcase to the bar mantelpiece.

Sunday, Jan. 22.—The PRÜFLING, the old DAGLING, and the South Kensington were launched repeatedly into a chill North-Easter—ground-hops, mostly auto-launched. The renovated PRÜFLING was a treat to fly—so delightfully sensitive after what we have lately had to put up with. So, at least, our Mr. Dent discovered when he heard someone say, "Pull the stick back," just as he began to move. Twenty feet up—and still no land in sight—he pushed it hard forward again; the PRÜFLING responded snappily, but Mr. Dent carried on in the same direction as before. After a cursory inspection of PRÜFLING's wing from the inside, he extricated his head in time to pull the machine out of its dive. Two prospective members (brought by the writer), who had just reached the "how-much-is-the-subscription" stage, thereupon remembered they ought to be getting home, and were unmoved by protests that "he's really quite a good pilot, and knew perfectly well what he was doing."

Later, we had most of the machines out on the tarmac *(sic)*, and proceeded to amuse ourselves by trying new ways of getting the "sardines" into their "tin." But South Kensington Went On Flying.

NEWCASTLE GLIDING CLUB.

Saturday, Dec. 17th, 1932.—Misfortune beheld us on arrival at Killingworth in one of the worst gales in our experience, when we were met by a gaping hole in the hangar roof. A section of the roof had been blown 20 yards away. For some unknown reason we had an extraordinarily large attendance—members must have sensed damage because they knew it was too windy to fly. Every member was eager to get on with the repair, and although we laboured all day until dusk, our work was a failure—the gale won. The machines were lashed to railings and anything available, and work abandoned for the day. The only damage to equipment was a crashed elevator on the Ground Training Device.

Sunday, Dec. 18th, 1932.—Work on roof repair completed between 9 a.m. and 2 p.m. Wind S.S.W. Too gusty for flying.

Saturday, Dec. 24th, 1932.—Commenced extending hangar, which we are increasing by 40 per cent, in anticipation of further progress and equipment. Part of this extension will be equipped for scientific and meterological research.

Test flights on the new intermediate machine were continued by W. E. Hick, and it was decided to alter the aileron control from pulleys to levers, and to make a new rudder as the machine had a tendency to yaw.

Saturday, Dec. 31st, 1932, and Jan. 7th, 1933.—These afternoons were devoted to pushing the hangar extensions, as there was insufficient wind to fly. Model enthusiasts of our associated club—The Northern Model Aircraft Club, had a very successful afternoon each day.

Sunday, Jan. 8th, 1933.—A truly fine day for gliding—wind, weather and temperature just right—length of daylight was the only disadvantage. As a result of this we only succeeded in making eight flights in the Cramcraft. Three of these were Sinclair's first, and we were most pleased to find in him the makings of a good pilot, who we hope will soon be added to the advanced group.

Saturday, Jan. 14th, 1933—Only eight hardy Northrenners and one Indian—our newest member—Ajit Bandhu Guha—ventured through the fog and cold to the flying field. This was the coldest day of the winter so far, and continual launching of the Cramcraft was necessary to keep one's blood in circulation. Hick and Mewes made remarkably fine flights which create a duration record for the Killingworth site. Special attention was paid to Sinclair, who again made three good flights.

Constructional Work.—In addition to the hangar extensions which are progressing favourably between flying, Hick has made considerable progress on his "Merlin." This will be an intermediate machine of his own design, with a wing span of 32 ft., and a total length of 14 ft. 9 in. Göttingen 535 is the wing section, which will be covered with ply to the rear spar, and will be in three sections. The fuselage will be similar to the PROFESSOR in appearance, but of hexagonal section. The estimated gliding angle is 1 in 20.

All material, with the exception of fabric, is now on hand, and several ribs and the rudder are now completed.

OFFICIAL NOTICES

COUNCIL MEETING.

The 44th Meeting of the Council of the British Gliding Association was held in the Library of the Royal Aeronautical Society, on Monday, January 23rd, 1933, at 6.30 p.m., when, amongst other business, the following resolutions were considered and passed:—

1. **"THE SAILPLANE."**—(a) "That the Council accept with the deepest reluctance and regret Captain Entwistle's resignation of the editorship of THE SAILPLANE and ask him to accept a most sincere and cordial vote of thanks for his able editorship, and to place on record their appreciation of the high standard to which he has brought the paper during his term of honorary editorship from December, 1931, to January, 1933."

(b) "To accept the offer of Dr. A. E. Slater to undertake the editorship of THE SAILPLANE AND GLIDER, and to express the Council's thanks for his generous offer in taking on so arduous an honorary post."

2. **1933 ISTUS INTERNATIONAL GLIDING COMPETITIONS.**—"That the B.G.A. be authorised to enter a team of three sailplanes to represent Great Britain in the 1933 Istus International Competitions and that the B.G.A. should contribute a sum not exceeding £100 towards the expenses of entrances fees, insurance, transport and general expenses of the machines, competitors and staff, and that the Contest Committee be instructed to draw up the necessary rules and regulations for eliminating trials to be organised early in the year among representatives of Clubs and members of the British Gliding Association from which to select machines and pilots."

Mr. L. A. Desoutter was elected to membership of the B.G.A.

The **next meeting of the Council** will be held in the same place on Monday, February 20th, 1933, at 6.30 p.m. The **Annual General Meeting** will follow at 7.30 p.m.

A LECTURE ON CLOUDS.

On February 16th, Sir Gilbert Walker is lecturing to the Royal Aeronautical Society on "Cloud Formation." The lecture will be given at the Royal Society of Arts, 18, John Street, Adelphi, London, at 6.30 p.m. Visitors are admitted on signing the visitors' book.

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