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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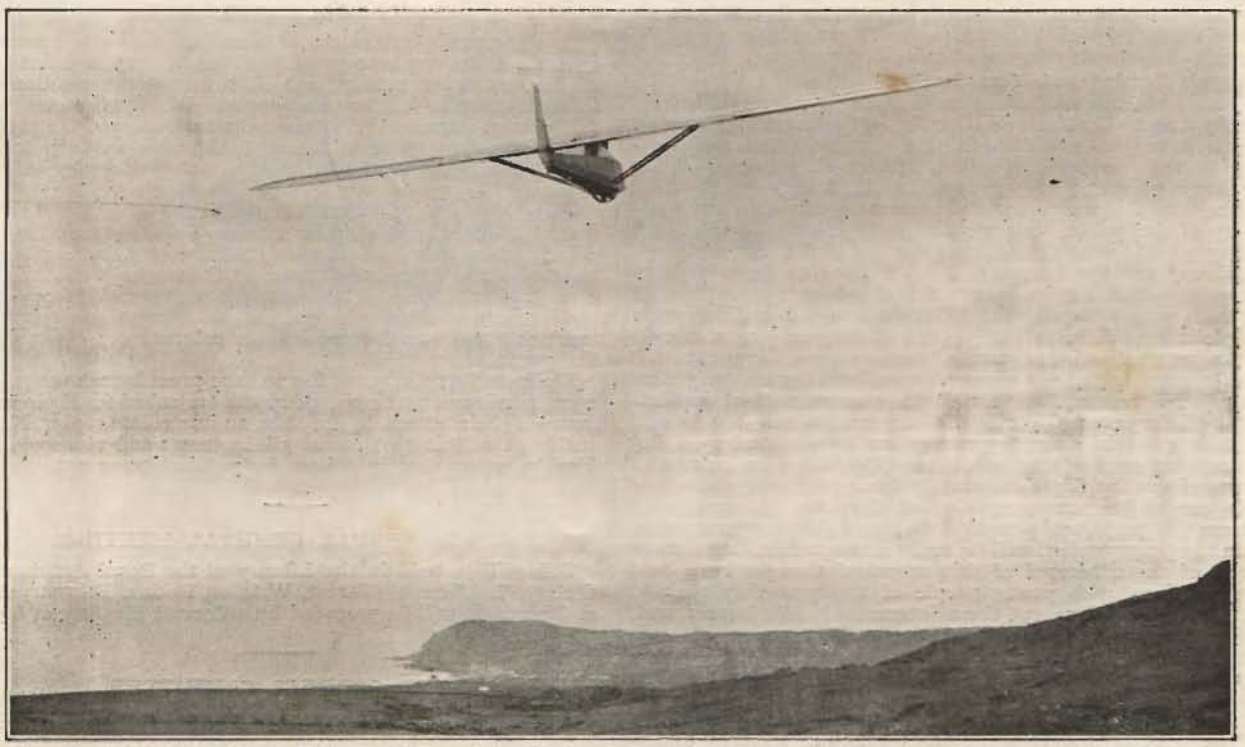
PRINCIPAL CONTENTS

SOARING IN IRELAND.



The Ulster Club's "Kassel 20" launched from the vicinity of Sallagh Braes, Co. Antrim. Ballygally Head can be seen in the distance.

THE SAILPLANE AND GLIDER

43, CHANCERY LANE, W.C.2. JANUARY, 1934

The Sutton Bank Scheme.

We are sorry to hear that the scheme for setting up a permanent gliding and soaring centre at Sutton Bank in Yorkshire is meeting with unexpected difficulties. Much is being done behind the scenes, but one cause of the set-back is evidently the premature publicity which has been given to the proposal in the local press, who got wind of it in some way, with the result that in the local County and Rural Councils the usual outcry has been raised about "desecration of the peaceful countryside."

The difficulty of acquiring sites has been one of the chief stumbling-blocks to the progress of gliding and soaring in this country. At least one club (the North Kent) has had to close down for no other reason. Even the London Club was harried from pillar to post in its young days, and the use of its present site has only been possible because its legal members discovered that part of the hill belonged to a farmer, and not, as was first thought, to the local conservators, who had tried to stop the flying. Yet its site is the only satisfactory one obtainable within reasonable distance of London, and, but for the happy accident of the real ownership of the said portion of hill being discovered, apparently London would be still without a gliding club capable of carrying out soaring flights, and the greater part of the soaring which has been done in the last three years would never have been performed at all.

Public Hostility to Gliding.

Various reasons are given for turning gliders off the land: desecration of the landscape, ditto of the Sabbath day, disturbance of game, injury to land by the rubber-necking public; but we cannot help thinking that there is among the public a general atmosphere of hostility to gliding, which causes such difficulties to be raised which otherwise would not be raised at all. We also cannot help thinking that this is due to the inability of the public at large to realise that the real purpose of gliding is the achievement of soaring flight and the further progress and development of the art of soaring. There is a common impression that gliding is carried on by a lot of hair-brained, foolhardy youths who have somehow escaped the vigilance of their parents, and who for some inexplicable reason choose to hop down short inclines in flimsy aerial machines which must necessarily be uncontrollable owing to the absence of an engine.

Wanted: Soaring and More Soaring.

We believe this attitude of mind is, as we have said before, chiefly due to the fact that hardly any outstanding soaring flights have yet been done in this country. And we would like to see a wider realisation, among all sections of the gliding movement, of the fact that it is only by progress in the art of soaring that the movement can gain the sympathy of the public at large, the interest of "air-minded" young people who are looking for an outlet for their enthusiasm, and the necessary driving force to keep itself in a healthy state and to secure the disinterested devotion of its adherents and potential adherents. We sometimes hear people talk as if the only object of a gliding movement should be to get "air-minded youths," whose ages happen to fall within some arbitrarily chosen limits, into the air on gliders for no other reason than that, in the present state of development of the internal combustion engine, it can be claimed that better aerial value for money can be obtained by flying without an engine than with one. On this view, advanced forms of soaring flight are merely freak performances whose only use to the movement is that they can be mentioned among the propaganda on the off-chance that someone, other than the propagandist, will be really interested in them. How many of the adherents of this school of thought have held conversations with young people of the type they seek to attract, and tried to get them interested? We have found, as we have said before, that the usual reaction of such young people is a complete lack of interest in the subject, due to an unwillingness to believe that soaring flight is within their capabilities, or is even possible at all, and a fear of being ridiculed by their friends if they merely indulge in the brief hops over small fields which is all they understand by the term "gliding."

So let's to it. Progress in soaring flight must be our prime object, or we shall get nowhere worth getting to. If the Sutton Bank scheme goes through, and if, as is to be hoped, a permanent national gliding and soaring school can be established there, we may at last see the country's stock of sailplanes being used for the purposes for which they were built, and every properly ambitious glider pilot will be provided with the wherewithal for the realisation of his proper ambitions.

CORRECTIONS TO JANUARY ISSUE.

The last issue of THE SAILPLANE suffered various alterations after it was out of our hands.

Clouds over Switzerland.—In the description of the first photograph (p. 9), for "cumulus-nimbus" read "cumulo-nimbus." At the end of the article, for "up-currents that form between miles" read "up-currents that form between whiles."

Hay Fever.—The title "Hay, Hay Fever and Cumulus Clouds" was turned into nonsense by the insertion of another comma after the second "Hay." Perhaps we should be thankful that the perpetrator did not try to shove a third "Hay" into the title. He seems fond of the stuff.

The Missing Word.—At the end of the list of signals for gliders, the last of which was "Horse Wanted" (p. 15), we added: "We hope the penultimate word is not a misprint for 'hearse.'" The hearse got mislaid somehow, leaving the sentence incomplete. Perhaps it was thought that our readers would enjoy the little problem of trying to find the missing word.

A Soaring Flight.—The last line of the Ulster Club News (p. 14) took off from the bottom of the column and was to be found masquerading among the London Club news four lines from the top.

The Soaring Flight of Birds.— In Capt. Latimer-Needham's article under this title, two lines were omitted between page 5 and page 6. The passage which includes the missing lines should read as follows:

"Further evidence on this point was furnished by Sqdn. Ldr. G. M. Dyott, writing on his experiences of flying in Peru, who wrote: 'The conditions of the atmosphere could be judged very accurately by the careful observation of the flight of turkey buzzards . . . (which) can only maintain flight in calm, still air with considerable effort, and they depend on horizontal or vertical air currents to keep aloft for any time . . .'"

The formula under Fig. 3 (p. 7) should be amended. For "1/theta=60 deg." read "If theta=60 deg."

OUR PUBLICATION DAY.

It is regretted that, since our transformation into a monthly journal, it has not been possible so far to keep to a fixed day of the month for publication. Last month the position was further complicated by unexpected delays after we were ready to go to press. This has in its turn delayed the present issue, but we expect in future to be able to keep to our announced publication day of the second Tuesday in each month.

Club News and other contributed matter should reach THE SAILPLANE office at least 12 days before the date of publication. (No payment can be made for contributions, but authors of articles can ask for extra copies of the issues in which their contributions appear.) Readers who want advice from other gliding enthusiasts on matters of general interest are reminded that our Correspondence columns are available for the purpose.

Work on THE SAILPLANE has to take precedence over private correspondence, and correspondents are asked for their indulgence if their letters do not elicit an immediate reply. Nevertheless, the Editor welcomes gliding news and views of every kind, whether sent in a form for publication or not.

B.G.A. ANNUAL GENERAL MEETING.

This will be held in the Library of the Royal Aeronautical Society, 7, Albemarle Street, W.1., on Friday, February 23rd, at 7 p.m. It will be preceded by a Council Meeting at 6 p.m.

THE GORRELL COMMITTEE.

The Committee, under the chairmanship of Lord Gorrell, which has been appointed by the Secretary of State for Air to review the position of civil aviation, has now been requested in addition to examine the position of gliding in this country.

THE "MOAZAGOTL," HIRTH'S NEW SAILPLANE

A Wooden Model of the "Moazagotl," made by H. L. Richardson while attending a course at the Hornberg School.

[*Wolf Hirth's new high-performance sailplane, which he has named "Moazagotl" after the local name for a lenticular cloud under which he soared last year, was first seen at the Rhön competitions last August. On it he performed the longest flight of the meeting—a soaring flight of 109 miles from the Wasserkuppe to Zwickau. The following description of the machine has been translated from "Flugsport."*]

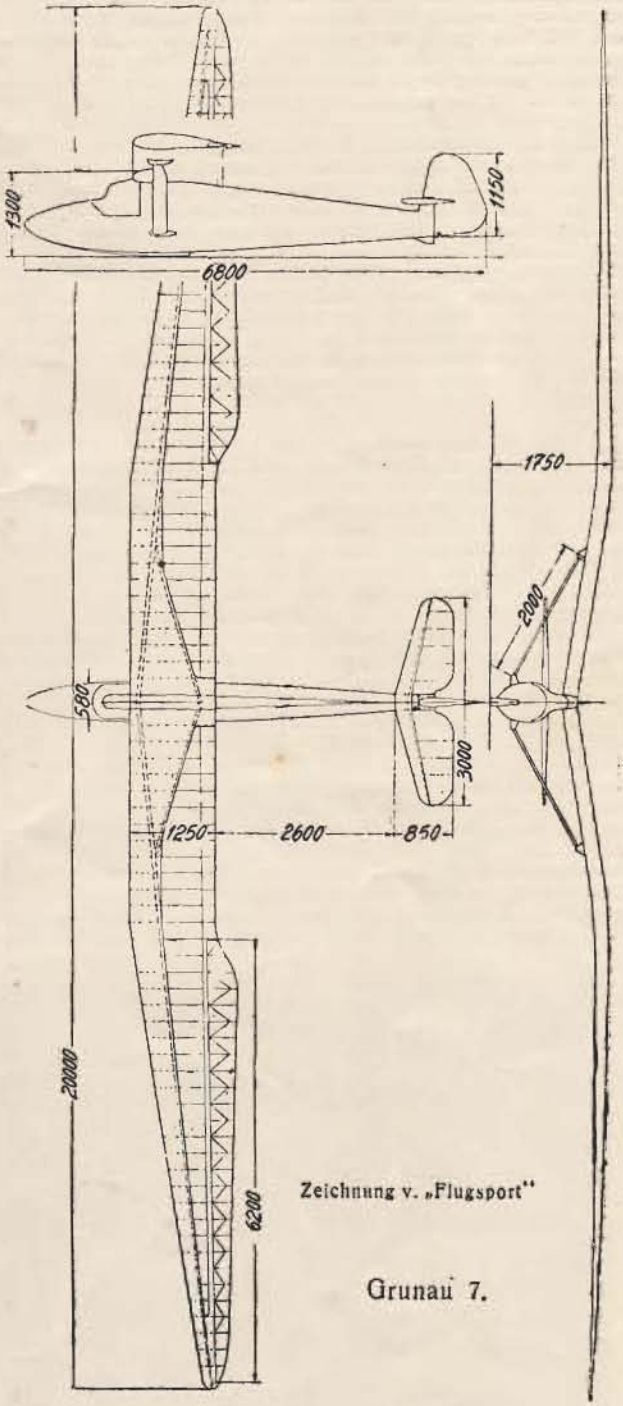
The GRUNAU 7 (the machine's type name) is Hirth's newest 20 metre high-performance sailplane. In the design of the wing Hirth has doubtless turned to account the experience obtained with the "FAFNIR Bent Wing" introduced by Lippisch. Typical of Hirth's methods of design is the use of a single strut in conjunction with a strong torsion-resisting junction in the middle section of the wing.

The strut has an unsymmetrical section and can be turned through 30 degrees for the purpose of steepening the gliding angle. The bend in the wing is very marked, and, together with the slight sweep-back of the wings, ensures excellent directional and longitudinal stability in blind flying. Specially interesting is the ease in making turns which results therefrom. The long, backward-projecting ailerons, together with the pronounced tapering of the wings, greatly facilitate the manœuvrability. The FAFNIR and CONDOR have shown that such a "bent wing" enables very tight and steeply-banked turns to be safely performed. A comparison of these three machines, which have been flown by three "silver C" pilots, is conclusive evidence of the benefit of the "bent wing" design.

The wing of the GRUNAU 7 is in two parts. Aileron connections are by toothed segments. Inner wing-section (Göttingen) 535, with transition to symmetrical section at the ends. The rounded fuselage is comparatively short. Elevator is undamped and adjustable during flight. Behind the pilot's seat a water tank is built in for the purpose of altering the wing loading.

Dimensions: span, 20 m. (65.6 ft.); wing area, 20 sq. m. (215.3 sq. ft.); weight empty, 178 kg. (392 lbs.); weight in flight, 258 kg. (569 lbs.); wing loading, 12.8 kg. per sq. m. 2.62 lbs. per sq. ft.). Cost of construction about 5,000 R.M.

[The figures for weight given above are taken from *Der Segelflieger* of more recent date. *Flugsport* gave: weight empty, 190 kg. (419 lbs.); flying weight, 270 kg. (595 lbs.); with water ballast, 310 kg. (683 lbs.). The water tank holds 40 litres (8.8 gallons). *Der Segelflieger* further states that, since any small additional weight makes little difference to the flying speed, there is an adjustable trailing edge flap in the middle of the wing to allow for increased speed.]



The "Moazagotl" at last year's Rhön Competitions.

THE "SILVER C" CERTIFICATE

The "Silver C." Certificate, now know in Germany as the *Leistungssegelfliegerabzeichen* or Performance Sail-flyers' Badge, was instituted in Germany in February, 1931, with the object of providing an additional badge to the "A," "B" and "C" badges which had then been in existence for some years, since the great strides which were being made in the realm of soaring flight had rendered something of the kind desirable. It has occasionally been referred to as the "D" badge.

The original conditions for obtaining the badge were that the pilot should make officially observed flights of 5 hours' duration, 50 kilometres' (31.068 miles) distance and 1,000 metres' (3280.8 feet) climb above the starting point. The distance and duration had to be done in separate flights, but the altitude flight could be combined with either of the others. In June of the same year the conditions were amended so as to include flights made after casting off from an aeroplane tow. The point of release was then regarded as the start of the flight in reckoning distance or altitude, and the moment of release for duration; while, for a distance flight, the height of the release point above the starting point on the ground must not exceed 1 per cent. of the distance.

At the London meeting of the International Commission for the Study of Motorless Flight, held in October, 1931, it was agreed that the "Silver C" badge should be adopted internationally, but without the distinguishing nationality letter used on the other three. Applications for it had to be made to the Secretary-General of the I.C.S.M.F., enclosing affidavits for each flight signed by two official observers.

At present 18 pilots are holders of the badge; 15 are of German, 1 Austrian and 2 United States nationality.

We know of several British pilots who have not forgotten the existence of this badge. So far, none have fulfilled the conditions for altitude or distance, but three have done soaring flights of over 5 hours' duration; these are: S. Humphries (5 hours 6 mins. at Dunstable on August 19th, 1933), E. L. Mole (6 hours 55 mins. at Dunstable, July 30th, 1933), and J. Laver (7 hours 22 mins. at Sutton Bank on October 9th, 1933—the present British duration record). All these flights were officially observed. Mr. Mole also did an unofficial flight of 6 hours 10 mins. at Ditchling on August 2nd, 1931. J. P. Dewsbery got very near the altitude requirement when he climbed about 3,000 feet from Dunstable Downs into the base of a cumulus cloud on August 20th last year, but he carried no barograph. The distance of 31 miles is still some way ahead of the best British performances, which are the flights of G. M. Buxton (about 13 miles, in 1932) and G. R. Collins (about 20 miles, last August).

The names of all the present holders of the badge were given in *Flugsport* recently, together with figures relating to the actual flights by which they obtained it. We reproduce the list here, as it will doubtless be of considerable interest.

Holders of the "Silver C."

Name and Dwelling Place.	*Distance.*	*Duration.*	*Altitude.*
	km.	*h.m.*	*Metres.*
Robert Kronfeld, Vienna	164	7.34	2160
Wolf Hirth, Hornberg	53	7.7	1025
Günter Groenhoff, Frankfurt	130	5.16	1225
Kurt Starck, Darmstadt	75	6.17	1000
Otto Fuchs, Darmstadt	75	7.50	1000
Hermann Mayer, Stettin	125	8.22	1840
Peter Riedel, Berlin	153.5	8.49	1027
Martin Schempp, Pittsburgh	102	6	1636
Heinrich Dittmar, Griesheim	65	8.31	1070
Paul Steinig, Grunau	83	5.51	1180
Erhard Muschik, Dresden	126	6.53	1500
Jack O'Meara, New York	107.2	8.18	1457
Peter van Husen, Gruna	86	8.37	1120
Walter Fremd, Frankenhausen	50	12.5	1200
Anton Endres, Würzburg	64.1	5.12	1089
Heinz Kensche, Berlin	140	6.6	1350
Otto Bräutigam, Grossenham	138	5.5	1400
Rudolf Oeltzschner, Merseburg	93	5.21	1800

We regret we are too busy to convert all these kilometres into miles and metres into feet. Roughly speaking, 8 kilometres are 5 miles, and to convert metres into feet, multiply by 3 and add 10 per cent. 100 miles are 160.9 kms., and 100 kms. are 62.1 miles; 1,000 metres are 3,281 feet, 1,500 metres 4,921 feet, and 2,000 metres 6,562 feet.

A few of these names are well known to our readers. "These Names Make News," as the papers say.

R. Kronfeld was the first pilot to use cumulus clouds for cross-country soaring, in 1928, and has since then carried out many outstanding flights, including a 50 mile flight along the South Downs in 1930 and a soaring flight from Hanworth to Chatham, returning to Hanworth by the same means the next day.

W. Hirth has been soaring for many years; it was he who, first in 1930, developed the art of soaring in invisible thermal currents unconnected with clouds. Like Kronfeld, he has visited England several times, the last visit being about a year ago, when he imparted his expert knowledge to the

Some "Silver C" pilots and others: a photograph taken at the 1932 Rhön meeting. Left to right: Oskar Ursinus (Editor of "Flugsport"), Kronfeld, Riedel, Groenhoff, Martha Mendel (runs a gliding group at Mainz exclusively for ladies), Hemmer (former holder of Rhön duration record), Bachem (author of text-book on soaring), Heinrich and Edgar Dittmar, Teichmann. Front row: Bedau (visited England 3 years ago and gave us a lecture), Hirth, Bräutigam.

Reproduced from "Flugsport."

THE "SILVER C" BADGE

(White gulls on blue background surrounded by silver wreath)

London Gliding Club in a series of lectures.

G. Groenhoff unfortunately lost his life in 1932, in making a parachute descent from too low an altitude. He was an outstanding pilot and made some wonderful long-distance flights.

Starck and Fuchs took part in the Darmstadt Group's expedition to Berlin in 1931, when scientific investigations into the possibilities of thermal soaring were carried out. Fuchs broke his leg in a bad landing in the 1931 Rhön Competitions, and, we believe, has not flown since.

Mayer was designer, constructor, and very able pilot. He lost his life in an accident due to structural failure, last year.

Riedel, after being aeroplane pilot to the Rhön-Rossitten Gesellschaft, took up sailplaning seriously about two years ago; almost immediately he made his qualifying distance flight for the "Silver C" with a flight from Wasserkuppe to Plauen, during calm weather, in thermal currents capped by tiny clouds.

Martin Schempp is our American Correspondent. He emigrated from Germany to the U.S.A. some years ago, taking with him his enthusiasm for soaring, and is now one of the leading spirits in the motorless flying movement in America. His altitude flight, which was made flying blind in thunderstorm clouds, was described in THE SAILPLANE for Sept. 23rd, 1932.

H. Dittmar is the younger of two brothers; the other, Edgar, used to fly regularly in the Rhön Competitions. Heinrich, who is barely grown up yet, has jumped suddenly and unexpectedly into the front rank of soaring pilots; there should be a great future for him. He flies the CONDOR, which he and his brother designed and built.

Steinig has been an instructor at the Grunau Gliding School for some years; he qualified for the badge on May 13th last year (see THE SAILPLANE for July 28th). Muschik did several fine altitude and distance flights from Dresden last year (see same issue, and issue for May 12th).

Jack O'Meara once held the unofficial American duration record (then 9 hours). He is an intrepid pilot, always eager for new experiences, and distinguished himself last year by taking part in looping contests for gliders, his record being 46 consecutive loops.

Fremd, Endres and Kensche, flying a RHÖNADLER, the WINDHUND *and the* WÜRZBURG respectively, all did well at last year's Rhön meeting. Otto Bräutigam runs a glider factory which turns out types of its own design suitable for various stages of training.

From the smallness of the above list, it is evident that the time has not yet come for the institution of a "Golden C" or "E" badge. When that arrives, what sort of performances will be required of its prospective holders?

AERO-TOWING AT DARMSTADT.

The *Bulletin de l'Aéro-Club d'Alsace* publishes an interview with Peter Riedel, the German soaring pilot, in which he describes thus the work of the Griesheim (Darmstadt) aeroplane-towing school for sailplane pilots:

"The Griesheim school takes pupils of every category: aeroplane pilots (it is now obligatory for all pilots on German air lines to pass through there); young people who already have some gliding experience, and 'hundred per cent.' beginners.

"The duration of the courses, theoretical and practical, varies from a fortnight for the first category to a month for the other two. Only a very few slides and launches by elastic rope are given on a training machine, but no winch launching.

"The teaching progresses very quickly to towed flight, even for the beginners, who are at first trained in dual control gliders, then flying solo, towed on a high performance machine.

"When the pupil is able to keep a towed machine under proper control, and has become accustomed to progressively increasing heights, he is, in calm weather, taken up and released so that he can practice evolutions and the return to the flying terrain. Following this he is released above a point where ascending currents are known to exist, or in front of a thunderstorm front, in rough weather, etc.

"The method of starting from a mountain is falling more and more into disuse. It is to be noted that the ground as Griesheim is absolutely flat and situated in a district of very slight unevenness."

Riedel is convinced that, after a fortnight in the School, an aeroplane pilot should be capable of carrying out a flight of 100 kms. (62 miles) in a straight line, in front of a thunderstorm. For a beginner of average ability, a month's training should enable him to do a distance flight of about 10 or 12 miles.

NEWS FROM VIENNA

Flugsport states that Robert Kronfeld was married in Vienna on November 16th last.

On November 23rd, Bruno Gumpert soared over the town of Wiener Neustadt for 5 hrs. 38 mins. in a GRUNAU BABY.

Kronfeld's New Soaring School.

In an article in the Vienna *Neue Freie Presse*, R. Kronfeld points out that gliding in Austria is at present only at the stage which was reached in Germany ten years ago; gliding groups are small, and their instructors inexperienced. What is required is a soaring school where teachers can be trained and advanced pupils receive instruction suited to their needs; it is also very desirable in the present state of the country to attract foreign visitors, and an international soaring school should help towards this end. It is also necessary to establish a centre where auto and winch launching and aeroplane towing can be taught by experienced practitioners. Further, the high mountains in Austria render that country particularly suited for scientific investigations into air currents around such mountains, which are on a much larger scale than those in the Rhön district.

It is to meet all these requirements that Kronfeld has started his soaring school on the Gaisberg, near Salzburg. He claims that in this school Austria possesses the best soaring school in the world. There are 265 kilometres of interconnected mountain chains, and this, combined with other geographical features, should make possible the setting up of fresh world's distance records. One suitable route leads from Salzburg *via* Hansruck and the Dannbe valley along the entire length of the Böhmerwald to near Bayreuth (which town Kronfeld once reached from the Wasserkuppe), while thermal soaring over flat country can be carried out westwards along the Danube valley or eastwards in the direction of Munich and Stuttgart. The southern route, he states, leads directly among the high Alps and over their passes to Italy. Thus the problem of crossing the Alps in soaring flight is one which Austrian pilots should make it their special business to attack and solve.

GLIDERS ON STAGE AND FILM.

We have already reported that a play dealing with life at a gliding school has been written by two German glider pilots. The hero is a young Frenchman who joins the school, is well received by all the Germans there, and strikes up a friendship with a charming German lady pupil. We learn that the play has now been put on at the Berlin *Lustspielhaus*, and has achieved a great success, with official blessing. A picture in the *Berliner Illustrierte Zeitung* shows the Frenchman Vidal (acted by Adolf Wohlbrück) shaking hands with his fellow-pupil Hannes (Wolfgang Liebeneiner) in the presence of the young lady Herta (Trude Moos). The play was presented by Heinz D. Kenter.

During last year's Rhön Competitions in August, the Ufa Film Company was to be seen engaged in making a film in which gliders played a prominent part. Most of those engaged in the work lived in sixteen small tents and two marquees spread out along one side of the aerodrome. The *Leipziger Neueste Nachrichten* states that the film is now ready for showing, and gives some "stills" showing Claus Clausen getting into a sailplane (it looks like the CONDOR) and Hilde Gebühr apparently sitting in the rear cockpit of a two-seater. Probably neither could actually fly. (Hilde Gebühr was the star in the German version of the film "F.P.1," which dealt with an imaginary floating aerodrome in the middle of the Atlantic.) Besides the professional actors, several sports enthusiasts took part, including the ski expert Guzzi Lantschner, who also happens to be quite a good soaring pilot in his spare time. Hanna Reitch, the well-known lady soaring pilot, was also in the cast.

The film is to be called "Rivals of the Air."

A FRENCH SAILPLANE IN NORTH AFRICA.

A German expedition has gone out to Brazil to study soaring possibilities in the tropics. It seems that an opportunity for similar study in Northern Africa is now available, since a French sailplane has been practising aero-towed flights there. On January 3rd, according to *Les Ailes*, the pilot Monville flew 80 kilometres (50 miles) in an AVIA-32 sailplane towed behind an aeroplane; the flight was from Mascara to Sidi-Bel-Abbas, and took 50 minutes. The same day the sailplane was towed above Bel-Abbas and cast off at 2,300 feet, but it only made a prolonged descent. M. Monville must be of a trusting disposition, for the sailplane was a new one and had never been in the air before.

TWENTY - FIVE YEARS AGO

The issue of *Flight* for January 4th commences the 26th year of that journal's publication, for the first number of the "First Aeronautical Weekly in the World" (a copy of which we once possessed but stupidly re-sold to a schoolfellow for its published price of one penny) appeared on January 2nd, 1909. Some years back, however, we picked up second-hand a bound copy of Vol. I, so we have been celebrating the present occasion by going through it page by page in an attempt to live again through those exciting times.

It was during the years 1908 and 1909 that the general public became convinced that aeroplanes could really fly, just as in 1922 they learned that gliders could soar, but, while they have never been allowed to forget the first of these facts, the second has somehow never got itself properly lodged in their memory.

The year 1909, of which *Flight* Vol. I treats, saw Bleriot's crossing of the Channel. (This same Channel has yet to be crossed by a sailplane in *soaring* flight.) Flying meetings were being organized in nearly all the civilized countries of the world. No wonder everyone was thinking of mechanical flight in one form or another, to the exclusion of real flying (which needs no engine at all). Strange and weird were some of the contraptions illustrated—flapping wings, aerial paddle-wheels and Venetian blinds, flying bicycles—and our Contemporary appears to have taken them almost as seriously as the more conventional monoplanes and biplanes; no wonder, for only a proportion of these latter could get off the ground, let alone remain intact after getting back to it. As one commentator put it, describing the first Olympia Exhibition of March that year, "There are far more liars than flyers in this building."

José Weiss.

Amid all this welter of machinery it was to be expected that the ideal of soaring flight should be forgotten, although it had been the inspiration of most of the early experimenters whose work led to the advent of the aeroplane. But there was one still, small voice, that of José Weiss. At this same Olympia Exhibition a small, tailless, bird-like monoplane of his design was exhibited by Mr. Handley Page. Though a power-driven machine, its design was based on that of the Weiss gliders, which in their turn were an expression of the inventor's opinion, based on his study of the birds, that a perfectly shaped flying machine should suffer no resistance at all to its passage through the air other than skin friction, and thus its sinking rate would be so small that hardly any power should be needed to keep it up. The monoplane exhibited was controlled by two ailerons-cum-elevators as in most tailless machines. Each was worked by one pedal, so that the pilot's feet moved in unison for elevator control and in opposite directions for lateral balance. The machine, like the smaller model gliders from which it was developed, had its framework built almost entirely of cane.

It was at the Weiss stall that Mr. Gordon England, after vainly tackling the other exhibitors, made enquiries which later led to his being engaged to fly the Weiss gliders at Amberley in Sussex. In the course of these gliding trials he is recorded to have risen 100 feet above the starting point and to have remained in the air 58 seconds. Both figures must have been world's records at the time, yet although the former (and perhaps also the latter) was set up in 1909, neither it nor the trials themselves attracted enough interest to receive mention in *Flight*. Most flying experimenters of the period would have given a lot to be able to solve the problem of inherent stability, yet it had been practically solved by the Weiss glider, which, however, having no engine, they no doubt considered beneath their notice.

It is significant that, although articles on soaring flight by Wilbur Wright and Octave Chanute were published, they gave rise to no discussion in the Correspondence columns of the paper. They were actually reprints of papers read in 1902 and 1907 respectively, and it is noteworthy that the "secret" of the soaring flight of birds was no mystery to these pioneers, although Chanute admitted that it took him "two years and a whole series of observations" to find out the truth. Both experimenters not only understood how soaring over a slope could be done, but gave detailed instructions for circling in rising columns of air to higher levels. Wright said in 1902 that "many workers believe that success will first come by this road," and there can be no doubt that it would soon have done so, but for the coincidence that a light enough engine for power flying became available just about that time. Motor-assisted flying won by a short head, and it took the cause of soaring flight nearly 20 years to recover from the blow.

To descend from soaring to plain gliding: a certain amount of space, though not much, was allotted to this subject.

The Wright-Clarke Glider.

An excellent-looking machine, the Wright-Clarke glider, built by T. W. K. Clarke and Co. to Wright designs for Mr. Alec Ogilvie, is described in some detail. It was a biplane, with a biplane elevator in front and a single rudder behind, very similar to the first Wright aeroplane The front and rear wing spars were 1¼ inches wide and only 1 inch deep! By a remarkably ingenious arrangement, the elevators were made to increase their camber when they were pulled down and lose it altogether when raised; this was done by their being actuated by a bar placed between them, parallel to their chords, whose fulcrum was slightly further forward than the aileron hinges, the latter being at about 30 per cent. of the chord from the front.

The controls were similar to those of the Wright aeroplane, and their action, which is explained in detail, is worth describing. There were two control sticks. That on the pilot's left moved forwards and backwards and worked the elevators alone. That on the right moved in all directions: from side to side to warp the wings for lateral balance, and forward and backward to move the rudder to left or right respectively. It might be thought that it would be impossibly confusing to learn to work the rudder in this way, but actually it was not so bad, owing to the fact that the lateral and rudder controls were purposely designed to be worked in conjunction—the design was in fact the Wrights' own patent and the subject of much subsequent litigation. The point is that with a warping wing, as with ailerons, when that on one side is pulled down, it sets up increased air resistance and causes the machine to tend to slew round towards the same side. In a modern glider this can be counteracted by pushing the opposite foot to move the rudder over (writers in THE SAILPLANE call this "kicking up the low wing"). To obtain the same effect in the Wright machine, the right-hand stick, whenever it is moved to the left, is pushed slightly forwards, and when to the right, backwards. This is quite a natural way of moving the arm, as we found when learning to glide at Rossitten. (At that school the pupils are, or were, taught to hold the arm forward so that the elevator can be worked by movements from the wrist alone, thus giving a more delicate control; the unfortunate result was that movements of the ailerons were often accompanied by unconscious displacement of the elevator due to the arm naturally moving diagonally, and the glider would take on an unexpected bucking motion, to the discomfiture of the novice in charge. In the Wright machine, however, such a diagonal movement was the correct method of lateral control.) It is only when the Wright glider has to make a turn that the control movements become really complicated; the necessary movements then result in the right-hand control stick describing a complete oval in the course of the turn.

The design cannot have been very efficient aerodynamically; Wright himself stated that his glider, when flying in still air, had a vertical rate of descent of nearly 6 feet per second.

Gliding in 1909.

A fair amount of gliding activity appears to have been going on in 1909, both in this and in other countries, but it is noteworthy that none of it was done with the idea of trying to soar, but merely as an introduction to power flying, or for trying out the stability of a machine before putting an engine in it. One writer explained that for gliding

The Nyborg Sailplane being packed on its trailer at Dunstable recently, after making a glide of about ¼ mile with hardly any loss of height. The inventor has his back to the camera. In 1909 Mr. Nyborg had already been working for some years at the problem of flight.

one wants a " precipitous hill with plenty of space at the bottom," whereas nowadays we ask for a precipitous hill with plenty of space on the top.

On Sept. 17th of that year Lieuts. Porte and Pirie tried to take off from Portsdown Hill, the present site of the Portsmouth and Southsea Gliding Club, in a biplane glider with a 45-degree stagger. It only achieved another kind of stagger, for it crashed before leaving the ground, probably because both experimenters were on board—for with true naval gallantry neither would leave his comrade to face unknown risks alone.

Another gliding man was H. W. H. Vaughan, who built himself a biplane " hang " glider with a box tail. Having discovered that it flew better with one horizontal and the two vertical panels removed, he then took off what remained of the tail in the hope of still better results. When he flew again, the resulting wreckage showed him where his logic was at fault. Three years later he gave his next machine, which was of Wright-Clarke type, to a gliding club formed by students of the Polytechic Institute, which operated on Amberley Downs.

Considering that in Germany the gliding movement owes its present existence largely to the enthusiasm of the student groups in past years, this example of a similar thing in England is interesting historically. But the idea has never really caught on here; even now, the Imperial College Gliding Club is the only example of such a group in this country. We read, however, in the issue of May 29th, 1909, that an academy for aeronautical study had just been founded at Munich, and that they proposed " to construct an artificial hill, by the aid of which it will be possible for its members to carry out gliding experiments on the lines proposed by Lilienthal." It would be interesting to know if there has been an unbroken continuity between this body and the present Munich Academic Flying Group, one of whose sailplanes, of the Group's own design, recently flew 80 miles from its home town to Regensburg, *via* Ingolstadt. Munich was also the starting place of the present cross-country world's record of 156 miles; could any of the proposers of the artificial gliding hill have been got to believe that such things would one day come to pass?

Other artificial hills for gliding were in existence at that time, and one wonders whether the idea would not be worth consideration by present-day gliding clubs who have to do all their primary training on flat ground. Messrs. Handley Page, Ltd., had set up a factory at Creekmouth, Barking, in the summer, and one of the attractions of the adjacent flying ground was that an artificial hill was available for gliding experiments. At the Frankfurt aeronautical exhibition that year, a gliding hill had been specially built in the grounds outside, for the convenience of patrons. Prizes were offered at this display.

Prizes and Competitions.

Talking of prizes for gliding, a curious prize was one of 2,000 francs, offered by a M. Soulé, for gliding down the side of a mountain without touching it; the aviator had to " descend from an altitude of 500 metres without using his engine, while following naturally sloping ground." Another, which any modern sailplane pilot could win, was the René Quinton Prize of 10,000 francs " for the first aviator who, having stopped his engine, keeps aloft for 5 minutes without descending more than 50 metres."

Some interesting rules for gliding competitions were formulated by the Commission Aerienne Mixte, in which the following trials were admitted for records :—

(1) Glides of gradual descent.
(2) Trials of sustaining power.
(3) Trials of load-weight ratio.

The " sustaining power " was considered as the ratio of the weight per square metre of surface to the weight of a parachute falling with the same vertical speed, the latter being calculated from a formula which the size of the supposed parachute did not apparently enter into at all.

Auto-towing of gliders was frequently practised 25 years ago, as the next best thing to having an engine in the machine. One American experimenter thrilled the crowds at a flying display by being pitched out of his glider over a picket fence, so violent were its uncontrollable evolutions behind the car.

It is pleasing to see that our Mr. Nyborg was well to the fore even in 1909, using his knowledge of bird flight to demolish the theories of those who knew not what they were talking about. As a contrast, we will conclude this review with a quotation from one Major Fink, who, after a lecture on kite-flying, delivered himself thus on the subject of soaring flight :—

" There are still conditions in the bird with regard to its body construction which give it its powers of floatability or ability to poise itself in various atmospheres which no aeroplane has yet been able to achieve, and, until such are introduced, the art of flying will always be attended by failures. . . . Take, for instance, the art of floating on your back in water. . . . The full inflation of the lungs and letting yourselves go into a state of passive stillness helps considerably. If such be the conditions to ensure our floating, there must be similar conditions in various birds to enable them to poise in various atmospheres with stillness, and not a single move of a feather. How is this accomplished? I maintain it is the inflation of the lungs, and some birds have a greater air capacity in their lungs than others . . . and this—what I term floatability or levitation, for want of a better word to express myself—is, in my opinion, a very great feature necessary in solving the problem of aerial navigation."

AERIAL TOBOGGANING 200 YEARS AGO.

A little known method of motorless " flight " practised in the Midlands during the 18th Century is described in *Popular Flying*. In October, 1732, a man named Cadman "flew " down a rope stretched from the top of All Saints' steeple to the bottom of St. Michael's, Derby, supported on a sort of wooden breastplate with a groove to fit the rope. Naturally the rope itself took care of directional control and angle of descent, but correct lateral balance was left to the " flyer's " own skill. He evidently used his limbs for the purpose; for once, when an ass was launched down the rope instead, the beast was deemed incapable of looking after its own lateral control, so half a hundredweight of lead was tied to each of its feet.

The trick caught on and became all the rage. All over the district ropes were fixed to trees, houses, high posts and steep banks by youths and men eager for " flying " experience. It is a wonder that all this gliding activity did not lead to the invention of the aileron for balancing purposes, and thus save subsequent flying inventors much trouble, for, though it seems obvious enough to us, such a simple solution of the problem of lateral balance was beyond the inventive powers of many early aeroplane designers.

Cadman continued to delight the public in this way for eight years, until one day, at Shrewsbury, the rope gave way in the middle of his glide. His " flights " must have been thrilling to watch; not only did he leave a trail of smoke due to friction between the rope and his wooden breastplate, but he would often perform such feats as beating a drum in his descent, and on one occasion sounded a trumpet and fired a pistol while in full " flight." Perhaps we shall live to see his publicity methods adapted to present-day gliding.

FILMS OF BIRD FLIGHT.

THE SAILPLANE was invited on January 20th to a private showing of some films showing the soaring flight of birds.

The first, which shows the soaring of albatrosses, was taken during the last " Discovery " expedition by Mr. Laurie, whose brother used to be a member of the London Gliding Club and is now in India. The film was shown during the Huish meeting last year. It has since been cut and rearranged to form a better sequence, by Capt. Latimer Needham. It shows the birds engaged not only in their usual " dynamic soaring," but in soaring on the windward side of the ship. From Mr. Laurie's description, it would seem that the latter is the only kind of soaring practised by the birds in air currents due to the presence of the ship; he never saw them soaring to leeward of the stern in the manner of gulls.

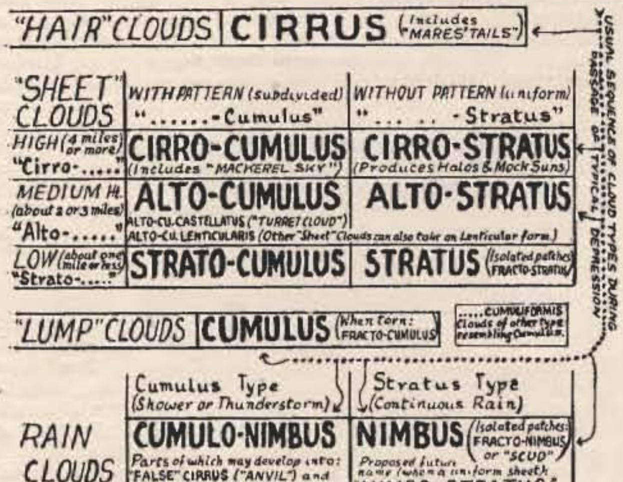
The other film was taken by Capt. Latimer Needham last summer during his visits to islands off Scotland and Wales; it shows gannets and other sea birds both in flapping and in soaring flight. For some " shots " a telescopic lens was used.

No doubt Capt. Needham will deal with the lessons to be learnt from these films in the course of his series of articles on the soaring flight of birds, which THE SAILPLANE is now publishing.

GLIDER FLOWN AS A KITE.

A remarkable " flight " by the French pilot Abrial is reported in *Les Ailes*. On January 14th, in very squally weather, he took off in the glider AVIA-ÉCOLE, launched by a winch. So strong was the wind that, when he had reached 1,000 feet, it was no longer necessary to wind in the winch. The cable was then gradually let out again, little by little, until the glider had raised itself to 2,030 feet. It could have remained there indefinitely, had not a storm approached and raised the machine's air speed suddenly from 31 to 62 m.p.h., whereupon Abrial deemed it wise to cast off. He had to dive at a steep angle back to earth to avoid being blown backwards, and landed after a flight of 8 mins. 7 secs. The previous record for such a flight was stated to be 6 mins. 22 secs.

CLOUD NOMENCLATURE



The Names of the Clouds.

Fig. 1.—A problem in cloud nomenclature: a patch of cirro-stratus seen at Dartford on May 20th, 1933, at 10.5 a.m. (G.M.T.), looking S.S.E., but at a high angle. The right-hand edge is exactly like the windward edge of a stationary lenticular cloud when not divided into cloudlets, yet this cloud was moving from the top right to bottom left corner of the picture, i.e., from N.W. On the left the sheet takes the form of cirro-cumulus; this was being newly formed as such, and not from breaking up of the cloud sheet. From it some little round knobs are protruding upwards, showing small local up-currents as in castellatus clouds. Other similar patches were in the sky, and all had cirro-cumulus on their N.E. side. At the top right corner is some fracto-cumulus.

Among the cloud types whose names appear in THE SAILPLANE, probably the only one whose identity is never in doubt to any of our readers is that called "cumulus," the common round-topped "wool-pack" cloud that can give the sailplane pilot such valuable clues as to the whereabouts of rising columns of air on sunny days.

But other cloud-names sometimes appear in these columns; more often than not, they are double-barrelled ones, and, though a short explanation of such terms is usually given whenever they are mentioned, it is not to be expected that they will easily stick in the memory without being reduced to some sort of order.

The classification internationally adopted in 1894 has been in general use ever since; it established ten principal types,

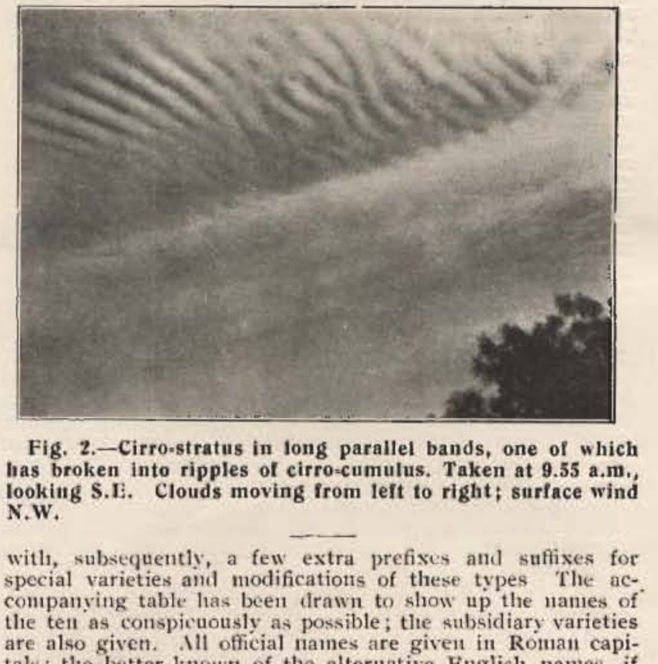


Fig. 2.—Cirro-stratus in long parallel bands, one of which has broken into ripples of cirro-cumulus. Taken at 9.55 a.m., looking S.E. Clouds moving from left to right; surface wind N.W.

with, subsequently, a few extra prefixes and suffixes for special varieties and modifications of these types The accompanying table has been drawn to show up the names of the ten as conspicuously as possible; the subsidiary varieties are also given. All official names are given in Roman capitals; the better known of the alternative English names, if any, are also included.

It will be seen that there are four distinct groups, which may be called for short the Hairs, the Sheets, the Lumps, and the Rain clouds. Thus the clouds are chiefly classified by their appearance, except perhaps the rain clouds, which stimulate another of the five senses; but the rain clouds are really only a special variety of some of the others, and their names are applied not only when it is raining (or snowing), but often when it isn't but looks as if it is going to.

Although clouds have existed for at least as long as the human race, the latter seem to have found it astonishingly difficult to invent an intelligible classification for them, probably because it is next to impossible to draw a hard-and-fast line between one type and another, be the nomenclature never so complicated.

The first man to invent a classification generally accepted by others was the Quaker, Luke Howard, in 1803. He proposed the four simple terms "cirrus," "stratus," "cumulus" and "nimbus," and it will be seen that these words form the basis of present-day cloud classification. In fact, these names correspond pretty well to the four principal groups in the accompanying table, and most of the complication is due to the sheet clouds having had to be subdivided into six, and the rain clouds into two; the cirrus and cumulus remain unaltered since Luke Howard's time.

The "Sheet" Clouds.

It is probably the six subdivisions of the sheet clouds which give novices the most difficulty in getting familiar with cloud names. This is partly because the usual text-books give all the ten principal types one after another in a vertical list, evidently expecting their readers to learn each one of the ten individually and separately, without any attempt to systematise them in an easily remembered form.

The table given here is an attempt to get over this difficulty. It will be seen that the sheet clouds can be divided either into two groups according to their structure, or into three groups according to their height. The first half of each compound name depends upon the height, and the second half

Fig. 3.—Alto-cumulus at Dartford, December, 1932, afternoon. Two different varieties, possibly at different levels. One sheet is divided into globular cloudlets with shadows, the other into thin wavelets without shadows, with a few ripples arranged at a different angle.

denotes the kind of structure.

Structurally the cloud may be either a formless sheet, or it may be broken up into a more or less regular *pattern*. This pattern can be one of speckles, ripples, waves, globules, flakes, plates, rolls, and so on, the smaller subdivisions being usual in the high cirro-cumulus and the larger in the low strato-cumulus; but, whatever the shapes into which the cloud sheet is subdivided, the essential thing is that they repeat themselves—not of course exactly, for Nature never creates two things precisely similar, but in a way that often gives an impression of exact repetition at a cursory glance. Whenever this subdivision is present, the name of the cloud-sheet ends in "cumulus"; where there is no regular or quasi-regular subdivision, "stratus" ends the name (except for the last of the six types, which according to this rule should be "strato-stratus," but is just called "stratus").

As for height, it is of course impossible to estimate this entirely by eye, except where a cloud is in contact with

Fig. 4.—A sheet divided into polygon-shaped slabs, which was noted at the time as alto-cumulus, but might well pass as a thinned-out portion of a sheet of high strato-cumulus. Vale of Llangollen, July 19th, 1932, 6.24 p.m. (G.M.T.), looking West.

a mountain or other object of known height (nimbus often envelops the tops of the Rugby wireless masts), but, generally speaking, cirro-cumulus and cirro-stratus show pure white, while the separate cloudlets of alto-cumulus are often grey in the middle where the sunlight cannot penetrate the whole thickness of the cloudlet, just as alto-stratus is a grey or blue-grey sheet and not a white one. Strato-cumulus is usually in the form of thick rolls or cumulus-like lumps, though the higher varieties can consist of thin polygonal slabs with only a light grey shading.

The name is thus applied according as the cloud sheet *appears* high or *appears* low, and in practice this works out not far differently from classifying the clouds according to their *actual* height. There is, however, one way in which the observer can be deceived. Often a cloud sheet will show large and fairly thick subdivisions over most of its area, but change by degrees into small and transparent cloudlets at its edges; for similar reasons a small finely-divided patch of, say, alto-cumulus, can give an impression of much greater height and be classified as cirro-cumulus. This mistake has so often happened in the past that the latest International Commission for the Study of Clouds has altered the definition of cirro-cumulus, and the term must now only be used when the cloud has developed from, or is connected with, or bears resemblances to, cirrus or cirro-stratus.

Other Clouds.

Chief attention has been given in this article to the subdivided-sheet clouds. The uniform sheets and the nimbus will be discussed in the next article, which will deal with the changes in cloud types, wind direction, and soarability of the air, during the passage of a typical depression across the British Isles. Cumulo-nimbus is such a complicated cloud that it will need a whole article to itself.

Cirrus has not yet been described. It has the appearance of bundles of hair, or at other times, of splayed-out feathers; it is very high up, and its only use to the sailplane pilot is the assistance it may give in forecasting weather; if present in quantity, it may even hinder his soaring by cutting off the sun's heat from the ground.

A. R. S.

Fig. 5.—Strato-cumulus at Dartford, July, 1933. A certain regularity of pattern is discernible, and, owing to a gap in the sheet, a side view of some of the cumulus-like masses in the further portion is obtained.

THE WEATHER OF 1933.

At a meeting of the Royal Meteorological Society held on December 20th, Dr. J. Glaspoole read a paper entitled "The Exceptional Summer of 1933."

The sunshine recorded over the British Isles exceeded the average in each of the four months, June-September, the mean excesses being 21, 17, 35 and 33 hours respectively. During this period many places in the South of England registered more than 1,000 hours of bright sunshine, nearly 200 hours more than usual. The mean temperature over the country generally exceeded the usual amount in each month February—October, and the outstanding feature of the whole summer was the warmth of June—September.

Since it has been suggested that the sudden outburst of thermal soaring last summer—the first time purely thermal flights had ever been done by British pilots—may have been partly due to the exceptional conditions, these figures may be of interest.

Fig. 6.—Small cumulus masses with, in the lower half of the picture, a tendency to repetitive arrangement suggesting strato-cumulus. Transition forms between the two types are common. The "Tern" sailplane is seen circling in a mild thermal current, the photo being taken during the Huish meeting last year.

"WEATHER AND GLIDING"

Notes on a Lecture given by SIR GILBERT WALKER, F.R.S., to the Imperial College Gliding Club on Nov. 21st, 1933.

Sir Gilbert Walker, who is Professor of Meteorology at the Imperial College, and is also on the Council of the British Gliding Association, is to be presented on January 17th with the Symons Gold Medal for 1934. The medal is awarded biennially by the Royal Meteorological Society for distinguished work in connection with meteorological science. We take this opportunity of offering him our congratulations. Sir Gilbert was also President of Section A (Mathematical and Physical Sciences) at the British Association meeting last year, and gave his presidential address on the subject of "Seasonal Weather and its Prediction."

The present lecture was essentially a review of what meteorology has to say on the subject of soaring flight, and the first part of it covered very briefly much the same ground as two lectures given by Capt. F. Entwistle some time back (reported in our issues of March 27th, 1931, and March 15th, 1932), and his own lecture of last year (see issues of March 17th and April 28th). So we will devote our available space to those matters with which our readers are less familiar.

Among the numerous slides projected on the screen was a particularly interesting diagram showing the changes in wind direction over different parts of a plot of land 500 feet square, the records being made on a fairly windy day in winter, and readings measured over every 10 seconds. It was evident that when the air flow at the various spots converged towards one particular region, there must be an up-current there, while divergence showed the presence of a down-current. (It was rather surprising to learn that this is the only instance the lecturer knew of such an investigation being made. Evidently such research work has hitherto been regarded as of no known practical use.) As an example of the same thing on a more violent scale, Sir Gilbert said that in India as many as 20 or 30 "dust devils" had sometimes been seen simultaneously, and he regarded such a phenomenon as an example of the "cellular" arrangement of up-currents on which he has lately done research work. As an instance of the velocity of thermal currents near the ground in India, he mentioned that cigar smoke had been known to rise as fast at 5 ft. per second.

In talking of thermal currents, in which birds can sometimes be seen circling spirally upwards, Sir Gilbert Walker mentioned that, if there is any wind, the axis of the spiral does not go vertically upwards, but is inclined away from the wind. Consequently a bird going up in a thermal current appears to drift away with the wind, and this is usually explained by saying that the thermal current itself is travelling away down-wind. Sir Gilbert does not agree; he thinks that in such cases the current is sometimes stationary, and that the gradual shifting of the circling birds down-wind is due to their desire to keep within the rising current as they go up. (See Fig. 1.)

As a further argument, he mentioned the slope away from the wind that some small clouds exhibit, and drew us some like those shown in Fig. 1 (upper part). The common theory is that, owing to the increase of wind speed with height, the tops of the clouds get blown on ahead of their bases. Sir Gilbert characterised this idea as absurd, because the top and bottom of the cloud would then part company. He therefore believed in the only likely alternative. (We have drawn Fig. 1 to illustrate this.)

We take it that Sir Gilbert Walker has reached this conclusion from theoretical considerations alone. We must, however, beg most respectfully to differ from it, for our own observations do not bear out his theory. The sloping small cumulus clouds that we have seen have invariably been moving along with the wind, and we would attribute their failure to be torn in half to the fact that such clouds do not usually live longer than about a quarter of an hour, and have melted away before the tearing action can take effect. Our explanation of the sloping of the cloud would therefore be somewhat as in Fig. 2, the arrangement of several clouds in line, if present, being a result of Hirth's "bubble" effect. To show that this is not mere speculation, we reproduce (Fig. 3) a series of drawings of a small cloud seen at New Cross, in which the progressive increase of slope is well seen, and it even looks at times as if the top end really will get torn off.

After this we were prepared for further unorthodoxies, and were not disappointed. In replying to a question, the lecturer put forward the very interesting and original suggestion that upward currents might be formed *above* cumulus clouds owing to the upper surface of the cloud becoming heated up, for cumulus clouds, like the ground, are opaque to heat. We might mention here that Kronfeld's soaring flight on July 30th, 1929, from the Wasserkuppe to Bayreuth (93 miles, at that time a world's record), included some soaring over cumulus tops. After rising through an enormous cumulus to 7,000 feet above the start, he found himself well above all the other clouds. In "Kronfeld on Gliding and Soaring" (p. 137) he describes how "although at first I tried to slip through between the cloud peaks I soon found myself flying calmly just above the clouds, for they bore me perfectly." His experience is, however, capable of the alternative explanation that the air above the clouds is being pushed up from below by the growing cumulus. The evidence for this is in the type of cloud that forms above an actively growing cumulus. Often a flat "cap" of thin cloud will appear above the cumulus top, later to become a "scarf" as the cumulus pushes up through it; while A. W. Clayden, in his "Cloud Studies," suggests that small patches of alto-cumulus cloud often form high above cumulus clouds for the same reason. But does one ever see one cumulus directly above another, as might happen if Sir Gilbert Walker's suggestion is correct? There is a type of cloud called "castellatus," which looks very like miniature cumulus and forms at high levels in unstable air. The lecturer threw on the screen a photograph by Captain Cave showing the exceedingly rare phenomenon of cumulus and castellatus cloud together in the same sky (but not as an illustration of the theory here mentioned).

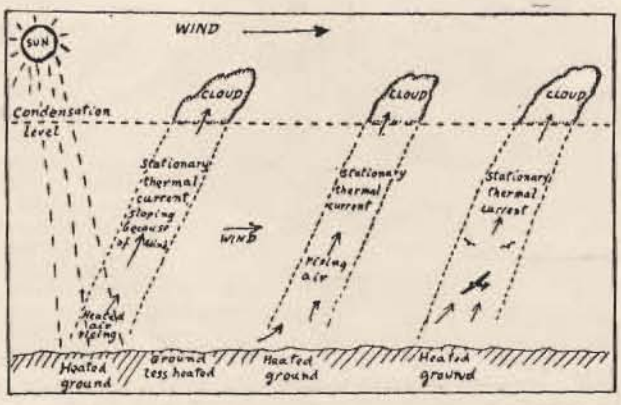


Fig. 1.—This diagram requires modification: See Sir Gilbert Walker's Comments.

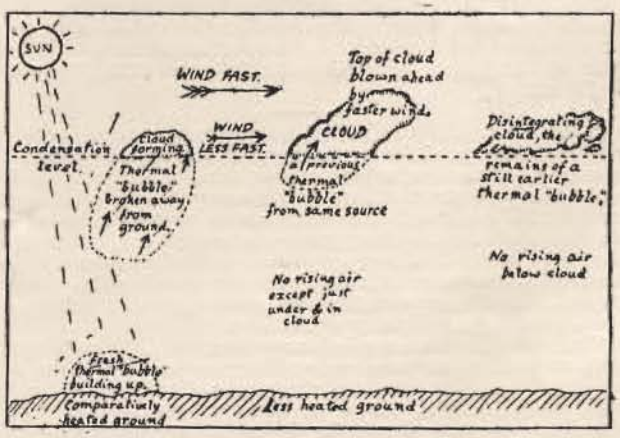


Fig 2.

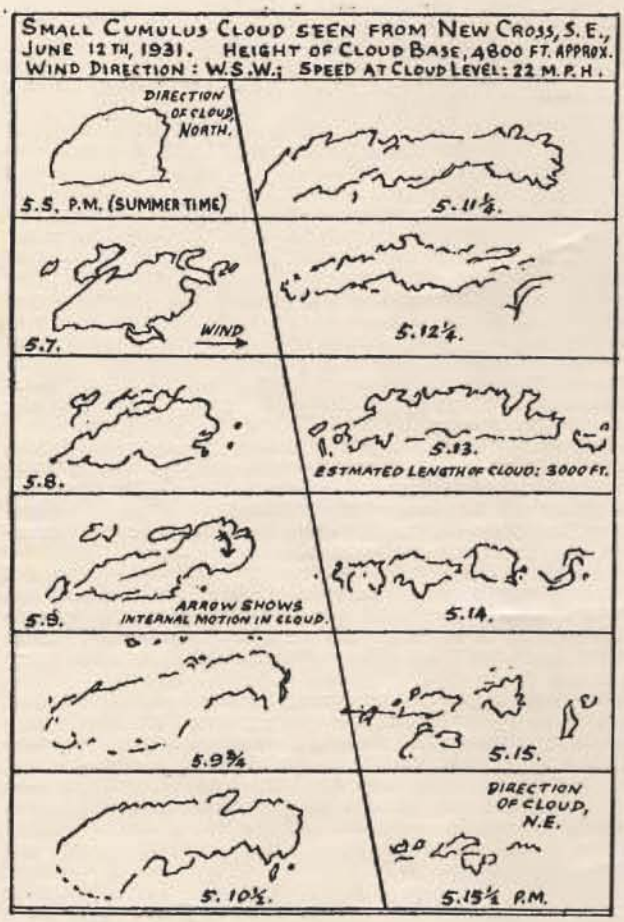


Fig. 3.—Drawings of a small cumulus cloud, showing progressive changes; the first drawing was added from memory after the rest were finished. The cloud was probably only a few minutes old when first seen. The wind speed at cloud level was found by measuring the speed of cloud shadows over the ground. This was compared with the apparent velocity of clouds passing overhead to find their height; the dimensions of any cloud could then be roughly calculated by comparing its apparent dimensions with its apparent height above the horizon.

The experiences of balloonists may throw some light on the subject. Mr. Gordon Selfridge, Jnr., describing a recent balloon voyage of his, during which an attempt was made to get down through a large cumulus cloud, wrote: "The basket entered the cloud, and we immediately started to rise again; this was caused by the sun's warmth reflected on to the bottom of the envelope, which gave us more lift, and we had to valve more gas." It is conceivable that the real cause of the balloon's rising was a "thermal current" just above the cloud top.

A further effect of the presence of such a rising current would be a convergence of air flow across the upper surface of the cloud; this flow should be rendered visible by a corresponding movement of parts of the cloud top. We have never noticed such a phenomenon, but it might easily be masked by the (probably stronger) opposite tendency, in a growing cloud, for the upward protuberances to be forced away from each other by portions of the cloud newly ascended from below, as well as by their own continued enlargement.

Clouds over mountain tops, the lecturer said, are of two kinds. The first is shapeless, and is formed by moist air climbing up the slopes. The other is in the shape of a "banner," to leeward of the mountain, and this category includes also the lenticular type. Clouds of this type may remain in the same place for half a day, although the wind is blowing through them all the time. (He did not mention that a lenticular cloud can be and has been soared under, as recorded in THE SAILPLANE of June 23rd, 1933.)

Dynamic flight was explained by the lecturer. This is a method of soaring flight by which, instead of rising currents, changes of wind velocity or direction are utilised, the bird (or sailplane) having to manœuvre so as continually to maintain its air speed. In England, he said, crows fly by this method on a gusty day, while in India an exhibition of dynamic soaring by the birds could certainly be seen. If the day was sunny the birds would be gliding in their normal manner; but when clouds passed before the sun, all the birds would come down. Then, if stormy weather developed, the air would be full of birds performing dynamic soaring in all directions. Sir Gilbert Walker was certain that, if children could only begin learning at the age of 3 or 4, they would be able to perform dynamic soaring quite as skilfully as the birds, for he attributed the latter's ability to long practice rather than to instinct.

Another kind of dynamic soaring was practised by the albatross, who utilises, not gusts, but the fact that the wind blows slower at sea level than it does higher up. The bird alternately rises into the wind and then turns and glides steeply down with the wind behind it. This needs a stiff breeze for it to be successful; the lecturer said that a wind of 20 m.p.h. was not enough, and that is why the albatross keeps to the "Roaring Forties" and never comes north of the Equator.

A most interesting lecture, but rather poorly attended. (THE SAILPLANE had not been told in time to advertise it!)

Sir Gilbert Walker's Comments

The above notes were shown to Sir Gilbert Walker, and he has very kindly sent the following comments:—

"I am very glad that my remarks have stimulated discussion.

"1.—First of all the reason why we have not more examples of simultaneous wind measurements at a group of neighbouring points is chiefly the expense; there were at Cardington four equipments of special self-recording anemometers running at 144 times the rate of those at an ordinary first-class observatory on towers 50 feet high. Ordinary instruments would be useless.

"2.—The difference of attitude regarding sloping clouds between the Editor and myself arises because we refer to different things. I did not make it clear that I referred to clouds produced in cells, a 'cell' being a pattern of steady motion set up, in the sky as well as the laboratory, in a vertically unstable layer of air when the wind is blowing faster at the top than at the bottom. Thus in the Editor's Fig. 1 the ground should be represented as uniformly heated, the distance between the ascending columns being decided, not by local inequalities in the heating, but by the thickness of the layer of unstable air. In this connection a 'thermal current' is due to general heating of the ground, not to local heating. Accordingly we should expect, and we find, that the slope in strato-cumulus clouds of this type is roughly constant. On looking through my handbooks for a photograph showing typical sloping clouds I picked out Fig. 69, p. 204, of Wegener's 'Thermodynamik der Atmosphäre,' and there Fig. 70 shows that there were strato-cumulus clouds in the North Atlantic trade-region arranged in rows between which are lanes running N.-S. and E.-W.; thus the clouds were products of a uniform layer, not of local heating.

"On the other hand, the Editor's clouds are of isolated cumulus due to local heating; and with his remarks on his Figs. 2 and 3 I agree.

"3.—Regarding my suggestion that ascending motion above a cumulus cloud might be produced by solar heating of its upper surface, I see that Wegener put it forward in 1911, but remarked that it was probably only of secondary importance. This ascending motion is chiefly due to the main up-rush that produces the cumulus below; and the strong up-rush associated with the cumulo-nimbus of a thunderstorm may produce cloud at several successive inversions which may be kilometres above the main mass. As cloud formed in this way has been observed at a height of 8 km. it would appear that a sailplane might on this occasion have used the thunderstorm to climb to a height of 26,000 feet."

SOARING IN THE UNITED STATES.

It is some time since we gave any news of American soaring; this is not because we have no news to give, but because there is so much of it that a fair-sized article will be required to get it all in. So far, the space for such an article has not been available, but we hope to include it in our next issue.

CORRESPONDENCE

THE SCUD II.

Sir,

It is a pity that Mr. Baynes takes it that way. His main line seems to be nothing more or less than the last-ditch legal method of "discrediting the witness." Of course he has every right to do this, but one would have preferred something more rational and less acrimonious, something more typical of Mr. Baynes.

You as Editor publish the best of the contributions that you receive, presumably praying for something better. To my certain knowledge Mr. Baynes can supply you with many better things, but he does not send them in. I shall always be grateful to him for a complete correspondence course in Aeronautics without Tears. If you can persuade him to send you the manuscripts, you will be able to exclude "Die-Hard" articles for six months, to the benefit of THE SAILPLANE.

Meanwhile you are left with the "Die-Hard" articles. But, poor and misguided as they may be, they are at any rate written in good faith and are based upon first-hand experience, not only of the writer, but also of some other pilots who, like the writer, grab joyfully at a chance to fly any fresh machine even if the owner insist on being handed a blank cheque before the launch.

The articles bring no remuneration and no kudos to the writer, but they serve their purpose. They dispel lethargy. "Kentigern," "Northern Nomad" and Mr. Baynes have all three been forced into print. This, as the French say, is already something. But at present Mr. Baynes has only come down half-way from his Olympian heights. All being well we will one day have him spending half his time in doing ground-hops and the other half in putting his theoretical knowledge into print as well as into SCUDS. That will indeed be great.

DIE-HARD.

ON MANY MATTERS.

Sir,

The correspondence in the January issue of THE SAILPLANE would appear to a stranger to present a lamentable scene of strife within a purely sporting movement. And yet really we are an extraordinarily united and inter-dependent lot! If the angel of concord decided to go round with a heavenly sand-bag, he would only have to wield it twice or thrice, and once more peace would reign. I am deeply sorry, Mr. Baynes—I myself did not know that my semi-own SCUD was a freak size—so how could poor "Die-Hard" know, as I didn't tell him.

Now may I descant still further on the B. G. A. Nearly everyone overlooks a most vital section of our adherents. The members of all gliding bodies can probably be split into three sections :—

1. The 100 per cent. hairy-chested "C" men (including aspiring dittos).
2. The 100 per cent. self-seekers (including me-toos and all the other scoundrels so ably epitomised by "Thirty-Hours").
3. The people who are so deeply interested in gliding from one or another angle that, without being able (for one of a multitude of reasons) personally to adventure the air, they are prepared to undertake all the really thankless jobs such as pulling on bunjies, collecting money at meetings to pay the expenses thereon, etc.

It is this last class that seem to me a definite proof of the all-seeing benevolence of Providence, who provided them. They are heroes who do their unpleasant but essential jobs unsung and definitely unhonoured. Neither "Thirty-Hours" nor I are amongst their number. We merely benefit by their unselfish services.

And if you asked "Thirty-Hours" for *proportions* even he would not put it worse than class (1) 20 per cent., class (2) 5 per cent., class (3) 75 per cent. Yet a great many rude things have been said by many people impartially against everyone who does not fall under class one. Ingrates all! If you cause class three to retire hurt, you will suffer both financially and practically—you certainly would hate to do their work yourselves. Now about THE SAILPLANE—it may be asking too much of the ubiquitous editor to give us similar figures for London Gliding Club members who are subscribers or not. But I make a guess than they would look about as bad. And is it more reprehensible for, say, a meteorological member of the B.G.A. who doesn't want to read it, not to buy THE SAILPLANE; or for leading and opulent members of the L.G.C. who are intensely interested in it, to sneak into the Royal Aero Club every month and avidly consume the contents, gratis, in a dark corner? . . . And yet many do.

Now as regards modernisation of the B.G.A., this has really been going on quietly all the time. Perhaps the prime cause of the trouble is that the elective powers for the Council were drafted when there were nearly 100 clubs, each entitled to a representative. Consequently quite a large number of representatives of ordinary and non-flying members was reasonable. Now the number of Clubs has sunk to the twenties, consequently the proportion of club to non-club members on the Council is thrown out. And I do not think there would be any opposition at all to an alteration in the rules in this respect.

With the expressed object of making it easier for distant clubs to attend, the number of Council meetings have recently been reduced to a minimum of four a year. The expenses of the association have been reduced to a really absurd figure, less than half the £100 annually which by common consent has been called a reasonable maximum.

I am honoured at "Thirty-Hours'" kind words to myself But if he only knew the number of hours, both business and spare which I have found myself devoting to gliding matters recently, he would not ask me to take on more. I should get the sack, and leave the gliding field for the Bankruptcy Court.

The really important remaining improvement to be hoped for lies, in my opinion, in the carrying out of Mr. Hardwick's excellent suggestion of consolidation set forth in the January SAILPLANE. If that can be brought about, the last cloud will have rolled away, and we can set out on a 1934 season devoted solely to improved aerial performances, and hindered only by a possible continuance of the vile Easterly weather of the last six months. Which is probably the real cause of all this crossness.

P. A. WILLS.

REGULATIONS GOVERNING SIZE OF TRAILERS.

Uncertainty as to what is the maximum permissible size of a trailer may prove a source of worry to anyone who contemplates the design or purchase of a sailplane of large span. A member of the London Gliding Club recently wrote to the Secretary of the Automobile Association asking him what were the present regulations on the subject, so the following extracts from his reply may be of interest:

"Limits to the size of trailers are laid down by the Regulations which provide that the overall width shall not exceed 7 ft. 6 ins. and the overall length 22 ft. The latter, however, is subject to the qualification that this requirement shall not be applicable in the case of a trailer constructed and normally used for the conveyance of indivisible loads of exceptional length.

"Further, you will be interested to know that the Minister has specially authorised the drawing on roads by motor vehicles of aircraft the overall length of which does not exceed 30 ft., and the weight 1 ton notwithstanding that such aircraft do not comply with the requirements of the regulations.

"In the case of a trailer on which the glider may be transported, if exceeding 2 cwt. in weight unladen it will require to be fitted with an efficient braking system but this will be complied with by a brake operating automatically on the overrun of the trailer provided the vehicle does not exceed 1 ton in weight unladen.

"Also, a person in addition to the driver is to be carried for the purpose of attending to the trailer if the latter is equipped with more than two wheels.

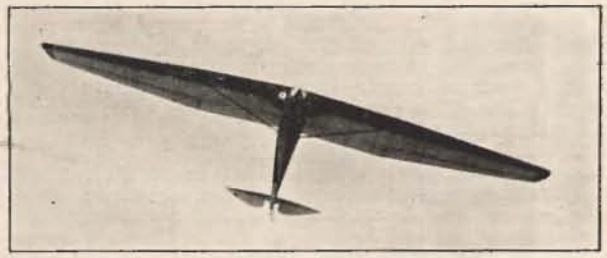
"No additional tax will be payable in respect of the trailer if drawn by a private car taxed on the basis of horse-power."

WHO TO WRITE TO.

Subscriptions, and enquiries concerning subscriptions, should be sent to the Publishers of "The Sailplane and Glider," 43, Chancery Lane, W.C.2.

Questions upon matters which are the concern of the British Gliding Association should not be addressed to the Editor, but to the Hon. Secretary of the British Gliding Association, 19, Berkeley Street, W.1. A stamped addressed envelope must be enclosed.

NEWS FROM THE CLUBS.



The "Willow Wren," piloted by its designer and constructor, W. L. Manuel.

DORSET GLIDING CLUB.

Gliding Meetings are being held at Maiden Newton each Sunday at 12 o'clock. (Saturday meetings will also be held later on, when the days are longer.) The first Gliding Meeting of 1934 was billed to take place on the 14th January. The Clerk of the Weather, who knows that gliding men like a little wind for their sport, did his best, but evidently over-estimated our requirements, providing a hectic gale from the S.W. which put paid to any thoughts of gliding that week-end.

On **Sunday, the 21st Jan.**, there was a good attendance at the hangar (mostly non-members) in the hopes of there being something doing, but on this day the Weather Clerk went to the opposite extreme, and a dead calm prevailed. Not a breath of wind from any quarter. We, however, spent a useful hour or two in final adjustments to DAGLING, and also did a job on the club car; and then stowed both away for another week, hoping for better luck the third and next time.

So come along chaps! Leave all your troubles on the ground, and get into the air. GLIDE! and take a look at the world from above.

Keep your tail up, and KEEP UP YOUR SPEED!

We have lost a staunch and energetic member, and our senior "C" pilot, by Mr. A. L. Haslam's removal to Hanworth last month. While regretting his departure from our ranks, we at the same time wish him success and happiness in his new job.

Constructional Work.—The work of building a B.A.C. VII. two-seater sailplane has commenced in earnest.

Work meetings are being held at Weymouth each Tuesday and Thursday evening at Marsh and Wright's Workshop, Victoria Street; also at Dorchester at Mr. W. H. Davis' Workshop. Come along and lend a hand.

[We are most gratified to see that the Club News-sheet, from which the above paragraphs are extracted, includes an appeal to all the Club members to take THE SAILPLANE AND GLIDER regularly. It says: "We should all be very sorry to see this excellent journal fade out for lack of support, the more so because it is quite unnecessary that it should, if all those interested in the gliding movement will buy a copy each month." How true! Further (and this is an idea that other Clubs might well copy), at the end is an inviting-looking form, all ready to be filled in on the dotted line, torn off and despatched to the SAILPLANE Office with the necessary 5s. 6d. or 10s. to bring the journal regularly to your door.—ED.]

A CLUB FOR GUERNSEY.

The first general meeting of the Guernsey Gliding and Sailplaning Club was held at the Rectory Hall on January 17th, according to the local press. It was decided to purchase a shop-soiled machine which had been offered at a reduced price by Messrs. Abbotts of Farnham. A lady member generously offered to loan the Club £20 to help towards the purchase.

The entrance fee was fixed at 2 guineas and the annual subscription 1 guinea; persons paying one guinea can become non-flying members.

The registered offices of the Club are at 9, Le Marchant Street, Guernsey. The Hon. Financial Secretary is Mr. B. C. de Guérin. Other executive officers are: President, Mr. O. Priaulx; Vice-President, Mr. C. W. Noel; Committee, Messrs. R. Le Lacheur, C. Smith, J. Beasley, R. S. Mallett and — Seedman.

Between 30 and 40 persons attended the meeting, including two ladies.

No mention is made of a flying site, but a writer in another local paper suggested some months ago that "the Vardes Hill at L'Ancasse should be a very suitable spot for a take-off."

LONDON GLIDING CLUB.

Sunday, Jan 7th.—Yesterday a violently gusty south-west wind banged up against the hill obliquely. The KASSEL 2-seater was flown down once, with a passenger, but the pilot found that conditions were so unreasonably rough that he put the machine away without any further ado. The PRÜFLING took off, and in spite of all up-currents sank pretty well straight down, landing in the centre of the landing-square, intact. The second attempt, with another pilot, was even more alarming. The machine reared up to a hideous extent, went through a set of spontaneous aerobatics, and walloped back on to the hill-top, slightly damaging a wing-tip. This pilot had previously said that he wished to learn how to do "slips."

To-day the wind was even more vicious, but mercifully its direction was all wrong, and work was confined to the workshop and to repairs to club cars, which now include a six-cylinder 20-year-old. Curiously enough, the attendance was the best for many weeks. The SCUD arrived fruitlessly, its towing-car driven by a bowler-hatted gent whose sartorial elegance turned out to be superficial. There was a great deal of chat, our visionaries and pseudo-legal lights having regained their form. The nacelled R.F.D., newly obtained from Bedford, looks a nice stout piece of work. It has traffic-lights in its bows, for signalling to the launching car; strange, but true. Also two levers on the dash-board for releases fore and aft. Her manufacturer's number is immediately adjacent to that of our old original R.F.D.

Saturday, Jan. 13th.— At last the horrible run of foul winds has broken. This afternoon there was a fleeting spell of good soaring on the home stretch, with the wind S.W., 15 to 20 m.p.h. The PRÜFLING, KASSEL 2-seater with passengers, KASSEL 20 and SCUD II brought back a joy into life by soaring simultaneously, making seven flights, aggregate about 2½ hours. At tea-time the wind backed prior to a gale, the lift went, and the machines were flown home.

Sunday, Jan. 14th.—A howling gale from S.W. Deep depression touring N.E. across the Midlands. The lee-end of the club-house was sucked away from its moorings, but was prevented from taking off. After lunch the vice had gone out of the wind and the four machines of yesterday went into action. Fourteen soaring flights, six passengers carried, many hill-top landings, the Zoo reached twice, maximum heights about plus 350 feet, uncanny lift over the club-house after sunset, lots of fun, and everybody beaming with old-fashioned good humour.

Conditions were delightfully gusty, the loaded two-seater tramping through them like a steamroller, and the SCUD II hopping as lively as a cricket. And we finished with four whole machines and an immense tea. The poor CRESTED WREN was not so lucky, being heaved into the air at the launching point and slammed down on her wing-tip and elevator-tip, thus putting her out of the running for the first time in sixteen months' hard labour.

This is just the kind of day that puts a curl in the Club Tail. It makes one thankful at having survived until now. The last three months have been utterly infuriating. There have been livers, thoughts of suicide, wars, and rumours of wars. But now—Hallelujah! All is well again! Nations may rage, and kings and empires fall, for all we care, just so long as the wind stamps in heartily from the west. (Heaven, please note, and act accordingly.)

Saturday, Jan. 20th.—Practically a flat calm. Repeated descents from the hill-top, without untoward incident, of the open R.F.D. and PRÜFLING.

Sunday, Jan. 21st.—A beautiful sunny morning with a faint air from the south-east backing to east. The overhaul of the Beardmore PROFESSOR fuselage being completed, the wings were extracted from store and aired in the sun prior to detailed examination. Beginners and others, a dozen altogether, were given hops all day in the R.F.D., the big boys having a violent auto-launch as a special treat. Nothing came un-

stuck. The Order of the Groggy Aileron, First Class, is being bestowed upon the sportsman who drove his nice car over the grass at 35 m.p.h. in order to propel fat men as near to heaven as they could get. A pleasantly large attendance of members, much amiable cackling, adequate bartakings, and oceanic mud. That is to say, a picnic.

Saturday, Jan. 27th.— After a glorious but wasted soaring wind in the morning, conditions died down until the SCUD II and KASSEL 2-seater took off at 3.30 into a feeble N.W. breeze. After a struggle to remain in the air, the SCUD II picked up magic conditions near the Zoo and toured about with impunity. The KASSEL 2-seater dashed over to the aerial fountain, found it, and by stepping from heave to heave was soon soaring and circling comfortably, half a mile in front of the hill. This refreshing phenomenon was clearly associated with the passage of a large patch of rain. After twenty minutes conditions went back to their original feebleness.

Sunday, Jan. 28th.—Lots of harmless amusement-park-fun with the R.F.D. in the morning in practically a dead calm. In the afternon the HOLS, PRÜFLING, KASSEL 20, R.F.D., and CRESTED WREN slid down the bannisters until dark, coming to no harm. A trifling N.W. air put a little extra fun into the proceedings, the CRESTED WREN managing to delay her descent for four minutes by vigorously chasing her tail close up to the hill-side. One day there will be a general craving for nimbleness rather than for hair-splitting over sinking-speeds.

Anyway, a most enjoyable time was had by all, as the local paper said. Noble flew down from the hill-top, Smith Tertius was promoted from the flat to the door-step, Ivanoff naughtily side-slipped, the Editor himself flew the KASSEL 20, Smith Major adorned the landscape, the mud was fruity, and nothing was broken. And yes, our Vice-Chairman was there.

ROCHDALE GLIDING CLUB.

We have no activities to report over Christmas and the New Year.

Jan. 6th.—Wind 15 m.p.h. Six members and one prospective member turned up, so we rigged DICKSON. Each member then had two slides each. McLaughlin and Edwards each managed a hop before darkness put a stop to the activities.

Jan 13th.—Wind 2 m.p.h. Six members again turned up, but try as we would, DICKSON refused to come unstuck. Curses on these absent members.

Jan. 14th.— The Gale. Our ground flyers had a beano.

SOUTHDOWN GLIDING CLUB.
1933 Annual Report.

The year 1933 opened with a depression in the Gliding Movement generally, but the Club's policy of progress has been well maintained, and the future is bright with promise.

In January the Headquarters of the Club under its new designation of "Limited" were registered at the existing address of the Hon. Secretary in Tisbury Road, Hove; and as he was giving up his tenancy of Gliding Rights at Balsdean in the ensuing March, he and the Vice-Chairman negotiated for the use of the site and barn at Steep Down, Lancing; whither all Club property was subsequently transferred and where operations have been continued with success throughout the year.

Several new members have joined the Club, and there is a general re-awakening of interest in gliding locally. Certificates gained by members during the year raise the Club aggregate to the following figures:—"A" 51; "B" 26; "C" 14.

The Club has been represented at two open competitive meetings organised during the year by the British Gliding Association—at Huish (Wilts.) and Sutton Bank (Yorks.)—where outstanding flights of altitude and distance were put up by Messrs. Little and Reffell. At the former meeting the Club's two-seater dual-controlled sailplane was hired by the B.G.A. and used for a month in instructional and pleasure flying.

The Club is pleased to record the well-deserved honour accorded to its Chairman—Mr. R. F. Dagnall—by the B.G.A. in electing him as a Vice-President in return for his many services to the Movement. Mr. Dagnall has continued his benefactions to the Club this year, as, in addition to the presentation outright of his high-performance sailplane, he has provided work-shop accommodation for the overhaul and repair of gliders and presented car batteries and secured the gift of a Chrysler car to the Club for auto-towing purposes.

Club equipment now comprises: one training glider with spare fuselage, etc.; two secondary gliders; one dual-controlled two-seater sailplane, and one high-performance variable-span sailplane; together with three glider-trailers; two cars (retrieving and auto-towing); a hand-trolley; launching ropes; quick release apparatus; sundry spares and repairs materials.

New sites have been reviewed at Saddlescombe and Wolstonbury Hill and give promise of scope for advanced work in soaring.

In September the Hon. Secretary removed to the above-given address, at which the Office is registered together with a Club "Bar."

Recently negotiations were concluded for the tenancy for another year of the Site and Hangar at Steep Down, Lancing (reached via Passmore's Farm near Lancing College), and here is stored all Club gliding property in good condition.

The balance-sheet discloses that the Club is in a sound financial position. During 1933, liabilities to the amount of £39 have been discharged, and the year closes with a cash credit balance of some £10.

An important step with regard to membership fees was the introduction recently of the plan whereby members may now pay their annual subscriptions by instalments, i.e., 10s. 6d. quarterly in advance.

It is proposed to hold the Annual Ball on March 3rd, a variation this year being that of fancy dress.

Officers elected for 1934: Captain, A. H. Reffell; Treasurer, Dr. V. C. Hackworth; Secretary, A. York Bramble; Chief Ground Engineer, G. A. Little.

[The Hon. Secretary writes that new members are joining steadily, and training is proceeding regularly; and that the Club is operating one of its sailplanes and one of the intermediate machines every week-end at the Lancing site. The last flying news which we received from the Club was dated January 8th, 1933.—Ed.]

LAST MONTH'S WEATHER

LAST MONTH'S WEATHER.

Throughout most of the month a series of depressions from the Atlantic passed over the British Isles, giving winds chiefly between south and west. The sequence was, however, twice broken by short periods of anticyclonic weather with light winds, and it so happened that these coincided with two out of the four week-ends.

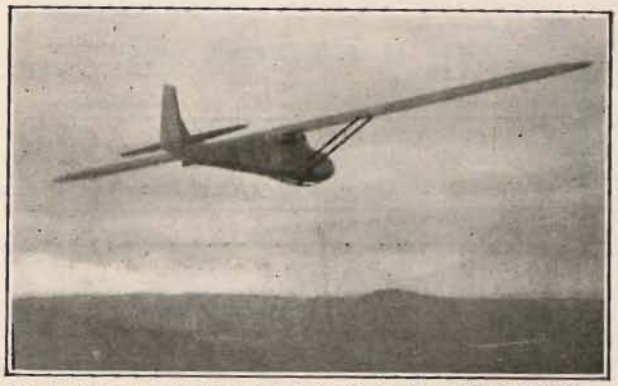
Week-end Jan. 6th and 7th.—The weather was dominated by a depression which covered Ireland on the Saturday morning and spread to most of England in the afternoon. Sunday was a wet day, with S.S.W. winds. The "cold front" which brought clearer weather crossed England from the north-west during Sunday night, leaving a W.S.W. wind in its wake.

Week-end Jan. 13th and 14th.—This came in the middle of a period of very stormy weather. The *centres* of the depressions which caused such weather passed to the north of the British Isles, as usual—with one exception, and that exception happened at the week-end. On the morning of Sunday, the 14th, a depression was centred over the middle of England; it had come in quickly from the south-west, and it passed away rapidly over the North Sea; consequently the wind in Southern England veered on Sunday morning from S.S.W. to W.S.W., and in the latter wind some fine soaring was done at Dunstable. Northern England, being on the other side of the centre, experienced a change of wind through east to north.

Week-end Jan. 20th and 21st.—After the last of a series of depressions had passed away on Thursday night, the 18th, a wedge of high pressure insinuated itself and later developed into a separate anticyclone. Weather was calm over the week-end, with fog in places, except that in Northern England south-west winds gradually set in, heralding more bad weather from the Atlantic, which, however, was several days in coming.

During the following week a depression centre passed to the north of us, sending a couple of "fronts" across the British Isles. Afterwards weather became again anticyclonic for the **week-end Jan. 27th and 28th**—that is, if the week-end be considered as starting on Saturday evening; for earlier on the Saturday some unexpected lift was found by a sailplane pilot at Dunstable, right away from the hill, in the north-westerly wind left behind after the passage of the mid-week depression.

Clouds.—No cumulus clouds whatever were noted at Dartford during the month; only on the 15th, the day after the



W. B. Murray starting for a flight in the "Kassel 20" at Dunstable on January 14th. Showing low clouds of a depression which was crossing the Midlands.
Photo by W Exner.

depression which was centred over the middle of England, small clouds with a tendency to develop rounded tops appeared in the morning, but later they became merged into a sheet of nimbus. Similar clouds were seen on the 19th.

The passage of a cold front is usually followed by rather unstable air in which cumulus, and sometimes cumulo-nimbus, can easily develop. These are good clouds for soaring, but they were absent during January.

Lapse Rate.—Since Jan. 21st we have been receiving all three sections of the Air Ministry's published weather reports, instead of only one as heretofore. These include a lapse rate diagram, on which are plotted the observations of air temperature at different heights as found by aeroplane ascents at Duxford and various stations in Europe. At this time of year the air near the ground is usually stable; the diagrams will be more exciting during the summer.

Two of last month's diagrams are, however, worthy of note. On the 25th, a depression to the north of us sent two "fronts" across the British Isles, as already mentioned. These were both "occluded" fronts, i.e., in each case the cold front had overtaken the warm front and lifted the "warm sector" (a body of relatively warm air usually present in the rainy part of a depression) right off the ground. The lapse-rate diagram for that day shows in all parts of Europe a terrific "inversion" at 2,000 to 3,000 feet; that is, immediately above that layer the air was 15 to 25 degrees hotter than just below it. The air in the "inversion" layer would have been so stable that a sailplane pilot soaring over a mountain would probably have found it impossible to get up through; if a mountain sticks up into such a layer, the air tries to get round the mountain instead of over it, for such a well-developed "inversion" is a barrier which up-currents find it hard to penetrate.

The other interesting diagram is that for the 27th, the day on which a sailplane at the London Club was able to soar in a patch of rising air unconnected with the lift over the hill. On that day the meteorological aeroplane at Duxford (which is not so far away), ascending at 8.15 a.m., found a more-than-adiabatic lapse rate between 3,250 ft. and 4,770 ft. The fall of temperature in going up through this layer (1,520 ft. thick) was 10.5 degrees Fahr., or nearly 7 degrees per 1,000 feet. This is about 2 degrees more than the adiabatic rate for dry air, and even more in excess of the rate for saturated air (which applied in this case because the layer was filled with strato-cumulus cloud). The extra lift at Dunstable was, according to the London Club Notes, "clearly associated with the passage of a large patch of rain," which looks as if the clouds at that point were extra thick and the region of unstable, specially soarable air extended nearly down to ground level.

Wind Percentages.—The following figures give, in every case, percentages of the total winds of all kinds during January at Kew Observatory; they were measured from the published "wind rose" with a ruler, and may be about 1 per cent. wrong. There were 4 calm days :—

Wind Direction.	*All Winds.*	*Winds of over 12 m.p.h.*
N.	3	0
N.W.	5	0
W.	14	4
S.W.	27	14
S.	25	9
S.E	0	0
E.	3	0
N.E.	6	0