THE SAILPLANE & GLIDER

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

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

OFFICIAL ORGAN OF THE BRITISH GLIDING ASSOCIATION.

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

NOTE: There will be an interval of three weeks between this issue and the next, i.e., the NEXT ISSUE will be published on JULY 14th. Fortnightly publication will then be resumed.

Soaring Flight.

We have no doubt that members of the public who attend the Huish meeting will be suitably amazed when they see, as they may do any day when there is a south wind, a glider keeping up for minutes, or even hours, without losing any height. We would, therefore, remind any of them who are good enough to buy this journal that this is the normal way in which a glider is intended to be flown. It is what we call "soaring flight." If a glider is seen merely gliding from the top of a hill to the bottom, it is either because the pilot is as yet only in the elementary stage of learning to soar, or because the wind conditions are such as do not permit the glider to be soared.

Keeping up a glider for two hours is *not* twice as wonderful as keeping it up for one hour, any more than a man who rides a bicycle for two hours without falling off is twice as clever as the man who dismounts at the end of an hour.

Our weekly contemporary, *Cycling*, does not make a great splash of headlines whenever anybody keeps up on a bicycle for more than a minute or two; nor do we make a similar splash when anyone in this country performs a soaring flight. News of such flights, if recorded at all, will usually be found in the Club News at the end of the paper, where they are rightly regarded as part of the routine activities of a gliding club.

Lenticular Clouds.

What does get us all worked up, however, is the news of some entirely new development in the art of motorless flying, whereby a new region of the Kingdom of the Air is opened up to those who would adventure therein.

Such an occasion is that recorded in this issue, when Hans Deutschmann and Wolf Hirth, both of whom we have recently welcomed in England, succeeded in soaring under a "lenticular" cloud, thus doing something which has never been done before.

We have, by the way, recently been bespattering our pages with cloud names of all sorts, many of which must be so much Greek, or rather, Latin, to those of our readers who have not given the subject much study. But these

names are really quite simple, and very limited in number. They only need reducing to some kind of order. This we shortly hope to do.

Sea Breezes.

Another achievement which has excited us is that recorded in the Ulster Club News. They have succeeded in soaring in a "sea breeze," in the special signification of the term. The method of production, on an otherwise calm day, of the "sea breeze" and the "land breeze" on a sea coast is about the only piece of meteorology that most of us ever learnt at school. In the day-time, the sun heats up the land more than the sea; over the land the heated air rises, and air from the sea moves in to take its place. Then, at night, the land cools down faster than the sea, so that an opposite wind, the "land breeze," is established. The feat recorded by the Ulster Club is the only case we know of where the "sea breeze," in this special sense, has been used for soaring.

The phenomenon is of importance also to yachtsmen, and Manfred Curry, in his many writings on yacht racing, has shown how a sailing man can make use of it to the discomfiture of his rivals in the race.

The Huish Site.

We are pleased to hear, from the Secretary of the B.G.A., of the number of entries for the Huish Competitions. It is to be hoped that more will roll up in the course of the month.

THE HUISH MEETING.

Judging by the entries which have been received for the forthcoming Gliding Meeting at Huish Hill, near Marlborough, from June 15th to July 16th, those who have yet to experience their first glider thrill will find satisfaction in the fact that there will be eight sailplanes at this big Meeting.

It has already been pointed out that the British Gliding Association has two objectives in connection with the Gliding Meeting this year—(1) the holding of yearly competitions, and (2) the provision of a well-organised instructional course for the thorough training of both beginners and more advanced pupils. It is, therefore, the aim of the B.G.A. to give everyone interested in gliding and soaring flight as wide an opportunity as possible of having actual flying lessons. The two-seater sailplanes are available for pupils, and, as the course lasts a month, pupils can have as many flying days as they wish, but the minimum is five.

This is the first time the B.G.A. has included an instructional course in the organisation of its gliding meeting, and it augurs well for the advancement of the science of motorless flying.

J. L. R. WAPLINGTON,
Secretary, British Gliding Association.

STOP PRESS.

A full account of the B.G.A. meeting at Huish will appear in our next issue. There is just time, as we go to press, to record the first successful day's flying.

On Sunday, June 18th, there was a fierce wind from W.N.W., and three machines were trundled over from Huish to Pewsey Down.

Collins opened the ball with the Southdown Club's B.A.C. VII. two-seater, and made three flights with passengers. Even he found conditions very bumpy.

The TERN made two fine flights—piloted by two of its owners in turn—got up really high, and flew "steady as a rock."

But the sensation of the day was J. Laver's flight in the Dorset Club's DORSLING. He stayed up over four hours, flew through at least half-a-dozen rainstorms, one of which lasted an hour, and got repeatedly drenched, not only to the skin, but to the bone. Neither he nor the DORSLING had ever done anything like it in their lives.

The following flights were made:

B.A.C. VII. (Southdown); pilot, Collins; passenger, Hardwick; 2.16 to 2.50 p.m.

TERN (Southdown); pilot, Little; 2.55 to 3.40; estimated height, 700 ft.

B.A.C. VII.; pilot, Collins; passenger, Tester; 3.24 to 3.43.

TERN; pilot, Reffell; 3.57 to 4.48; estimated height, 600 ft.

B.A.C. VII.; pilot, Collins; passenger, Hardwick; 4.15 to 4.28.

DORSLING (Dorset); pilot, Laver; 4.52 to 9.5; estimated height, 450 ft.

"O FOR A PAIR OF ——"

The *Week-end Review* has become well known for the amusing series of competitions which it sets its readers week by week. Among the latest, a prize is offered for "the best list of six suggested improvements in the human frame."

There is no need to ask readers of THE SAILPLANE which they would place first on their list as the improvement most urgently required. But Naomi Royde-Smith, who set the competition, reports that most of the entrants "agree that it is too much to ask that wings be added to our members. Something should be left to hope, or what's a heaven for?"

The winner of the competition postulated the following as Improvement No. 6:

"Heel-springs. As Mercury wings are too wild a hope, I suggest an elastic Achilles tendon, enabling us to reproduce the glorious sensation of dreams, of skimming along a few inches from the ground."

The writer, who goes by the name of "Majolica," should enquire of the Secretary of the B.G.A. for particulars of the nearest gliding club.

While, however, the human species is content with a vain wish, the animal world is up and doing something about it. The Oxford correspondent of the *Morning Post*, quoted in *Flight*, reports as follows:

"The Oxford Zoo authorities were recently informed that a strange animal had been seen in Summertown, and Mr. Sawyer, the curator, armed with a net, went out to catch it. He succeeded, and was surprised to find that his capture was a domestic cat with two fairly large furry wings growing from the middle of its back. The animal is now housed in the Zoo, but will not be exhibited, and unless it is claimed by an owner in a day or two it will be destroyed. The cat, except for its 'wings,' appears to be a normal, well-fed animal, between two and three years old. Its 'wings' are not unlike those of a penguin, but apparently lack muscular development."

ARE YOU A CLOUD PHOTOGRAPHER?

The intensive international study of meteorology during the Second International Polar year, 1932-33, includes also the sky, and General Delcambre, President of the International Commission for the Study of Clouds, has selected two periods for specially detailed investigation in France and neighbouring countries. The first was on April 12th and 13th, while the second is arranged for July 12th and 13th this year, and General Delcambre has asked for material from England.

Photographers who are interested in meteorology are asked to take at least three cloud photographs each day, as near as possible to 8 a.m., 2 p.m. and 7.p.m. (Summer Time), and at intermediate hours if the character of the sky changes. The purpose of the photographs is to represent the changes of the sky as a whole, and cloud-systems should be photographed rather than individual clouds, using, for preference, a wide-angle lens. (The same effect can be got by taking photographs of adjoining regions and fitting them together to form a panorama.—ED.) Artistic merit is a secondary consideration; the prints should show as much detail as possible, but should not be re-touched. The use of a filter may bring out the structure better.

On the back of each print should be written the name and address of the photographer, place where taken, date and time. It is desirable also to add notes as to the fraction of the sky covered by cloud, the nature of the clouds in the part of the sky not included in the photograph, the direction in which the camera was pointing and the approximate elevation above the horizon.

Prints should be addressed to: M. le Ministre de l'Air, Office National Météorologique. 196 rue de l'Université. Paris 7, and in the corner should be written "Année des Nuages."

A meeting at Maiden Newton on May 21st. Left, above: Mr. Norman Wright, the Club Chairman, is launched on the "Dagling." Left, below: retrieving the "Dagling" by winch (kindly lent by Messrs. Petter's, Ltd., Yeovil).

Right, above: Buck flying the "Dagling." Right, below: the Lunch Hour. L. to R.: R. L. Rolfe, B. V. Leak, Mrs. Hill, A. L. Haslam, W. H. Davis, Mrs. Haslam, Miss E. Davis. The ladies are non-flying members. (Why?—Ed.)

Photos by J. Laver.

RIEDEL'S NEW DISTANCE RECORD.

On June 7th Peter Riedel, the German soaring expert, carried out a soaring flight of 245 km. (152 miles) from the Griesheim aerodrome, near Darmstadt, to a point 11 miles north-east of Epinal, in France. The landing place was close by the village of Vomecourt, four miles south of Rambervillers, on the western border of the Vosges mountain district. He thus came near to beating the world's record set up by the late Gunther Groenhoff when the latter flew in the FAFNIR from Munich to Kaaden, in Czechoslovakia, a distance of 165 miles, on May 4th, 1931.

It was in this same FAFNIR that Riedel flew, and, as in the case of Groenhoff's record, the start was made by towing behind an aeroplane.

Riedel was towed by a KLEMM to a height of about 1,500 feet; he then cast off, continued to gain height, and went away southwards, using thermal currents to keep him up. The general direction of the whole flight was south-west by south. He flew most of the time at about 7,000 feet. Towards the end of the flight the up-currents became feeble, and when Riedel was about to land, which he did at 4.40 p.m., he had the heart-breaking experience of seeing large cumulo-nimbus clouds ahead of him, in the direction of Epinal, which he was unable to reach.

The flight lasted 5 hours 40 minutes.

The 6 p.m. weather report from Strasbourg, near the line of flight, on that day was as follows: Wind N.N.E., force 4 (about 15 m.p.h.); low cloud: fine-weather cumulus at about 5,700 feet, covering less than 1/20 of the sky; high cloud covering about half the sky. (Possibly the amount of cumulus would be greater in the mountainous district over which the flight passed.)

Upon landing, Riedel is reported to have been arrested for flying over a forbidden area. He could not have languished in goal for long, however, for a report from France states that he became the guest of M. Raymond, of the Aéro Club de la Haute-Meurthe, during his stay in Rambervillers.

There have been several more long-distance soaring flights in Germany lately (though not quite as long as this), and we hope to give particulars of them in our next issue.

FOR HIRE, June-July, Rice Standard Folding Caravan, one double, one single berth; 2½gns. weekly.—Box 4126, "Sailplane," Offices, 43, Chancery Lane, London, W.C.2.

KRONFELD OVER VESUVIUS.

In our last issue we reported that Robert Kronfeld, in the course of a tour in Italy, had carried out a soaring flight over Vesuvius in his new sailplane. He has now sent to *Flugsport* the following account of his experience:

"My soaring flight lasted four hours and a half. The atmospheric conditions for its success were very good, and in consequence I could try gliding at a comparatively low altitude over the crater of Vesuvius, so as really to enjoy the glorious spectacle. As is known, Vesuvius became active again a week ago, and every moment there were eruptions, which, however, brought no harm to the district around, in spite of their violence.

"It was a fascinating but at the same time frightening experience to find oneself so near the fiery throat of the volcano, with nothing else for support but a 260 lb. aircraft. And yet the grandiose surroundings overpowered any feeling of danger. The principal crater of Vesuvius disappeared at times in a thick cloud of smoke which, lit up by subterranean fire, was continually changing colour.

At the moment of an eruption, thundering roars shook the air; the smoke clouds parted and the bare outlines of the crater became visible. Glowing masses of lava poured out over its walls, then after a few seconds flowed back again, only to rise once more with thunders and lightnings the very next moment.

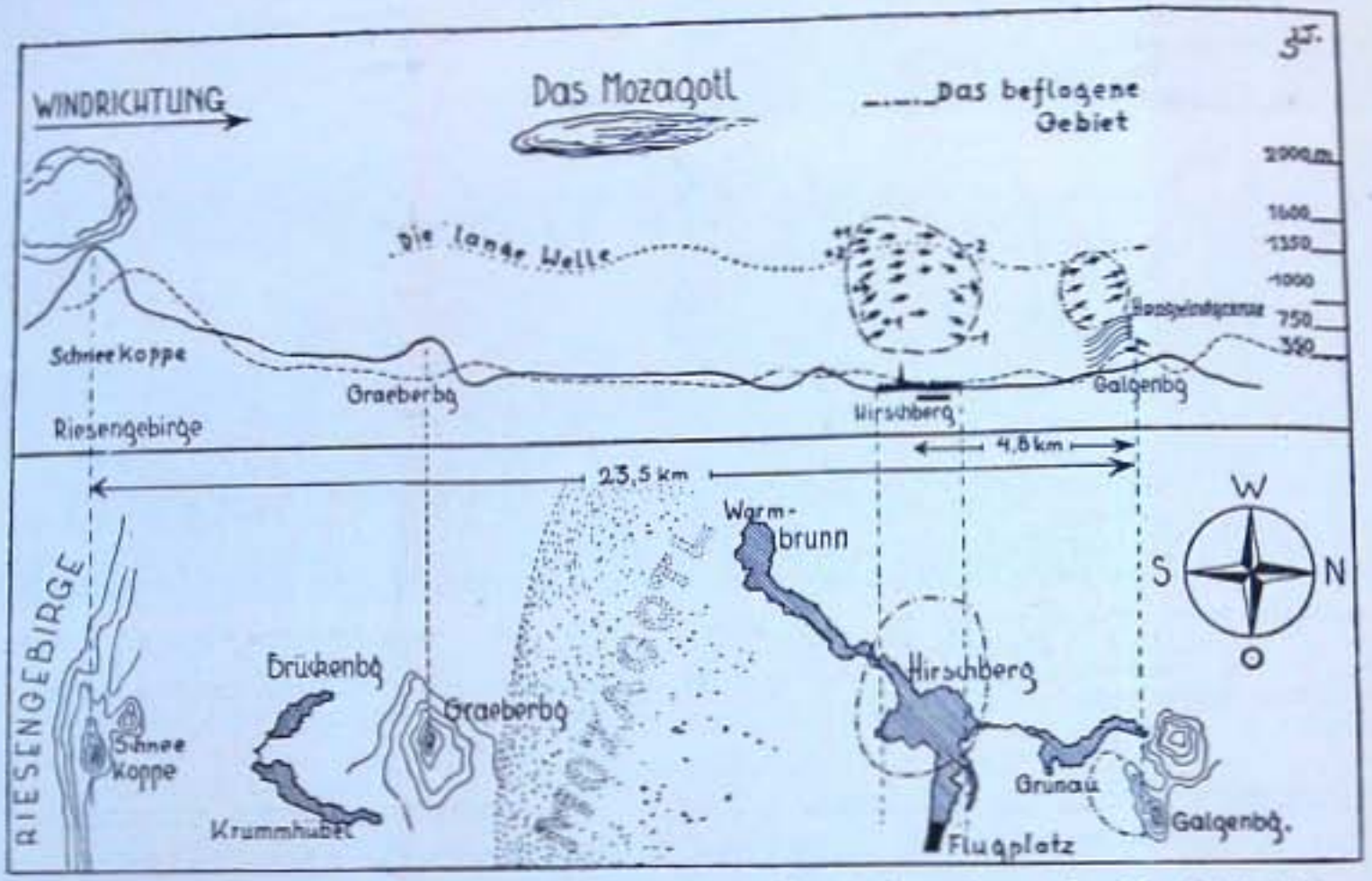
"For more than 20 minutes I flew above the crater of Vesuvius, with the growlings and thunderings of the active volcano in my ears. An unforgettable experience, and one which is a match for anything in the way of a high-performance record."

A correspondent of *Les Ailes* gives further particulars of this flight. Kronfeld started in the evening from the military aerodrome of "Capo di Chino," near Naples. He was towed by an aeroplane to 5,000 feet, and cast off when above the mountain terminus of the funicular railway which connects Naples with the mountain. After a few spirals along the edges of the crater, he got into the cloud of sulphurous fumes, where he was "brutally shaken," but was nevertheless able to demonstrate that the said fumes did not provide sufficient up-draught to enable him to gain height.

Kronfeld intends to have another try. Next time he will be accompanied by an Italian military aeroplane with a cinematograph operator on board.

THE SECRET OF THE MOAZAGOTL

By Wolf Hirth.



Elevation and plan showing the "Moazagotl." The sailplanes flew in the regions enclosed by dot-dash lines. Oblique-shaded regions are towns and villages. "Die lange Welle": the long wave. "Hangwindgrenze": boundary of slope up-current. "Flugplatz" aerodrome. Horizontal scale about three miles to the inch.

In order not to attract the wrong circle of readers, it should be made clear at the outset that this article does not deal with an adventurous story from Mexico, but with a "stationary cloud," between the Riesengebirge and Hirschberg mountains, which has since olden times borne the name of "Das Moazagotl." What that means is not definitely known. There is a story going about which tells of an eccentric fellow, many years ago, who, instead of merely driving his plough, was in the habit of looking up at the sky and the clouds. He would tell others that there must be some special significance about a cloud which, whenever the wind was in the south, would not move along with the wind like other respectable clouds, but would stay constantly in the same place.

This man's name is said to have been Gottlieb Motz, or in Silesian parlance, "Der Moatza Gotl."

But that is, as has been said, only a tradition.

When, in the spring of 1931, I returned from New York to Grunau in the Riesengebirge district, I was made aware of the "Moazagotl" by Herr Feige, the Director of the Krietern Observatory near Breslau, and it was pointed out to me that it would be well worth while, in the interests of soaring flight, to investigate the air conditions in this neighbourhood

Although it was nearly two years before the first step in this direction was made, the results were so much the more startling. On March 3rd two sailplanes succeeded, without either thermal currents, thunderstorm or slope up-currents, in carrying out an hour's flight at a height of 800 to 1,400 metres (2,600 to 4,600 ft.) above the Hirschberg valley, almost directly above the town of Hirschberg.

Already in the year 1917, near Sofia in Bulgaria, the meteorologists discovered an upward current of air whose origin was very probably due to the same cause. Admittedly that was at the time purely a measurement from the ground, and Prof. Georgii, the well-known meteorologist, discussed it in his book on soaring flight in 1922.

On the afternoon of the day mentioned, when I was present at the auto-towed flights of my pupils on the Hirschberg aerodrome, we noticed that one of our sailplanes, soaring over the grounds of the Grunau soaring school 2½ miles away, got up to an astonishing height and began to fly against the wind towards the town of Hirschberg. Immediately, and with great acceleration, I had our Grunau Baby 2 (a small sailplane of 43 ft. span) brought to the starting point and the towing aeroplane (Klemm L 25, 60 h.p. Hirth motor) started up. When, at the end of half an hour, everything was ready, there followed the most exciting towed launch of my life.

Owing to an extraordinary eddying of the air, we started at a very low height above tree-tops, suspended cables, and chimneys. We had hardly struggled up to 150 ft. when a gust threw us down again to 60 ft. The aeroplane before me danced like a horse gone wild. Quite ten times I came near to casting off the connecting cable. But a severe crash might have resulted to the aeroplane, due to the cable hanging down beneath it.

So there was nothing for it but to clench one's teeth and carry on.

At last, after five hard minutes, 300 feet of height were gained. There now followed a period of rapid climbing up to 2,600 feet, where the other machine was already soaring. I now uncoupled myself from the aeroplane, flew nearer to my comrade, and recognised the Grunau Baby D-Dominicus (a machine belonging to the Grunau Athletic Club) and also its pilot, Hans Deutschmann, one of the best of the young generation of German soaring pilots. The turbulance of the air was even at this height extraordinary, but it no longer brought the great danger that it had near the ground. I set about forthwith measuring the strength of the rising current, and could actually confirm the existence of a stationary up-current region, which began south of Hirschberg at a somewhat low altitude and stretched to a height of 4,600 feet as far as 1 km. (⅝th mile) to the north of Hirschberg. The height reached was such that we could see well over the plateau of the Riesengebirge which lay before us.

I could establish up-current velocities of up to 4 metres' (13 ft.) rise per second, while to the north, at a lesser

height, down-currents of 4 metres' fall per second were measured. The lost height could always be won back again without difficulty in the up-current region lying to the south of Hirschberg.

When the sun had disappeared behind the Isergebirge, we both set about the return flight. Deutschmann, who had flown entirely without instruments, landed back at his starting-point in Grunau, after a remarkable flight of over two hours, while I went back to the Hirschberg aerodrome after having flown for 1¼ hours.

The secret of the "Moazagotl," beneath which we flew, is still not entirely solved. For that a series of further research flights will be needed. Still, we have performed the first deliberate soaring flight in a type of up-current hitherto never made use of, which I might call the "long wave," since it is undoubtedly concerned with a long wave-like motion of the air, arising from the turbulence behind the high mountain.

LENTICULAR CLOUDS

The "Moazagotl," described by Wolf Hirth in the article he has kindly sent to THE SAILPLANE, is a typical example of a lenticular cloud. The name is given because such a cloud is commonly lens-shaped in section.

The diagram (Fig. 1), being a diagram, is very diagrammatic; nothing is drawn in correct proportion. It is intended merely to show the probable cause of the formation of lenticular clouds and of their peculiar character. It does not claim to be absolutely correct, but it fits in with the explanations usually given in books on the subject. If only our hordes of aeroplane pilots would take a little interest in the medium in which they fly, such a problem might be speedily settled. Many of them could well afford the necessary recording instruments, and have leisure enough and to spare.

The peculiarity of a lenticular cloud is that it stays in the same place, and does not move along with the wind. It performs this extraordinary feat by continually growing at the windward edge and melting away at the leeward edge. It may be compared to a waterfall, which always stays put, although the water of which it is composed is continually entering it at one end and leaving at the other. Or, better still, to the wave caused by the presence in a swiftly-flowing river of a boulder beneath the surface.

And here the comparison is particularly apt. For a submerged boulder does not merely produce one wave; it gives rise to a whole series of waves away down stream, one after another. What is more, these waves remain stationary, although the water can be seen rushing at speed right through the series. If only the same phenomenon could be reproduced on a larger scale, it should be possible for a surf-rider to remain poised in one position by sliding down the front of the wave immediately over the boulder (down relatively to the water, not to the landscape), which is virtually what the slope-soaring of gliders amounts to. But our surf-rider could perform the same trick on any of the other waves further down stream. And this is, in effect, precisely what Hirth and Deutschmann did. The water in the river sweeps up over the boulder, drops down the other side, and rebounds up again, not once but several times. Similarly, the air sweeps up over the mountain, descends beyond it, and rebounds up again. And in one of these upward rebounds the sailplanes soared.

It is the fact of their being formed in this *rebounding* air that is the chief characteristic of lenticular clouds.

Fig. 2 is the most typical view of lenticular clouds I can produce. The clouds are approaching the observer. The two photographs forming the panorama were taken one afternoon in March, 1926, looking west from the Bournemouth-Birmingham Express, near Mangotsfield (hence the foregrounds do not fit). Single lenticular clouds are often compared to airships in appearance; only one airship-like shape can be seen here, but the clouds in the rest of the picture are equally characteristic of their type. It will be seen that the edges of the clouds are very bright, but the central portions are too thick to let the sunlight through.

(In the left part of Fig. 2 is a dark scrap of rudimentary cumulus, leaning over to the left.)

Many lenticular clouds are lacking in detailed structure, but others, perhaps the majority, show edges broken up into tiny cloudlets. Both kinds appear in Fig. 2. The cloudlets are carried along with the wind, and, if a close *and patient* watch be kept, they will be seen to be continually forming at the windward edge of each main cloud, subsequently moving into the cloud and getting swallowed up in it. At the leeward edge, little cloudlets will continually emerge, only to melt away before long into nothing.

In Fig. 2, owing to the rapidly changing perspective, a portion of the nearest cloud appears in both halves of the picture. But, by comparing these, it will be seen that there has been little change in the cloudlets at its further edge. Cloudlets were, in fact, continually appearing there, but the process on this occasion was very slow.

As for these cloudlets, the conventional explanation would probably be that they were due to a ripple motion in the air, just as, in our river-and-boulder simile, any ripples on the surface of the water would travel along

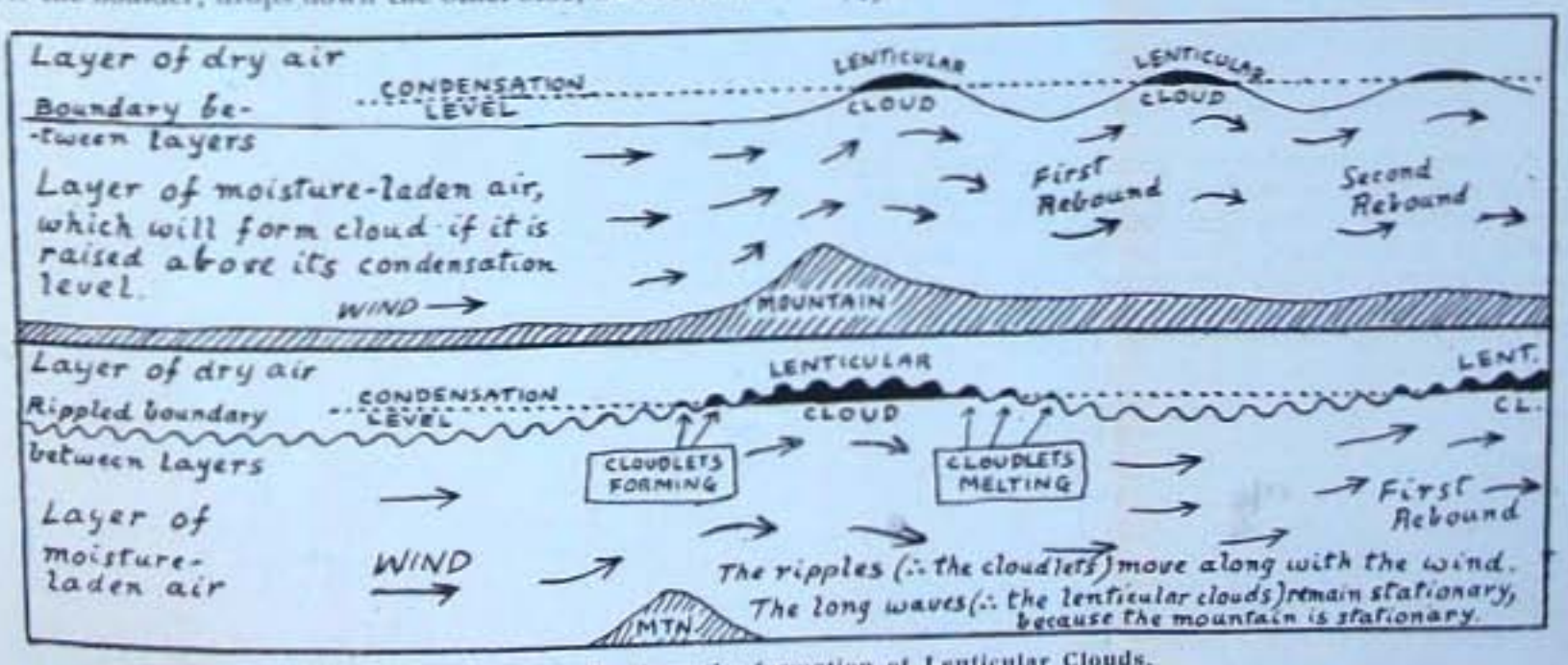


Fig. 1.—To show the formation of Lenticular Clouds.

Fig. 2.—Lenticular Clouds seen from a Railway Train.

with the stream, up and over each big wave in turn, and not remain stationary like the latter. Helmholz showed many years ago that ripples or waves *must* be produced whenever two masses of fluid (whether liquids or gases or one of each) slide over one another. But Sir Gilbert Walker would probably attribute the cloudlets to the existence of a cell-like distribution of small up-currents, caused by the air at that level being unstable. In favour of this explanation is the fact that the cloudlets are nearly always circular or oval; only very rarely have I seen them in the form of ripples. I think, however, that the lower diagram in Fig. 1 should explain the presence and behaviour of the cloudlets, whichever theory is true.

While Fig. 2 gives a view of lenticular clouds approaching, Fig. 3 shows a view of such clouds from the side. The photograph was taken after sunset one Summer evening in 1924, looking north-west from near Albrighton, Salop. There was a dying west wind, i.e., from left to right across the picture. The clouds, which show dark against the twilight, and are very far off, are made up almost entirely of separate cloudlets. As the under surface of the clouds is visible, their apearance is not quite like that of the similar clouds in the lower diagram of Fig. 1, which are shown in section, or edge-on. Three clouds, or groups of clouds, are seen. Later in the evening there were five, two more being added on the right; in other words, the number of "rebounds" was increasing.

The particular hill, or hills, which caused these clouds could not be identified, though they were probably near or beyond the Welsh border. Such clouds differ very greatly in height at different times and places; if their height were only known, their distance could have been calculated by measuring the photograph, and *vice versa*.

The clouds of Fig. 2, which covered a large part of the sky, were probably due to the general hilliness of the country to the west, also on the Welsh border.

Fig. 4, taken near Bewdley one summer, looking south-west (date and time unrecorded), shows a rather different variety of lenticular clouds. Such clouds as these cannot be related to any particular hill or mountain; they are continually appearing and disappearing in different parts of the sky, as was shown by another photograph taken shortly after Fig. 4. Yet their shape suggests that they are due to some sort of long-wave motion in the air,

Fig. 3.—Lenticular Clouds showing dark against the sunset. Wind from left to right.

and it should be quite exciting to try and soar under them. Evidently, at such times, the atmosphere takes on a gentle heaving motion, rather like a ground-swell at sea. An extraordinary case of such a kind occurred on the afternoon of August 3rd (Bank Holiday), 1925, when the sky, seen from Richmond Park, was filled with lenticular clouds at an incredible variety of heights. Practically no blue sky was visible, except far off in the south, while a few drops of rain fell. It was really unique, and the camera had been left behind!

The wind on that occasion was north-west. In fact, I cannot remember a single occasion, when there were lenticular clouds in the sky, on which the wind has not been somewhere between north and west. There seems some peculiar tendency of north-west winds to form lenticular clouds, particularly in the evening. Yet the "Moazagotl" is only to be seen in a south wind.

Fig. 4.—Evanescent Lenticular Clouds. Also a few scraps of rudimentary cumulus at a much lower altitude. Wind from right to left.

Fig 5 is a peculiar case. It is a mongrel. It is neither keeping still, nor moving as fast as the wind. It is without structure on the right-hand side where it is growing, yet on the leeward side (left) it is melting away into cloudlets. Yet, in spite of growing to windward and melting to leeward, it is gradually creeping over the landscape. From its yellow-brown tinge and the apparent rate at which the wind was rushing through it, it was evidently quite low down.

The photograph was taken at Tre-arddur Bay, Anglesey, in September, 1925. A few miles to windward, in the north-west (N.W. as usual), is Holyhead Mountain, 720 feet high, which may have had something to do with it. It is a rare example of a lenticular cloud which could have been used for cross-country soaring.

For those not accustomed to cloud photographs, it should be explained that the dark part at the top is sky; the dark within the white is the thickest part of the cloud; below is again sky.

A beautiful phenomenon, observable in lenticular clouds, is "irisation." A thin part of the cloud, not far

from the sun, will blossom forth into the most marvellous pinks and greens and violets, very like mother-of-pearl. It is generally explained by the fact that, in a newly-formed cloud, all the water-particles are the same size, and, therefore, when seen at a certain angular distance from the sun, all refract the same colour. (Perhaps that is the wrong term; I believe the phenomenon has to do with the wave-length of light and "interference" effects.) It can also be seen in newly-formed fracto-cumulus; in fact, several people noticed it for the first time in their lives during the eclipse of the sun in 1927 (the "partial" phase), and thought it had to do with the eclipse. One lady from Devonshire wrote to *The Times* about it, saying that it would remain with her as a beautiful memory for ever, little knowing that she could see it often enough again if she would only look.

One word of warning: if you see "irisation," do not call anyone's attention to it. If you do, the only reply you will get is, "Does that mean it's going to rain?"

A. E. S.

Fig. 5.—The Lenticular Cloud which suffered from "wanderlust."

A GLIDER PILOT'S LETTERS TO HIS SON

[In this series of letters, the first two of which appeared in our last issue, the reader is asked to imagine himself living in the year 1960, by which time many of our more promising young pilots will be the fathers of families. The letters, then, are addressed by an elderly "C" pilot to his son who has taken up gliding.]

III.

Dear Otto,

This is sad news indeed! You were launched from the hill-top in a soaring breeze and failed to keep up. Meanwhile, your rival, who joined the club the same day as you, stayed up for 21 minutes and so obtained his "C." Little wonder that you went behind the haystack and wept tears of rage. But be cheerful; it was sent to try you, and one day you will not regret the lesson you have learnt. Yes, I know! If only you had turned sooner, after the launch; if only you had not lost your head and flown so fast; if only . . . the whole of human tribulation is contained in those two words.

Do not think, because the stage that you have just mastered is now easy, that the next one will be, before you have already mastered it. On a soaring flight, and especially on your first, you must know exactly where you are going to fly and so fly there.

Now listen to me! You hear the words "walk! run! release!" Keep the machine near the ground until the elastic drops off. You will now have plenty of air-speed and so you can afford to climb. Well, do so and you will find that you do not, as usual, begin to lose height as soon as you get over the edge of the hill. Your air speed is healthy and yet you still seem to be flying on level, even rising.

Now beware! do not be trapped by this novel sensation of flying off the top of the hill without descending. Take a look along the hill as soon as you pass over the edge and try and imagine yourself already flying along it. Then you must proceed to make your dream come true by turning at once and as speedily as you can. If you have followed my advice of practising your turns at every opportunity, this should not worry you. So take a point at the edge of the ridge, some distance along and, your turn completed, make a bee-line for it. At this stage, you may be tempted to fly fast in order, in your impatience, to get there the sooner. Resist the urge, for you are already soaring. Fly at the slowest safe speed straight towards it and, having reached it, execute a slight turn to bring the nose of your machine pointing slightly outwards from the ridge. Now adjust your position until your inside wing-tip just overlaps the flat top of the hill. You should still be flying as slow as you feel safe.

You are now soaring! Listen to the steady hum of the wind past your machine. The grass slope slides slowly past. You see boys, leaning on their bicycles, looking up at you, open-mouthed. Old men pointing accusing walking-sticks up at you, and couples in the grass totally oblivious of the great bird silently passing over them. This is flight! This is what the gulls like, as they soar above the cliff-top! Hats off to the man who first thought out the principle of the aerofoil! Hats off to the man who built this machine! Hats off to my good, my faithful instructor, who has watched over me so patiently these long months! But look, the end of the ridge approaches and I must turn.

"Turn, the very word is like a bell,
To call me back again to my sole self."

(KEATS.)

Figuratively speaking, you must come down to earth and collect your wits for the turn. Now, what have I been taught?—gentle stick and rudder. Ha! the nose of the faithful craft has started its journey round the horizon. The ridge disappears from my sight for a second but comes round again on the other side. Quick, I must stop turning in time, for it takes time to get a machine out of a turn. So, before the machine is anywhere near pointing along the ridge, gentle but persistent opposite controls. Look, she is straight again and flying back towards the launching-point. See! there is my instructor, wildly waving his hat. I have never seen him behave like that before. Good, kind instructor—at times I have hated you, but now! . . . now!

Such, in sober terms, will be the sensations of your first successful soaring flight, my son. Do not scruple to stay up a good long time, for you will learn more in those twenty minutes than you have ever done before or ever will do in so short a space of time. You are crossing the Rubicon, burning your boats, whatever you like: once having learnt to fly, you will never forget.

One last word—when you decide to land you will have to pull yourself together, for landing skill and flying skill are two very different things and it must be your constant endeavour to combine them. Do not let soaring go to your head, for you need all that you can muster of that part of your body for the approach and the landing, which you can only bring off by cold, accurate judgment, unchilled by fear, unheated by the exaltation of flight.

So pick the area on which you wish to land, get to leeward of it, lose height in a series of "S" turns in which you can fly as fast as you like; then a straight glide from 30 feet to the landing. But of landing and more, in a later letter.

Well, good-bye, my son.

And remember that, to land well, you must put soaring right out of mind.

FATHER.

(To be continued.)

THE 1933 U.S. SOARING CONTEST

The First Annual American Gliding and Soaring Contest was held in 1930 at Elmira, New York State. Since then, a contest has been held there annually, so that this year will see the Fourth Annual National Soaring Contest take place on the site.

The ridges which are used for soaring all overlook the city of Elmira, which is only a few miles away, and the local airport, being only a mile from the foot of the so-called South Mountain, makes a convenient landing ground.

At the 1930 meeting, Wolf Hirth was present and did several fine flights. In 1931 the weather was troublesome, but Martin Schempp won the distance prize with a flight of 15 miles.

Last year's meeting resulted in some excellent performances. Jack O'Meara got away on a flight of 66.6 miles, with Schempp not far behind with 63.7 miles. The latter also achieved an altitude record of 5,370 feet. These performances were achieved with sailplanes, but a popular machine is the FRANKLIN UTILITY glider, a kind of all-purpose machine. Robert Eaton, on one of these "Utilities," as they are called, actually achieved a distance of 29.5 miles.

This year a new idea is to be tried out. The actual contest, which is fixed for July 10th to 23rd inclusive, is to be preceded by a four weeks' training camp, an innovation which brings to mind this year's similar experiment on the part of our B.G.A., except that in the latter case the instructional course proceeds simultaneously with the competitions.

We reproduce the following particulars from the circular sent out by the Soaring Society of America and forwarded to us by our American correspondent.

Formation of the Soaring Society.

The introduction of gliding into the United States suffered in the early stages from divided control, two rival bodies being in the running; furthermore, gliding was too often looked on merely as a means for spectacular display, and its real purpose as an introduction to the art of soaring flight was becoming forgotten. The situation was saved when, early in 1932, the Soaring Society of America, Inc., was organised by a group of soaring pilots and others deeply interested in the sport, to co-ordinate the various groups and individuals active in it, and to assure continuity of its growth by sponsoring the Third Annual National Soaring Contest at Elmira.

Four fundamental considerations were kept constantly in mind from the start—

(1) Advancement of the sporting aspects of gliding and soaring.

(2) Operations of The Soaring Society on a strictly non-commercial basis.

(3) Thorough training of experienced pilots qualified to effectively instruct students as an absolute prerequisite to any general expansion of gliding and soaring as a movement.

(4) Conduct of all activities on a national and international basis.

The first objective of The Soaring Society was the staging of the successful national soaring contest of last year. It was felt that the holding of a well-managed, accidentless contest in which a great number could participate and in which new national or at least contest records would be made constituted the most important contribution to be sought for 1932.

The success of the 1932 contest exceeded fondest hopes. Sixty-seven pilots and 18 soaring craft participated. Soaring time totalled almost 200 hours during the two weeks of competition. Especially important was the fact that the contest added 29 new soaring pilots to the list of those holding licences. Two new national records were established and the general performance figures clearly indicated a notable advance in the progress of soaring in the U.S.A.

For the sake of effectiveness in putting across its initial programme, The Soaring Society in 1932 consisted only of its charter members. Under its expanded programme membership is open to all persons interested in gliding and soaring. The fee is 2 dols., payable annually through the president or the secretary. There is no initiation fee. Membership is on an individual rather than a group basis, the society not wishing to foster at this time the building up of a chain of clubs.

Plans for 1933.

On the basis of 1932 experience, The Soaring Society early in 1933 decided on two objectives for this year—

(1) The holding of another carefully conducted national contest.

(2) The provision of a well-organised soaring camp for the thorough training of both beginners and advanced students.

Both the contest and the soaring camp will be under the direction of a corps of officials of The Soaring Society. The camp will be conducted along the same strict lines as the contest itself. Instruction on UTILITIES at the camp will be under the direction of a member of the Society's corps of officials. Instruction on sailplanes will be available from the Haller School of Soaring Flight, which will be located at Elmira during the camp period and which also will be under the Society's supervision. *No instruction will be provided by The Soaring Society during the contest.*

For the actual contest, all pilots and all aircraft have to be licensed by the Department of Commerce, to conform to the New York State laws. Only soaring pilots who have passed their "C" test are allowed to compete. Such pilots will also be required to pass qualification tests on the airport, regardless of their previous experience.

This year, as last, the actual competition will be set up to provide equal opportunity for every class of soaring craft. While records are one of the objectives of the contest, The Soaring Society is even more desirous of making it an opportunity for as many pilots as possible to compete on equal terms and gain the all-important experience of soaring flight.

Apart from the Edward S. Evans Trophy for national soaring champion, the prizes will consist mostly of instruments and equipment of value to soaring pilots.

As many of our readers may be wondering what this sort of thing costs over in America, we reproduce the following financial particulars:

Fees for the Soaring Camp Training.

The Society has made every effort to keep the cost of instruction at the soaring camp to the lowest possible minimum. It has established the following:

Beginners' Course, taking the student through 360-degree turns—50 dols.

Advanced Course (for glider pilots who have been making 360-degree flights), qualifying flights on airport (auto-tow), shock cord flights on airport, mountain-to-airport glide, the "C" (soaring) test and 15 minutes' soaring—25 dols.

Complete Course, taking the student through the beginner's course, "B" licence check, at least two shock cord flights on airport, mountain-to-airport glide, the "C" (soaring) test and 15 minutes of actual soaring—75 dols.

Soaring flights beyond the formal course will be available at 7.50 dols. for the first hour, 5 dols. for each additional hour.

All of the courses include lectures on gliding, soaring, meteorology, etc.

Reduced prices are available to those entering the camp during the first ten days.

Living Costs at Elmira.

Special rates will be available this year at the Mark Twain Hotel and the Y.M.C.A. The latter has rooms for 2.50 dols. and 3.50 dols. per week, and meals: breakfast, 15c.; packed lunch, 25c.; dinner, 35s.

CORRESPONDENCE

SOARING OVER AIRSHIP HANGARS.

Sir,

I note with much interest your remarks on the possibility of soaring over the two airship hangars at Cardington. In 1931 I flew with the late Mr. Lowe-Wylde in his B.A.C. VII. a short distance from Cardington. He expressed a great desire at that period to attempt to carry out this experiment.

Twelve months later he was actually flying over these hangars with a passenger, still using a B.A.C. VII. Weather conditions were not extremely favourable, but observing from the ground he certainly appeared to gain extra lift in these regions.

He was on tour with Sir Alan Cobham, and undoubtedly the B.G.A. representatives who were present could supply further information.

This subject is one which could and ought to be exploited further. I feel sure that an efficient machine, working under ideal conditions, would produce, with the co-operation of the local meteorological experts, some rather interesting results.

We must remember, however, that this is not America and that any such attempt would probably receive a very official setback; in addition, quite a fair amount of power-plane work has been carried out there recently. The prospects apparently are not rosy, but somebody ought to do something about it.

G. A. CHAMBERLAIN.

Mr. G. L. Bell, of Bedford, also writes to say that he saw the late Mr. Lowe-Wylde soar over the southern shed at Cardington on April 15th, last year, when Sir Alan Cobham's Circus visited the Aerodrome. He believes it was a solo flight, and says that Mr. Lowe-Wylde only flew once along the shed, and afterwards, when giving the usual passenger flights, kept clear of it. The wind must have been south-east, as it blew almost straight up the shed, and, though about moderate, seemed to puff the machine about a bit.

[We had forgotten for the moment that there are two airship hangars at Cardington, not one. They stand side by side, separated (at the top) by rather more than the width of one hangar. This would no doubt complicate the air flow considerably. But a thorough investigation of it would not only be of use for soaring flight, but might have helped considerably with the problem of getting an airship out of its shed in a cross-wind. We are not aware that any such investigation has ever been carried out, except that something was discovered about to air flow a long way to leeward of the sheds, in the course of the investigations which led to Mr. Durst formulating his "gust cell" theory. (See Geophysical Memoir 54, pages 49 and 62-63.)

There is, by the way, a further use for airships in connection with gliding, or, rather, the other way round. About 1930 the U.S. Navy thought that, for dropping a messenger to earth from an airship, the glider should be superior to the parachute. In consequence, Lieut. Ralph Barnaby (a gliding enthusiast since 1909) was suspended in his PRÖFLING type glider from the airship LOS ANGELES and taken up to 3,000 feet over Lakehurst. Barnaby wrote as follows about what happened after he had cast off:

"The only danger I had foreseen was the possibility of fouling the dirigible, so I immediately put the glider into a steep dive. I levelled off some 100 feet below the dirigible and, because of the speed gained in the dive, well ahead of its nose. It was not until several minutes later, when I was banked in one of the turns over the field, that I again caught sight of the LOS ANGELES. I held the glider at a speed of between 35 and 40 knots except when passing over the hangar. Then I slowed to about 30. I wanted to see if the hangar could provide any lift. Though it was only a 5 to 8 mile an hour wind, and more along the hangar than across it, I could feel decided up-currents at 1,500 feet. They were more noticeable as I descended, and when I passed over it at 200 feet I was able to pick up some altitude."

He landed after a flight of 13 minutes.—ED.]

SELF-TAUGHT CLUBS.

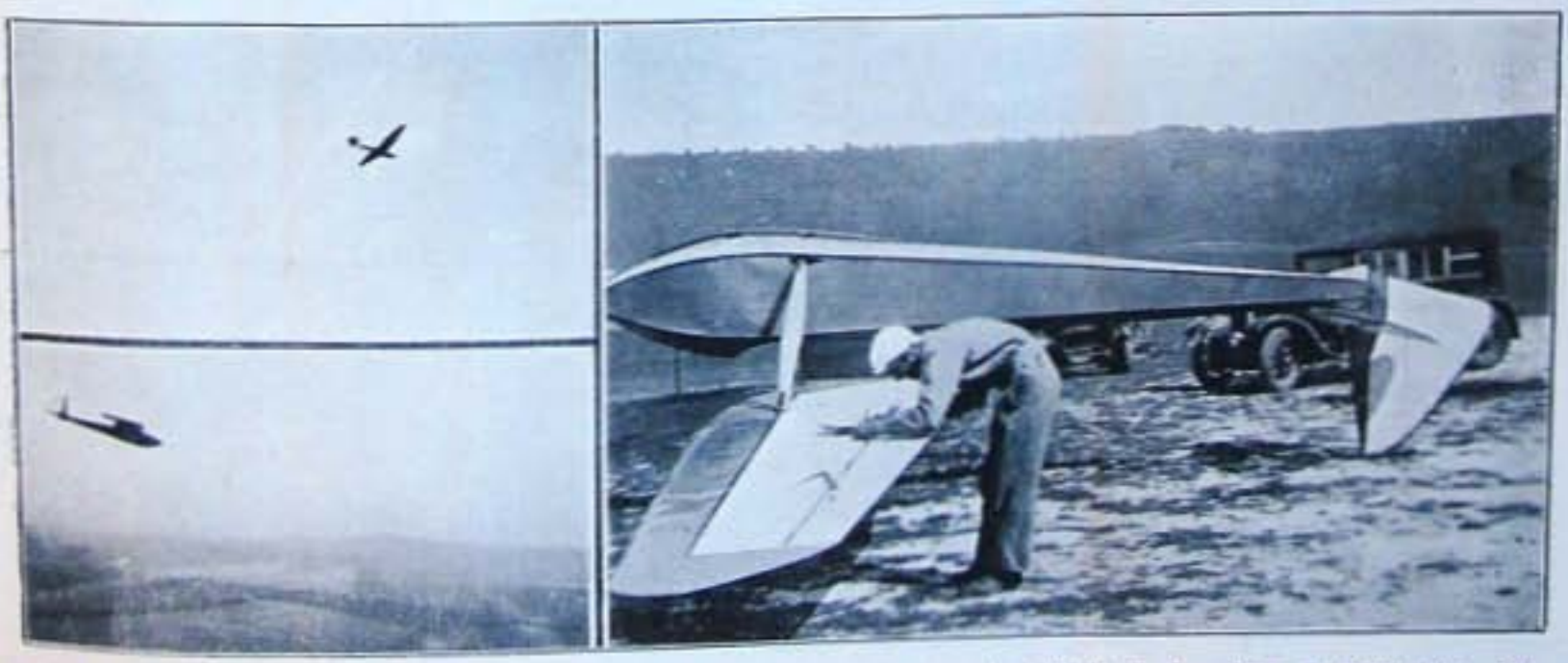
Sir,

I was very interested to read in your paper the report of the activities of the Furness Gliding Club, more particularly the report of their activities on April 9th last, and must congratulate them on obtaining their first "C" certificate, which is certainly praiseworthy for an *ab initio* club.

At the same time I would like to point out that the Ulster Gliding and Aviation Club obtained two "C" certificates last July, and at the present time they have six "C" certificates, and theirs is also an entirely *ab initio* club.

PERCY H. BAXTER.

[The point we made was that the Furness Club have no one who brought in any experience of instruction from outside. We understand that one member of the Ulster Gliding Club had had a little instruction at another club, and passed on to his fellow-members the modicum of knowledge he had thereby gained. However, the point is scarcely worth arguing about, especially in view of what the Ulster Club has recently been up to. We await with impatience the day when their KASSEL 20 sets out on its first cross-country cloud-flight.—ED.]



THE NEW "WILLOW WREN."—On the left: being given its first soaring flight by Dewsbery at Dunstable. On the right: Mr. Manuel, its designer and constructor puts a few finishing touches.

NEWS FROM THE CLUBS.

The Bradford Club's Transport Section, showing the Club Car (*sic*) in the rear.

ACCRINGTON GLIDING CLUB.

The Annual Meeting of the Accrington and District Gliding Club was, according to the *Accrington Observer*, held at Hameldon Hall Farm, the club's flying ground. Mr. E. Ranson was re-elected president; Mrs. E. Sharples, hon. vice-president; Mr. J. Stephenson, chairman; Mr. J. Nolan, secretary; and Messrs. J. Chadwick and J. Pollard were appointed on the committee. Mr. M. Bainbridge is the captain of the club.

The new secondary type machine, which has been constructed by members of the club, is expected to be ready for flying in the course of a few weeks. Some of the members are putting up a remarkably good show, considering that they had no experience of flying before joining the club. So far this year there have been more flights made than during the whole of last year. A few weeks ago a record was made when the machine was rigged and nine flights were made, though only five members of the club were present.

Another local journal reports that the Club's flying ground ends in a precipice, with a cemetery lying far below, while over on another side is a big reservoir It is mentioned that the members of the club are adepts at turning.

BRADFORD AND COUNTY GLIDING CLUB.

Whitsun Meeting. Saturday, June 3rd, to Tuesday, June 6th.—With the exception of a few members who lived under canvas, an actual camp was not held this year, daily excursions being made to the flying ground.

The great event was the appearance of the Club's new HOL'S DER TEUFEL, which has been constructed mainly by our ground engineer, Holdsworth, with the able assistance of other members.

On Saturday afternoon the majestic procession arrived, Verity leading the way driving the towing car, from which blue vapour was issuing. This did not originate from the engine, but from Verity, as apparently only one of the cylinders had been doing its stuff, the others enjoying the ride. Following, with an eagle eye, was Sharpe, anxiously watching to see the wheels did not fall off the trailer, or that no small boys pinched the HOL's wings for kites.

The rest of Saturday was spent in rigging the machine and getting it ready for the air.

Sunday.—In spite of supplications to Allah the previous night, the wind was south-east, and no amount of entreaty or cursing would induce it to change. The HOL's was therefore taken to the east slope, and Stedman was detailed for the test flight. He decided to take the machine right off the top without any preliminary hops, and climbed into the seat, where he sat with a look of grim determination on his face. All the other members seemed to have cameras, and departed to get photos of the first flight, but when it was realised that, without some assistance from them, the machine could not leave the ground, a crew was mustered, leaving Sharpe (who has a good camera) and a Ciné operator to record the great event.

Stedman, after swallowing hard and nearly losing his Adam's apple, gave the usual commands and shortly after was gazing at the ground from a great height. Turns were made, and the machine then landed and passed as O.K. Sharpe has promised Stedman a bottle of something good!

Further flights were then made by Sharpe, Holdsworth and Hastwell, all of whom were delighted with the performance of the machine. Holdsworth, in fact, was so delighted he tried to christen it in a nearby reservoir, but changed his mind (and his rudder) and landed on the ground.

Monday.—Wind south-west—better, certainly, but a west wind was wanted. Short flights were made on the HOL's by Stedman, Sharpe, Holdsworth and Hastwell. Just before Hastwell's take-off it was noticed that the wind was rapidly coming round to west, so he flew the machine down near to the start point for the long west slope. Stedman then took off and followed the ridge, turning at the end and coming half-way back before again turning and making for the landing ground. On landing he was besieged by a huge crowd, and his frantic shrieks and yells to various curious spectators to stop pushing the rudder and flapping the elevators about, and to keep off the pitot head, must have been heard for miles.

Help arrived shortly, however, dragging the bogie and a 750 yd. rope to get the machine back up the hill. We have now got a car(?) with which we tow machines about, and jack up to pull them back up the hill, using a spare wheel without a tyre as a capstan. It is a great idea providing the signals are observed, but it is rather awkward if they are not. The men at the top are frantically trying to haul the rope in, and making sundry remarks about the others riding on the bogie, while the said "others" are just as frantically trying to hold the rope back, while others still feverishly make adjustments to the machine on the bogie. There is certainly an education to be had if one goes gliding!

This car(?) is seen in the photo behind the REYNARD, and the "official driver" is always supposed to wear a

The Bradford Club's "Hol's der Teufel." Left: Stedman giving it the first test flight. Right: Sharpe flying it.

top-hat (loaned by Verity except when wanted for weddings and christenings, when it is worn exclusively by Sharpe).

Tuesday.—The wind, having regretted its kindness on Monday, was again east, so REYNARD was rigged for training. Alderson led off down the east slope, drawing himself several pints on the way. Armstrong was then sent off for his "A," which he obtained with a very well-judged flight. Alderson, having worked up another thirst, was again sent aloft, and got himself another gallon or two. After a few more training flights the meeting ended, and was voted a great success.

FURNESS GLIDING CLUB.

May 20th.—Wind light; west. The B.A.C. II. was rigged, but after a few flights the usual Saturday's downpour set in and we hurriedly dismantled in heavy rain.

May 21st.—Unsettled and misty. Our patience was rewarded later, as we were able to get in some flights on the B.A.C. II.

May 27th.—Threatening weather. Having been soaked on four successive Saturday afternoons, we decided to dodge the weather and worked on the repair of the R.F.D. Sure enough, the rain came promptly at 4 p.m. We discovered later that it remained fine at Ireleth.

May 28th.—Wind west, 8-10 m.p.h., steady. Devoted to flights off the "Knob" at Ireleth. Gross did his final qualifying "45," and then obtained his "B" with 62 seconds. Todd did his two qualifying "45's," but failed to manage the "B."

June 2nd.—The repaired R.F.D. was returned to Ireleth "O.K."

June 3rd.—Wind E.N.E. Various "odd jobs" were attended to.

June 4th.—Also E.N.E. Short test flights were made in the R.F.D. which was finally passed as airworthy once more.

June 10th.—Wind W.—later, N.W. The R.F.D. was rigged, a flight made from the "Knob" on to the top of the site. Gross had his first flight in a nacelled machine. It is still in one piece. The usual rainstorm arrived at the usual time—every Saturday with one exception for six weeks!

June 11th.—Bright to-day, contrary breezes. We kicked our heels, hoping for better conditions, which, however, failed to arrive.

June 12th.—A good soaring breeze during the afternoon led us to rush to Ireleth in the evening and rig the R.F.D. By the time we were ready, the wind was dropping and proceeded through N.W. to N. One short "test" flight was made, and the conditions won once again.

Summer Camp. We are holding a camp on the Bootle Fell—Black Combe site, this Summer, from July 29th to August 12th. We expect to have a thorough try-out on this site, and are confident that it will prove itself as good as anything in the country. We hope to have a map, etc., ready for the next issue of THE SAILPLANE. Anyone interested will be made very welcome; we expect some real soaring to be done. The site offers something for any wind direction, and is comparatively devoid of walls, etc. Accommodation will be arranged at a farm within one mile of the site.

You are cordially invited.

LONDON GLIDING CLUB.

During the past two weeks the wind has visited every point of the compass but west and north-west, except for a few moments in the early—the too early—morning of Sunday, June 11th. So auto-launching and hand-launching have been indulged in. Two more *ab-initios* have been promoted to the PRÜFLING. Among the visitors to the clubhouse on that day was Commander Perrin, Secretary of the Royal Aero Club.

SCUD 11

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ULSTER GLIDING AND AVIATION CLUB.

Sunday, May 28th.—KASSEL 20 was taken to Macgilligan Strand, Co. Londonderry. At about 1 p.m. the wind was 5 m.p.h. from N.W. Two flights were made before lunch, during which interval the wind died down to very light airs, and clouds ceased to form, leaving the sun supreme—a pleasant state of affairs ordinarily but of little use for soaring. A few towed launches were made, but the resulting flights were simply a steady loss of height.

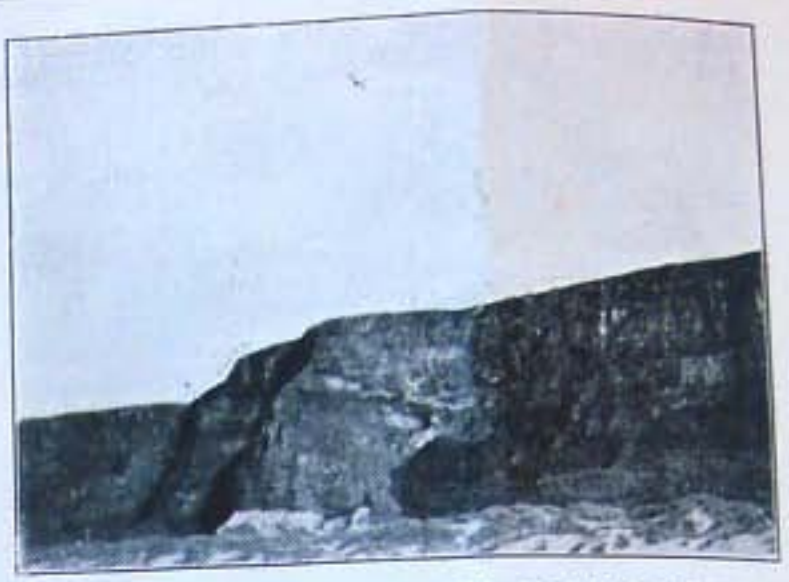
We stayed on, hoping for a sea breeze to start up later on, in accordance with meteorological principles. These principles rose to the occasion in a modest sort of way at about 6.30 p.m., producing a breeze of about 4—5 m.p.h., on the ground, from due North, i.e., directly off the sea. This small zephyr, aided and probably abetted by the ascent of hot air from the sands, sufficed to give the KASSEL about 130 feet on to the towing height, so that we were soaring quite comfortably at about 750 ft. over the appropriate section of the cliff, a beat of about two miles. Mackie landed on the sands at Port Stewart, about three miles from the start, to finish up the day.

A CLUB FOR CHESTERFIELD.

A meeting was recently held at the Station Hotel, Chesterfield, with a view of forming a gliding club in the town.

Mr. W. F. Waddington, of Chesterfield, who presided, said that there was at one time a club in Matlock, which, however, has ceased functioning, but he saw no reason why the old Matlock Club could not associate itself with or become merged in a Chesterfield Club.

It was eventually decided to form a committee to view suitable sites in the neighbourhood, and a further meeting was arranged for June 8th in the Station Hotel, so that its report could be received and the matter discussed further.



THE NEW "SAILPLANE" COMPETITION

Entrants for this Competition are asked to send a short article of not less than 250 words accompanied by either a photograph or a sketch illustrative of the article. The subject-matter must be related to motorless flight. More than one illustration may be sent, or verse (minimum five lines) may be substituted for the article. No part of the entry may have been published elsewhere.

Competitors should state that they are entering for the Competition, and give name, address and gliding club (if any). These will not be published if so desired. The best entry received during any one month will entitle the winner to receive THE SAILPLANE free for six months. In addition, the sender of any entry published, whether a winner or not, will receive two extra copies of the issue in which it is published.

The Editor's decision is final.

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