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MARCH 1951

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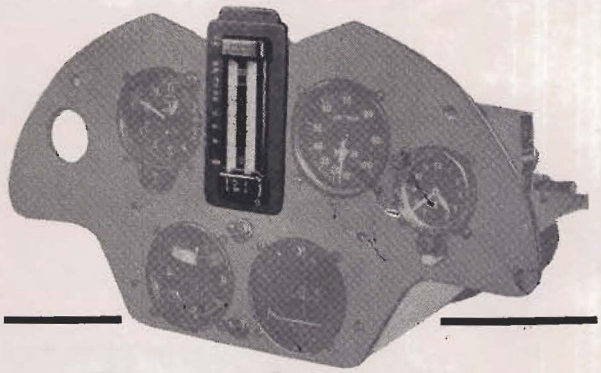
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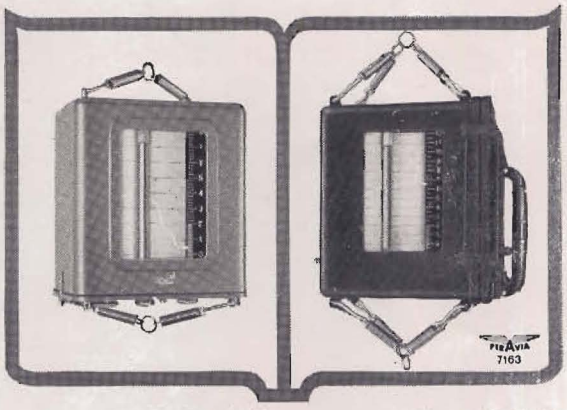
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THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

MARCH 1951 ★ Vol XIX No 3

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COVER PHOTO:
Bristol Gliding Club "Type 21b", flying at Lulsgate Airfield.

COMPETITION TRAINING

THE B.G.A. have evolved an ingenious scheme for improving the standard of our competition flying. A series of tasks have been specified and pilots will battle against each other, the winners to be chosen British representatives in the next series of international contests. There will be four set tasks. 1. A goal race along a course not nearer than 45° to the wind direction. 2. An out-and-return race to a point at least twenty miles away. 3. A race round a triangular course of 100 kilometres, and 4. an upwind distance contest, to be flown only if the windspeed at 1,000 metres is at least 15 knots.

In so far as this series of task flying matches may act as a spur or may make us undergo necessary training, they are an excellent idea, but we doubt if they are even yet the answer to who should represent the British Isles abroad. It is the very nature of the sport of soaring that no two flights can ever be alike, if only for the fact that a good launch at the psychological moment may mean so much in a quick getaway; and tests made in, say, Scotland and the Long Mynd might be of no comparable difficulty, even though the weather be similar.

It is a well-known fact in any gliding club that there are always one or two pilots with a little something the others haven't got. With identical training one man will always be able to stay up long after the rest have called it a day, or he will set out on a successful cross-country when no one else can find so much as the smell of a thermal. From among these super birdmen (for at times they seem to have some bird sense as well as human skill) a group might be formed for a fortnight's intensive training, and the flying matches could take place on any suitable days as an elimination contest.

Then let the final half dozen or so practice again and again—if possible over the terrain of the international meet, or at least over roughly similar country, if such can be found at home. After some years of this we might be able to come near the head of the list!

The answer lies in our training. We have heard ourselves excused on the grounds that most of us can only fly week-ends. No soap. The same applies to the Swiss, who are not subsidised neither are they specially groomed; but week-end flyers as we both are, they can run rings round us nine times out of ten. Why? Training, practice, and discipline. We are a strange race. Magnificently disciplined in war, we are hopelessly sloppy in peace. It may be because of our education. The public school has taught us that games should never be taken too seriously and that it is not quite decent to play against the other fellow if you are considerably better than he is—but that schoolboy complex ought not to stop us pulling up our socks when we find we are considerably worse than he is. Our power pilots have no superior in the world.

Would that we could say the same of our soaring pilots!

NEW BRITISH RECORD

According to information available as we go to press, Flt. Lt. R. C. (Jock) Forbes, set up a new British gain of height record for multi-seaters, during his recent visit to Bishop, California.

In an interview with *Sailplane* on a trunk line to Corstorphine, Edinburgh, where "Jock" was posted immediately on his return to Detling, his old R.A.F. Station, he said "I have been very busy since my return, what with my new posting and one thing and another but I can say that my barograph shows a climb to 26,500 ft. This is a new record, but" he added "it is subject to official confirmation."

Flt. Lt. Forbes said he hopes to have time to write for our readers a full story of his trip, for the next issue.

"Jock's" flight was made in a two-seater, but unfortunately his passenger, so we understand, became sick, so he had to come down.

This was on December 30, the same day as William Ivans, of Mesa, California, made 30,000 feet gain above low point and 42,000 feet absolute altitude for a new international single place record, subject to homologation by the F.A.I. in Paris.

The previous British gain of height record was held by James Grantham and Basil Bell, in the Cambridge Gliding Club's "Kranich". Their flight to 10,080 ft. was made in July, 1949.

AND—THE LADIES TOO

We hear from Poland that Andrzej Brzuski is stated, on December 3, to have attained a height of 9,850 m. (32,313 ft.), accompanied by a passenger. This is said to be a new International height record.

Probably a record for gain of height, as it is said to have beaten Per Axel Persson's record of 8,050 m. (26,411 ft.), in Sweden on July 12, 1947.

The ladies, are also said to have created a new record in that country, for two-seaters. They go by the names of Kemp and Wlazlo. It is said that they reached 7,200 m. (23,620 ft.), but we do not know on which date. The previous record was held by Betsy Woodward, U.S.A. who, on April 7 last year climbed to 10,800 ft., at El Mirage Field, California, with Vera Gere as her passenger.

LONDON CLUB COMES OF AGE

" PROSPERITY AND ACHIEVEMENT "

"SAILPLANE" offers its congratulations and gives pride of place this month to the London Gliding Club, which celebrated its coming of age with a dinner and dance at the Club House, Dunstable, on Saturday, February 17th.

Remarkable fact about this occasion was that many of the founder members, pioneers, who truly gave birth and life to the club, back in 1930, were able to be present.

Our correspondent was in attendance and his story is published below.

The Beginning

Readers of the January issue of the club's own " Gazette " will have seen A. E. Slater's article " How the Club Started."

This is probably the most authoritative piece of literature ever written around the club and for our many thousands of readers both at home and abroad, who do not read the Gazette I quote the " Doc " as follows :—

" London Gliding Club was officially inaugurated on February 20th, 1930, at a meeting in Dr. William's Library, Gordon square, Bloomsbury, at 7.45 p.m. " This was the Doc's first contact with the club. He had seen an announcement of the meeting in " Flight " of February 14 that year.

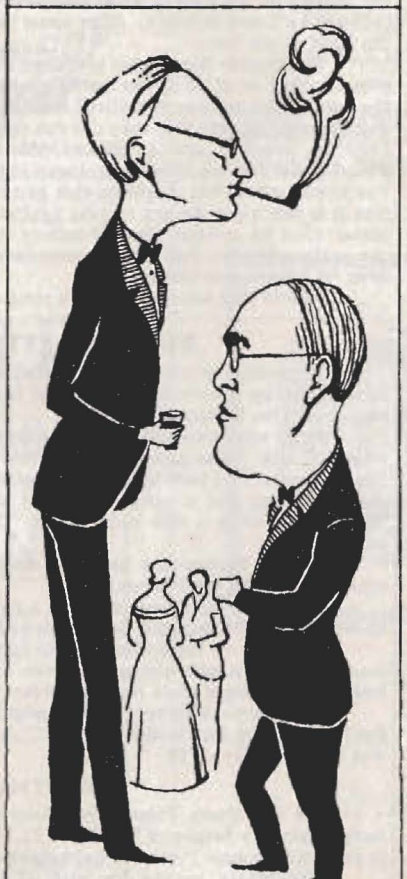
" There was a crowd of about 50 people, and in the chair was J. R. Ashwell-Cooke, who must have been in his early twenties and looked even younger," he writes.

" He was an active member of the Cinq Ports Flying Club at Lympne and owned a " Moth."

" At this meeting several people from aircraft factories got up and said how they could use their position to further the interests of the Club, and I said," continued Mr. Slater, " that I intended going to a German gliding school to learn. This idea was welcomed, because nobody seemed to have the slightest idea how gliding could safely be taught to beginners."



THE CLUBHOUSE AT DUNSTABLE



Philip Wills and Doc Slater seen at the Dunstable celebrations

" I paid over my subscription of one guinea entrance fee and half a guinea to Thurstan James, then on the staff of " Aeroplane " and now its Editor." It is interesting to note here that seven months later in September, Mr. Thurstan James became the first Editor of *Sailplane*.

This meeting however, according to Doc, was not the beginning of the club, for it already ran to headed note paper and printed forms. In fact it would be difficult to date the club's birth, because at the start it was inextricably mixed with the British Gliding Association.

It will be recalled that the famous Gliding Lunch of December 4, 1929, was originally called to form a gliding club, not an association ; but at the end of the lunch, after the 56 people had started the Association, a show of hands revealed 37 of them willing to join a club in the London district. But it was on an undiscoverable date in January, 1930, that some of them got together and set up a Provisional Committee. So, as the Kent Gliding Club had already been formed on January 4th, the London Club was not the first.

Presiding at the dinner, Dudley Hiscox, chairman, introduced Mr. Ashwell-Cooke, guest of honour, by saying that if it had not been for him and the few others who started the club in 1930, the dinner would not have been possible.

Replying, Mr. Ashwell-Cooke spoke of the formation of the Club which had flourished and prospered and which was today such a credit to those with the earliest associations. " Although February 17 is the date of the formation meeting at Dr. William's Library, March 16 is the actual date when gliders first took the air." This was at Stoke Park Farm, near Guildford. " Mrs. Turvey," he continued, " has really made it possible for us to be here this evening, she is one of the most important stepping-stones in our club's history."

The health and continued prosperity of the London Gliding Club was toasted and Mr. Peter Rivers was asked to reply on behalf of the younger generation.

The Birthday cake was then cut into 76 pieces by Mrs. Ashwell-Cooke after Dudley Hiscox had remarked that it was to have been cut with the winch axe—but this apparently could not be found.

Philip Wills, C.B.E., then spoke a few words of appreciation about Dudley and proposed a toast.

Amongst the company present were Mr. Dan Smith, C.F.I., and his wife; Doctor A. E. Slater, Mr. Thurstan James, Editor of "Aeroplane" and his wife; Arthur Sweet, Secretary; Charles Ellis; A. K. Robinson, Editor of the Club's "Gazette" and Miss Mary Greaves and A. Ivanoff, of the "Gazette" committee. There were also present members of other Clubs.

After the dinner there was a dance, and at this point many more people arrived who had been unable to attend the dinner.

This was my first visit to the Club and I could not help feeling as I wandered around the building what a fine job the late Christopher Nicholson had done when he designed it.

Although, of course, being primarily a Club for people who want to glide, it has excellent qualities from the point of social amenities.

But, oh dear, what an awful job it is to get there when one has to rely on public transport. I had to leave my Bromley, Kent, home at 3.25 p.m., in order to be punctual for the dinner at seven o'clock. A "fast" train from St. Pancras took me over an hour to get to Luton. Then a long bus ride and a walk of almost a mile. And isn't it windy down Dunstable way?

The after-dinner speeches I felt were rather short, but perhaps this was merciful for others. Little was said of the future and I do not know the intentions of those who gave birth to the club, now relieved of their parental responsibilities. But "Doc" is still on the active flying list.

Although the celebrations went on well into the early hours I was surprised to see so many up around eight o'clock the next morning. It was cold and windy but the party was over and it was back to the serious business of gliding. The wind was at gale force, but several members took the air and seemed quite happy just to "sit" up on the ridge before lunch.

During the morning Dudley Hiscox told me that every week-end, whether the weather is wet or fine, a crowd of the young and old alike gather along the top of The Bowl at Dunstable, parking cars just off the road, to witness members of the Club aloft in their soaring machines.

Many of them, Dudley is certain, would like to be up there too, emulating the birds instead of just looking on.

Sometimes a shower will send them hurrying to their cars for shelter but they re-appear again when the sun pokes its way through the clouds, and continue their watching.

One week-end soon there's going to be a shower of a different sort, when the Club's two-seater will drop leaflets inviting them to become associate members of the Club for a modest fee, and/or "come for a ride in the machine that scattered these on you for just a few bob."

Dudley said that he hopes by this method to obtain many new members . . . "and besides," he added, "we can do with the shillings we shall take in five and ten-minute flights."

"Those who join as associate members can drink in the bar and get a really first-class lunch very cheaply," he remarked.

This seems to me to be quite a good idea towards solving the financial problems. What about it you other clubs?

The London Club aren't running any courses this summer, but there will be three meetings during which B.G.A. Task Flights will be attempted: May 5—20; June 16—July 1; and Aug. 4—19, and details about these, which I am told will be very good, can be got from the Club.

R.G.B.

HIGHLIGHTS OF THE EVENING . . . . By JACK HANKS



J. R. Ashwell-Cooke and Dudley Hiscox in foreground



Dan Smith, C.F.I., pours out champagne for guest of honour, J. R. Ashwell-Cooke



Mrs. Ashwell-Cooke cuts the cake

"SAILPLANE UNDER THE MAGNIFYING GLASS"

By Gerhard Blessing, Hamburg—Harburg.

Translated by G. S. Neumann

THE point of this article is not a new sailplane but a method to enable the qualified glider pilot to get soaring.

We know that only a comparatively small number of people have got as far as real soaring flight. It is like a lottery; many go in for it, but there are only a few winners.

Not all gliding groups have a suitable site at their doorstep; most of them have to travel 60 miles or more, and it often entails an awkward transport of aircraft. Nowadays nobody finds anything peculiar with the fact that a sailplane requires a trailer and a retrieving car. But who can afford this equipment?

So why not construct the front part of the fuselage as a motor-scooter? For transport the "trailer" is hooked on, consisting of the rear part of the fuselage and the wings folded up. This is the cheapest way to move a sailplane to the site and retrieve it after a cross-country flight. Moreover, this gives us a motor-scooter for other purposes which does not look too bad at all. Between the flying days the small wings are stored in the loft or in any odd place. Hangars are no longer necessary; they would only be a financial burden.

To practise the sport of soaring a performance like that of the "Bussard" is sufficient. The "Falter" is intended to be a third step towards the private sailplane, after "Kolibri" and "Kobold," and it does not follow the general trend of improving the performance by "breeding" for low sinking speed and flat gliding angle.

Let us look at our "Falter" now:—The inner wing has a chord of 35 inches; so it occupies very little space when folded up. The sections used are Gö 535 for the inner ring, and Gö 676 for the tips. Other wing sections would provide a better performance, but they would not give us enough depth for a strong spar. Besides, Gö 535 is extremely fool-proof.

The wings are entirely covered with plywood. The very large torsion box is not weakened by any lightening holes. The thickness of the plywood varies from 2 mm. to .8 mm. On transport, the sides of the wings with the thinner cover come to lie inside. The plywood panels are not scarfed but meet flush on a broad glueing base. This saves work, and damage can more easily be repaired. It also guarantees a perfect reproduction of the section, and makes the treatment of the surface easier. The small depth of the spar (6½ inches) necessitates a laminated wooden spar without lightening holes. All fittings are glued on with "Cohesan M" and riveted. The breaks are bolted (flange to flange). Similar to the "Kobold," each wing can be folded up with greatest ease.

The fuselage is made of steel tubing. Its front part (the motor-scooter) is covered with dural sheeting, the rear part with fabric. The stressed part of the fuselage is triangular, while the top part serves as a fairing only, and provides room for accessories.

A great dihedral angle is given to the sailplane in order to increase the stability in the yawing plane. For the same reason a triangular strip of wood is fixed on top of the fuselage, leading to the rudder fin.

The end of the fuselage is carried through underneath the rudder and serves as drawbar on transport.

In the front part of the fuselage all the strain is taken by the strong metal girder between the wheels (also when used as a motor-scooter). This girder leads up to the steering head with the front fork. The handlebar can be turned up and down. In "gliding position" it rests against the bulkhead and thus blocks the front wheel.

The sides of the cockpit can be taken out and rolled up. Then the back cushion (sorbo-cushion) becomes the seat of the motor-scooter. As with the "Kolibri", the parachute comes to lie on the wings.

The engine for the scooter, a 160 c.c. air-cooled "Fichtel & Sachs," is fixed over the rear wheel which it drives through a three-gear transmission. The fuel tank can be detached, and we can go for petrol to the nearest village after our cross-country flight if we do not want to carry a gallon with us.

Without engine and folding breaks our "Falter" would weigh about 112 lb. less. With its empty weight of approximately 325 lb. (everything included) the "Falter" has a certain parallel in the motor-glider "C-10" of the "Akaflieg Chemnitz." The weight of this aircraft was 450 lb., the span being 40 feet. In spite of this, the soaring performance was very good indeed.

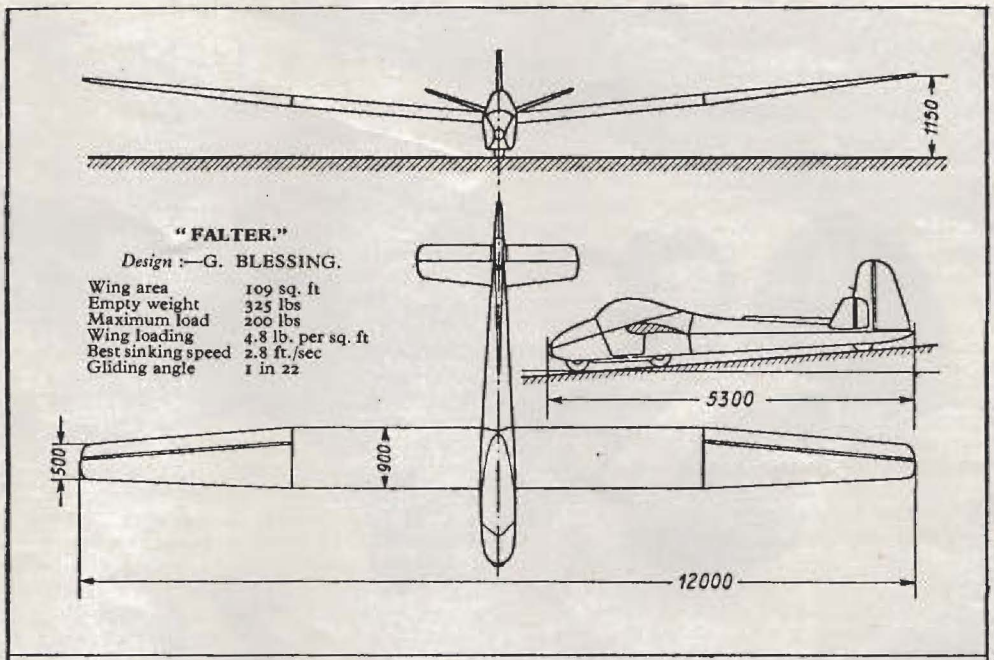
Owing to the additional equipment there is a loss in sinking speed of .5 feet per second. Of course, engine, gearbox and transport accessories can be taken off if we want the aircraft for local flying. Then we shall stay up longer than in the "Cargo-Falter."

With the engine running and somebody at the wing-tip, the sailplane, fully rigged up, can be taxied on the airfield. It may be worthwhile to install a power-take-off gear later on so that we can climb a slope with the aid of only two people. Perhaps the self-launching problem could be solved for hill-soaring by reeling up a length of cable (about 100 feet), one end of it being fixed to the ground with an open hook. It will have to be tried out how far this is possible with 160 c.c. The man for the wing-tip can always be found.

It cannot be said at the present stage whether the scooter with trailer will prove satisfactory on the road, especially in a side-wind. Road-tests will provide the answer. I am convinced that the combination would be roadworthy and could average up to 20 m.p.h.

Of course, I should prefer to fly sailplanes of a higher performance, but with the conventional construction method we shall always have to struggle with financial difficulties, since car and trailer are essential. With our "Falter," however, there will be no unemployed capital standing about. Many a

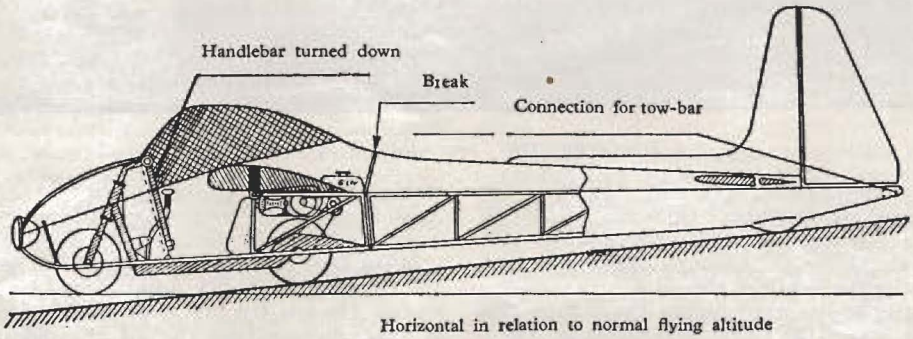
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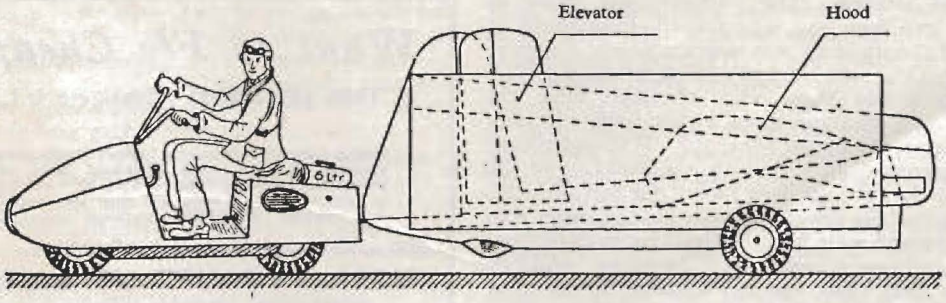
"FALTER."

Design :—G. BLESSING.

Wing area	109 sq. ft
Empty weight	325 lbs
Maximum load	200 lbs
Wing loading	4.8 lb. per sq. ft
Best sinking speed	2.8 ft./sec
Gliding angle	1 in 22



Horizontal in relation to normal flying altitude



MILAN BORISEK'S TRAGIC DEATH—*Official Statement*



Milan in the "Orao" some hours before his death.

ON August 22nd, 1950, at 1 p.m., the Yugoslav record-breaking sailplane "Orao II," piloted by the well-known soaring pilot Milan Borisek, who was third in the World Soaring Championships last year, crashed, causing the death of the pilot.

This catastrophe occurred during the filming of a movie picture about the flying movement in Yugoslavia (The Aeronautical Union of Yugoslavia), near the Tower on the hill of Wrshaz.

Before the tragic event the sailplane was flying in a shallow climbing turn at a laterally inclined angle of about 20 degrees. The "Orao" was flying at about 150 kms. per hour and the climbing speed at the time of the incident was approximately 6 metres per second. The wind speed was between 2 and 3 metres/second and there were thermals near the Tower giving a climbing speed of 2-4 metres/second.

The disaster was caused, says an official statement from the Aeronautical Union, by the breaking of the rear part of the fuselage, just fore of the tail surfaces. The fuselage at the breaking point disintegrated into little pieces which were scattered as if by an explosion.

So instantaneous was this breaking and so unexpected that there was no warning to the pilot and not enough time for him to make a jump.

Considering the abruptness of the break and taking into account the fact that the tail surfaces were not statically balanced, it is suggested that this break may have been caused by the dynamic forces originating from the flutter of the tail surfaces on the fuselage.

Milan Borisek's death is a great loss to the Gliding World especially to the Aeronautical Union of Yugoslavia. He was the first post-war Golden "C" pilot in that country and one of the oldest and most experienced.

A new series of "Orao" sailplanes will be built this year for the next World Soaring Championships in 1952.

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SOARING IN FRANCE

The Vauville Soaring Site

by GUY BORGÉ

A West Wind coming in from the sea and striking the coast is very interesting from the soaring point of view. Its airflow is nearly " laminor " and it can blow for a period of days.

But in France it exists only at a small number of favourable coastal sites with slopes facing west : at Arcachon, near Bordeaux, on the long Pilat slope ; near Boulogne, and along the west side of the Cotentin peninsula.

In this last country we find Vauville, a famous soaring centre used from 1923 and with which name is coupled some historical events that we recall here.

During 1922-1923 winter, after success of the Itford Hill Contest, the " Association Francaise Aérienne " (A.F.A.), a private organization, founded to develop Soaring and Ultra Light Aviation, discovered the sandhills of Vauville and decided to create a Soaring Centre. This was a favourable decision, because on January 29th, 1923, Manoyrel broke the world duration record with a flight of 8 hours 5 min., in his famous " Peyret " tandem. He ended his flight at night (as at Itford Hill), and landed by some furze fires.

From 6th to 26th August, 1923, the A.F.A. organized at Vauville its " 2nd Congrès Expérimental" open to sailplanes and ultra light aircraft. Some interesting performances were as follows : Barbot flew 6 hours 4, Thoret travelled a distance of 5 miles with a " meteorological " frog in his sailplane, but he " landed " in the sea. Maximum altitude of 968 feet. The competition was marred by the fatal accident of Hemmerdinger in his " Thomas " sailplane the first in the world to be fitted with a variometer.

1925 was a year marked by breakage of several records during the Third " Congrès Expérimental " from July 26th to August 9th. On the first day, July 26th, Auger in the Abrial-Peyret " Vautour " attained 2,360 feet, the highest altitude ever reached by a sailplane at that time.

He had climbed in cloud lift, getting help from his variometer. Three Belgian pilots soared in concert for an attempt against the duration record. Unhappily one of them, Victor Simonet, crashed and was killed when an elevator control broke.

Another control " rupture " was endured by the second Belgian, Damblon, but he landed after ten hours of flight. The third Belgian, Massaux, put in 10 hours 41 minutes and became a world recordman.

In 1928 an international competition received participation from German pilots, and Wolf Hirth took the four first prizes.

Gain of height—1st, Hirth (" Wurtemberg " sailplane), 1,073 feet ; 2nd, Nehring (" Darmstadt " sailplane), 755 feet.

Distance in straight line—1st, Hirth—18 miles ; 2nd, Nehring—15 miles ; 3rd, Kegel (" Kassel ")—4 miles.

Total of recorded heights—1st, Hirth—4,080 feet.

Greatest number of durations superior to 30 minutes : 1st, Hirth—10 flights ; 2nd, Magersuppe —6 flights ; 3rd, Nehring—4 flights.

Best landing precision—Hirth, with 64 yards.

Caudron prize for duration—1st, Kegel, with 1 hour, 10.

West wind was very weak, between 6 and 12 feet/ second, and this fact explains the small number of flights and the modest altitudes attained.

The first French sailplane, the Abrial " Rapace " appeared on the last day of the competition but without wind could not display its interesting qualities, a gliding ratio of 24. The other French sailplane, the Abrial-Peyret " Vautour " with its aspect ratio of 8 could not outpass the German machines which were given an aspect ratio of 14 or 16.

1931—The " Société Francaise de Vol à Voile " organized a competition with participation of Kronfeld, Auger, Abrial and the " Groupe l'Air."

During the following years no flights were accomplished at Vauville. The site became a sort of " Belle au Bois Dormant ," was waked by a team of the " Club Aéronautique Universitaire " bringing a sailplane, during Easter, 1934. But wind blew from East without slope lift.

In 1935, Georges Abrial, the President of the " Groupe l'Air " who had known Vauville at the famous precedent years and had drawn the "Vautour" and the " Rapace " remembered the site and decided on a Club expedition, during annual holidays.

In September they brought 3 gliders to Vaúville. An " Avia 10 A " primary for beginners, a nacelled primary, " Avia 15 A " and a " Kassel 20." Results appeared good with 56 launches, 40 hours 14, 8 " C " badges, 2 durations of 5 hours, during 8 favourable days.

The " Avia 15 A " proved excellent in all soaring aptitudes and maintained height at about 500/650 feet, offering advantage of a greater handling than the " Kassel." By wind of 33 miles/hour, the " 15 A " climbed to 1,640 feet on one occasion. When wind was unfavourable or nil, the pilots took some bathes on the beach ; or they landed the primary " 10 A " on the same beach from which they were launched and came again to the airfield.

After some pleasing holidays, the " Groupe l'Air " returned to Vauville in September, 1937, this time with 2 performance sailplanes, " Avia 40 P " and the faithful " Avia 15 A." During 23 days of holidays a West Wind blew on 8 occasions only, but they were fully used. The 9 pilots completed 72 hours 15, 42 launches, 2 Silver " C " durations, 2 " C's."

Clamamus broke the local record of Massaux with 11 hours 11 min., in an " Avia 40 P," by weak wind of 12/20 feet/second. Experience proved that 6/10 feet/second of wind were good enough for the " 40 P." Best day recorded, 24 hours 8 minutes of flight with the 3 sailplanes.

In 1938 the site was used by two Clubs, during August by the Alexis Maneyrol section of the " Aéro-Club de l'Atlantique " that got 2 Silver " C " durations and 3 " C " badges ; then in September by the " Groupe l'Air " that again brought two " Avia 40 P's " (of which one was equipped with radio) and the " Avia 15 A."

(*Continued on page* 60)

THE I.S.4 "JASTRZAB" (HAWK) AEROBATIC GLIDER

THE I.S.4 " Jastrzab " (Hawk) is the fourth design of the Instytut Szybownictwa (Gliding Institute) of Bielsko, Poland, though it is their fifth design to fly, since the I.S.5 " Kaczka " flew several months before the completion of the " Jastrzab." The design of the " Jastrzab " goes back to the International Gliding Week at Samedan, Switzerland, in 1947. Jozef Niespal and Wladyslaw Janica who were responsible for the I.S.1 " Sep." of which the prototype was competing in this event piloted by Adam Zientek, had gone there to see how it compared with other designs. While they were there they decided to design an aerobatic glider based on the " Sep," and sketched out rough drawings of it. Owing to pressure of other work the design of the " Jastrzab " did not get fully under way till autumn 1948.

It is a cantilever high-wing monoplane of all-wooden construction. One rather remarkable feature of its design is that it is intended to fly equally well inverted or the right way up, and the manufacturers even quote inverted performance.

As might be expected, its appearance is quite distinctive owing to the fact that its gull wings are slightly swept forward. They have compound taper and are fitted with flaps and dive brakes. The cantilever tail unit has a single fin and rudder. The tailplane is set on top of the fuselage, forward of the fin, and the elevators are in two parts with cut-out for rudder movement. A ventral skid and a small tail skid are fitted.

The fuselage is of oval section and the cockpit is enclosed, having a moulded one-piece cover.

The design had no teething troubles at all. This can be seen from the fact that Piotr Mynarski started its tests by making three flights in the same afternoon, on December 21st, 1949, with aero-tow by a " Po-2 " for take-off.

On the third flight he released at 2,300 ft. (700 m.) and did several figures of eight and spirals, followed by a dive down to the aerodrome where he landed. The machine behaved entirely satisfactorily all the time and the pilot's confidence is evidenced by the evolutions performed. It is probable that the " Jastrzab " is now in series production.

Data :—Span, 39 ft. 4½ in. (12 m.) ; length, 19 ft. 8¼ in. (6 m.) ; height, 3 ft. 11¼ in. (1.2 m.) ; wing area, 129.168 ft.² (12 m.²) ; weight, empty, 330 lb. (150 kg) ; all-up weight, 616 lb. (280 kg.) ; wing loading, 4.92 lb./sq. ft. (24 kg./m.²) ; aspect ratio, 12. Estimated performance : finesse at 55.89 m.p.h. (90 km./h.)=23.5 ; rate of descent at 43.47 m.p.h. (70 km./h.)=2.79 ft./sec. (0.85 m./sec.) ; diving speed without brakes=max. 310.5 m.p.h. (500 km./h.) ; safety factor, 7. Estimated performance (inverted) : finesse at 50 m.p.h. (80 km./h.)=21.5 ; rate of descent at 43.47 m.p.h. (70 km./h.)=3.42 ft./sec. (1.05 m./sec.).

R. A. G. STUART.

"INTENSIVE TRAINING NEEDED"

—say YUGOSLAVS

BORIS CIJAN, well-known aircraft constructor, who had a big hand in the building of the " Orao II " and has been elected to the Scientific Committee and Board of Ostiv, writes in a recent issue of *Narodna Krila* :—

" The Aeronautical Union of Yugoslavia, member of the Ostiv—will contribute to the aims of this international organisation by active work, our country having been successful during the last few years in new sailplane construction, the vast gliding movement raising the standard of our soaring pilots to a high degree."

After dealing with the technical aspect on the world championship in soaring at Orebro and discussion on the large span and big aspect ratio high performance sailplanes which he says have more possibilities than the short spanned ones, he continues : " It is difficult to appraise different types of competing sailplanes with pilots of different classes. Orebro has proved that the " Olympia " sailplane, proposed by the ISTUS would lessen the results if adopted for the unified competing type. The " Weihe " showed its qualities, but it can't be said that it was the best sailplane of the contest, as e.g., " Air-100 " can be qualified equal to the " Weihe." He concludes : " The prevailing role on the placing in a soaring competition is not played only by the soaring pilots ; but also by a qualitative sailplane adopted to the conditions of each contest. All the experiences from Orebro show the need for intensive training of pilots, aerodynamic improving of the competing sailplanes and detailed study on flying tactics for the next world soaring championship."

* * * *

" MEN of our Sky," is the name of a film, the first of its kind, to be made about the work of Aeronautical Union of Yugoslavia. This 25-minute feature will acquaint the general public in that country with the work and successes of the flying people.

'SAILPLANE UNDER THE MAGNIFYING GLASS'

(*continued from page* 52)

gliding man is the owner of a motor-cycle. If he sold it he would almost get half of the " Falter " for it, and would still not have to go without his " mobile undercarriage " ; for the " Falter-Scooter " is no make-shift but a motor-vehicle of full value, and the parts of it which help to make up our sailplane on the week-end do not wear out unduly.—*From " Thermik."*

It is worth noting that this combination of scooter and trailer is not allowed on the road in this country, because a motor-cycle of this kind must not draw a trailer. This difficulty could probably be overcome by fitting a third wheel to the scooter which then becomes a motor-tricycle, providing the two rear wheels are far enough apart. Nevertheless, G. Blessing's design appears to be a promising suggestion, and anybody who should seriously consider its further development would be advised to consult the corresponding police department. G.S.N.

Central African Gliding



Sir Godfrey Huggins (Prime Minister of S. Rhodesia) talking to Robert Mitchell, Chairman of Salisbury Club.

FINGER trouble has delayed the start of this epistle, but even its tardy appearance has brought little to add about the formation of the Association. At least, there are enough clubs in Rhodesia to justify this, but what with the struggle in keeping the clubs going, few types find the time to work, let alone to start something new!

Umtali Gliding Club.

Pride of place must go to Umtali, the oldest club. After 1949, a very disappointing year, 1950 has seen the re-birth of enthusiasm within the Umtali Gliding Club, in fact, the only disappointment during the year was that the club was unable to attend the Salisbury Rally, due, as always, to trouble with the tow-car, which must be fairly reliable to travel 400 miles in a week-end and still allow plenty of flying time.

Wally Tite, who has two legs to his Silver " C " is the C.F.I. Noel Sinclair, the Hon. Secretary, has just completed the first cross-country, albeit only 8 miles, yet made in Rhodesia, and Saint, the Chairman, has obtained his " C ".

Actually, like other Rhodesian Clubs, with the current scarcity of aircraft, it is necessary to think twice before attempting a cross-country over the African bush, especially in the mountainous Eastern Districts of Umtali, previously the only cross-countries achieved were done whilst visiting South Africa.

In spite of having only one " Dagling " and one " Kirby Kite," this club has done extremely well, having made 350 primary launches and completed over six hours in the " Kite " since September. This is partially due to the excellent winch and to the convenience and condition of the aerodrome which has enabled flying to be carried out during the short Rhodesian evenings, in addition to the week-ends.

Harry Mason, Jock Brenner and Bob Parry have, as usual, been doing most of the constructional work which has averaged 30 hours to each flying hour on primary repairs.

The Club has about 12 active members including strangely enough, one lady member, who is, I am told, doing extremely well, with Susman instructing. Total membership is now 20. Saint tells me the club is hoping to acquire a " two-seater," but capital is short. Apparently Rhodesia is one of the few countries where gliding is not subsidised by philanthropists, patriots, or the State.

Salisbury.

1950 dawned badly for the Salisbury Club, struggling into its second year. One wing and the " A " frame of the " Grunau " primary were under repair ; the " Kadet " wings had been blown off the lorry en

(*Continued on page* 65)

No. 2

WOMEN BEHIND GLIDING

LONDON

or "The Ladies"—God Bless 'em.

by **DUDLEY HISCOX**

DURING his whimsical address on the occasion of the 21st Anniversary Party, the Chairman of the British Gliding Association, referred to the importance of choosing the right girl friend !

In all seriousness I will say that if it had not been for a succession of lady friends of the right type, the London Gliding Club might never have grown to its present size or even attained its coming of age.

At the time I first joined the London Gliding Club it was operating at Ivinghoe Beacon with a " Zögling " primary, a " Prüfling " secondary and a " Poppenhausen " 2-seater.

These were housed, more or less, in a hired marquee beside a petrol station that then existed at the foot of the Beacon. No bar, no clubhouse, no meals ; but Mrs. Marcus Manton, wife of our C.F.I., or Captain, as he was called then, used to beckon to people, if she liked them and say " could you drink a cup of tea, would you like a cake ? " To many a parched tongue and many an aching void did Ruby Manton thus administer.

Subsequently when I bought a kit of parts for my original " Hols der Teufel," it was in Mrs. Manton's drawing room at Cricklewood that Marcus, Harry Bolton and I constructed all but the wings of the machine. Did we make a mess of that drawing room !

When the spectators' cars caused such obstruction on the roads that the police ordered the Club to " move on " and we lost the use of the Beacon, someone found Tom Turvey of Lockington Farm, Totternhoe. Good fellow that he is, he agreed to permit the dismantled gliders to be stored in his barn. This certainly was a time of crisis in the history of our Club which might easily have dissolved at that point but for Mrs. Turvey. This true friend set to and served Club members with marvellous farm-house teas on the beautiful antique refectory table in her delightful 15th century lounge.

For that reward at the end of the day, members cheerfully would rig the primary or the " Prüfling " or both, drag them to what is now our own ground and bungy launch them all day.

My next recollection of feminine influence was the arrival of the then Mlle. Susie Lippens of Belgium, with a brand new German " Professor " sailplane. This high performance machine stimulated renewed interest, particularly with those members who had been power pilots and were getting bored with elementary gliders.

Soon after that my adopted niece, young Beryl Simon (now Mrs. Geoffrey Stephenson) came on the scene. Her rôle then as now was by the example of her enthusiasm and *joie de vie* to encourage young members to continue cheerfully to pull on the bungy and to lug the machines up the face of the hill so they could be hand-launched from the top. Now, with Mrs. Kitty Wills and Mrs. Pat Foster, Beryl has joined the band of champion drivers of retrieving cars.

In the early days a New Zealander named Abdullah was Club Secretary. In his office at St. Martins-le-Grand, was a most efficient young woman whose name escapes me. Her *pièce-de-résistance* was to charm £150 out of a gentleman who called at that office. This was to, and did in fact, enable us to purchase and erect our first Club House into which the said gentleman was to install " fruit machines," and thereby hangs another tale.

A lady who by her influence has contributed considerably is Mrs. Joan Collins. Without her encouragement and support the late Eric Collins might have found it impossible to create the British Gliding records that he did. By so doing he certainly elevated gliding in general, and the London Gliding Club in particular, to a higher plane when, breaking away from aerial toboganning and ridge polishing, he demonstrated cloud and thermal soaring. In the process and from Dunstable he made the first British cross-country flight of over 100 miles.

Allow me to raise my hat to Mrs. Joan Price too. By her immaculate flying, and by her charm and her modesty, Joan has contributed grace and dignity to the art of soaring flight and done much to disperse the " mumbo-jumbo " with which it was originally associated. Incidentally Joan, whose interest in gliding dates from 1930, has demonstrated how completely unnecessary it is to break anything.

Mrs. Walker, the wife of our " Johnnie " for so many years the " Pooh Bah " of the L.G.C., certainly deserves mention. How and why she ever allowed her husband to pursue a gliding club career with all its uncertainties, I cannot imagine. I for one do thank her though.

Of course by naming my heroines as I have done, I most certainly have stuck my neck out. It is a very worthy cause and for any omissions I am going to blame the Editor for allowing me space only enough to say the following should also be " mentioned in despatches " :—Mesdames Dixon, Hiscox, Lang, Latto, Lee, Marshall, Parsons, Slazengei, Smith and the Misses Battlebury, Boyd, Buxton, Delchar, Dickinson, Dinsdale, Fox-Strangways, Goodricke, Greaves, Hobbs, Impey, Jennings, Koch, Mason, Perreau, Rose, Salsbury, Saulez, Sellar and Wright.

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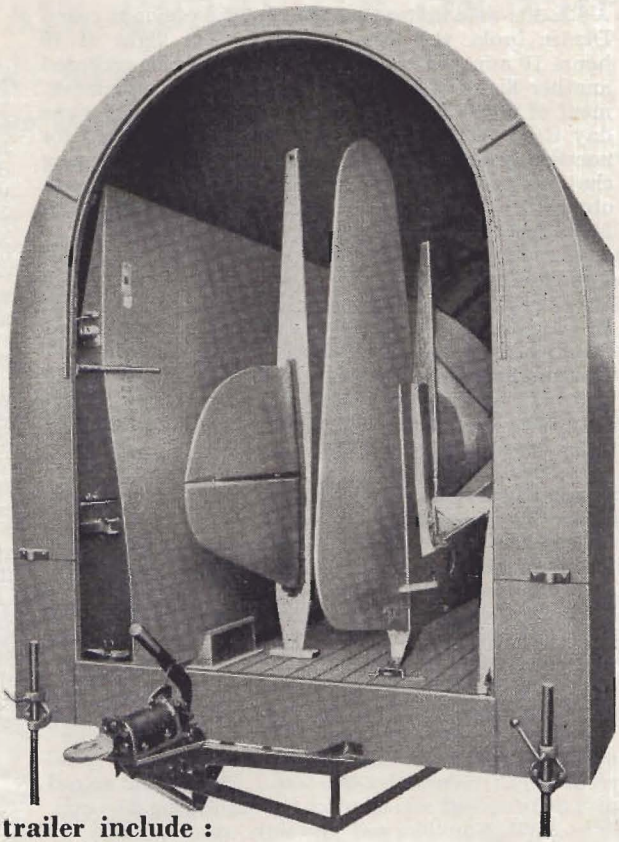
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SOARING IN FRANCE—(*Continued from page 55*)

Results were better than those of the previous years. Denize broke the local record with a flight of 19 hours 16 min., on the 1st October ; later he recorded another flight of 12 hours 33, and the nice achievement of nearly 32 hours in 2 launches. On the same day the " Avia 15 A " established a new record for nacelled primaries ; it flew a total of 23 hours during the day, from which 2 Silver " C " durations were obtained. Wind was not very strong, an average of 15/22 feet/second.

War began in 1939 and any new utilization of Vauville for soaring was stopped. But it took place after 1941 in the German Atlantic Wall, and the airfield became spoiled by blockhaus, bombarded before and after the " D " Day. It was only in 1947 that the flights could be resumed after repairs to the airfield. The " Groupe l'Air " came again from July 15th to August 15th and totalled 42 hours of flight by no or weak winds.

In 1949, the Cherbourg Aéro-Club, favoured by proximity of Vauville (13 miles) organized a soaring course for its pupils.

1950 was a great year with inauguration of the brand-new buildings and hangar, studied by Abrial, and of the new pists usable by planes for aero-tows.

The " Groupe l'Air " brought a sailplane, the Caen Club two, and the Cherbourg Club one. From August 28th to September 20th, the 14 present pilots enjoyed 14 fine days and recorded 122 hours, 1 " C " badge and 7 Silver " C " durations. Jean Damico, 16 years old and the son of an " old " soaring pilot, flew 8 hours 32 and beat the local record of altitude with 2,985 feet. The present record of 2,360 ft., had remained unaltered during 25 years.

In 1951 Vauville will certainly receive visits by new expeditions. The site offers great interest for soaring because of its excellent situation. The West Wind, very frequent, blows straight against the 400 feet slope in the form of bowl on a favourable length of 9 miles from the Nez de Jobourg to Siouville. The landing field is a plateau above the hill, but it is possible to land on the beach. The site appears perfect to study slope ascending currents because the sandhill offers a simple form without much turbulence and receives the wind unaltered after having flown above immensities of sea. At Vauville, Pierre Idrac made a complete study of airflow currents along the slope and could draw the known schemes of the lift ; interesting comparisons were found with the theoretical calculations of Georgii, Pockels, Lyra, Queney.

The longest periods of West Wind must logically occur during the " equinoxes," but with risks of gales accompanied by low ceilings.

Sea influence seems bad for thermal formation and never could soaring be attempted without wind and no one Silver " C " altitude gain appeared possible on the slope or inland country. The form of the Cotentin peninsula, wide by 30 miles, forbids any superior distance flight.

Interest of Vauville is then confined to duration performances, and the site even appears suitable to breaking national or world records.

Pilots who wish to " pile " flying hours and to spend some delightful holidays at sea will appreciate, with high praise, the soaring centre of Vauville.

" GLIDING "

A Review.

NO. 4 of our little competitor, " Gliding," is already in print and keeps up the high standard of the earlier numbers. Of purely local interest so far, it yet fills a gap in the English gliding world by being able to devote more space to Club news than we can, owing to our wider and more international scope. The prestige of *Sailplane* abroad stands very high indeed, after twenty years' continuous publication (we celebrate our " twenty-first " in our issue for next September), and from the welcome given us everywhere I am sure that any new British magazine devoted to gliding would be sure of a kind reception.

The article on " Radio for Sailplanes " is interesting, likewise the speculation on lee waves. Lawrence Wright's " Obstinate Beliefs " are to be commended and Philip Wills has some afterthoughts on our poor showing in the World Championships in Orebro. He also has an article on Slingsby's new high performance machine, and another, equally laudatory, on the Pullin turn-and-bank. I see that he is offering a " Weihe " for sale ; would that be the one I had the pleasure of helping him unload from an " Anson " in the autumn of '44 ? That was the first time we had had a chance to inspect the wing fittings of the " Weihe " and it was a revelation in simplicity.

I liked Delta's " Criticism of Soaring Contests " and agree with almost all his remarks, especially those on simplifying contests. An international Dunstable to Madrid race sounds a wonderful idea, though I cannot think how you would ever collect the competitors together again after the start ! But at least he has given us something to think about.

V.P.

NATIONAL " COMPS."

AS we reported last month the National Championships are to be held at Camphill this year from July 22—29 inclusive, with the 21st as a practice day. This was recently confirmed by the B.G.A.

But——

Qualifications : possession of a " C " gliding certificate ; at least 20 hours' solo flying, of which five must have been devoted to hill soaring and must include a 50 km. cross-country on aircraft of up to 1,250 lb. a.u.w. ; at least ten winch launches ; and possession of a valid F.A.I. competitor's licence. We understand that the organizers may also require evidence of the fact that pilots are in current flying practice.

ANNUAL TROPHIES

A HIGHLIGHT at the Annual General Meeting of the B.G.A., to be held at Londonderry House, on Saturday, March 17, at 2.30 p.m., will be the presentation of annual awards as follows : *de Havilland Trophy*, to F/Lt A. W. Bedford, A.F.C., for an absolute height of 21,345 ft., and gain of 19,120 ft., during his flight from Odiham in an " Olympia," on August 24, last year ; the *Manio Cup* to P. A. Wills, C.B.E., for a goal flight of 134 miles in a " Weihe " from Camphill to Coltishall, at the National Contests on July 27 ; the *Wakefield Trophy* to Lorne Welch for a distance flight of 203 miles in a " Weihe " from Redhill to Melsbroek (Brussels) on April 12 ; the *Volk Cup* to J. A. C. Karran and W. Kahn for their out-and-return flights of 141 miles in " Olympias " from Redhill to Netheravon on July 2 ; and the *Seager Cup* to J. Grantham and A. R. I. Austin in a " Kranich " for a goal flight of 85 miles from Camphill to Ingoldmells, Lincs., at the National Contest on July 24.

The Council of the B.G.A., has endorsed these awards which were recommended by the Flying Committee.

NOTE ON VERTICAL AIR CURRENTS ON THE TASMANIAN AIR ROUTE

By E. DESMOND and U. RADOK

Observational Evidence

THE existence of systematic vertical air currents on parts of the Tasmanian air route was first suspected when on May 16th, 1948, an airline pilot reported that, while climbing near Tunbridge in order to evade turbulence at 7,000 feet, he encountered a strong steady downdraft which caused the aircraft to loose height at the rate of 500 feet/min., despite full climbing power. The descent was arrested at 6,000 feet and was followed immediately by a similarly uncontrollable rise, which took the aircraft to 7,500 feet, even though the pilot closed both throttles, put the wheels down and increased speed to 180 m.p.h. Both the sink and the rise took place in perfectly smooth air.

On May 19th similar occurrences were reported—this time between Western Junction and Low Head, and most surprisingly also far out to sea, at the latitude of Flinders Island (40°S). In addition, several pilots who had been on the Tasmanian run for a considerable time expressed the view that similar areas of ascending and descending air were not unusual.

In view of these facts a systematic interviewing programme was adopted which resulted in the phenomenon being found on four occasions during the following month, viz., on June 2nd, 23rd, 26th and 28th. On June 27th the disturbance failed to materialize although the broad synoptic situation appeared unchanged.

In this way the following points emerged :—

1. The regions of updrafts and downdrafts are situated on the radio beam (*a*) between Western Junction and Tunbridge ; (*b*) between Western Junction and Low Head ; and (*c*) between Low Head and the latitude of Flinders Island (40°S). The disturbances may exist at any or all of these positions at the same time, and may extend over all or part of the respective sections.

2. The broad synoptic situation in which they occur is that of an intense stream from West to South, with velocities exceeding 30 knots, a few hours after the passage of a cold front.

3. The disturbances have been found up to date in the height range from 5,000 to 12,000 feet (without necessarily extending over the entire range at any one time).

4. The two more northerly disturbances (in particular that found off Flinders Island) require a more southerly direction of the air stream. In terms of the pilot balloon observations at Western Junction, it appears that a sufficiently strong wind from 220° to 180° will set up the Tunbridge disturbance, whereas for those between Western Junction and Low Head, and between Low Head and 40°S, respectively, winds are required between 200° and 180°, and 190° and 180°. The wind field showed in general little vertical shear ; on two occasions strong shear was actually observed, but the excessive wind velocities computed then would probably represent the influence of the disturbances on the rate of ascent of the pilot balloon.

5. Excepting one occasion, no clouds have been observed in connection with the disturbances. The exception is described at the end of this section. On the other hand, lenticular type clouds were observed when the disturbances were absent.

All this evidence points to the Tasmanian Central Plateau as responsible for some sort of wave motion in the region of the air route. Since the latter runs parallel to the Eastern escarpment from Tunbridge to Western Junction, and roughly at right angles away from the Northern escarpment in the stretch from Western Junction to the 40°S position, estimates of the wave length can only be derived from observations made North of Western Junction whereas the sequences of up and downdrafts in the Tunbridge section would be due to the aircraft not flying strictly parallel to the trough or ridges of the waves. In the region between Low Head and the beam position at 40°S rough estimates for the duration of up and downdrafts together with the reported airspeed yielded for the length of each half-wave the value 12 to 15 miles.

It is however clear that the method of obtaining these results is very unsatisfactory. The airline pilots naturally do not look at the phenomenon from a scientific point of view, but are mainly concerned with flying on a given tract at a prescribed altitude. Consequently they would frequently obliterate all traces of only moderately intense vertical currents by counteracting vertical motion ; or miss such currents altogether when they do not coincide exactly with the radio beam. In addition all estimates of times and speeds are made from memory and are very approximate. The following table illustrates the type of reports made :—

Date, 2.6.1948.

Section—Tunbridge—Western Junction.

Time	Remarks.
12.36	Northbound. Pilot experienced steady lift all the way from Tunbridge to Western Junction. Climbed from 8,000 feet to 10,500 feet and passed Western Junction at 230 m.p.h. I.A.S.
16.30	Southbound. Pilot attempting to descend from 9,000 feet, reach 10,000 feet before being able to make the aircraft descend
16.44	Southbound. At 5,000 feet the aircraft experienced a smooth upcurrent, followed by a similar downcurrent.
18.40	Northbound. Turbulence at 8,000 feet, but no details reported.

Section—Abeam off Flinders Island.

Time.	Remarks.
14.40	Southbound. Altitude 7,000 feet. Waves between 40°S and 40°30'S. Approximate time in sink or climb 5 minutes; both rises and sinks uncontrollable. I.A.S. 175 m.p.h.
15.16	Southbound. Altitude 7,000 feet. No turbulence.
15.53	Southbound. Altitude 9,000 feet. Waves from 40°S to 40°30'S; aircraft capable of maintaining correct altitude.
18.01	Northbound. Altitude 8,000 feet. Waves all the way from Low Head to 40°S. Average time spent in upcurrents and downcurrents approximately 4 minutes.
18.17	Southbound. Altitude 5,000 feet. No turbulence.
20.20	Southbound. Altitude 6,000 feet. No turbulence.
20.40	Northbound. Altitude 5,000 feet. No turbulence.

How a detailed knowledge of the disturbances could affect operations is shown by the experience of a pilot who on June 28th encountered turbulence near Tunbridge in the vicinity of thin lenticular clouds (some 1,000 to 2,000 feet thick) at 7,000 feet. Flying east to evade the turbulence he struck an intense downdraft and was unable to maintain his altitude. On the return journey the same pilot recalled the author's advice to keep to the west side of the clouds, and when doing so found himself flying all the way from Tunbridge to Western Junction in "terrific" smooth lift, maintaining his altitude under flying conditions which normally would have corresponded to a steep descent.

A better understanding of the disturbances described above and of the conditions under which they must be expected to occur seems therefore of considerable importance for safe and efficient operations on the Tasmanian Air Route.

Theoretical Background

From the extensive theory of wave motion in the atmosphere two particular studies have been selected as possibly relevant to the phenomena described in the preceding section. One of these (Queney 1947, 1948) represents the most recent study of atmospheric oscillations due to mountains by means of the method of small perturbations, due to V. Bjerknes (1927); the other (Kuttner 1938) took its start from sailplane observations of stationary waves in the lee of the Riesengebirge (Giant Mountains) and of the Alps. The Tasmanian data seemed however inadequate for a strict verification of any theory and the main emphasis was therefore placed on the assumptions made in either approach and their applicability to the present case.

Queney's analysis assumes a homogeneous atmosphere characterised by a constant co-efficient of vertical stability defined by $s = \sqrt{g/\theta \frac{\partial \theta}{\partial z}}$ where g is the acceleration of gravity, θ the potential temperature and z the elevation. From a small sinusoidal surface disturbance (which has no practical analogy except possibly that of an infinite series of mountain chains) a typical mountain profile is derived by means of the Fourier integral. This profile is given by $z = b/\left(1 + \frac{x^2}{a^2}\right)$ where b represents the height of the mountain and a has the character of a half-width, (i.e. the distance in which the profile descends from b to b/2). In order that the theory of small perturbations can apply strictly, b must be small compared with a; however, qualitative agreement may exist between theory and reality even when b approaches a/2.

The profile may be described as a small smooth obstacle and was adopted because it led to simple results. A further transformation yields the shape of a plateau for which flow phenomena would depend essentially on the shape of the lee escarpment only (although the magnitude of the disturbances turns out to increase in size the length of the plateau). By superposition of a number of profiles and plateaux with different parameters a and b, a given smooth mountain may be closely approximated; while the resulting disturbances are found by a similar superposition of those of the individual profiles.

For the typical smooth profile the analysis shows that proper oscillations will only occur when the velocity of the air stream u, is in the neighbourhood of one of the three following critical values :

1. $u = s.a$ 2. $u = f.a$ and 3. $u = p.a^2$ (for West wind only). where s has been defined above (co-efficient of vertical stability $f = 2\omega \sin \phi$ is the vertical component of the Coriolis parameter, and B is the North-South variation of f, viz. $\frac{\partial f}{\partial y} = -(2\omega/r) \cot \phi$.

When u lies between these critical values the disturbances are restricted to the immediate vicinity of the obstacle.

Since the order of magnitude of the parameters s, f and B, is respectively 10^{-2}, 10^{-4}, and 10^{-8}, any mountain will in general give rise, if at all, only to one of the three types of waves. Conversely, if we consider a stream of constant velocity u = 15 m/sec. (approximately 30 knots, the limiting value established in sect. 2 from the Tasmanian data) we find that oscillations can be expected only, for typical mountain profiles, when the half-width has roughly one of the following values :—

$a_1 \sim 1.5$ km. $a_2 \sim 150$ km. $a_3 \sim 3{,}880$ km.

The corresponding wave lengths are given by $L = 2\pi a$ (except in case 2 where the wave length decreases from $2\pi a_2$ near the surface to $2\pi a_1$ at great elevations) which yields in the above case

$L_1 \sim 9.4$ km. $L_2 \sim 940$ km. $L_3 \sim 24{,}400$ km.

(Continued on page 64)

Introducing the "Peravia" B-139 Barograph for Glider Pilots

EVERY glider pilot will be interested in a new type of barograph now being produced by Peravia Ltd., Berne, Switzerland.

From a mass of information and technical data received by us about this beautiful instrument we publish herewith some of the details which we consider to be most interesting, it being understood that pressure on space prevents us saying as much as we would like.

The " Peravia " B-139 (illus. right) is designed for use by glider pilots and sporting flyers. It indicates the altitude of flight and records altitude and duration of flight. As the punctures of the recording needle follow each other at regular intervals, the barograph thereby, also registers the climbing speed and rate of descent.

The measuring mechanism of this apparatus is of the same type as that of the " Peravia " barograph BR-242 (Fig. II shows this model out of case). The " B-139 " has, however, the following simplifications :—

1. Grey aluminium case, not air-tight, without handgrip (as against black case of plastic material, with handgrip for the B-242) Union for static pressure not required.
2. No thermostat.
3. No relay for remote switching the mechanism on and off.
4. Graduation limited to 8 km.

Indication and record are the same for both types of barograph.

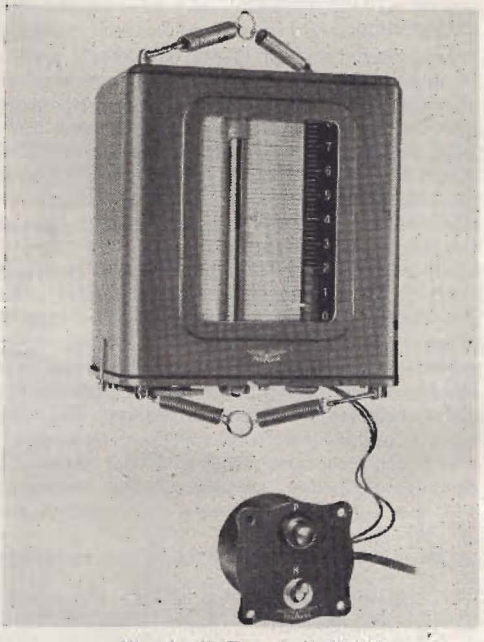


Fig. 1 : " *Peravia* " *B*-139

Characteristics :

1. A clear, extended record of linear scale, easy to read in all its particulars. Straight, not curved record.
2. Uninterrupted record on continuous paper chart.
3. No ink or carbon used for the recording; records are not written, but punched by a steel needle. Punctures are made at intervals of 6 seconds, on a paper moving at a speed of 3 mm. per minute. Consequently, spacing of the punctures is such that the record appears as like an uninterrupted line. With the help of a magnifying glass however, each puncture can be identified. This enables the reading of differencies in altitude, within comparatively small periods, f.i., rapid descents or climbs.

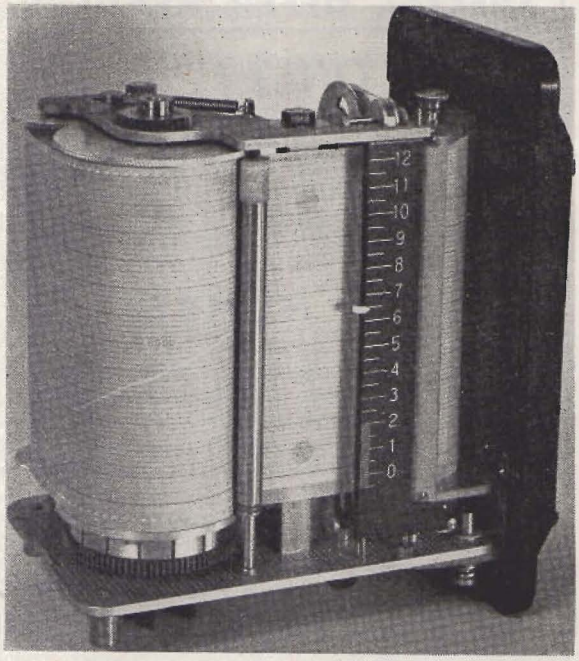


Fig. 2 : " *Peravia* " *BR-242 out of its case.*

4. Accuracy of measuring. Admissible error ± 2% of graduation from an altitude of 1,000 metres upward.
5. The instrument is unaffected by :—
   (a) Vibrations and shocks, such as will normally occur in service.
   (b) Flying altitude.
   (c) Influence of temperature, i.e. :
      I. between —40° C. and +60° C. for barograph without heating device.
      II. between —50° C. and +60° C. for barograph with heating device.
   (d) Electric and magnetic influence.
6. A special punching device makes it possible to mark on the record any moment of particular interest during the flight.
7. Easy and rapid exchange of diagram rolls.
8. Records cannot be forged.
9. Records can easily be reproduced.
10. At intervals of half-an-hour, the apparatus automatically punches its number into the record chart, thus avoiding the possibility that the record might, later on, be mistaken for that of another apparatus.
11. The apparatus can rapidly and easily be adjusted to the altitude of the starting point.
12. The case can be sealed.
13. The mechanism of the apparatus can be set on and off at pleasure, consequently the consumption of diagram paper is economical.
14. Strong construction.

Further details and Brochure from PERAVIA LTD., Berne, Switzerland.

(*Continued from page* 62)

In the present context thus only the first case could apply, the others leading to wave of synoptic dimensions. It should be noted that the waves in question, details of which can be found in Queney's second (1948) paper should extend throughout the troposphere.

In contrast to the above, Kuttner's work attempts to explain the stationary waves observed in the lee of many mountains as oscillations affecting mainly one or several high inversion layers and the air adjacent to them. Following a paper by W. Thomson (Lord Kelvin) in 1886 which dealt with the analogous case of the flow of water over a submerged obstacle, stationary conditions are assumed, so that instead of the equations of motion their first integral in the form of Bernoulli's equation can be used. This leads to a height for the discontinuity surface above the obstacle which differs from that at a large distance before and behind it. The difference is negative for small flow velocities and positive for large ones, while for some critical intermediate value of the velocity it tends to infinity. This critical velocity is identical with that of the propagation of waves which are long compared with the average height of the discontinuity surface above the obstacle H, and for adiabatic changes has the value $u_{crit} = \sqrt{gH \frac{T' - T}{T'}}$ where T' and T are respectively the temperatures above and below the discontinuity. If the latter has a small finite thickness the difference in temperatures is to be replaced by that of the potential temperatures, i.e. the "ideal inversion" (Wegener, 1912); this takes account of a corresponding increase in the velocity of long waves confirmed analytically by Haurwitz (1931).

While the actual wave motion falls outside the scope of this treatment it is obvious that a change in the elevation of the discontinuity surface would lead in general to oscillations about the new equilibrium height; these oscillations would reach considerable amplitudes for a sharp obstacle and would in practice develop breaker forms as the velocity of the flow approaches the critical value. Kuttner's treatment gives no immediate clue to the length of these waves. It seems likely, however, that at a certain subcritical speed only waves with the same speed of propagation could be stationary. Such waves would be no longer large compared with the height of the discontinuity surface ("Stoke's waves"), and their velocities of propagation are given by a function of their wave lengths. Such waves have been studied in the paper by Haurwitz (1931) previously quoted for the case of two infinite isothermal layers and adiabatic changes. While these conditions appear somewhat unrealistic (having been chosen for mathematical convenience) the results are in good agreement with observations of waves in cloud layers ("Helmholtz waves"); and they also seem to be applicable to the stationary waves observed in the lee of the Riesengebirge, on which Kuttner's paper is based. The lengths of these waves are of the order 5 to 10 km. which, for a fairly strong inversion, corresponds to velocities of propagation of 17 m/secs. to 30 m/secs. (Haurwitz 1931 p. 93) close to the observed values.

Kuttner's approach has been contested, however, in view of the great altitude of the Riesengebirge waves which rendered doubtful the presence of inversions. This difficulty seems likely to have been settled in later publications on the subject by means of direct aerological observations; unfortunately none of these later papers have been accessible to us. At any rate it will be seen below that the existence of inversions is established for the Tasmanian case, so that the above difficulty does not enter into the present discussion.

Another difficulty arises from the fact, however, that the height of the observed disturbances cannot be considered as large compared with that of the obstacle. While there appears to be no justification for Kuttner's contention that disturbances cannot occur in this case (which is disproved by the disturbed surface observed for any shallow fast-flowing creek), the same analysis leads then to a critical velocity slightly lower than that for the same discontinuity at great elevations. Details of the calculations will be omitted here since from the Tasmanian data the height of the discontinuity surface cannot be accurately established; but it should be kept in mind that the critical velocities computed by means of Kuttner's formula given above are likely to be too large.

Finally it should be noted that both approaches agree in assuming constant wind velocities over the whole depth of the air stream. In Kuttner's case this was actually established by observation, and the same state of affairs is indicated for the Tasmanian conditions (cf. section 2).

To be continued.

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Brevities

INDIA'S PRIME MINISTER VISITS POONA GLIDERDROME

THE Indian Gliding Association by the Trans-World Airline, was formally handed over to Mr. Jawaharlal Nehru by Mr. F. W. Benson, Traffic Manager, T.W.A., at the opening of the gliderdrome in Poona on November 7th.

Mr. Nehru performed the opening ceremony of the gliderdrome at Fursungi, said to be one of the largest gliderdromes in Asia.

Immediately after opening the gliderdrome at Fursungi, near Poona on November 7th, India's Prime Minister, Mr. Nehru, went up in the air in one of the gliders.

HAL CRONKHITE, President of the Texas Soaring Association has resigned his office to accept the position of Chief of Structures Engineer at Aero Design and Engineering Company, Oklohoma City. Hal, besides having been the efficient Centre Director for three contests including the 17th National, has been a leader and guiding hand in many activities of the association and will be greatly missed.

DURING 1950, 6 Gold " C " and 43 Silver " C " badges were gained by soaring pilots in Yugoslavia. Four of the Silver " C's " were won by women.

Besides this there were also 3 diamond " C's " awarded.

The six new Gold " C " pilots are :—late Milan Borisek, Marks Arbajter, Mijo Pusic, Franc Mordej, Bozo Komac and Aleksander Saradic.

ON SHOW TO THE WORLD

A " SKY " (Slingsby's new high performance sailplane T/34) is to be on exhibition at the Festival of Great Britain. It will be seen in the Transport and Communications Pavilion which adjoins the Dome of Discovery. Other exhibits suspended from the roof include an " Olympia " sailplane and the original " DH Comet G-ACSS " which won the Mildenhall-Melbourne air race in 1934. All other aeronautical exhibits will be housed in the Pavilion.

FIRST INDIAN-BUILT GLIDER TAKES WINGS

THE Civil Aviation Training Centre at Allahabad takes the credit for building the first Glider in India to actually fly. This single-seater aircraft was tested at Bamrauli aerodrome near Allahabad last November ; in all ten launches were made. It now remains to decide if the C.A.T.C. is capable of building gliders in quantity, if so, it would seem to turn into a glider factory and may lose some of its training background which would be a pity as training is of vital importance and the Centre, although well progressed, still has a long way to reach the standard of training to be found in first-class aeronautical schools in other parts of the world. Care should be taken not to fall between the schools of training and construction.—*Indian Skyways.*

Central African Gliding—(*Continued from page* 57)

route from Umtali, and the " Tutor " was in need of overhaul. The winch was still under construction and the club heavily in debt. Great efforts were made, particularly by Wall, Bone and the writer, and the primary was put back in flying condition, only to be pranged on its first flight by Eric Bone, due to high wind—an unusual condition in our country—and long grass—unfortunately a too usual condition.

However, August saw both the " primary " and the " Tutor " on the airfield and the winch going well. An " At Home " was held, attended by the Salisbury branch of the R.A.F. Association, and the Committee of the newly-formed Bulawayo Gliding Club.

The meeting was attended by our President, Sir Godfrey Huggins, and Lady Huggins. Sir Godfrey, who is, of course, our Prime Minister, witnessed beginners under instruction and some good soaring by Bone and Jerry Wall in the "Tutor."

Two members arrived in their own powered aircraft and a very enjoyable day was brought to a sad end by Harris of Bulawayo bending the " Tutor " nose, again due to long grass, and several pupils, myself included, doing too many heavy landings on the " primary."

The meeting was also attended by one of our M.P.'s, Mr. L. M. Cullinan, who is widely known for the support and encouragement he gives to the flying and gliding movements. Mr. Cullinan, now our Vice-President, became a life member, as did one of our power-flying visitors, Mr. Knill, a farmer of Marandellas.

The " primary " was soon in condition again but the " Tutor " fuselage was re-built and considerably improved, streamlined and modified and fitted with a wheeled undercarriage, which has since proved itself. Subsequently, the " Kadet " wings were completed, and Roy Wallis, Hugh Rowland and Sam Barker have converted to " Cadet."

At the close of the year the "primary " was sold to the Bulawayo Gliding Club and we hope to purchase a " two-seater " in the near future. Meanwhile, Sam Barker, Roy Wallis, Jimmy Harrold and myself have purchased a " H.17," which is at the time of writing at Beira.

Finally, we all welcome back Derek Lane after his long sojourn in the old country. Doubtless he will be missed by gliding circles back there.

Gwelo.

Stevens of the R.A.F. Station, Thornhill, is trying to get a club started here. At the moment it is touch and go but we all look forward to his success, which will make it possible to have a first-rate Central African Gliding Contest.

Here, in Central Africa, we are pioneering, but the coming year should see some really worth-while cross-countries. Our thermals are virtually unexplored but we do know that their possibilities are tremendous and we have even heard rumours of standing waves. The country is developing so fast that we think gliding has come to stay and the immigrants from the old country and South Africa include enthusiasts amongst their ranks. However, we should like to see some more—many more.

DOWN BY THE ZOO

PART II.

"WOT DUN IT"?

By CHARLES ELLIS

AN attempt to explain the queer happenings of April 2nd, described in last month's issue.

The Central Forecasting Station was visited by L. Wright and myself the following week-end, in the hope that they would have a record of the wind speed and direction at the time in question, but we were told that their instrument had gone u/s. However, we were shown the relevant weather charts. At 12.00 hrs., a depression of almost circular, text-book shape was centred over N.E. England, and it was confirmed that winds of 30 kts., from west or west south west could be expected at Dunstable from such a depression. On the 13.00 hrs. chart the depression showed little change apart from a slight displacement of the centre towards E. and the faintest " kink " in the isobars, about which the forecaster appeared to have some doubts, as the front was denoted by the faintest of pencil lines. This ran N.E.—S.W. across southern England, almost parallel to the Chilterns and a few miles upwind of Dunstable, but the change in direction of the isobars, as shown on the chart, was not sufficient to indicate any appreciable veer in the wind, neither was there any significant change in temperature or wind strength—no new-born babe could have looked more innocent. Yet this was undoubtedly the lusty infant that smote us 30 minutes after birth.

As a satisfactory explanation was not forthcoming from this source it was decided to call for pilots' accounts, and these showed certain interesting similarities :—

(1) Wind speed—This was originally 30-35 m.p.h. and increased during the squall to at least 60 and probably reached 70 m.p.h.

(2) The veering was only associated with the squall. No significant veer was reported before the increase in wind speed became apparent, and it was proved that an equivalent backing took place afterwards.

(3) The cloud associated with the squall was moving at the same speed as other clouds in the sky.

(4) Maximum lift occurred well in advance of the cloud, and was extensive—several widely separated aircraft were climbing in it at once.

(5) Maximum sink followed max. lift almost without any intermediate state, and was of similar magnitude. It also existed in advance of the cloud, but may have continued into it.

(6) There was no great vertical development in the cloud, and the advancing wall appeared to be of almost uniform thickness.

(7) Precipitation occurred throughout the length of the line of cloud, and sometimes took the form of hail.

If we study the above points we can hardly fail to ask ourselves the following questions :—

(a) As the cloud was moving at normal speed why was the wind associated with it moving twice as fast ?

(b) Why did maximum lift occur outside the cloud ?

(c) Is there not some significance between the similarity of the degree of max. lift and max. sink ?

(d) If the cloud indicated a front, why did the wind back behind it ?

The answers, I suggest, are as follows :—

(a) Meteorologists, in describing the gusts associated with the passing of a cold front, usually attribute them to strong downcurrents which are deflected horizontally on striking the ground, and these downcurrents are said to be at the rear of the frontal cloud and following the powerful upcurrents which are alleged to exist in the most advanced part of the clouds.

(An idealized sketch of this set-up is given by K. O. Lange on p. 141 of " Flight without Power "). But in our case the increase in wind speed was experienced at a considerable height, and in association with strong up and downcurrents, some distance in advance of the cloud. It seems therefore that the squall air must have had a strong horizontal component at height, and not merely at ground level, and that our front was unlike those described in the text-books.

To get a clue we must look, I suggest, at other conditions which exhibit a marked difference between cloud speed and associated wind velocity. The most notable similarity occurs with orographic cloud, which appears to remain stationary over mountain tops, although they are swept by high winds. Small clouds may be formed up-wind of the main mass, and rush rapidly towards it, to be swallowed up in the uniform featurelessness of the stationary cloud. No cloud ever detaches itself on the down-wind side. (The down-wind side of our cloud was remarkable for its uniform continuity, and had no smaller clouds forming in advance of it, as shown in text-book illustrations of cold fronts).

So, although our squall cloud appeared to be moving at the same speed as other clouds in the sky, the air may have been moving through it at twice this speed. But why, if there was no mountain ?

It is true that we had no mountain, but we had a slope, a moving slope, with a speed in excess of 30 m.p.h. This was the boundary formed at the front, between the dense cold air and the less dense air of the warm sector. It has been proved that the gradient of this slope, in a mature front, is of the order 1:200. But our front was only ½ hr. old, and since, at birth, the boundary must have been nearly vertical, the gradient of our infant front was certainly much steeper than 1:200. Now I find it impossible to imagine this warm-sector air lying upon this slope without giving up some of its heat to the colder " mountain." It seems clear that at some time a thin layer of air, of intermediate temperature and density, will be formed upon the slope, and this will tend to flow, like any other fluid, down the slope

under the influence of gravity, in a similar manner to a katabatic wind. Its speed in relation to the ground, when it reaches the foot of the slope, will be the sum of its own horizontal component plus the forward speed of the front.

The warmer air, if cooled sufficiently by this contact, will become saturated, but any cloud formed will only be boosted by the latent heat of condensation, as the air is too stable to promote deep vertical development. In general we can expect the cloud to be confined within the mixing limits of our intermediate layer, and although this mixing may in places produce hail these would not cover extensive areas, and would be of short duration. If rain is formed however, we should expect to find the largest drops at the lowest part of the cloud, well down the slope, where the downward flow of the intermediate layer reaches its greatest speed. The cloud itself will extend down the slope until it reaches a temperature at which its water droplets evaporate, but the cloud-free air still plunges on, and having given up a lot of its moisture in rain, is now much drier and denser. At this stage the similarity to orographic cloud may be extended to include the " föhn " effect.

We now have an explanation for the violent downcurrent reported by pilots immediately in advance of the cloud wall, and why they found no lift within it, or up-wind of it, as is to be found with convection cloud. My own report that strong lift existed below the advancing edge of the cloud was, I think, due to the fact that this was steeply inclined forward and that although vertically beneath it the air lifting me did not in fact rise into the cloud, i.e., if I had circled I should never have entered the cloud. As it was I turned downwind too late, having pressed forward too close to the cloud and into the downcurrent.

(b) The explanation so far concerns itself with the big " down " but the reason for the strong upcurrent which immediately preceded it is not hard to find if we try to imagine what happens when the intermediate air, sliding down the slope, reaches the ground. I suggest that it is reflected, and bounces upwards at an angle approximating to the slope down which it has descended.

(c) This would account for the similarity between the degree of max. lift and max. sink reported, and the rapidity with which pilots passed from one to the other. The air " bounced " to over 2,800 ft., without forming cloud, and my own impression is that it then descended and again re-bounded, with diminishing amplitude, perhaps many times. The severity of the downcurrents between the " ups " may well have been the cause of the stranding of the "Prefect " before the arrival of the front.

(d) The backing of the wind, following a brief initial veer, after the passing of a front, is nothing new to Dunstable pilots. Neither is the fact that the increase in wind only lasts for the brief period of the veer. But I have never seen any attempted explanation of this, which is contrary to the text-books ; and the classical description of the passing of a cold front demands that the wind shall veer, and remain veered afterwards.

I have already explained that the change in direction of the isobars was not sufficient to produce any marked veering, and this was borne out by events. There was no appreciable difference in the wind direction before and after the passing of the front. The veer only existed during the squall.

The explanation is really quite simple. As the squall was due to air flowing off a slope, the direction of flow will depend entirely upon the " dip " of the slope, which is at right angles to its " strike " across country. The map showed, and the pilots confirmed, that the front lay S.W.—N.E. and was advancing from W. to E. Air flowing down the slope of this front, like water taking the shortest route, will flow from N.W. to S.E. After the passing of the front the wind will revert to its general westerly direction.

In conclusion, and while making no attempt to offer the above explanation for fully matured fronts, I should like to draw attention to published descriptions of soaring flights with cold fronts which have had the following features :

(1) Best area of lift is an extensive area in advance of the front, and running parallel to it.

(2) Sink within the cloud.

(3) Best height in clear air well above cloud base and without cloud forming above.

(Acknowledgments to the London Club's " Gazette.")

ULTRA LIGHT AIRCRAFT ASSOCIATION

EXTRACTS FROM JANUARY BULLETIN

DEPARTING FRIENDS

THE New Year brings with it the news of departure to distant shores of two members and one ex-member of the Association's Executive Committee.

Group Captain Edward Mole, Chairman, leaves to take up his appointment as Director of Civil Aviation in the Bahamas and takes with him our hard working Bulletin Secretary, Joan Bowen, as his wife.

Our second departure is that of our first Executive Committee Chairman and Founder, Ronald Clegg, who is also on the high seas en route for Hong Kong where he takes up an appointment with a big shipping Company. Thirdly, founder member and ex-Committee member, due in Central Africa in two month's time, is F/O. Ian Imray.

Our best wishes are extended to all these our friends, in their new ventures, and we confidently predict that, world conditions permitting, we shall have at least three new overseas groups within a year if these stalwarts run true to form.

But we feel regret at the loss of such active members especially Edward Mole, who during the past year has been such a tower of strength in our organization. It is only fitting that we place on record our appreciation and thanks for the immense amount he has achieved as Chairman of the Executive Committee.

Mr. Maurice Imray (Vice-Chairman of the E.C.), has been provisionally elected Acting Chairman until the next Annual General Meeting, and Captain E. S. Davis (Chairman of the Operations Sub-Committee), has been provisionally elected Vice-Chairman in place of Mr. Imray.

Mr. Alan Stratford, B.Sc., A.F.R.Ae.S., who has been elected Chairman of the Design Sub-Committee in place of Group Captain E. L. Mole, is an ex-R.A.F. pilot who is employed on the technical staff of British European Airways.

He is a member of the Airways Aero Club, and an enthusiast amateur pilot, and will follow up the various projects of the previous Chairman and will sponsor the design and development of new types of ultra light aircraft and engines. He will also co-operate closely with the U.L.A.A. Design Team (headed by Mr. A. R. Weyl, A.F.R.Ae.S.) on all airworthiness matters.

Mr. R. W. Clegg has been forced to resign from the post of Chairman of the Communications Sub-Committee because of his forthcoming departure to an appointment abroad. The post is being left vacant temporarily.

He will be remembered as the original Founder Member of the Association and our first Chairman and Hon. Secretary. The U.L.A.A. owes its existence to his hard work and organising ability, for which he was recently formally elected a Life Honorary Member. He is anxious to keep in touch with the Association and would like members to write to him. His address will be : Wireless Superintendent, China Navigation Co., Ltd., Hong Kong.

DESIGN SUPPLEMENT

Contributed by Group Captain E. L. Mole, Chairman Design Sub-Committee.

It is with considerable regret that this is to be the last Design Supplement I shall have the pleasure of contributing to the U.L.A.A. Bulletin. For four years the Design Sub-Committee has consistently striven to encourage the design and development of ultra light aircraft, and I particularly regret leaving the movement now that our long awaited engine is nearly ready for flight tests, with the consequence that our efforts to obtain suitable new aircraft are likely before long to be successful.

I am, however, happy to welcome Mr. Alan Stratford as my successor. He is highly qualified technically for the work besides being an enthusiastic pilot. Members can be assured that our design and development projects will be in good hands.

Although relinquishing an active part on the Executive Committee, I shall still take a keen interest in the progress of the Association and its efforts and I should be pleased to hear from any enthusiasts who may care to write to me :—Director of Civil Aviation, Nassau Airport, Bahamas.

Review of the U.L.A. and Engine Design Projects in Hand.—The advent of the New Year is a good opportunity to take stock of the position as regards the design and development of new aircraft and engines, and we have accordingly prepared the following review of the projects which have been going ahead during the past year. In addition to these projects, there are also a number of others which have lapsed into abeyance pending the growth of our movement and the development of a market for ultra light aircraft. The lack of a suitable engine in production has been a serious bottle-neck to progress but with the advent of the " Coventry Victor " engine we may look forward confidently to a considerable expansion of interest before long in the design and development field.

AIRCRAFT DESIGNS

Slingbys " Motor-Tutor."—An interesting and successful conversion of the well proved " Tutor " glider into a powered aircraft by the installation of a 36 h.p. Aeronca JAP engine. The " Motor-Tutor " has the distinction of being the first post-war ultra light aircraft to be awarded its Type C. of A. Although having only a moderate cruising speed, the machine has remarkably short take-off and landing runs, and a steep angle of climb. It is extremely easy and pleasant to fly, and is of special value in that it offers the means of converting glider pilots to powered flying without the expense of dual instruction. The first production " Motor-Tutor " is being operated by the Southend Flying School as an experiment, where it may be flown by any licensed pilots, for a charge of 30/- per hour. Slingsby Sailplanes Ltd., are prepared to offer complete kits of pre-fabricated components of the aircraft for home construction at a price of about £285 (less engine and propellor).

" Dart Kitten " (general purpose type).—A neat and robust single-seater low wing monoplane which flew successfully before the war with the 36 h.p. Aeronca JAP engine. It cruises at over 80 m.p.h. on 2½ gallons of petrol per hour, and has take-off and landing runs of only 90 yards.

Two pre-war aircraft have been re-conditioned and re-issued with their permits-to-fly ; one of these is being operated at the Herts and Essex Aero Club and the other at the Southend Flying Club, both at 30/- per hour. Dart Aircraft Ltd., is building a post-war prototype of the JAP-engined " Kitten" in order to obtain a Type C. of A., after which the machine will be available in kits of parts for home construction at a price of about £235 (less engine and propellor). Another airframe has been ordered by the Association (with the assistance of the Kemsley Flying Trust) in order to carry out the flight trials of the new " Coventry Victor " engine. A Type C. of A. for this version of the " Kitten " may be expected once the engine has completed its trials and received A.R.B. approval.

Ultra Light Airship.—Lord Ventry's interesting project, in the construction and development of which several members of the Association are concerned. The envelope is to be of 45,000 cu. ft. capacity and 97 ft. long. The airship should be capable of carrying five to six persons for short flights, and have a maximum endurance of about 10 hours. The cabin, with the installation of a 75 h.p. Salmson engine, has already been completed, and the envelope is being assembled. There is every chance of seeing this enterprising project airborne before long.

The Design and Construction of the BRITTEN-NORMAN BN-1F

(These notes have been sent to us by John Britten. They are of great interest, illustrating some of the problems relating to home construction on an ambitious scale).

Desmond Norman and I had both been at the de Havilland Technical School for some time and

wanted to put our ideas of aircraft design into practice. First we spent nearly two years on the "back of the envelope stage." There was at that time no real hurry and we knew that the scheme on which we finalised would decide our future plans. First, the aircraft had to be simple and able to be built with the minimum of labour; for we are both extremely lazy types, and hard or prolonged work is an anathema to us. Next the machine had to have the aerodynamics we desired; and finally it needed to be robust, constructionally foolproof, and very small (less to build).

We soon discarded schemes for low-wing clean aircraft, they would take too long to build and anyway excellent designs such as the "Chilton" and the "Kitten" existed in this category already and so eventually we evolved the layout of the "BN-1F" as being potentially the easiest design from all points of view. All this stage we began paying visits to those having authority over matters aeronautical in this country to see what sort of reception an amateur project of this nature would receive. All without exception, were most helpful. A.R.B. proved not to be a bureaucratic ogre, but a collection of tolerant and kindly individuals with a large fund of aeronautical experience which, though not always easily applied to aircraft below the size of the "Comet" was nevertheless very welcome. The Ministry of Supply were most willing to co-operate and gave permits for all the materials we required. Mr. Weyl became our design consultant and the U.L.A.A. helped and encouraged us in a hundred ways.

We then felt we were ready to go ahead. About six months were spent on design calculations and drawings, all of which had to be checked by the unfortunate Mr. Weyl who had to decipher my calculations, correct them for errors, and finally pronounce the design to be safe and to the book.

In January we started construction. Desmond Norman was by then in the R.A.F. and so we hired a young but very good carpenter to take the brunt of the work while I became buying manager, chief designer and workshop mate. Meanwhile Desmond was flying down nearly every week-end on leave to assist and discuss the project. There was a lot of work to do, but at the end of every week there was always satisfying progress as the little machine took shape. By May you could see it taking shape (surprisingly like the drawing) and many people had their first view of it at the Bembridge Air Rally as a naked skeleton almost ready for covering.

At the end of June we began wing-less taxi-ing trials with just the fuselage, engine and tail unit to test the undercarriage—the one unit of which we had any real doubt. However it seemed satisfactory and so we called in everybody we could lay hands on to help with the covering and doping. This was a big job as we were determined to have a first class finish. She received nine coats of dope and about a fortnight's "simonising." At this stage, including labour, the aircraft had cost us just on £700 and taken six months to build. However, we were in for a disappointment. In an early hopping test the wheels caught on the tip of a ditch, pushing the undercarriage back into the fuselage and causing untold havoc to the fuselage structure, which we have had to write off. It was a sad setback on the threshold of the culmination of all our hopes. However, we decided to make the best of it and to build a new fuselage incorporating various modifications together with a more powerful engine.

And so that is what we are now doing. The new machine will emerge, we hope, around February 1951, fitted with a "Lycoming" 52 h.p. engine, a completely re-designed undercarriage and several other small changes that we thought desirable. We hope this time to be more successful in our tests and then in the Summer to be able to fly her around the Clubs.

NEWS FROM THE GROUPS

Christchurch Aero Club

During the evening of Saturday, the 9th December, despite thick fog spreading over most of the country, the recently re-formed Christchurch Aero Club, lately known as the South Hants Ultra Light Air Club, held an informal Dinner Dance to introduce members to their new headquarters.

Two aircraft bringing visitors from London were unable to leave base owing to weather conditions but Mrs. Lindsay Neal, Secretary to the Ultra Light Aircraft Association, to which the Club is affiliated, braved conditions and arrived by car just in time to enjoy a chicken dinner prepared by Mr. and Mrs. Jermy, the host and hostess of the Bure Club in which the Aero Club have their new home.

In a speech dealing with the Club's activities, the Chairman, Mr. K. R. Sealers, stressed that the basic idea behind the Club was to offer a helping hand to those fired with the ambition to fly aircraft—"We do not operate for profit as a business concern, but we do operate in a businesslike manner to provide competent and adequate instruction on construction, control, operation, and navigation of Club aircraft. We offer to anyone caring to join, instructional flying in "Auster" aircraft at 40/- per hour. An Ultra Light Aircraft would enable us to reduce this fee considerably if only we were in a position to purchase one but at present cost this was beyond our means."

Moving to their other activities Mr. Sealers told of the surprising number of people who turned up at the Club's first sound film lecture arranged by Mr. Vernon Lacey. There were over 40 present to see a 90 minute show varying from "Lift" as applied to an aerofoil, to a colour film made at the airfield and showing wonderful views of the surrounding countryside.

Community Flying Club

During October and November last year, flying was restricted to 25 hours because of the inclement weather.

The general uncertainty as to the future home of the Club has been responsible for a halting of the previous steady progress of the Club. It is hoped that this difficulty will be resolved in the near future, as negotiations are proceeding to transfer operations to another aerodrome, which will be more accessible than Blackbushe, and it will not be necessary to have to cope with the strong cross-winds, which were the rule rather than the exception, at the latter.

A Christmas Draw was constituted with 10 hours' instructional flying as the first prize.

THE ARMY GLIDING CLUB.

Many changes have been made in the membership, policy, organization and equipment of our Club, since the last notes appeared.

After various adventures at potential hill-sites during the previous "summer," we have withdrawn to our old site at Lasham, near Alton, there to prepare for the first timid thermals of the spring.

John Armitstead, who has served us for so long as Secretary (and in several other positions of authority) has gone to the R.A.F. Staff College, and we send him our good wishes.

His place has been taken by Sqn. Ld. "Pat" Smallman, who has done little gliding, but shows great interest and enthusiasm, and as a Royal Air Force pilot he has shown a gratifying, if simulated respect for the noble art upon which he is bent. Bent? Well, we hope so, and we hope not, if you follow.

Major Tony Deane-Drummond brings a Silver "C" and vast enthusiasm, instructional ability and drive as only part of his justification to be Chief Flying Instructor. He will be ably assisted by Bob Swinn's successor, John Free, who has recently joined us as Resident Flying Instructor. Our best wishes and thanks to Bob, for all his efforts on our behalf.

During February we have ceased all flying.

For us it is a month for C's of A, for the paint pots and pliers, and plans for the warmer weather.

Lasham, with its long tarmac runways, seems ideal for auto-towing, and accordingly a vast belligerent-looking car, as yet unchristened, has appeared in the hangar. It will soon have a name, other than the unprintable selection already bestowed upon it by Charles Dorman and its other hand-maidens.

In addition to the "Red Olympia" the "Grunau" and the "S.G. 38" we now have our long-desired "T21-B" and, as each of us has been initiated alongside Tony so we have climbed out, afterwards, thoughtfully, ruefully wondering that we had ever really been competent to fly solo before. All of which is immensely good for us!

Courses, camps, and VIP days are ahead of us, and with the influx of new members which we expect in the Spring, we intend to compel the Editor of this journal to use two pages per month for the list on the inside back page.

R.L.P.

Owing to lack of space all other Club News held over until next month.

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CORRESPONDENCE

Somewhere in England.

DEAR SIR,

With reference to Mr. Slingsby's letter in the February issue, one of the few blots on the fair face of the "9/34" is that same wheel. Do something about it, Mr. Slingsby; putting an Olympia-type canopy on it is a good idea, too.

Yours &c.,
YOUR CORRESPONDENT.

DEAR LIONEL ALEXANDER,

We came home safely again after the trip to England. Of course our plans were a little upset by my friend's illness, but on the whole all went surprisingly well.

I am sorry we had no time to stay longer at the Derby & Lancs. Club. Everybody and everything was so very nice there.

We stayed some days at the Surrey Gliding Club where we made some circuits from winch launches in the Slingsby "T.21" and "Olympia." We enjoyed it very much and hope to be able to come back to England some time in the future and get a still closer contact with British Gliding.

Please send my best regards to Mr. Blunt and to your club-mates.

Yours, BENGT MICRANDER,
Gothenburg, Sweden.

K.5, St. Catharine's College
Cambridge.
13th Feb., 1951.

Sailplane and Glider.

DEAR SIR,

I read with interest the details given by Guy Borgé of the courses to be held at French Gliding Centres this year. And I would be very pleased if you could tell me to whom one should write, in order to obtain permission to spend some time at one of these centres. And also if you could tell me which centre is thought to have the best weather for soaring in the months of June and July.

Yours sincerely,
J. R. LEECH.

(*We have written to Guy on this matter and his reply will be published in April.*—Ed.).

Improving Your Performance

DEAR SIR,

I am sure that those readers who are anxious to improve the performance of their sailplanes will find the following described process of value. It has its main application on strutted intermediate types, but could be used on certain higher performance types.

Our group—Jack Halliday, Dr. Hall, Bob Chamberlin, and myself—have used it on the "Hutter H.17" as some slight help towards bettering the aircraft performance. All the awkward strut junctions, control horn connections, tail skid fairing, empennage fairings, etc., can be easily streamlined by an adaption of the paper-mache work familiar to most readers. The hard work of forming aluminium fillets or cover plates is avoided, and the finished laminated paper product is surprisingly strong, if made as described below. Work may be done while the aircraft is in

occasional use, as the airstream speeds up the drying process.

The usual mould materials were rejected as being impractical or too expensive. By chance the ideal was found in a supply of scrap soap. This should be obtained from a soap factory soon after a batch of soap has been made, when it is still in a soft, " clayey " condition. If allowed to harden over a week or so, it becomes unsuitable for moulding. Obtain about 8 lbs. of this fresh soap—approximately 5s. worth—which will provide enough material to fillet a strutted intermediate sailplane. Knead the scrap pieces until the whole mass is compactly mixed.

Other material required is a supply of torn newspaper strips, about ¾" wide, length dependent on width of strut and length of fillet. These must be torn, not cut. To make the binding paste, mix some flour in boiling water, to the consistency of syrup, about a pint for the whole job.

Apply soap in area of strut junction, gradually adding and shaping until the fillet assumes a rough shape approaching the desired ideal. A pencilled line on wing or fuselage may help in correct locating of main body of fillet. When the mould has been made as smooth as possible by hand, use straight-edged piece of 1 mm. ply to scrape off the uneven bits. Sight it from different angles, so that the streamline form is consistent throughout. Any compound curves should flow smoothly into the adjacent surfaces. Brush lightly with a wet rag to smooth surface. Remember that any blemish will be reproduced in the paper covering. Allow the surface skin of the soap to harden slightly overnight.

The soap is then coated lightly with motor oil to prevent the first paper layer adhering. Strips of paper are then lightly covered with paste—too much paste makes a lumpy finish—and laid evenly on the soap form. Apply the first layer lengthwise, the next crosswise, and in alternating directions until the required thickness is built up. When applying paper to areas of compound curve, use small lengths, otherwise lumps and wrinkles will form. Smooth any lumps with fingers. Apply all paper in even strips, not irregularly shaped pieces.

On the fuselage strut junction, and any place where more than usual wear is likely, it is best to make at least 8 layers to provide ample strength. Allow for this thickness by making the mould slightly undersize.

After allowing ample time for the paper layers to dry, apply either auto painter's " Stop Putty " to the slightly irregular paper surface and sand down to overall smoothness ; or make a thickish paste of dope and icing sugar, and apply this, sanding between coats. When finish is satisfactory, give several coats of dope to weatherproof. Cut the fillet at trailing edge with razor blade, and prise gently off mould. Dope inside of paper fillet. The soap may then be removed easily from aircraft. By making the fillet cover a fair strut surface, this will anchor it reasonably, and locating wooden keys or pegs may be used to keep it in place on the airframe. A simpler way, and required for frequent dismantling, is to use clear Scotch tape for attachment to strut and other component, wing or fuselage.

The method described above for a strut/fuselage fillet can be adapted for any of the other fillets required to cut down drag. Provided a reasonable care is used, the finished job has the appearance of pressed metal, and improves both the performance and appearance of any sailplane, at a negligible cost in time and money.

Best wishes,
NIAL HART.
Toowoomba, Q'ld., Australia.

3, Bowden Street,
Parramatta,
New South Wales,
Australia.
20th January, 1951.

THE EDITOR,
" SAILPLANE AND GLIDER."

Dear Sir,

THE SIMPLE LIFE

In a letter to the Editor, published in the December issue, Mr. J. A. Allan of London raises a point on which I would like to comment.

Mr. Allan asks why the *Sailplane* uses its pages to tell " how some not particularly clever pilot flies a moderate distance in an inferior machine," and his general tone seems to suggest that he disapproves of this practice.

In reply, Mr. Blunt points out that most pilots are not particularly clever, most distances are moderate and most machines are inferior and therefore the majority of people who read *Sailplane* would be interested in such articles.

Bravo, Mr. Blunt !

As one of the not particularly clever pilots I whole-heartedly support this view. I fly purely for the fun of flying ; I have never broken a record and I don't suppose I ever shall. I am far more interested in the doings of other pilots of my own calibre than I am in record breakers. While I " doffs me lid " to those who establish records I don't see why I should be fed an exclusive diet of their activities.

There are probably a thousand or more active glider pilots in Britain, of whom not more than fifty can claim that they make regular cross-country flights. Why then is there such an emphasis on telling people how to make cross-country flights ? A lot of people do not want to make them, and are not really interested in those who do.

If I can reach three or four thousand feet during a one-hour flight around my home field, I feel quite satisfied, and go home feeling that I have had a pleasant afternoon's gliding.

It is obvious that there are a lot of other people who feel the same way, yet we never hear of each other's activities.

All we read about is how the great Joe Dogsbody flew from Bluehill to Much Cuddling in the Porch at an average speed of 99 m.p.h., thus setting a new goal record ; or how Wing-Commander Featherstonehaugh-Jones achieved Platinum " C " altitude in a Cumulus Columbus.

For these fine and noble flights let us give three rousing British cheers—'rah, 'rah, 'rah—but please do not expect me to imitate them. If Mr. Dogsbody wants to give himself ulcers by worrying about best speed between thermals or how to economically cross down currents, or Wing-Commander F.J. prefers to make himself airsick by battling for control in the bowels of a Cu.-Nimb., then all I can say is " more power to 'em ."

(*continued on next page*)

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(Issued under delegation, by the B.G.A.) JANUARY, 1951

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"B" .. 33
"C" .. 10
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Gold "C" —

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11739	Richard Vincent Cunningham	146 G.S.	30.12.50
11740	Bert Edward Everitt	104 G.S.	21. 1.51
12109	John Findlater	7 G.S.	17.12.50
12393	Robert Harston	Luneburg G.C.	13. 4.48
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12629	John Marshall	2 G.S.	17.12.50
12656	Geoffrey Benson	Hereford G.C.	23.12.50
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12725	Douald Exley	24 G.S.	26.11.50
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12883	Kenneth Cowap	R.A.F. Fassberg	2. 5.50

CORRESPONDENCE

(continued from previous page.)

For myself I prefer the simple life. When the lift gets so weak that I have to concentrate very hard, or the air becomes so cold or rough that I feel uncomfortable, I always land.

To misquote Malvolio: "Some are born to break records, some achieve records, while some have records thrust upon them."

The vast majority, however, are content to remain week-end pilots, who achieve nothing more than a few circuits or a bit of local soaring and, as it is this majority who keep the gliding movement functioning, I don't see why they should not hear more of their own or similar activities even if it does only amount to an account of "some not particularly clever pilot flying a moderate distance in an inferior machine."

Yours faithfully,
ALLAN ASH.

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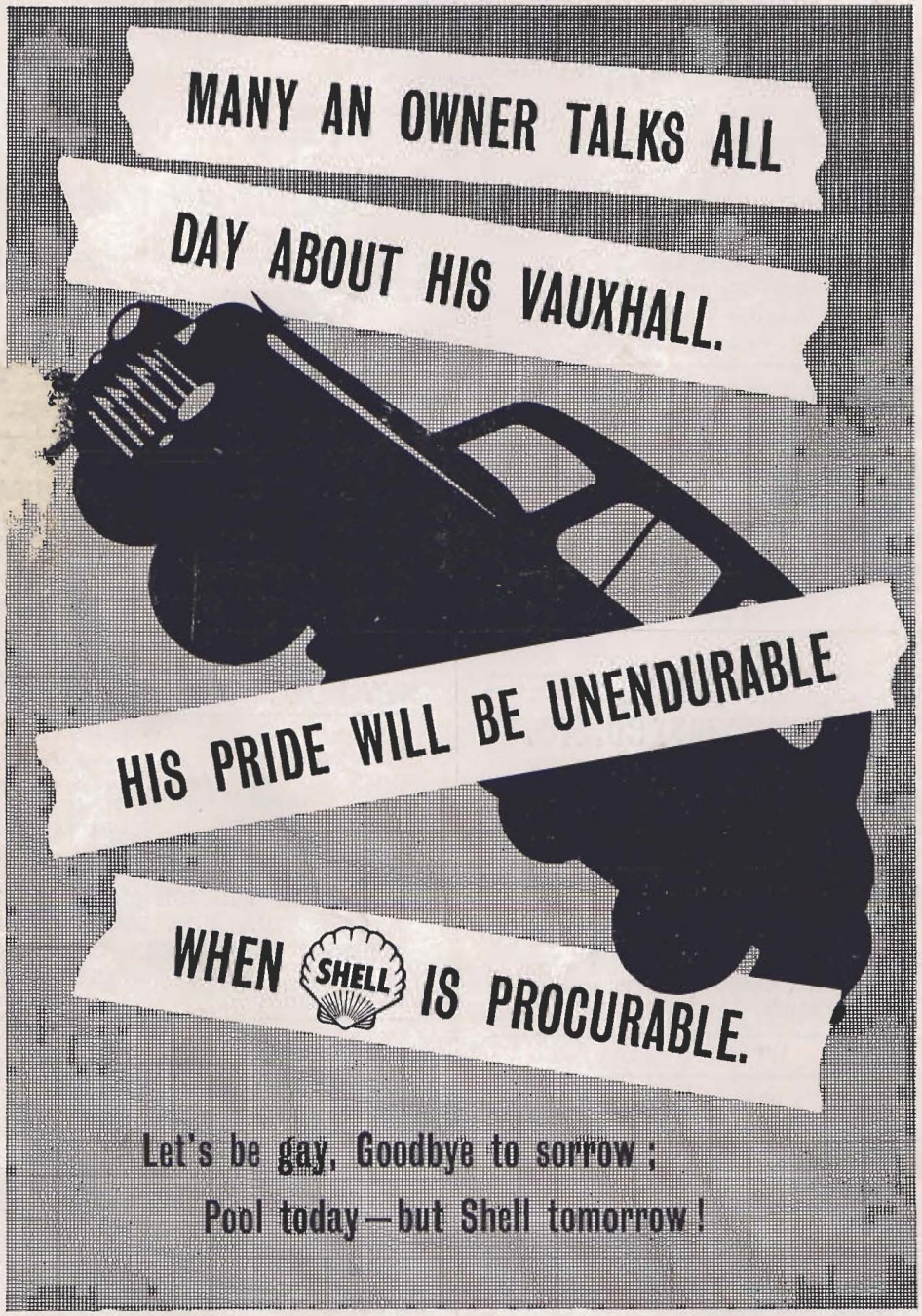
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