GLIDING

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GLIDING

Edited by Alan E. Slater, M.A., F.R.Met.S.

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Cover Photograph—An Eon Baby in Flight.

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Bulk orders (12 or more copies) should be sent direct to the publishers, The Sailflying Press Ltd., 38 Great Titchfield Street, London, W.1.

Instrumental History

With the very successful coming-of-age party of the British Gliding Association on 4th December, our thoughts have taken a historical turn. Furthermore, the articles in this issue on instrumental equipment are a reminder that this subject, too, has a history. Mr. Philip Wills's turn-and-bank did not quite "come of age" before having to be discarded; but the history of the variometer, or rate-of-climb indicator, of which Mr. Louis Slater writes, goes back further than that of soaring flight—at least, human soaring.

The early balloonists used a "statoscope" which told them whether they were rising or falling, though not the actual rate. Dr. Alexander Lippisch, the pioneer sailplane designer, records that he brought an "Atmos" variometer into use in 1918 for the test flights of Dornier aeroplanes; consequently, when Robert Kronfeld started climbing under cumulus clouds in 1928, Lippisch recommended a variometer to him. Kronfeld kept its use secret, telling everybody that the vacuum flask contained coffee.

But a variometer had been used to find thermals before this. Sir Roderick Hill, in his book "The Baghdad Air Mail," published in 1928, wrote that the Vickers Vernons found it so difficult to climb in the thin, hot desert air when taking-off fully loaded, that they had to seek out thermals, which they called "dunts," to help them up.

According to Sir Roderick, "One of the Air Mail pilots invented a useful instrument called a 'dunt indicator' . . . It was extremely simple, consisting of an empty 2-gallon petrol tin fixed behind the pilot's instrument board. The cap was sealed on, but through it was drilled a tiny hole. The tin was connected by a small pipe to one side of a pressure gauge visible to the pilot. The other side of the pressure gauge was open to the air in the pilot's cockpit."

Another Baghdad Mail pilot would find a thermal by watching a kite soaring; this was also the method used by Wolf Hirth when he made the world's first blue-sky thermal flight (in "dry" thermals) at Elmira in 1930. Three years later, Wolf actually succeeded in finding thermals by the sensations in his ears. Unfortunately Nature has made the human ear-drum more sensitive to down-currents than to up-currents, though in the birds she has arranged matters the other way round.

A correspondent refers to the method of throwing light objects overboard and watching their vertical displacement. But of the various forms of paper which have been used, strips many yards long seem much the most useful, because it is found that different parts of the strip go up at different rates. An accomplished sailplane pilot must not merely find his thermal but, as last year's International Contest showed, continually adjust his position to stay in its strongest part.

NOTES and NEWS

Gliding at Cranwell

Gliding is now part of the curriculum at the R.A.F. Cadet College at Cranwell where, according to latest news, 65% of the cadets have reached "B" certificate stage, while "C" and even "Silver C" certificates are beginning to come in. It looks as if, in another year or two, every young officer-pilot in the R.A.F. will know all about gliding.

First Triple Diamond

John Robinson, of U.S.A., is the first pilot to qualify for the addition of three diamonds to his "Gold C," according to a statement put out by the Fédération Aéronautique Internationale early in October. Qualifications are: 500 kms. distance, 5,000 metres climb and 300 kms. goal flight. Mr Robinson flew 325 miles (513 kms.) from Wichita Falls to Barstow, Texas, in July, 1947, and climbed 24,200 feet (7,376 m.) at Bishop, California, in January, 1949.

Airmet Petition

The Editors of *Weather* obtained 21,400 signatures to the petition organised by them for the restoration of Airmet. Motives stated by the signatories have been analysed as follows :—Agriculture 27 per cent., sport 21 per cent., aviation 21 per cent., general interest and miscellaneous 14 per cent., industry 7 per cent., education 6 per cent., science 4 per cent. The proportion of gliding people in the aviation group is not stated, but a Bristol glider pilot wrote that he used to plot a tephigram in bed on Sunday morning and decide whether to get up and rig his sailplane or turn over and go to sleep again!

The petition is to be presented to the Secretary of State for Air, but of the many Government departments concerned, it seems that the Post Office, which controls broadcasting, is the one to be ultimately convinced. The Editors of *Weather* state that various constructive suggestions for solving the wavelength problem have been made, and "until detailed reasons have been given showing that all of these are impossible, the Airmet battle will not be dropped."

Winter Cross-Countries

Two flights have been made in the competition for Lord Kemsley's prizes for winter cross-country flights, up to the time of going to press. On 12th November, Harry Cook went 46 miles from the Derby and Lancs. Gliding Club to Scotter, Lincs., and on the same day Philip Leech went 33 miles to Finningley. They used standing waves, but details have not yet been sent in. At the time, the site lay between two occlusions, with a stable layer at about 8,000 ft., but with no appreciable shear in the wind except at a much higher level. The competition continues till 28th February, 1951, inclusive.

Many pilots soared in the wave lift that day, and J. S. Armstrong reached 8,600 ft. in the next wave up-wind, which was over Kinder Scout and appeared to be the first of the series.

Another cross-country flight the same day was by Harry Midwood, 33 miles to Ganston.

Height Records in Poland

A new international altitude record was claimed in Poland on 3rd December. Andrzej Brzuski, accompanied by a passenger, is stated to have attained a height of 9,850 m. (32,313 ft.). Presumably this is a record for gain of height, as it is stated to have beaten the record of 8,050 m. (26,411 ft.) put up by Per Axel Persson in Sweden on 12th July, 1947. According to the weather charts a double cold front crossed Poland from NNW to SSE on 2nd December, but on the 3rd a "wave" developed on this front, and the eastern part moved northwards again over Poland as a warm front.

A new two-seater record for women is also claimed in Poland. The pilots' names are given as Kemp and Wlazlo and they are stated to have reached 7,200 m. (23,620 ft.) in a two-seater sailplane. The date is not given. The previous record was held by Betsy Woodward of U.S.A. Flying a two-seater Schweizer TG-3 sailplane, with Vera Gere as passenger, she climbed 3,291 m. (10,800 ft.) at El Mirage Field, Adelanto, California, on 7th April, 1950.

American Contest, 1951

Elmira, N.Y., has been chosen for the National Soaring Meet in 1951. This was the site used in 1949, 1948 and every pre-war year since 1930. Last year and in 1947 the Meet was held in Texas.

Cloud Photographer

Captain C. J. P. Cave, who died on 8th December, was well known for his book "Clouds and Weather Phenomena," first published in 1926 by Cambridge University Press at 5s., with over 40 excellent photographs. Paradoxically, he made his reputation among meteorologists with a monograph on "The Structure of the Atmosphere in Clear Weather."

A new edition of the cloud book, published in 1943, refers to sailplanes in cloud lift, and in the same paragraph includes an interesting observation on cloud streets: "These lines may be very long, especially at sea. I once saw one in mid-Atlantic that lay nearly parallel to the course of the steamer and was visible all day till the late afternoon, when the steamer passed under the cloud and experienced a slight shower."

Thus the authors of the three standard books on clouds have died in successive years: A. W. Clayden ("Cloud Studies," 1905; 2nd edition 1925) in June, 1948: G. A. Clarke ("Clouds," 1920) in February, 1949, and Cave in 1950.

CORRECTIONS

In the last issue, in the middle of the 3rd paragraph of the Editorial: the special gliding number of *The Aeroplane* was published in 1929, not 1922. On page 143, Kronfeld's name was wrongly spelt in the title.

The photo of the National Contests on page 121 shows the Newcastle Club's Petrel in flight, not the Kranich. It was taken by John Pressland.

The cross-country flight in a series of standing waves, made by R. D. Roper and described on pages 134-5, was the second of its kind from the Derbyshire and Lancashire Club's site, not the first. In the previous year, Harry Midwood made a similar flight from the site. The first British cross-country flight in a series of waves was made by David Carrow in March, 1949 from Long Mynd to Newbury, winning the Kemsley Winter Prize.

SAILFLYING PRESS SHOOTS A LINE

How are we doing? Well, to tell the truth we are modestly startled. When GLIDING was launched, we declared with a light laugh that it was to be a non-profit-making venture, and if by any miracle we ever made such a thing it would be ploughed in to make a better magazine.

Well, we don't need a very large plough yet, but we pay our printers, the hon. Editor's stamps, and each issue has done a little better than the last. So it is clear that Gliding folk really do want a quarterly magazine of technical authority entirely devoted to motorless flight.

The other proof of this lies here, in our contents, which show what a lot of valuable material has been going unrecorded for lack of a suitable medium.

GLIDING is now sold to 17 overseas countries. We are read in romantic-sounding places like Zomba and Narayangany, in Brage and Ipoh and Kongwa.* It is fascinating to speculate that our groundnut may eventually be packed off to Britain carefully wrapped up in an old page of GLIDING.

We get very heartening support from the Services and the A.T.C. And lastly, from our advertisers. In its early days a new magazine is obviously a highly speculative advertising medium, and those firms which backed us up practically before we were house-trained especially earn our thanks. A survey of our pages shows how the keen business noses of advertisers now detect that we have Made the Grade.

We have had from many quarters one major criticism—that we are not a monthly. But this, my dear sir, is too easy. All that is needed is that you, and you, and you, should get a pal to become a subscriber, and it will be done. But the main difference between a quarterly and a monthly is that the first can just be done in our spare time.

So we start 1951 in good heart. It's a lot of work, but it's fun, which after all has always been the motto and the foundation of the success of British gliding.

* Nyasaland, East Pakistan, Portugal, Malaya, Tanganyika.

Coming-of-Age Party

THE twenty-first birthday of the British Gliding Association was celebrated by a most successful party on 4th December, 1950.

Proceedings began at 6.15 p.m. with a reception and cocktail party given by Viscount Kemsley, President of the B.G.A., and Lady Kemsley, in the library of Londonderry House. Almost every period of British gliding history was represented among the guests. For example, Douglas Culver organised the "Gliding Lunch" on the same date 21 years before, when the B.G.A. was born. *The Aeroplane*, through whose publicity those lunchers assembled, was represented by its Editor, Thurstan James, who incidentally founded the *Sailplane and Glider* in 1930; C. G. Grey, founder of *The Aeroplane*, accepted, but was unfortunately unable to come. E. C. Gordon England was the first Chairman of the B.G.A. after its official inauguration on 25th March, 1930; but he was gliding in 1909, when he once climbed 100 feet above launch at Amerbley Downs, and he also soared at Itford in 1922. Captain C. H. Latimer Needham holds the first British "C" certificate, and once put up a British duration record in an open Primary. Lord Sempill and Prof. Sir David Brunt are both past Presidents of the B.G.A. And so on: a full catalogue of every guest's contributions to British gliding would fill this journal. Among other notable guests were Lord Brabazon of Tara, Sir Frederick Handley Page, Sir Miles Thomas, Air Chief Marshal Sir Frederick Bowhill, Col. R. L. Preston, Capt. A. G. Lamplugh, the Hon. B. Bathurst, Peter Masefield, Sir Francis McClean and Rear Admiral Abel Smith.



Statue at Londonderry House is awarded a Gliding Badge by Mrs. Wills.

By 8 p.m. a lot more guests had arrived and some 250 people trooped upstairs to be received by Philip and Kitty Wills, who had organised a dance and cabaret show. The ballroom was comfortably full but not unduly crowded, as a large proportion of the gliding guests continued to reminisce and talk shop all over the stairway and in the bar.

For the cabaret show, the Cambridge Club had prepared a witty sketch showing the Operations Controller and his staff at Filton Airfield on the occasion of the National Gliding Contest in June, 1961. We heard how 27 sailplane pilots were simultaneously flung aloft by the new Rice 28-drum winch; among them were Air Commodore F-rb-s, flying a Slingsby Gull VI, and Admiral of the Fleet Sir A. G--dh-rt, still faithful to the Mu-13. There were also two Sedberghs flown by Cadet Corporal Bloggs and Cadet Sergeant Blenkinsop respectively, with Wing Commander Bedford and Wing Commander Mallett as "passengers"; while Mr. Wills, who had flown to Inverness and come back for another attempt to make better speed, was reported to be beating up and down the leading edge of the Brabazon. Other contributors to the show were the Derby and Lancs., Surrey and Imperial College, and London Clubs; and, of course, we had the famous turn of the green and red Fairies Lift and Sink (respectively).

Before the entertainment Mr. Wills gave the assembled glider pilots a lot of valuable advice on the choice of a wife, and especially on the difficult problem of finding one who can back a trailer into a landing field; after which his own wife showed that another of her accomplishments was cutting an outsize birthday cake with a sword.

After midnight the guests, five times as many as those who had come to the Lunch 21 years before, reluctantly departed to skid and side-slip home over the ice-



covered roads, hoping they will still be fit to attend an equally successful Jubilee party in 1979.

Key to Group Photograph

We have done our best to identify everyone in the photograph but without complete success, and regret also that it has been impossible, despite enquiries, to supply some of the missing surnames.

1, Mrs. L. Wright; 2, Philip A. Wills; 3, Mrs. P. A. Wills; 4, Dr. A. E. Slater; 5, Pat Wright; 6, Eileen Purdon; 7, David Purdon; 8, A. ("Johnny") Walker; 9, Jack Parsons; 10, John Howe.

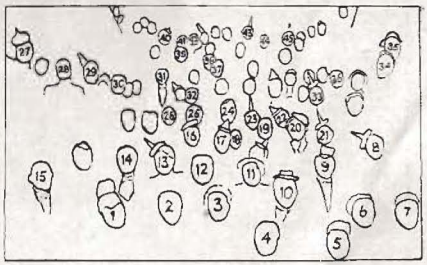
11, Maureen ———; 12, Jack Hanks; 13, Miss G. Richardson; 14, Major A. K. Robinson; 15, Lawrence Wright; 16, Rosemary Slater; 17, Roger Dickson; 18, Mrs. A. H. Yates; 19, Alan H. Yates; 20, Pat Dickson.

21, Mrs. H. E. Bolton; 22, George Gregory; 23, Barbara ———; 24, Ralph Hooper; 25, Prof. G. Varley; 26, Mrs. H. M. Latto; 27, Mike ———; 28, Molly ——; 29, Don Brown; 30, "Bungy" Baker.

31, Frank Moore; 32, Col. R. L. Preston; 33, H. E. Bolton; 34, Frank G. Irving; 35, David Carrow; 36, T. Gil Phillips; 37, Hugh Trotter; 38, Peter Helson; 39, Brenda ———; 40, N. P. Anson.

41, Dorothy Dellchar, 42, Mrs. N. P. Anson; 43, Yvonne Lott; 44, Tony Goodhart; 45, Nick Goodhart.

Enlargements of this photograph, 10 x 7¾ ins., may be obtained from the B.G.A. at 7s. 6d. each post free.



B.G.A. NEWS

Task-flying Matches

To help the British Gliding Association in judging the respective merits of candidates for inclusion in the British team at future international contests, a scheme is being worked out whereby pairs of pilots may attempt various tasks by mutual arrangement, starting from the same place at the same time. The idea is to supplement information provided by flights made at the national contests, which have not been found to give sufficient scope for a thorough judgment of most of the pilots' capabilities. The proposal is that each pilot should fly against a number of other pilots, one at a time, on various dates throughout the year.

There are four kinds of contest which, it is suggested, should be flown:—(1) Goal races, (2) Out-and-return-races, (3) Races over 100-km. triangular courses, and (4) Maximum distance up-wind. It should be noted that these tasks do not involve long retrieves from far distant places.

A Committee is working on the scheme, and full details will be circulated to the clubs as soon as ready.

Glider Experience and Pilots' Licence

The 40 hours flying required for the Private Pilots' Licence may now include gliding experience, as announced in the last issue (p. 119). Since that paragraph went to press, full details of the conditions have been published. They are:—

(*a*) The holder of a "Silver C" certificate or Dual Instructor's Category "A" will have to pass the practical flying tests and the technical examination.

(*b*) In addition to (*a*) above, the holder of Dual Instructor's Category "B2" will be asked to show evidence of at least three hours of cross-country flying as a pilot in charge, carried out during the six months immediately preceding the date of the application. This cross-country flying must include one flight during which the applicant landed and came to rest at two intermediate places, one being not less than 50 nautical miles from the place of departure.

(*c*) In addition to (*a*) and (*b*) above, the holder of a "C" Certificate will be called upon to:—

(i) show evidence of at least 10 hours flying training under a competent instructor in a dual-controlled aeroplane.

(ii) show evidence of at least 10 hours flying as pilot in charge of an aeroplane.

It has also been agreed that for the renewal of the Private Pilots' Licence two hours of the required five may be glider flying time.

Financial Assistance for Group Syndicates

The Trustees of the Kemsley Flying Trust have advised the B.G.A. that they are prepared to assist suitably qualified Group Syndicates in the purchase of high-performance sailplanes. The terms would be a subject of negotiation, but would not be substantially different from those already enjoyed by Clubs making purchase of similar equipment. It is a condition that all Group Syndicates wishing to take advantage of this assistance shall be or become Members of the Association. Applications must be made through the Association and supported by their recommendation.

M76 High-Performance Two-Seater.

In 1946, the British Gliding Association held a Design Competition for a two-seater high-performance Glider, in which the first prize, presented by the Duke of Sutherland, was won by Mr. H. Kendall. A development of his prize winning design is now under construction for the Association by Messrs. F. G. Miles Ltd., Redhill Aerodrome, Surrey. It is expected that two machines will be flying in 1952 for participation in the World Gliding Championships to be held in that year. The project is being financed by the Kemsley Flying Trust and the Ministry of Supply.

The machine has a wing span of sixty feet and has side-by-side seating. Certain parts are being made of a plastic material in order to facilitate manufacture and reduce costs. Special attention has been paid to ease of rigging, maintenance and handling on the ground. The aerodynamic design is advanced in conception with the accent on fast cross-country flying.

F. G. IRVING,
For Two-Seater High Performance
Progress Committee.

Ye Olde Tyrne and Banke.

by Philip Wills.

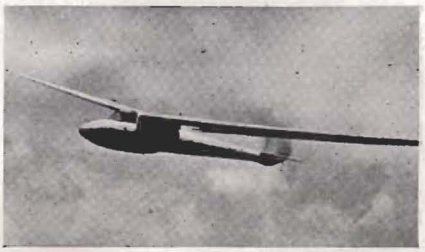
At the end of the 1950 Season, I made the usual survey of what work might be required to be done on the Weihe during the Winter months, and thought of my electric Turn and Bank Indicator. Perhaps it was beginning to run a little noisily? And the Slip needle had been sticking ever so slightly for some years.

For some years? When I came to think of it, the situation was a little surprising. I had bought the instrument, one of the first available, in 1935. For the first year or so I had had a little bother with the commutator which used to carbon up and require wiping with a silk rag. But since around 1937 it had had no attention of any kind, except to be switched on and off when wanted!

The number of hours it had run was probably not very large, compared to powered aircraft utilisation, but sixteen years is a long time for a delicate piece of machinery to remain unattended.

It had been fitted in the first place to Hjordis, then to Minimoa, and finally to Weihe. On the first, I had promptly nearly broken my neck in a high-speed spiral dive, which had taught me that there was more to blind-flying than merely attaching a new instrument to the dashboard. Then we went to the 1937 International Competitions at the Wasserkuppe, where it was a surprise to find that in the matter of Turn and Bank Indicators (if in little else) we were ahead of the Germans, who all had venturi-driven instruments and all complained of icing troubles.

Then came Minimoa, in which it achieved two cu.-nim. record flights, then five years rest for my Turn-and Bank, after which it was, without any attention, put to hum in the Weihe, and immediately achieved another one. In fact, with the exception of a fortnight's break in 1939, when Noel McClean took the height record with his remarkable flight to 11,000 ft. in a Grunau Baby in the Helm Wind, my Early Pullin had held the British single-seat height record from 5th June, 1938, until 24th August, 1950, when Flt. Lt. Bedford took it away from it.



Mr. Wills's "Weihe," in which Ye Tyrne and Banke last functioned.

My instrument had hummed its way through all three International Competitions (which probably makes it unique amongst instruments). It did hours of running at Samaden in 1948 at altitudes between 14,000 and 20,000 ft. (the makers now tell me that it is not governed, and so not compensated for altitude and voltage variations like their latest models, but this didn't seem to matter). Its current consumption is so small that two 6-volt dry batteries last a season, and sometimes outlive their winter's sleep and start it humming again in the following Spring. And during the whole of its life it has never once let me down.

When I asked Pullin's to overhaul it, they expressed some surprise at its existence. Their latest instruments are "improved" greatly—presumably one now wills them to one's grandchildren. For since the time of my instrument, electric turn and bank indicators have developed mightily and have been adopted in a big way for Service and Civil powered aircraft.

So an instrument that received its first encouragement from a demand from the gliding movement has become Big Business. We sometimes feel rather shy in the gliding world about our queer and small-scale requirements, but more often than we realise we start off something bigger than we think.

Letter From South Africa

We are approaching midsummer here and are treated to a storm nearly every afternoon in Johannesburg. Indeed it seems almost worse than Durban in this respect. Yesterday I saw some quite large hail-stones—the largest I have ever seen, though I believe they do come even larger—they were about the size of pigeons' eggs, and roughly that shape too. They made quite a loud 'ping' when they fell.

It will make your mouth water when I tell you that cloud base (cumulus) here is seldom lower than 6,000 ft. and more commonly in the region of 8,000 ft., which is 13,000 ft. above sea-level. Consequently "Silver C" height is passed on nine out of every ten flights that we make at Baragwanath here. Our main struggle is the 5-hour duration; so many of the boys fall down at the 4½-hour mark, usually because the late afternoon storms make flying unpleasant.

Did I tell you that we have formed a gliding club at Baragwanath? It is part of the Johannesburg Light Plane Club and is known as the Soaring Section of this club. Hans Würth is, of course, the C.F.I., and I will give you one guess as to who has fallen for the job of Secretary Bird!

We are easily the largest soaring centre in Africa and have the pick of the Union's pilots with us—mostly private owners and small syndicates. Hans has the Kranich and has just finished the Spalinger S-15, which I have access to; Heli Lasch has the Air-100 which he took to Sweden for the Internationals; there is Sparky Davidson with his Spalinger S-18, a team of two with a super Baby, a Minimoa flown at our site by the Pioneer G.C., and an H-17 is expected to join us soon. Besides these we hope soon to take delivery of another Baby from Portuguese East Africa, and Hans has another Kranich and an S-18 ready for rebuilding.

It is quite a site on weekends at Baragwanath, I can assure you. We have three Tiger Moth tugs at our disposal which are owned by J.L.P.C. Our gliding times this summer so far have been in the region of 20 hours and more per weekend—all of which is in thermals.

The Competitions

The day before yesterday we all arrived back from the South African Gliding Competitions, which this year were held at Standerton, about 100 miles from here on the road to Durban. The competitions covered 11 flying days and the weather was good throughout, except of course for our usual Transvaal afternoon storms which cut many cross-country flights short.

We gave points only for mileage—none for height or duration. Points were earned at the rate of 1 per km. with a bonus of 20% for reaching a goal, and 2 points per kilometre for the homeward journey of an out-and-return flight, with an additional 20% bonus for reaching home.

We fly in two main groups: the Unlimited Class and the Limited Class, the latter being for machines of 14 metres span and less, all of which must be flown by teams of three bods to a machine. In the Unlimited Class there was the Air-100, the S-18 and the Minimoa only. The limited section consisted of three Babys, an S-15 and a Schweizer 1-19. The Durban club fell out on the first day after smashing the bows of their Baby on a rock. The S-15 was flown by Hans Würth, Boet Dommisse (last year's champion) and myself as team.

Between us at Baragwanath we walked off with every cup and trophy that was to be won—nobody else got a look-in. Our team on the S-15 won the Limited Class, with Hans Würth winning the distance trophy as well by doing a remarkable flight for a medium-performance machine of 142 miles, covering on the way some really tricky country.

Heli Lasch was leading in the Unlimited Class but his Air-100 carried a handicap, and so "Sparky" Davidson in his S-18 became National Champion for 1950. Heli did the biggest goal flight and also the greatest height of 20,000 ft. odd. "Sparky" did the best out-and-return, covering over 60 miles each way and taking about six hours to do it. Our Baby also did a very good out-and-return of some 45 miles each way, and Hans a similar flight in the S-15.

As I have said, we were held up most days by the storms in the afternoon. All

the winds carried us eastwards towards Swaziland, 70 miles away, which is very hilly and so a good source for the storms. It was only the few pilots of great experience who managed to weave their ways through the storms and so make better distances than the average. It was the experience that counted this time, not the machine, which is just the reverse to last year's Rally in the Free State.

Cumulus cloud base ranged between 6,000 ft. and 9,000 ft. a.s.l. Convection started at about 10 a.m. or later each day, and the storms at about 2 p.m. or later. Thermal strength was usually in the region of 10-15 ft. per second, though 1,500 ft. per minute I sometimes recorded. Gliders were permitted to tow to 2,000 ft. maximum, though most released in good lift below 1,000 ft.

Climbing to cloud base was fairly easy, though sometimes the going was rough. On my first cross-country this year I seem to have reached "Gold C" height, but I cannot confirm this until the barograph has been re-calibrated. In any case it is very close indeed; as far as I can make out I reached about 15,000 ft. above sea level, making a climb above release of close on the 10,000 ft. mark. Cloud base that day was the best of the Rally; from then onwards it remained around 8,000 ft.

This first flight took me 65 miles, the first 40 of which I flew, as usual, quite ignorant of my real course. I nominated a goal some 10 deg. to the south of my track! However, I outflew the goal by 30 miles or so, and then hit the thunder and muck with very angry skies all round. I discovered that heavy rain on the wings makes a very frightening noise. The second flight took me a similar distance, except that I met the muck after about 35 miles and chose a gap between two storms, which gave me quite calm air and a straight glide of 28 miles with a very nice view.

On the last day I got away for the third time and nominated a goal 45 miles away—Volksrust—and cursed like hell when I was forced down 2 miles short, thus losing my 20% bonus. [According to the map, there is a place called Volksrust about 145 miles away.—ED.] Actually this was quite like the classics of which we read in the gliding books. My cloud turned into a storm and I rode along rather timidly in front of it in the conventional manner. I even had the usual vulture to accompany me! Unfortunately, he had far more clues, because I allowed the muck to overtake me and finally had to run like the devil for clear air.

However, I learnt a lot at this Rally. Believe me, cross-country flying is *the* way to gain experience; you feel so utterly alone, so far away from the friendly field. It teaches you to keep your wits about you and fly well. The real bugbear to it all is the retrieving afterwards; I found this very tiring, especially when one has to fly after a late retrieve the day before. Driving a car with a large trailer behind on the South African roads is very nerve-racking, I can assure you. We have very few tarred roads in this country; most of them are of ordinary dirt surface, which becomes very corrugated and broken.

In all we flew 3,100 miles by glider this Rally, and must have covered far more miles on the road.

K. B. NEWMAN.

(*Formerly Secretary of Southdown Gliding Club*).

Correspondence

Sir,

Honour where honour is due. One of Mr. Donald Brown's grand stories in your Autumn issue refers to the practice of throwing paper from the cockpit into a thermal, and mentions that "the originator of this cunning device" flew in the 1950 National Competitions. I don't think he did. Mungo Buxton was throwing confetti into thermals so long ago that I—having been gliding for only thirteen years—know of it only as older history. This was probably in the period when he owned the Scud II, later one-third mine, in which incidentally I found mysterious little tubes ending at various points flush with the wing surface. Through these, I learned, he listened for the stall (via an "exchange" in the cockpit) through a stethoscope borrowed from a doctor named Slater.

As originators of cunning devices, the older generation did pretty well—perhaps you will give us a scholarly footnote on the subject?

LAWRENCE WRIGHT.

The Slingsby T—34

by P. A. Wills

The T-34, the new high-performance machine produced by Slingsby Sailplanes, has been variously referred to as the "Slingsby 18-metre" and the "Gull V", and was described in our issue of July, 1950, on pages 86-88, where general arrangement drawings and polar curves were given. We understand that the name "Sky" is under consideration and will probably be adopted.

THROUGH the generosity of Slingsby, who put me on the list, and of Jock Forbes, who turned out on a blustery day at Detling, I flew the T-34 on 18th November. The wind was S.S.E., 15-20 m.p.h., up the hill, so I got in 40 minutes' rather rough slope-soaring at from 800 to 1,000 feet, in grey overcast sky, with bits of minor lift.

Forty minutes hardly qualify one as an expert, but were enough to convince me—as has been convinced Jock Forbes, who is doing the flight trials and so has considerably more authority to speak—that in the T-34 we at last possess a British 18-metre "better" than the Weihe, and one which will worthily represent this country in future international contests.

It is perhaps valuable to point out here how important it is to have an occasional first-class foreign machine in the country—the Weihe sets a standard against which our new machine can be measured. We know how good an advanced single-seater has to be to be good.

There are four comparisons which everyone wants: price, performance, stability and control, and ease of rigging. But there are two others which are too easily taken for granted, yet which matter a lot and require much design skill. These are: strength, and disposable load.

Regarding the last two, the T-34 is without argument greatly the superior. It meets current British Civil Airworthiness requirements, whereas the Weihe does not. And its disposable load is 250 lbs. against the Weihe's 196 lbs. The Weihe, in fact, is overweight on its lesser strength factors with a heavy pilot and oxygen equipment, before ever thinking of radio, artificial horizons and the like.

Regarding price, whilst at the time of writing this has not been finally calculated, it is understood that it will be several hundred pounds less than the Swedish-built Weihe.

On performance, until a polar curve has actually been produced one cannot speak with certainty. The machine has been flown against a Weihe at Detling and appeared to be as good at minimum sinking speed, and better in penetration. This conforms with the curves given on p. 86 of No. 2 issue of GLIDING, giving the manufacturer's estimated polar for the T-34 against the actual Weihe polar produced by No. 1 Test Group on the Surrey Club's Weihe. All one can say with *certainty* at this stage is that its performance is in the top class.

As regards stability and handling, I liked her very much. She has the crisp qualities of the Gull IV; in fact these machines handle a little more like a low-wing-loaded aeroplane than like most existing gliders. The stall occurs at 35-36 m.p.h. indicated, and there is plenty of stall warning. She flies hands off straight and level at 40 m.p.h., whilst in a turn of any steepness, speed has to be increased to 42-44 m.p.h., below which buffeting, indicating the approach of the stall, can be felt. When put into a spin, she spins nose-down and fast, but recovers instantly when wanted.

The ailerons are each split in two, are crisper and more effective than those of the Weihe, and do not go so solid at speed. The rate of roll is considerably faster. The air-brakes, though not large, are probably better as spoilers than the notoriously inadequate ones on the Weihe, and are certainly better as air-brakes, since they do in fact hold the brakes-out maximum



The T-34 at Kirbymoorside, Yorkshire, where it was built.

speed to below the critical speed of the aircraft.

She trims to fly, hands off, over an almost unnecessarily wide range of speeds. The cockpit is identical with that of the Gull IV, considerably roomier and more comfortable than that of the Weihe for a long pilot. The cockpit cover is well sealed with inset rubber, but on this prototype some mischievous elf in the works had carved a large unsealable round hole out of the perspex just behind one's left ear, which let in all the draughts again in concentrated form and produced an artistic organ-note which shattered the otherwise well-bred silence of one's progress. The clearing of such minor points, however, is what a prototype is for.

The single-wheel undercart is, I fear, a democratic necessity, in the general dearth at modern gliding clubs of black slaves or Hitler Jugend, to carry machines around on their whip-lashed backs. Inescapably, however, it provides an excrescence which must undo some of the work in the general careful streamlining of the design. It seems to hang almost indecently far below the keel; perhaps it could be retracted an inch or so, or a smaller wheel fitted. Personally I am not in favour of heavy and expensive expanding brakes on a glider wheel; a simple friction band rubbing on the top of the tyre when the brake is applied is surely cheaper, lighter, more reliable and just as effective. Pete Mallett fitted one of these to his Gull IV in Sweden this year in 24 hours. For World Championships, a skid with droppable wheels would give the pilot another 1 or 2 per cent. on his L/D at speed, which is not to be lightly thrown away. Something of the kind is being considered.

Lastly, rigging. The prototype wing-root fittings and control connections are going to be modified on production models, but will not, I think, quite equal in simplicity and ease of assembly the Weihe, which surely will never be bettered.

However, this is a comparatively minor point, and there is no doubt in my mind as to which machine I would rather own and fly in Competitions. To sum it up, against the Weihe, the T-34 (*a*) is stronger, (*b*) carries a greater disposable load, (*c*) is cheaper, (*d*) probably has a better performance, (*e*) probably handles better, (*f*) has a better cockpit, but (*g*) is not so quick and easy to rig.

There does not seem any doubt about it —the T-34 has it.

FOR SALE & WANTED

(Classified advertisements can now be accepted for this Magazine. Rates on application to The Trade Press Association Ltd., 57-61 Mortimer Street, W.1.)

Intermediate sailplane (preferably GRUNAU 2B or PREFECT) wanted in exchange for GULL I in good condition (recent C. of A. renewal), with cash adjustment. Or separate sale or purchase. Write c/o Box No. A153A The Trade Press Association.

For Sale—British record-holding WEIHE with all instruments except oxygen, first-class condition £750. Wills, Manor House, Paley Street, Nr. Maidenhead, Berks.

WANTED TO PURCHASE SAILPLANE Olympia Class. R. H. Pilcher, c/o Johnson & Phillips Ltd., Columbia House, Aldwych, W.C.2.

A Criticism of Soaring Contests

by "Delta"

What is the Aim of our present Contests?

ONE thing which all Soaring Contests seem to have in common is that the system of marking differs every time. Before the contest, there are lengthy and involved discussions to determine the best system, and to eliminate what are thought to have been the shortcomings of all previous systems; the final result reflects the relative influence of the protagonists of such conflicting requirements as keeping it simple, ensuring that the best pilot wins, ensuring that the best aircraft is not handicapped out of it, making the contest as exciting as possible, and so on. It is very likely this unresolved conflict that gives our contests an apparent lack of aim and continuity of purpose, and which has resulted, among other things, in the absence of any British-designed and built competition sailplane capable of challenging German designs of what is now the last decade. Possibly this situation will be remedied in 1951, but if it is, the various systems of marking and handicapping used in our National Contests have done nothing to encourage it.

It may be useful to compare the situation with that obtaining in motor racing and sailing, neither of which, incidentally, receive any form of subsidy, except for a small concession reducing the purchase tax upon racing cars and motor bicycles. Two differences stand out as likely to have some bearing upon the success of these sports: first, in addition to the purely sporting side of activities, there is the declared intention of "improving the breed"; in the motor cycling world, in particular, this has reached a point where British motor cycles dominate the world's markets. Secondly, nearly all racing takes place within carefully thought-out classes, having as their objects either the elimination of the costly, and often prohibitive, "unlimited" racing machine, or else the production of a class of boats or vehicles which, by being able to compete against each other on even terms, place a premium upon refinement of design and construction, and skill in driving or helmsmanship. Soaring, perhaps because it is still a comparatively new sport, lacks these refinements, and the only move in this direction was in 1938, when a number of competing designs were produced from which it was intended to select a "One Design" sailplane for use in the Olympic contests. Of these, only one, the German "Meise" (or DFS-Olympia), reached quantity production, and derivatives of it have been built in France, Czecho-slovakia, and Britain. Although capable of fine performance, the Meise is no longer in the first flight of competition sailplanes, and, indeed, after the twelve years since it was designed, it should be possible to produce something both better, and cheaper to build.

This does not sum up what motor and yacht racing have, but which soaring lacks; but the two points mentioned above are perhaps symptoms; and since it is the purpose of this article to provoke discussion, an attempt will be made, both to specify the shortcoming, and to describe a cure. It is therefore suggested that, whereas both motor and yacht racing have, over the years, developed their widely supported and profitable aims, capable of serving as a constant guide to their conduct, Soaring has not yet succeeded in doing so. What is needed, therefore, is a broad but nevertheless clearly defined aim, capable of attracting sufficient support to achieve continuity and stability over a long period, and of such a nature as to stimulate our contests upon healthy lines. Such an aim might be: *To involve the greatest number of participants in the most exciting possible competitions, consistent with improving the breed of sailplanes, and the standard of Flying.*

This aim involves four distinct and conflicting requirements, and if it is to result in a workable and successful plan for competition flying, then the conflicts must be resolved, and resolved in a manner which stimulates progress in each of the four fields concerned.

The greatest number of Participants

"To involve the greatest number of participants" has been placed first, because without widespread support no contest can be a success, nor are the three other requirements capable of satisfaction at all. "Participants" is the word used, because it is intended to include not only pilots, but all those members of ground and retrieving crews without whom no pilot can get airborne at all. (Although it must not be taken as advocating an increase in the size of ground and retrieving parties beyond what is necessary.) In the sailing world, this problem has been solved by the creation of one-design and restricted classes—in particular dinghies, such as the 12-foot "National" class, and the Fireflies, which, for a comparatively moderate and restricted cost, provide first-class racing, and whose numbers now amount to many hundreds. Their existence does not prejudice the survival of the faster, larger and more advanced racing yachts; on the contrary, they apparently bring into the sport many who subsequently transfer to the other classes and who otherwise might never have taken it up at all; the half-litre class seems to be fulfilling a somewhat similar function in the motor racing world. Here, then, is one possible solution of the problem of involving the greatest number of participants, namely, the establishment of a "National" one-design, or restricted, class of sailplane, of such a type as to be more easily within the reach of clubs and individuals than any existing high-performance type, and at the same time capable of providing good competition, and of attracting to contest-flying those who may later transfer to more advanced types. Naturally, it would offer many advantages if the selected type were also available in the A.T.C., and suitable for normal club training; something resembling a two-seater Mu-13 (the Mu-15 actually was such a type), with its welded steel-tube fuselage, might come close to the proposed "National" class.

Next, there is the problem of the "most exciting possible competition." Clearly the most exciting possible competition is one in which every entrant is eligible for the most important prize (if possible a substantial money prize), and in which the rules are such that a premium is placed upon careful planning, thorough preparation, and skilful flying, so that the pilot who displays these qualities to the most marked degree has the best chance of winning. Such a method clearly requires a method of handicapping based upon a comparison of known aircraft performance, and immediately produces a conflict with the third requirement of our aim, namely, that the plan for contests must be "consistent with improving the breed of sailplanes." One solution of this problem is to offer prizes during the contests for the best "absolute" performances regardless of handicap; under such a system there would be prizes for the longest flight, the highest speed, the longest out-and-return, and so on, in addition to the principal prize for which all could compete; and, since a meeting of this sort is often also the occasion for setting up records, there would always exist the incentive to enter sailplanes of the highest possible performance, in spite of any handicap imposed. But this should be additional to a system of handicapping which encourages the production of the healthiest sort of sailplane to meet our national requirements.

Handicapping

The actual method of handicapping is, of course, always a difficulty, and, combined with marking, is the central problem of any contest organisation. A bad system will inevitably stultify sailplane design; a system which fails to level up, within reason, the inequalities in aircraft performance, will fail to achieve the object of ensuring that the best pilot has the best chances of winning; and as a final snag, any handicapping must be based upon a system which is quick, efficient, simple, and which can, in fact, be done by the judges on the site.

At this point it is necessary to examine what, in fact, are the factors which give a sailplane competition performance; it is considered that there are three principal ones: first, the minimum rate of sink, for clearly the sailplane possessing the least rate of sink is the one capable of making maximum use of rising air; it will either reach a given height in a shorter time than an aircraft with a greater rate of sink, or will attain a greater maximum; in an extreme case it will be able to remain airborne when others cannot. Second are the two factors which govern "penetration," and which thus govern the use that may be made of height once it is gained. These are the

optimum gliding angle, and the speed at which it is attained; for the flatter the gliding angle, and the higher the speed at which this gliding angle is reached, the further the sailplane can reach from a given height, and the less it will be affected by adverse winds. The relative values of each of these three factors will naturally vary according to the changes in wind speed and instability under any particular set of conditions, so that their exact assessment in proportion to each other is difficult; however, it is possible to give a fair estimate of the "competition value" of any sailplane by multiplying all three together. The factor thus arrived at has been termed the "Performance Factor" and is shown worked out for a number of sailplanes and gliders in column (j) of Fig. 1. This factor cannot, of course, be determined except by reference to actual performance tests, such as would be impractical for the handicapping committee of any contest, especially if it were one in which foreign aircraft were expected to take part; however, there does appear to be a reasonably close relationship between the "Performance Factor" and the figure arrived at in column (e) of Fig. 1, which is:

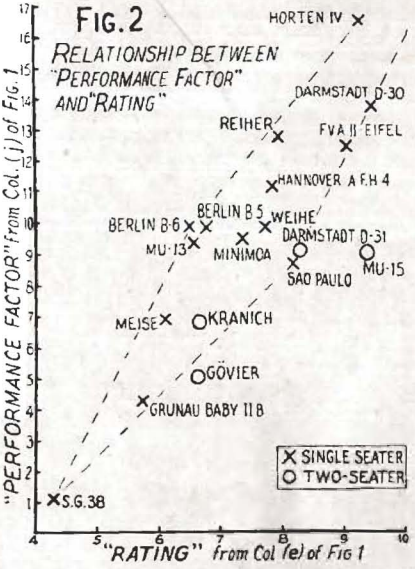
$$\sqrt{\frac{\text{all-up weight} \times (\text{span})^2}{\text{wing area} \times 10^2}}$$

or

$$\frac{\text{Span}}{10} \times \sqrt{\text{wing loading}}$$

Sailplane Type	Span (metres)	All-up weight (kilograms)	Wing area (square m.)	$2\sqrt{\frac{c \times b^2}{d \times 10^2}}$	Best gliding angle, expressed as one in . . .	Speed (Km/h) at which (f) is obtained	Min. sink (metres/sec.)	$\frac{f \times g}{h \times 10^2}$ (g in m/sec.)
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(j)
Horten IV	20	350	19.10	8.68	37	80	0.50	16.40
Darmstadt D.30	20	265	12	9.40	36	72	0.52	13.80
Reiher (DFS)	19	323	19.36	7.79	33	70	0.50	12.80
FVA II—Eiffel	18	350	14	9.00	33	85	0.63	12.36
Hannover—AFH 4 ..	15	270	10	7.80	32	91	0.72	11.20
Berlin FFG—B6	16	240	14.60	6.48	30	68	0.58	9.88
Berlin FFG—B5	15	225	11	6.75	30.5	76	0.67	9.85
Weihe (DFS)	18	335	18.34	7.68	29	70	0.58	9.87
Minimoa	17	353	19	7.34	26	85	0.65	9.46
Mu 13	16	285	17	6.56	28	70	0.58	9.40
Mu 15 (2-seater)	19	450	18.80	9.31	29	80	0.70	9.10
Darmstadt D31 (2-seater)..	20	350	20	8.24	31	67	0.56	9.10
Sao Paolo (DFS)	19	350	19	8.26	27	75	0.65	8.70
Meise (DFS-Olympia) ..	15	255	15	6.18	25.5	69	0.71	6.90
Kranich (DFS) (2-seater)..	18	435	22.68	6.89	23.6	70	0.69	6.65
Go. 4 (Govier) (2-seater)..	14.8	410	19	6.63	19	70	0.96	5.03
Grunau IIb	13.57	250	14.20	5.77	17	55	0.85	3.00
SG 38	10.41	210	16	4.28	10	52	1.30	1.10

Fig. 1. Letters in the formulae refer to the respective columns.



In order to bring out this point, the two values have been plotted, for all the aircraft listed, in graphical form at Fig. 2. It will be seen that there is not a very wide spread, considering the nature of the measurements used in calculating the factors plotted; and it is perhaps not without significance that those types which employ expensive forms of construction, in particular the Darmstadt D-30, and the two-seaters, are the ones which fall furthest to the right of the plot, and which would accordingly suffer most in a handicap system based upon measurement of this sort. The conclusion is that, if a suitable bonus is granted to two-seaters, then the factor arrived at in column (e) of Fig. 1 would give a reasonable estimate of the performance capabilities of the varying types, and in Fig. 2 it has accordingly been referred to as the "Rating."

All the measurements required for measuring this "Rating" can easily be checked on the ground on the competition site. Moreover, they are those which, to a considerable extent, govern the cost of any sailplane, for total weight and large span are almost invariably the accompaniment of high cost; weight and span are accordingly handicapped, whilst the formula gives encouragement to smaller aircraft with lower wing-loadings; the emphasis is upon refinement rather than size, the same emphasis which has produced the popular and large fleets of racing dinghies which abound on our coasts, rivers and lakes. Finally, such a system of handicapping, if once adopted, may reasonably be expected to remain constant for a number of years, and so to give manufacturers some basis for planning.

Handicap by "Rating"

Reference to Fig. 2 will show how such a handicapping system could be operated. To take a specific example, the rating of the "Meise" (DFS Olympia) works out at 6.18, the rating of the Weihe at 7.68. If therefore, these two aircraft were competing against each other, and the Meise accomplished a flight of 200 miles, the Weihe would need to go $\frac{200 \times 7.68}{6.18} = 248.6$ miles in order to equal it. Similarly, the Darmstadt D-30 would need to cover 304 in order to equal either; using this method, the aircraft with the lowest rating always serves as the "standard," and all others are calculated from it.

Under a system of this sort, there is a levelling-up between types sufficient to ensure good competition between equal pilots in unevenly matched aircraft, and at the same time encouragement to manufacturers to develop desirable types of sailplane; it avoids restrictions upon desirable features of design, which is a fault inherent in any system of measurement which attempts to handicap by measuring aids to performance, or performance itself. Finally, it is worth noting that Fig. 2 suggests that an appropriate bonus for two-seaters, so that they could compete on even terms with single seaters, would be a deduction of the order of 15% from the Rating figure arrived at in column (e) of Fig. 1; it must be admitted, however, that the four samples shown have too great a spread to make a very good estimate from these alone. Now, if this rating system were adopted, say, as the B.G.A. rating system for this country, there are a number of advantages to be gained. Firstly, inter-club and inter-team matches become possible upon an agreed basis with pilots using diverse types of sailplane; the principle is the same as that adopted many years ago for rating

yachts in this country, and now adopted internationally by the International Yacht Racing Union, the equivalent of the F.A.I. Secondly, the performances of all pilots may be reduced to some sort of common standard, a matter of importance when the selection of teams is necessary. Thirdly, the Rating may be used to define any "National" or other one-design or restricted class, by saying, for example, that such a class shall be so designed as to have a rating of, say, seven.

Simplify Contests

Finally, there is the question of organising contests so as to improve the standard of flying. To a great extent the actual holding of contests at all is the first, and perhaps the most effective method of doing this; any rating system, therefore, which makes inter-club and inter-team contests more easily held is bound to contribute to the same end; the growth of a one-design, or one-Rating class would contribute further; and finally there is the type of contest itself to be considered.

Except in International Contests, in which there has already been a marked move towards the set-task type of flying, such as flights to a set goal, combined with speed, and so on, the majority of contests have consisted largely of notifying the competitors of the marks available for various forms of activity throughout the meeting, and leaving them to accumulate points in the manner which the pilots select. It is doubtful if all the activities indulged in really lead to any advance in flying technique; for example, it is a long time since the mere fact of staying airborne for a long time was regarded as worthy of marks—it is merely a matter of favourable conditions and the ability to sit still; it seems likely that other items for which marks are still customarily awarded should now be relegated to the same position as plain endurance. Further, the diverse methods by which marks may be gained throw an unnecessary, and certainly uneconomic, amount of work upon judges and officials, besides making it difficult both for competitors and public to follow quickly and easily the progress of the contest; these things diminish the tension and excitement which it should be the aim of all contests to stimulate. It seems, therefore, that there are advantages to be gained by eliminating marks for the kinds of performance that complicate marking without a corresponding contribution to the excitement.

One such kind of performance is height climbs; for, in fact, the greatest gains in height are often made under the easiest conditions of flying, where there are neither the problems of navigation to consider, nor the complications of instrument flying. Such gains in height, whilst undoubtedly proving the performance of an aircraft, do not necessarily prove the skill of the pilot. It has already been stated that contests should place a premium upon piloting skill, and it is undoubtedly the case that the higher degree of skill is required, not by the pilot who is able to reach the greatest height in one locality, under what may be easy conditions, but by the pilot who is able, in varied and sometimes difficult conditions over a course, to convert his height continuously into distance and speed. Covering ground is therefore a measure of piloting skill to a much greater degree than mere gain in height, and does in fact include in itself a measure of the pilot's skill in gaining and maintaining height. Is there, then, any advantage in awarding marks for height? The disadvantages are numerous; in the first place there is the constant and never yet solved problem of deciding the fair proportion of marks to allocate for height; next there is the expense of barographs, and the vast amount of work connected with their calibration, sealing and checking, which is continuous throughout the contest; there is a horde of problems attendant upon these two, and it would seem that the time has come, at any rate in our own contests, when marks for height by itself could profitably be abolished.

If this is done, there remain distance flights, out-and-return, goal flights, and various combinations of these, including speed. All have two things in common, namely, that the less the distance that pilots finish up away from base, the less the retrieving costs, and the more that pilots can be encouraged to follow the same track, the easier things become to organise watchers at turning points, time-keepers, and officials and ground crews. The most economical form of contest, as well as the most exciting, might therefore be a series of out-and-return tasks, returning to the same base each time, using varied turning points each day, and giving due regard to speed. The Germans evolved a successful

variation of this pattern, in which the contest took the form of a tour of Germany, with the goal at the end of each day a different gliding site; thus, in the course of the meeting, visits were paid *en masse* to most of the important gliding sites, and the competing sailplanes were seen by the largest possible number of people. Provided that accommodation problems could be solved, a contest of this nature offers many attractions, and in an International Contest there would be possibilities in a race, say from Dunstable to Madrid. This is, perhaps, for the future; but in the meantime, at home, there seem strong arguments for simplifying our contests by eliminating marks for height, and thus the need for barographs, with all their attendant complications, and for more set tasks designed to cut down retrieving, as well as to add excitement.

Conclusion

These, then, are the three means by which it is suggested that the organisation of soaring contests might meet what is considered to be their proper aim, namely, "to involve the greatest number of participants in the most exciting possible competition, consistent with improving the breed of sailplanes and the standard of flying."

FIRST: Evolve a "National" restricted or one-design class.

SECOND: Adopt a Rating system for sailplanes, with the object of making possible handicapping on an equitable basis, and at the same time encouraging the most desirable types of sailplane.

THIRD: Simplify our contests, and give more set tasks.

Finally, let it be said that this article is written in the expectation that it will be shot at; if so, the writer will draw comfort from the old story of the Editor of the outspoken Western Daily, who, as a bullet splintered the panelling behind his head, and he dived under his desk, muttered: "They may not like it, but at least it shows they read it"; but as a precaution he signs himself—

DELTA.

Llewllyn H. Barker

WE regret to record the death of Llewellyn H. Barker in October, following a sudden illness believed to be due to heart trouble. Mr. Barker came into prominence during the few years before the war, when he owned a Scud III sailplane, in which he did much soaring, chiefly at the Yorkshire Gliding Club. He was the 36th British "Silver C" pilot and No. 860 in the international list.

During 1938 he made a number of cross-country flights in Yorkshire. In June that year he attended the Cambridge Club's camp in Wiltshire, from which he flew to Ringwood on the 13th, Gosport on the 15th, and nearly to Dunstable on the 17th. The last was a most interesting flight, during which the thermals remained as good as ever, although the haze got so thick as to blot out the ground, causing him to miss his goal at the London Club by three miles. After the war he sold his Scud, but continued to be active as Chief Instructor of the Yorkshire Club.

Mr. Barker was affectionately known as "Tough Tom," and more recently as "Bill." His home was at Norton-on-Tees and his job at a chemical works at Billingham. He was an effective controversialist in the press, and it would be appropriate to quote from a letter of his to *Flight* in 1937, in which he was de-bunking some statements made by another writer and concluded :—

"Those who wisely take up the grand pastime of soaring will find that sailplane pilots are not distinguished from their fellows by skill or wizardry, but by an enthusiasm that, until you catch it yourself, passes understanding."

Mr. Barker married in 1949. We would like to extend our sympathies to his widow on behalf of all readers of GLIDING.

A New Basic Trainer

by G. O. Smith

AT the time the Rip van Winkle British Gliding movement woke up to the fact that elementary training was best carried out in two-seater machines, the Slingsby "Sedbergh" was the only two-seater available in any numbers, so somewhat naturally it was hailed as the ideal machine for the job.

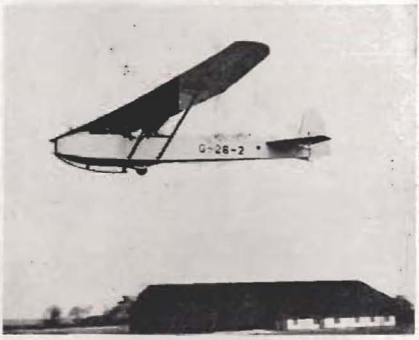
Let us, however, enumerate the requirements of a sound basic trainer and see whether we cannot improve upon the Sedbergh:—

1. COST.—Both capital and maintenance costs should be low. There is no necessity for "high performance" costs.
2. HANDLING.—The controls should be well balanced and the handling characteristics generally similar to those of the type likely to be encountered next.
3. PERFORMANCE.—Should be as similar as possible to that of the next machine the pupil will fly. It is neither necessary nor desirable to train in a high-performance machine.
4. GENERAL LAY-OUT.—Opinion varies more here. Personally I would plump every time for the Tandem arrangement, where the pupil gets the right outlook and the right "feel" from the start. The old argument that with side-by-side seating "you can talk comfortably to your pupil" cuts no ice with me. I think the instructor almost always talks too much anyway.

It will be seen, therefore, that although elementary training can of course be carried out satisfactorily in the Sedbergh, this machine (excellent though it is in many ways) can scarcely claim to be the ideal basic trainer.

With, I presume, some such thoughts in mind, Slingsby Sailplanes Ltd. have produced the T-31 basic trainer, which is virtually a tandem two-seater Tutor. The wings and tail surfaces are actually interchangeable with those of the Tutor, while a longer fuselage places one cockpit under the wing and one forward of it.

The Prototype T-31 has now been flying for some time with the Derbyshire and Lancashire Club, and in addition to carrying out the official A.R.B. type tests, quite



a number of pupils have been trained up to "solo circuit" stage in it. Our opinions of it, therefore, are not of the kind gained by one afternoon's flying, but are stabilised and considered opinions based on months of actual use.

Taking the various points to be considered in the order of our basic requirements, we have:—

1. COST.—I understand the cost of the T-31, ex works, is to be £500, which compares very favourably in a club budget with the corresponding figure of £875 for a Sedbergh. Furthermore, the simple construction of the Tutor wing, and, for that matter, of the new fuselage as well, should reduce maintenance costs to a minimum; while interchangeability of wings and tail surfaces with the Tutor will reduce "long term" maintenance costs and increase serviceability.

2. HANDLING.—As would be expected, the handling of the T-31 in the air is very similar to that of the Tutor; and this I consider a major advantage, since it is more than likely that the Tutor will be the first machine the pupil flies solo. Actually, we are still using a Cadet for first solos, more for economic than technical reasons, and a "conversion course" from T-31 to Cadet usually consists of one flight in the T-31 on the front hook, to demonstrate the pull required on the launch (T-31 extremes are: 8 lb. pull on front hook with C.G. forward,

and zero on rear hook with C.G. aft), and one straight hop to 100 ft. or so in the Cadet to get the slightly different "feel." In ground handling, also, the T-31 has advantages over a larger and heavier machine, in that it can be packed into a crowded hangar along with the solo machines without any special privilege of place.

3. PERFORMANCE.—I am certainly not going to start a controversy by quoting any performance figures, either estimated, measured, hoped for, dreamed of, or merely guessed at. However, I have noticed that on hill-soaring days the T-31 with two up is on average a little below the Tutor and a little above the Cadet. At anything approaching full load (incidentally you can have 15½ stone in *each* cockpit without exceeding either load or C.G. limitations) the stall is naturally at appreciably higher speed than on the Tutor, and in fact occurs at 38 m.p.h. at full load. This, however, is no disadvantage, as it gives the pupil an added margin of safety when he transfers to the Tutor. Like the Tutor, the T-31 performance falls off fairly rapidly with increasing speed, but this again is a "good fault" as the penalty for a few extra knots on the approach is not serious, and a wider margin is available within which the pupil can be allowed to make his own mistakes without interference.

4. GENERAL LAY-OUT.—This still remains a matter of opinion, and in this respect we cannot claim to have proved anything one way or the other by our successful operation of the T-31. However, our experience with it has confirmed rather than shaken my opinion that the tandem arrangement is best for training; and I have every confidence that this machine will more than earn its keep as a basic trainer.

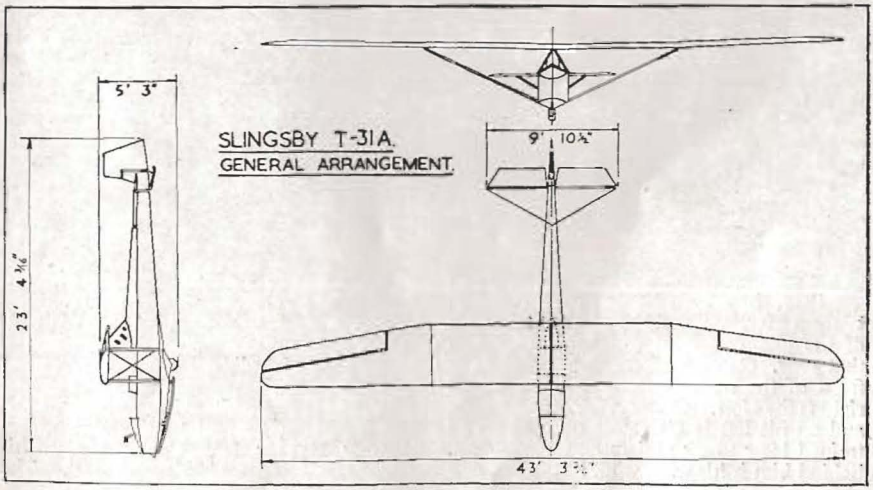
Prospective users may also be interested in the following facts and figures:

Span: 43ft. 3¾ins. Length: 23ft. 4 3/16ins. Height: 5ft. 3ins. Empty weight: 398lbs. Maximum load: 432lbs. (108% of the structure weight. How many aircraft can boast this?).

C.G. limits from 15ins. to 21.5ins. aft of the wing leading-edge. The significance of the weight and C.G. limits is that up to 12 stone can fly solo in the front cockpit without any ballast in the rear, while up to 15½ stone can fly solo with suitable ballast.

With the C.G. anywhere aft of the mid-position the aircraft can be flown quite comfortably "hands off," but with the C.G. fully forward it is fairly nose-heavy; the "hands off" speed being 79 m.p.h., while the pull required to maintain a normal speed of, say, 45 m.p.h. is 4 lb. This figure sounds high, but in practice it seems just not excessive. It would, I think, be an interesting experiment, although it is by no means essential, to fit an adjustable spring bias in the elevator circuit.

Lateral control is excellent, the change



from a 45° turn in one direction to a 45° turn in the other being effected in only 75% of the maximum time allowed by the current A.R.B. formula for this manoeuvre. The sideslip characteristics are a little unusual, in that, at maximum *steady* sideslip, you have 40° of yaw, *no* bank, and neutral ailerons. I think this is because the very high "parasol" wing places the C.P. of the fuselage unusually far below the C.P. of the wing, but I have no doubt the experts will think of some far more complicated reason. Although surprising at first glance, I am not sure this characteristic is so unusual after all. Unless for a specific test, very few pilots use maximum steady slip. A sideslip is a manoeuvre which, when required at all, is required quickly but probably for a short time only, and the majority of sideslips used in practice are carried out at a steeper angle than could be held as a steady condition, without turning.

The stall is quite innocuous at all conditions; in fact, at full load it is quite an "exercise" to stall at all, full aileron control being maintained meanwhile. At lighter loads and with the C.G. aft, the stall becomes more normal, but recovery is always both simple and immediate. It is almost inconceivable to spin inadvertently, and the most we have succeeded in doing is 1½ turns even when trying—this with C.G. fully aft.

First British Gliding School



THE accompanying photograph, taken in 1923, has been sent by Captain F. Warren Merriam, and shows some members of the gliding school which he started in that year. Captain Merriam is standing in front of the nose of the machine; on his right is the Hon. Secretary, Mr. John Smith, and on his left is his eldest son, whom he trained later to fly gliders and aeroplanes. Behind him is his wife, who, he claims, was the first girl to fly by moonlight when he took her up in an aeroplane in 1912.

The school was founded at Whiteley Bank, Isle of Wight, where this photograph was taken. The glider is the one entered by Captain Merriam for the first British Gliding Contest at Itford in October, 1922. It crashed on its first bunjy launch, but Antony Fokker lent Capt. Merriam his single-seater biplane to fly instead. The

original glider was later rebuilt with various modifications for use at the school; an extra seat was fitted, and the wings raised slightly to give the pilot and pupil a better view for landing. Capt. Merriam claims that it was the first glider to be fitted with dual controls.

Unfortunately the school came before its time, and had to close down for lack of support; an attempt to obtain cadets from the Air League fell through, having evidently been made just 16 years too soon. On the revival of British gliding in 1930, Capt. Merriam formed an "Isle of Wight Gliding Club."

Yugoslav National Contests

IN Yugoslavia the Annual Contests for soaring, power flying, parachuting and model aircraft are combined into one big event. This year's Third Federal Aeronautical Contest was held from 2nd to 12th July at Ruma, north of the Danube and 35 miles W.N.W. of Belgrade.

Six national records were beaten during the soaring contests; three of them were (subject to official confirmation) also international records for amphibian gliders. The best flights were made by 23 pilots flying six Weihes, nine Kranichs, four Orliks, two Triglavs, one Udarnik and one Iadran sea-glider.

The free goal-flight competition on 4th July resulted in two goal-flights of 73 miles to Vrshaz and seven to Panchevo (33.6 miles). The free distance-flight event on 5th July resulted in two flights of 355 km. (221 miles) to Skoplie, Macedonia, in Weihes, the first by Saravich Alexander and the second by Bozo Komaz, of Vrchaz. The latter reached 4,600 m. (15,092 ft.), which was a new national record.

Ivan Undriiashevich, of Spalato Dalmatia, established two national records for a goal-flight of 158.4 miles to Voochiirn and at the same time gained 6,759 ft. On the same day other flights were made to Zrze, on the Albanian border (184 miles), Prishtina (172 mi.), Lescovuz (171 mi.), Poduievo (157 mi.) two to Nish (152 mi.) and Kosovska Mitroviza (150 miles).

On the 9th July a speed/goal-flight contest was held to Runkovicheo (154.5 km.= 96 miles). There were seven entrants and the winner was Alexander, in a Weihe, at 67.8 km/h. (42 m.p.h.). On the next day there was a 100-km (62-mile) triangular flight competition from Ruma—Novi Slankamen—Dobanovci—Ruma. Nine



competitors entered and the best speed was attained by Alexander at 52.9 km/h. (33 m.p.h.), again in a Weihe.

The winner of the whole contest was Saravich Alexander with 486.1 points; second was Komaz Bozidar (Vrshaz) with 416.1 points, and third Dimitrovski Slavko (Skoplie) with 390.5 points. All flew Weihes. The best team was the Federal Soaring Centre Team from Vrshaz, Serbia.

Radio for Sailplanes

by K. E. Machin, M.A.

Co-ordinator of Radio, B.G.A. Research Committee

Scope of the Report

IT is intended in this report to give not only the information requested by Council, but also to review briefly the past negotiations with the General Post Office and Ministry of Civil Aviation.

Past Negotiations

On 2nd January, 1947 the G.P.O. authorised the B.G.A. and its Member Clubs to use, subject to certain restrictions, the frequency of 8511 Kc/s. for ground-to-ground communication. This frequency fell within the range of W.S. No. 38, supplies of which were obtained by the B.G.A. for Clubs from the Ministry of Supply. The use of this frequency was to cease at the end of 1947, and was to be replaced by a permanent allocation near 130 Mc/s.

As a result of representations made by the Cambridge University Gliding Club, a Meeting of representatives of B.G.A., M.C.A. and G.P.O. on 11th December, 1947, agreed to extend the use of 8511 Kc/s. for six months, to give time for the development of equipment for the 130 Mc/s. band, where it was now intended that the permanent allocation should lie. Further, it was agreed to allow the Cambridge Club to experiment with airborne sets on 8511 Kc/s.

Experiments confirmed the previous opinion that the W.S. 38 was of no use for ground-to-air and airfield communication, as its stability was very poor, and it required accurate tuning. The shock of landing would alter the tuning sufficiently to make signals unreadable, as did the usual amount of rough handling experienced.

It was realised that the move to the V.H.F. band, although inconvenient, was inevitable. The G.P.O. was bound by International Convention to place aircraft R/T in this band; in addition, only there can the operation of radio equipment by unskilled personnel take place without interference with other services. The disadvantages of the V.H.F. allocation included non-availability of suitable components and the relatively short range possible.

Efforts were then directed to getting the use of radio as free from restrictions as possible. The G.P.O. announced on 6th July, 1948, that 131.9 Mc/s. was to be the allotted frequency, and after considerable correspondence, the following concessions were made by the G.P.O. and M.C.A. :

1. No licences were necessary for operators or technicians (23rd November, 1948).
2. Ground stations may operate mobile, in cars (3rd March, 1950).
3. The inspection of radio installations in gliders is a matter for B.G.A. approved inspectors, and not the M.C.A. (June, 1950).
4. The airborne sets need not have full Air Registration Board approval, but need only comply with a reduced (and very reasonable) specification for glider radios (17th July, 1950).

At the moment, it is necessary for individual types of set to receive M.C.A. approval for glider use, but it is more or less automatic if they are already approved by the G.P.O.

Throughout all the negotiations, the G.P.O. and M.C.A. were always eventually very helpful and co-operative, although usually after an unconscionable delay.

Summary of the present Regulations

1. The frequency to be used is 131.9 Mc/s.
2. The maximum power to the final valve is 5 watts.
3. The ground station(s) may be operated mobile, i.e. in a car.
4. No operators' licences are necessary.
5. The airborne set shall be approved by M.C.A.
6. Fees payable to the G.P.O. are £5 per ground station, and 5/- per airborne station.
7. The G.P.O. may inspect the stations.

The procedure recommended for taking out a licence is as follows:—Notify M.C.A. that an application for a licence will be made, giving details of the set to be used in the aircraft, and ask them to inform the G.P.O. Overseas Telecommunications Branch that they approve the use of this set, and that they do not require to inspect the installation. Then submit an application

to the G.P.O. Overseas Telecommunications Branch, London, E.C.1, enclosing the necessary fee. The call-signs to be used will be allotted by M.C.A.

At the moment, negotiations are taking place with M.C.A. to simplify the procedure. and it is hoped to be able in future to deal solely with the G.P.O.

Equipment for Sailplane Radio

When 131.9 Mc/s. was allocated, it was realised that at that time no transmitter-receiver for this band using battery valves had ever been made. Accordingly a specification for a set, suitable for glider use, was drawn up and circularised to a few firms, asking them if they proposed to make anything suitable. Only one was interested, but required a guarantee that 50 sets would be bought, at about £100 each.

Correspondence with Clubs indicated that only four people were prepared to undertake development of a suitable set. Work was started on a receiver by the Cambridge Club, and Imperial College Club undertook the transmitter. Work progressed somewhat, but was later suspended through lack of time, and also because M.C.A. approval of the sets were necessary. Carrying out the required type approval tests would have involved considerable expense.

A set built by Marconi's for an entirely different purpose became available, and with the co-operation of the Company tests were carried out at Cambridge to establish the suitability of the set for gliding purposes. Further tests carried out during a hill-soaring camp confirmed the usefulness of the set, which costs £65.

Recently, information has become available about a smaller and cheaper set by Nav-Rad Ltd., which is almost ready for production. The set weighs 5 lbs. and measures 6½ x 6 x 6 ins. (cf. the Marconi H.19, 12 lbs., 8 x 9½ x 5½ ins.) and will cost about £35. Arrangements are in hand to put the prototype through the same tests as the H.19, as soon as it is fully developed.

It may be of interest to mention the types of set which have been used abroad. In both Australia and the U.S.A. successful use has been made of radio as an aid to retrieving, and its use has become very popular with pilots and ground crews. In both cases, however, the sets operate in the H.F. band, with the result that they can be very much smaller, simpler, cheaper and lighter, and have a range which is limited only by the transmitter power, instead of by the curvature of the earth as is the case for V.H.F. radio. The reason why in these countries operation in the H.F. band is permitted may be twofold. Firstly, the stations may be operated as amateur radio stations, in an amateur band. This was certainly true of early experiments by the Australians, and may still be the case. Such operation is not allowed by the British regulations. Secondly, the International agreement divided the world into zones for the purposes of frequency allocation, and it is possible that, in the zones in which Australia and the U.S.A. lie, aircraft R/T is permitted in the H.F. band.

It is possible of course, that these countries are still operating on early allocations, and that when the decisions of the International Conference are fully implemented, glider radio may even there have to move to the V.H.F. bands.

Installation of Radio

The Marconi H.19 is a little too large to go through the door of an Olympia barograph compartment, though it would stow there conveniently. Installation is simple in a Kranich or Weihe. The Nav-Rad set should be not much larger than a barograph, and will present no difficulties. The Marconi set requires slight modifications to allow of remote switching, and aerial mounting. These facilities will be provided for in the Nav-Rad set. Although in the tests an external whip aerial about 20 ins. long was used, it is quite feasible to mount an aerial inside a wooden fuselage. It could conveniently be T-shaped, the horizontal part being 40 ins. long, and the vertical rod 20 ins. long. ¼ in. diameter dural tubing would be quite suitable for the rods.

In general, it is not essential to shock-mount the sets, though if it is convenient to do it, valve life may be increased. The installation of the set should be perfectly straightforward to an approved ground engineer.

It is hoped after testing the Nav-Rad set, and when the licensing position is more logical, to incorporate such information as licensing regulations and procedure, hints on installation, construction of aerials and modifications to the S.C.R. 522, etc., in an article for GLIDING, and into an R.T.P.

Foehn Wave Exploration in a Klemm

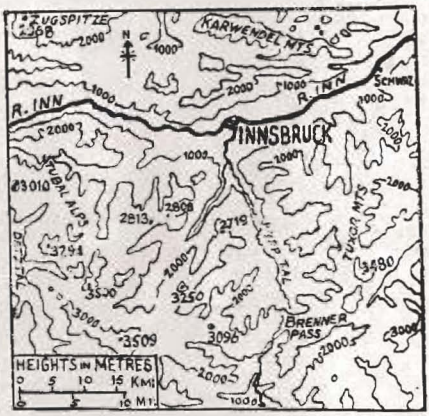
by O. Walter Neumark

On 21st November, 1950, I was at Innsbruck with a medium Föhn blowing above a shallow pool of valley cold-air reaching to about 900 ft. above ground level. The C.F.I. declared that one could not reach the slope in a sailplane under these conditions, and would not try, so I reluctantly took the Klemm 35B with Dr. Hohenleitner (a judge, and the oldest föhn wave soarer of Innsbruck) as a passenger in front. At 300 metres I joined the slope and slope-soared well in front of the ridge to 1700 metres, made a few cross-sections from slope to the bottom wave (about 2-3 km. upwind with a downcurrent in most places between slope and wave) and climbed in the wave at half throttle setting with progressively weak mixture to 18,000 ft. above sea level, reached 60 minutes after take-off. In spite of my silk and woollen gloves and stockings, my feet and fingers were so cold that I decided that it was essential to land immediately to retain some control over my limbs for landing.

With height the wave lift progressed forwards; maximum rate of climb was 3,600 ft. in 6 minutes from 11,500 to 15,100 ft. Then we did some more traversing, found steady lift up to and at 18,000 ft. a.m.s.l. (height of airfield 1920 ft. a.m.s.l.). The normal ceiling of this Klemm is about 10-11,000 ft. with nearly full throttle. For a rapid descent I flew forward into the downdraught and throttled back, occasionally warming the engine. Rate of descent was 12,100 ft. in 5 minutes.

When in the circuit, I was most alarmed when I saw the windsock fully extended and rapidly fluctuating from 180°, 010°, 180°, 000°, 200°, 000°, 200°, etc. Apparently the cold air pool had got very shallow and the föhn was really stirring up nodal waves. The grass strip is parallel to the runway 090°/270°, and a high-speed approach and wheeled gentle landing was accomplished (by chance) just at the right moment when the valley cold-air pool had one of its nodal periods.

On the following day the C.F.I. was again reluctant to take out sailplanes, because he thought that one could not winch through the cold air pool into the föhn wind; so I again took the Klemm 35 with a passenger in front. I spent some time slope-soaring with fully closed throttle at about 7-8,000 ft. and had to put up the speed to 180 km/h. to remain underneath



orographic cloud enveloping the peaks. Then I made several cross-section flights to the wave and rose to 16,500 ft. a.m.s.l. This time the wave lift moved back to exactly above the ridge. When flying in a second wave I noted straight horizontal bands of iridescence on the trailing edge of a lenticular, exactly as with soap films.

After descending, I flew out over the valley into an area of intense turbulence—evidently a rotor, which was marked by Cu, but not clearly in the shape of a rotor similar to the well-known photographs of Küttner.

The behaviour of the windsock was even more alarming than on the previous day. A normal approach was made at 140 km/h. with a perfect 3-pointer (no bounce), when a föhn gust lifted the aircraft to about 50 ft. Throttle was opened gently and the aircraft was smoothly landed with another gentle 3-pointer and stopped.

Although this shallow bath-water nodal wave effect had been visualised before I ever went to Innsbruck, this was the first time I had experienced it, and the natives claimed that it was very rare at the site of the new airfield at Kranebitten; it was common at the old airfield directly opposite the mouth of the Brenner valley.

Unfortunately the C.F.I. now claimed that conditions were far too rough for winching and landing sailplanes and did two test flights himself. Judging by his behaviour on the cable, and during approach and touch down, he was probably right.

I only made two landings and both happened to be nearly perfect, although I fly very little. I will venture to comment. The main danger is psychological; the windsock really behaves like something out of a nightmare—90° cross-wind from the left then 90° cross-wind from the right. I did not time the period, unfortunately, but believe that it was about two minutes. In an aircraft or sailplane requiring a short landing run, it should therefore be feasible to fly about 50 ft. above the ground until one gust hits you, to pull up on it and glide down and touch down in the lull before the reverse gust comes in. The gusts feel entirely different from those experienced when really strong thermals come off the runway during approaches on a hot day, due mainly to the strong cross-wind components. In the circuit at about 600 ft. (so low in order to watch the alarming windsock more closely), I experienced the most violent down which I have ever met—I was really thankful that the harness straps managed to take the strain.

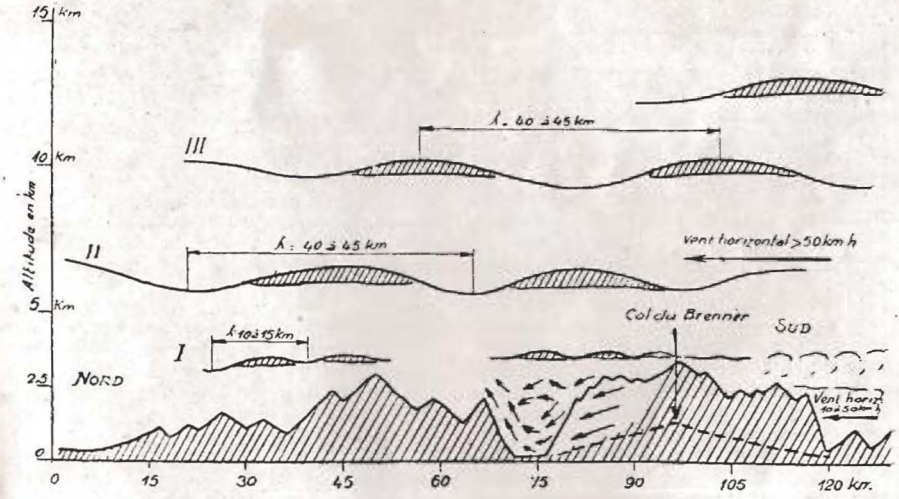


Diagram of Standing Waves in South Foehn over Innsbruck region, from Prof. W. Georgii's "Les Bases Meteorologiques du Vol a Voile." The hollow full of arrows is the Inn Valley. I: Local Waves. II and III: Great Foehn Waves. Note that the latter are displaced up-wind at increasing heights. The 18,000-foot level reached by Mr. Neumark corresponds to 5.5 kilometres.

History of the "Cosim" Variometer

by A. Louis Slater

I WONDER how many present-day sailplane pilots would blithely set out on cross-country flights and cover considerable distances without the use of a variometer? Yet, during the 1920's when Kronfeld, Wolf Hirth and other famous German sailflyers were making soaring history, many of the extraordinary soaring and cross-country flights were done without the use of (according to present-day standards) this indispensable instrument.

It was probably nearer 1930 when an instrument showing direct rate of ascent or descent first came into use. Robert Kronfeld in his book on Gliding and Soaring makes no mention of such an instrument, but on page 311 there is a brief reference to the need for an instrument which would indicate the entrance of a glider into a layer of warmer air.

In England round about 1933 several ingenious devices for indicating rates of ascent or descent were evolved, amongst them being David Dent's curious arrangement of glass tubes filled with balanced proportions of non-mixing colourless and red phenol. There was also Fred Coleman's soap bubble tubes and R. G. Robertson's elaboration of Dent's glass tube and phenol device which worked very well. In fact, both Robertson and I got our "Silver C's" with the use of this instrument. I also ruined a pair of socks through phenol dripping out of the atmospheric vent one very gusty bumpy day. A little later on, Eric Collins designed and had made a very neat little instrument with a dial face rather like the charge and discharge ammeters on the dashboards of motor cars.

All these variometers, whether of the sensitive capsule type or the liquid type, had a fixed leak in the form of a piece of glass capilliary tube. One could, by making the leak small, have a very sensitive instrument, but only at the expense of increased lag and *vice versa*. Some variometers were, and still are for that matter, fitted with two leaks, fine and coarse, controlled by a two-way cock operated by the pilot.

The answer, therefore, was to design an instrument in which the leak automatically adjusted itself to the correct size for any rate of climb or descent, and in 1936, after much thought and many experiments, the forerunner of the present "Cosim" was evolved. This was a joint effort on the part of R. B. Cobb and myself and was on the very simple principle of two tubes in which are moved, by the air flowing out of or into a vacuum flask, small indicators—green for ascent, red for descent. In those days, however, the tubes had taper bores and very tiny hollow balls as indicators. The size of the instrument face was 3 ins. high by $\frac{3}{4}$ in. wide, and the bores were 1/16 in. at their minimum diameter. The balls, hollow and coloured inside, were machined out of perspex and the wall thickness was 0.005 in. The instrument was purposely kept small, as it had to fit in any odd place on the somewhat cramped and tiny instrument panels of those days, when A.S.I's and altimeters measured about 5 inches across the dials.

The first recorded flight made with one of these little instruments was by Gerry Smith, who took the Golden Wren from Camphill across the border to Ruabon in Wales, thus completing his "Silver C," on 28th September, 1936.

We decided to put this instrument on the market, and it must have filled a very definite need, judging by the reported flights made with its use and the letters of appreciation we received. Wolf Hirth took one back to Germany after his visit to our National Competitions at Camphill in 1937, congratulating us on a fine achievement, and so we were encouraged to go on.

Since the war, cockpits are in general more roomy, and instrument panels, in addition to being larger, are usually much further from the pilot's eyes. In consequence the "Cosim" Variometer has been increased in size both to ease production difficulties and to be more easily read. The taper tubes have been superseded by parallel bore tubes, the leak being taken care of by machining a taper slot up the back of each bore, and the hollow balls replaced by pistons.

From 1946 onwards we have supplied many hundreds of "Cosim" Variometers, and these have gone to all parts of the world.

The 1950 World Championships

and what we are doing about it

by Philip Wills

THE biennial reports on the International Contest (henceforth to be called World Championships) must continue to take the form of an attempted analysis of why we did not do better, and suggestions as to how we can improve our performance next time. But enough has happened since we came back from Orebro to awake in at least one heart a flutter of wild hope that at last we have turned the corner—that at last enough people are sufficiently keen to see us do better next time, and that some of the necessary steps to that end will be taken.

Team Selection.—Several steps have now been taken to overcome this difficult problem next time. The form of future National Contests has been materially altered, and a system of week-end Club Matches has been worked out which, if it is a success, will go very far both to get our potential first-line pilots into practice and to enable their relative abilities more easily to be judged.

Equipment.—The outstanding feature of our equipment was, of course, that three of our four machines were Weihes, a 1937 German design, whilst the fourth was a 15 metre. The Weihe was, of course, easily the favourite machine at Orebro and was flown into first and second place by Sweden and the U.S.A., but clearly it is time that the gliding nations of the world produced something to beat it.

In this country, we have at least two first-line candidates for the 1952 World Championships—the Slingsby T.34 single-seater and the Miles-Kendall two-seater project. If we are seriously to go out for top honours, however, we must pay much more attention to detail. Paul MacCready had, on his Weihe, suppressed the pitot-head, closed the aileron-gaps with aluminium strips, taped up wing-root and other gaps, and had a very fine smooth finish. On a test, he achieved a maximum gliding angle of 1 in 31—certainly 5% and possibly 10% better than my machine. I couldn't afford to give away 10% like that. On this one count alone, with 10% better penetration I should have made the goal race to Norrköping, which would have brought my final placing up by anything from four to seven places.

Turning to other equipment, as Pirat Gehriger has since remarked, the World Gliding Championship must in fact be regarded as a combined sailplane and car race. The retrieving team and its equipment are almost as important as the sailplane and its pilot. In six flying days at Orebro twenty-nine aircraft flew a total straight-line distance in excess of 18,000 miles—an *average* of over 100 miles per day per machine. Retrieving crews therefore covered about 50,000 miles, excluding getting to and from the Contests.

It is therefore essential to have a large and absolutely reliable towing car, big enough to arrange a bed in the back for the pilot to sleep in. The Swedes had large lorries with a complete bunk, armchairs, and a wireless station. Crew fatigue also leads to road accidents, which of course can damage a pilot's chances just as much as air mishaps.

We had a lot of car trouble with our mixed fleet. John Sowery's 1926 Bentley was a magnificent warhorse, gave no mechanical trouble, and attracted much delighted attention; but Lorne Welch could get no sleep or rest in an open four-seater.

As regards instrumentation, it is increasingly important to achieve a reliable car/aircraft radio set, mainly to shorten retrieving times and hence lessen fatigue, but also to help brief the pilot from the ground. Nilsson and MacCready both had such sets; Forbes had a prototype which was not yet satisfactory.

The B.G.A. Research Committee have been working on this problem for some time and an article on the latest position appears elsewhere in this issue.

For blind-flying, about half the competitors relied on the simple turn-and-bank indicator, which the writer believes entirely adequate, providing some means of de-icing of the pitot-head is available.

I had a prototype pitot-head electrically heated from three six-volt dry batteries. The only good ice I met with was on the day before the Contests started. In a cu. -nim. on this day I climbed through the icing layer, waited until my A.S.I. went out, and switched on. Within forty seconds the icicle blew off, the A.S.I. returned, I switched off and continued to climb without further recurrence. As I had hoped, for sailplane use a thermal de-icer has only to work for a very short time and only once on most climbs. Mine takes 0.9 amps at 14 volts on discharge, so that a set of dry batteries will last a considerable time on 40-second bursts.

Pilotage.—Again, of course, our main deficiency. What can be done?

The largest short-range factor which brought us out lower than we ought to have been was, in my view, lack of practice. No member of the British team had during 1950 done more than a few hours' cross-country flying over the kindly fields of England. In the sterner countryside of Sweden, without absolute confidence that one could land safely in a maximum field of 100 yards with poor approaches, one could not fly to form. I do not mean by this that we had anyone in our team who, with a little more practice, would have outflown Nilsson, but I am absolutely certain that most or all of us, due to lack of practice, were for the first few days flying below form. It is absolutely essential that when we next compete our team gets at least a week's, preferably a fortnight's, intensive flying in the country of the contests.

But the main, background, strategic factor is, of course, our whole attitude over here to the sport, which as I have said above I do believe is at last beginning to change. And the best straw showing which way this wind is blowing is the general demand after our Nationals this year that in future Contests we should go in for task flying. The B.G.A. now hope to reshape future contests on lines calculated both to show up our best pilots and to improve our pilotage standards as rapidly as possible

Firstly, it is agreed to call our future contests the National Championships. This may sound like an alternative name for a rose, but it is more fundamental than that.

The Championships will be run in three separate classes—Club Team Championship, Individual Championship and Open Team Championship.

Once again the thanks of the Gliding movement are due to Lord Kemsley, who is giving us a magnificent Trophy to be awarded annually to the Champion Club team. The Londonderry Cup will in future be awarded to the Individual Champion; and the L.du Garde Peach Trophy to the Champion Open team. Aspirants to the British International Team will be pressed to enter in the Individual Championship, and their performance therein will be given due weight by the Selection Committee.

Secondly, task-flying will be the order of future contests, which should both increase the value to pilots and reduce the cost of retrieving.

The two most remarkable things from the pilotage point of view at Orebro were Nilsson's ability nearly every day to remain airborne up to an hour longer in the evening than anyone else; and secondly, Paul MacCready's ability to best everyone else by a large margin in speed-flying.

Nilsson's technique I do not know—possibly he achieved it by great experience of sailflying over his own country, but if so one would have expected the other Swedish pilots to show comparable results.

MacCready's speed was achieved partly by a great application of best cruising-speed technique. He calculates to a hair's breadth the performance of his machine, and the best speeds to fly at in different thermal and wind conditions.

The intensity of his approach to every aspect of the art is remarkable and the results he achieves spring from this, allied to an exceptional natural ability.

Rules.—The rules were excellent, but one or two changes were suggested for the future. With pilots of international calibre, the organisers commonly underestimate the high level of ability. Flying was only permitted on good-weather days, and the number of contest days was laid down as a minimum of four and a maximum of six. This maximum was too low. In eleven days' ideal weather, the ideal distribution of flying/rest days would be 2-1-2-1-2-1-2, so that a maximum of at least eight days should be catered for, whilst if out-and-return flying, and straight-line or even dog-leg races were included, with less retrieving, it might be nine days. Six days meant that

a single stroke of bad luck, such as occurred to Tage Löf on the first day, could not be retrieved.

A second point was that, by general consent, the double penalty for missing a declared goal—the loss of the 20% bonus and of the distance by only scoring on the projection of the actual landing point on to the declared goal line of flight—was too severe, as so much depended on the luck of the weather.

Thirdly, the rule that two-seaters could only be entered with one occupant was thought retrograde. Great importance is attached to the future development of two-seaters, and the advantages and disadvantages from the point of view of contest flying were thought to cancel out.

As a matter of fact, the writer can see little wrong with our own simple system of scoring in our Nationals this year, except that a "daily factor" is an essential addition.

Organisation.—The organisation at Orebro was simply flawless and contributed largely to the absolutely remarkable standard of good-humoured sportsmanship which prevailed throughout. Such a high standard sets a difficult problem of emulation for the next holding country.

1952 World Championships.—It has now been definitely decided not to include Gliding in the 1952 Olympic Games in Finland, and the F.A.I. will shortly be writing to all National Aero Clubs inviting offers to hold the 1952 World Championships. This has become an event of some international importance and we are now therefore seriously considering whether we should attempt to offer.

There is no doubt that the remarkable demonstration of the potentialities of soaring which these contests stage gives a very valuable boost to gliding in the holding country, and in Great Britain the holding of a successful World Championship would certainly produce important results.

On the other hand, much damage would be done if the Contest was held here and not run well, and its organisation is a very big task indeed. The decision as to which country's offer will be accepted must be made about February this year, as most countries, certainly our own, would have to hold a practice contest on the same lines in 1951.

Goal Flight from Dunstable to Coltishall

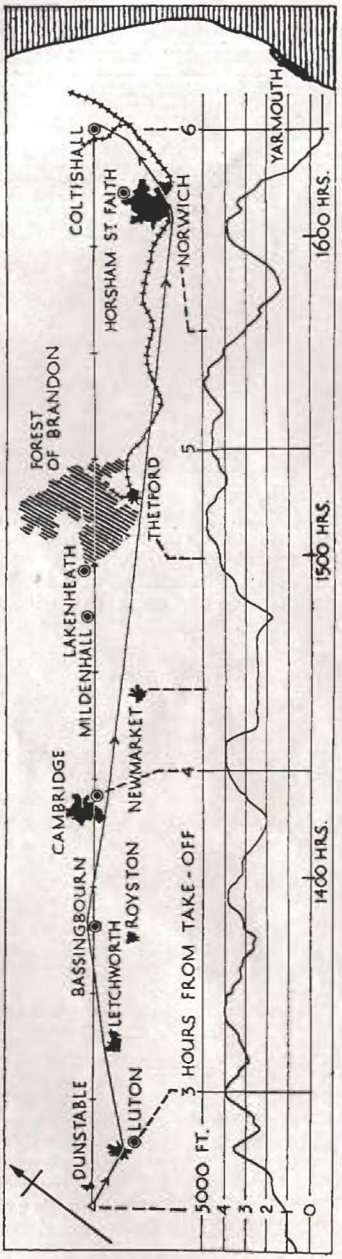
by Lawrence Wright

A 100-MILE circle drawn about Dunstable cuts the Norfolk coast to leave a sector about 50 miles wide by 13 miles at its deepest. North of the Wash, the circle cuts the coast again above Skegness, a very northerly goal. In the Norfolk sector, R.A.F. Coltishall is the furthest active airfield, 101 miles from the London Gliding Club.

By declaring for some lonely beach between Yarmouth and Cromer at low tide, the distance could be stretched to about 113 miles: it did not seem worth it, and I chose the comforts of Coltishall. As usual I drew a track on the "half-million" map, marked out four-mile dimensions each representing a loss of height of 1,000 feet, and gave a little preliminary armchairmanship to the matter.

I have no idea what the promised weather situation was on 1st August. I go by Greig's dictum: "You've got to be in the air when the right time comes. It's no use being on the road to the club, or rigging. You've got to be *in the air*." So I got airborne at 10.20 hours, with the wind light S.W. and the sky uncertain.

In the first hour my best effort was 2,400 feet in weak thermal. (All heights above take-off point, which is 500 feet above mean sea level). In the second hour, only 2,000 feet. There were alternating periods of high overcast, brief convection and clear blue sky. After two hour's work I was scraping the hill, with the sock drooping



Route and barograph record of Mr. Wright's goal flight from London Gliding Club to Coltishall.

miserably. The uninsured club machines landed in turn and left me the hill to myself. The Jeep started up to retrieve me, but upwind I could see a hundred square miles of cumulus creeping nearer, and I scraped on. After half an hour of this, thermals restarted, and having lost the first at 1,800 feet I worked the second up to 3,500 feet.

I judged that if I went downwind too soon I would overtake the poor conditions that had just passed, so decided to hang about awhile over Luton, with one foot in the airfield there. By 13.20 hours I had reached 4,000 feet and cloudbase over the Vauxhall works. Average ground speed for the first three hours, not quite three miles an hour. At this rate I might do my 101 miles by Wednesday night. The clouds downwind now looked better, and I set course for Cambridge, where I would be back on track after the diversion to Luton.

For the next forty minutes I kept easily between 3,000 and 4,000 feet. Although I messed about unduly over Letchworth in weak lift, made over-cautious by a wide blue gap ahead, and once went back a mile or so to a good cloud, the average from leaving the hill) had crept up to 22 m.p.h. on reaching Bassingbourn. Three times at cloudbase I was able to fly at 65 m.p.h. for minutes on end with the variometer at zero. But as I approached Cambridge I sank to 2,000 feet, and doubted if I could make Marshall's.

A strong and gassy thermal from a cement works came to the rescue, and as I smelled my way to the centre, it gave birth to a cloud which was quite flourishing when I left it at 4,000 feet. I dallied over Cambridge for Leica pictures, then sped on across another gap. This proved so wide that it looked like a straight glide to Newmarket racecourse, and a close finish by the post at that.

Down to 2,500 feet near Newmarket, I met weak lift. I widened my circles in search of the centre: there wasn't one. I looked up for cloud: there wasn't any. For fifteen minutes I drifted at a constant 2,500 feet, gyring and gimbling at Rate Half, past the racecourse, the town and the gallops (with a glance for the field where we planned to set up the Glider Training Squadron in 1940 until the Jockey Club objected). A slow but restful progress. Bored, I pressed on, and soon lost the little lift I had.

A quick look at my scale showed that I could make Mildenhall, but at that moment

a flight of Forts from Lakenheath, four miles further, reminded me of U.S.A.A.F. hospitality, known of old. The snag was that Lakenheath was barred downwind by the Forest of Brandon, nine miles across, and a last-minute save at that airfield would mean tree-top thermalling. My indecision was resolved at 1,800 feet by a good cloud which after some fumbling took me to 4,500 feet. There would be no candy or cigars to-day.

I passed Thetford in another of those pleasant dashes just under cloud at 65 m.p.h. without loss of height. For a while I bewildered myself by trying to use the Redhill-Coltishall track, more clearly marked on the map and now converging. By the time I had spotted this boob I was somewhere between the two tracks. The wind was freshening a bit: although the places I had passed receded very slowly, those yet to come seemed to approach quite rapidly. I preferred it that way round. Average groundspeed from Bassingbourn rose to about 40 m.p.h.

A jet came up at me from the ground, shot past vertically and disappeared into the stratosphere: a queer sight from my viewpoint.

I picked up the Thetford-Norwich railway, but Norwich refused to show up. In such a situation there is usually plenty of sink, and from my best height of the day, just under 5,000 feet, I did a long depressing glide, watching the compass, trying not to watch the altimeter. When Norwich loomed up through a slight haze, I had drifted south of my track, and the airfield of Horsham St. Faith was well out of range on the far side. I won about a hundred feet, then sank again, and sneaked round the city on the wrong side along a belt of water-meadows studded with pylons, inclined to prefer for a landing a large patch of what seemed to be bull-dozed-earth inside the built-up area. At 1,600 feet, with 3,000 needed to make Coltishall, I edged over the city for a last stand.

Above the roofs was a vast mass of gently rising air. Immersed in this, I wandered up to 4,000 feet, and as my goal came into the bag, dallied to take more Leica pictures. Then, as the haze seemed to be thickening (I never clearly saw the coastline), I steamed along the railway leading to my terminus.

To starboard was half a square mile of water, presumably a Norfolk Broad, so thick with sailing craft that few of them could have had more than twenty yards of sea-room. With cubic miles of sky all to myself, I pitied their wretched sport.

During the day I had flown under thick and thin clouds, large and small clouds, new and old clouds, and not one had failed to produce some degree of lift. In each of three or four wide blue gaps I had found something before reaching the other side. I had flown over dry hills, woods, towns and fenland, but the thermals went up, or failed regardless. I sometimes think the dear Lord does not read the textbooks on soaring meteorology. I had not incidentally overtaken the poor conditions of the morning.

At Coltishall I had about 2,000 feet in hand, and forced my way down through a last unwanted thermal. I might have gone on to the coast and back, but the retrieve would run late already. In the signals square I noted, I thought, a "land with caution" sign. After landing I discovered it was a "total prohibition." A lucky error, for I could not of course have deliberately disobeyed it.

I landed at 16.20 hours after just six hours in the air, quite fresh. Average speed about 30 m.p.h. for the 3½ hours from the base of the first good thermal at Dunstable. I had not hurried. A cloud-user could have travelled much faster, but might have had less fun. Probably two hours of soaring conditions remained to go.

Lessons Learned, or rather, Obstinate Beliefs Confirmed:—

(1). I often soar on the hill for hours on end for no apparent reason. This sometimes arouses scorn. But it is worth something to be able to fly for six hours or more if necessary without a thought of fatigue, and to be fresh enough at the end of a long ride to make right decisions. (A pilot from Camphill, with Lympne as his goal, came down from 8,000 feet over Luton to land at Dunstable for tea: he was tired).

(2). When you are used to it, the "half million" map is the best. The quarter-inch map is perhaps better for those who are lost and seek to identify minor features seen below. Those who *anticipate* major features from a simple map will not be lost.

(3). A flight of 100 miles or so in England on a reasonably good day does not demand high-speed technique and so is poor training for an International aspirant. I couldn't care less about this.

What are Lee Waves?

by R. S. Scorer

IT may seem impertinent for a theorist to offer an answer to this question to sailplane pilots—as if they didn't already know! But the purpose is to put before them some distinctions and ideas in the hope of helping those who meet lee waves to make the most of them.

The analogy with water flowing over a submerged weir is often quoted. It is a good analogy but it fails in two important respects: the water is not stably stratified and has a top surface, while the air is stably stratified and has no top surface. The springiness in a stream of water that enables waves to occur in it is derived from the discontinuity of density at the top surface, while in air that is stably stratified throughout, all the stream lines try to remain horizontal and one above the other in the same order. Even when there is vigorous convection, the space above cloud base that does not contain cloud is almost always stably stratified. When the water analogy is given it is usually suggested that the springiness in the air is provided by an inversion of temperature. This is definitely not true.

There is a change in density at a free water surface of nearly 100%, while at a most exceptional inversion in the air the change of density can scarcely exceed 5% and is usually 1—3%. The way in which two layers of fluid act upon one another is through the fluid pressure, and Bernoulli has informed us that the pressure depends, among other things, on $-\frac{1}{2}\rho U^2$, where ρ is the density and U is the velocity. The pressure is least where the velocity is greatest. It is the way in which this quantity is changed at a surface of discontinuity that matters. Even if we had a 20°F. inversion, i.e. a 5% change in ρ, it would only require a quite common change in velocity, say for 15 to 20 m.p.h., to give a 70% change in $\frac{1}{2}\rho U^2$, and we know that changes in velocity often, in fact generally, do occur at inversions. Velocity changes are therefore much more important than inversions of temperature. Though we can forget about sharp inversions we cannot ignore the stability, i.e. the temperature gradient over large depths, as will be seen later.

The water in the analogy has a top surface, and we need not worry what goes on above it provided that it is nothing violent like a strong gusty wind (which we know makes waves). The air, on the other hand, extends up to infinity and this places some restrictions on what can take place below. It means that, because the air is stably stratified up to infinity, standing waves of wavelength more than about 15 miles cannot normally exist, and can only be expected with very high winds. In the water, waves of any length can be produced.

The consequence of this is that, since (by Fourier's Theorem) any mountain shape can be thought of as built up from wave forms of all lengths, some of the components cannot exist, and the air cannot flow smoothly and steadily over the mountain. It must either "separate" and form a wake, or the flow must be unsteady. Actually it is not as bad as that because these restrictions only apply to an infinitely long mountain ridge lying across the wind, and when the ridge is only a few miles long, say up to 20 miles, smooth steady flow can occur. The longer the ridge—that is, the greater the width of the air-stream that it affects—the greater is the height to which it will affect the airflow, always provided that the flow is fairly steady and does not separate from the ground (more about separation later). Therefore if the flow over a very long ridge like the Norwegian mountains, or the Sierra Nevada in California, is steady and does not separate, one can expect vertical motions to a very great height, perhaps 100,000 feet.

Such motion, however, is not a lee wave. It is often called a standing wave, but the term "hill lift" is preferable. It is concentrated in the region close to the mountain and does not differ in kind from the lift found close to the ground over a slope. "Hill lift," therefore, means vertical motions in an airstream directly associated with a particular hill. A solitary wavelike cloud sitting over a hill is evidence of hill lift.

Besides hill lift the motion over a hill can

set up a train of lee waves. Whether such waves can exist or not is determined entirely by the nature of the airstream. Two hills of quite different shape could set up identical trains of lee waves in the same airstream though their hill lift would be quite different. For example, an upslope on to a plateau or a downslope off a plateau might do this. Every time there is any wind round a hill, there is some sort of hill lift; but only in suitable airstreams are lee waves formed, and if the airstream is suitable every hill forms them, though of course their amplitude will depend on the hill.

Much more is known about lee waves than about hill lift. Though it is spectacular to reach enormous heights in the hill lift of a great mountain system, there is no particular credit to be attached to doing so. The pilot who can fly in invisible lee waves over level ground is the real hero of the piece.

This raises the question of when they are visible. What is most likely to render any wavy motion visible is a shallow, very moist layer which forms a dense lenticular cloud when it is displaced upwards, with clear air in the hollows between. This is often achieved when there is an inversion of temperature, for the humidity always tends to become very high just below and very low just above an inversion. It was therefore inevitable that lee waves should first be discovered and explored on occasions when there was an inversion—hence the myth that the inversion had something to do with causing them. There is very good reason to believe that only a small fraction of the lee waves that occur actually become visible.

Since it is at present difficult to say much about hill lift from the theoretical standpoint, largely because the actual form it takes may vary a great deal according to the airstream and hill shape, it is best explored by pilots on the site. Quite a lot can be said, however, about lee waves, so some of the main points are now summarised.

If the airstream is suitable, every hill will produce lee waves; but if the hills are so placed that their trains of lee waves are exactly out of phase, they will cancel out. A long ridge lying across wind will produce a train of waves that extends a long way downstream and may contain up to 10 or 15 wave crests. A short ridge or circular hill will only produce one or two waves before they die out. The waves will lie more or less parallel to the hill crest. Their amplitude will be greatest if it is high and if its slopes are steep, provided that they are not so steep that separation of the flow takes place. The windward face of a plateau can produce a train of lee waves over the plateau, while the leeward edge produces one over the leeward plain. A coastline can produce lee waves out to sea if a sea breeze is blowing and the main wind is offshore, because the sea breeze circulation acts very much like a mountain range and deflects the streamlines from the land over



the top of it. It is very doubtful indeed whether standing waves of any sort ever occur at cold fronts: it is certainly most unlikely on theoretical grounds, and since there is always so much vertical motion going on anyway round a cold front, any evidence for waves is highly suspect.

So much for the things that can set up lee waves; what of the airstream? Broadly speaking, what is required is an increase of wind with height. Almost always, when there is such an increase, lee waves will be possible (and will therefore occur in the lee of any hill) unless one of the following also occurs:—

(1) A substantial increase in the stability. If the lapse rate is very much greater in the lower than in the upper layers, lee waves are unlikely. Conversely, of course, if the upper layers are less stable than the lower, lee waves are more likely; indeed, in exceptional cases the decrease in stability upwards might outweigh any wind effects, and if the lapse rate up top was near the dry adiabatic (or wet adiabatic with a complete cloud cover), waves might occur even if the wind did not increase with height. Sharp inversions of temperature can be ignored, but a thick isothermal or inversion layer of, say, 2,000 ft. or more in depth can be very helpful.

(2) A general stirring up of the air by convection. Even if the variation of wind with height required for waves is maintained, in spite of the stirring, it could abolish the waves if convection cells are of a size comparable with the wavelength. This is equivalent to saying that the flow must be laminar in the main. Convection bubbles small compared with the size of the hill and lee-wave length will only have a small effect and may often occur, sometimes penetrating the lenticular cloud. Vigorous convection in a shallow layer will not ruin lee waves if all the other required conditions are present in deep layers above.

(3) Separation of the airflow so as to produce a wake comparable in size with the hill. This may change the effective shape of the hill into one that produces lee waves of very small amplitude.

Most pilots are familiar with the idea of boundary-layer separation in aerodynamics. It occurs in the layer affected by viscosity when the airstream is opening out and moving towards higher pressure. The streamline leaves the boundary and a wake is formed. The same sort of thing can happen on the lee side of a mountain, but the phenomenon is on a much bigger scale so that the stable stratification may prevent separation, or if it does occur it may restrict it to a small region so that no vortices are shed. The stability is a force which tends to keep the streamline horizontal and always in the same order one above the other, and it inhibits overturning, so that even if the bottom streamline leaves the ground it may return at a short distance down-stream and enclose a standing eddy beneath it which merely alters the effective shape of the mountain. Such an alteration is certain to reduce the energy (and amplitude) of the lee waves.

Separation from the ground on normal slopes is most likely to occur if the air is not very stable, because in very stable air the standing eddy cannot be created. On the other hand, if a leeward (or windward) slope is very steep, it demands a streamline very much inclined to the horizontal, and this circumstance is opposed by stable stratification which therefore encourages separation. On steep slopes, therefore, a shallow unstable or turbulent layer will often prevent separation. At Gibraltar, which is very steep, separation occurs most easily in very stable conditions; at Hartside I would guess the reverse to be true in N.E. winds. (This has nothing to do with the length of the component waves which may be thought of as constituting the mountain shape. It is a friction layer phenomenon and is not taken into account in the theory of waves.)

It is not possible to calculate the wavelength with any accuracy from available observations; in fact, it is best regarded as one of the quantities most easily observed. Even if very accurate and minute observations were available, it would be a long job to calculate the wavelength, so long that no-one is ever likely to do it except possibly with an automatic electronic computer. One can choose special cases and calculate the wavelength or, easier still, choose a wavelength and find an airstream that has lee waves of that length; but that is not very helpful, since there are many quite different airstreams that have the same wavelength.

Lee waves may explain many queer observations, and if they give the correct explanation one may be able to exploit the phenomenon. What about those "evening thermals," for instance? And do they last all night? I don't know.

CLUB NEWS

Surrey Gliding Club and Imperial College Gliding Club

THE Monsoon set in even earlier than usual this year at Redhill, and flying has been very much curtailed during the last three months, though as much training has been carried out as possible. A number of flights on Boxhill have been performed during south wind conditions, and Ted Ashwell completed five hours there on 16th September.

An early start has been made on the Aircraft maintenance programme, and we hope to carry out all C. of A. inspections ourselves this year. However, the intervention of numerous parties is retarding the work to a certain extent. On 11th November the Clubhouse was turned into a picture palace, and Lawrence Wright showed his pre-war gliding film and cartoon. John Sowery produced a record of Orebro and Tony Deane-Drummond the Camphill story (1950). Subsequently the Empire Test Pilots' School, amongst others, sampled our Mark 2 Jungle Juice. . . .

The year's flying is now virtually over, and the figures are:—

Cross-Country Miles 3,700 plus 868 Private Owner.

Club Hours 890.

Club Launches (all methods) 5,600.

On 2nd September a vast fleet of Gliders left Redhill for Friston. Dudley Hiscox, Peter Cooper, Don Brown and Laurie Hall got there, and John Sowery and Cliff Dowdall fell a little short.

The two Stevens (A. B., and D. "Ginger") did 38 miles each on 10th September, to Smarden and Headcorn respectively, giving A. B. his "Silver C" distance. Ginger unfortunately started 500 feet higher.

On 18th September Jean Bird went 68 miles to Haine, near Manston. Tony D-Drummond covered the same distance on 5th September by travelling from Redhill to Guildford and then to Shere via Redhill and eventually back to Redhill again. A. B. Stevens celebrated the 1st of October by a visit to Eastling (45 miles).

During October a total of 828 launches was achieved, and Daisy (our T-21B Two-seater) celebrated her 5,000 launch. Though due for a fairly extensive surface overhaul, her main timbers are still sound.

In the hangar, a fresh attempt is being made to build a serviceable re-winch for retrieving the launching cable. It is hoped that this will be flight tested shortly.

Southdown Gliding Club

BY the time this copy of GLIDING is being read our Club may be the proud owners of a high-performance sailplane. At the time of writing these final 1950 notes, our Committee have been meeting to discuss ways and means of attaining this much desired goal, and it may be that in the next issue of this magazine we shall have much more to talk about than usual.

Although there are four or more week-ends to go to the end of 1950 we have already passed 400 hours of flying at Friston —the exact number at this moment is 410— for 2,000 launches. Certificates gained are four "A," eight "B," and nine "C." We put this down to our two-seater training programme, which has proved a great success and responsible for more hours and less launches, incidentally saving £50 in petrol alone.

We gather that Tutors do not rate very high but we have managed to hold our own with them. Flying our two, our members have obtained four 5-hour durations and one of 4 hrs. 57 mins. The latter flight, but for an unfortunate mistake in timing by the pilot, could easily have been another. Beachy Head was visited at 1,600 ft. by Tutor 1, and even Tutor 2 with only a nose-hook has looked down on the lighthouse.

Of these visits to Beachy Head, Chris Hughes holds the record height of 2,350 ft. in our T-21B with Dawbarn as co-pilot. On this Sunday we had a wind from the S.E. bringing very unstable air conditions which, coupled with our usual cliff-face lift, accounted for exceptional flying by all machines.

We have also been able to visit Firle on four occasions this year, thanks to a N-NE wind deciding to blow over these week-ends. Altogether we managed 24 hours' soaring along these Downs, and only possible thanks to the trailer made by Johnny Billeness. Late arrivals at Friston have

found our entrance gate marked with the magic word "Firle," and those with cars only wait long enough to scrape up less fortunate pedestrian members before turning round and belting through the valley to the bungy site. These late ones can be observed peering up through wind-screens with hungry eyes at machines already well aloft, their feet feeding more gas to already overloaded engines in their efforts to climb the hair-pin bends to the car park on top. Clouds of steam and whines of protest from flogged innards testify to their anxiety to get there before flying packs up for the day.

With a brief touch on my wooden desk I have to report that the Club has not experienced any trouble this year. This is due, in the main, to the energetic and often verbal activities of our C.F.I., Ray Brigden. At times I often wonder whether he has served a short time with the Ogpu, but banish this base thought when I see him almost (he never will completely) relax in a chair in our Clubhouse after all machines are put to bed on Sunday evening, surrounded by his clumsy clots and blank so-so's. We all realise that his is a thankless task with enough cans to carry to sink a battleship; that at heart he is ready to help anyone to try and atttain his standard of flying.

We are fortunate too in having members who are willing to turn their hands to any job that will benefit the rest. They are led by Don Snodgrass to whom we owe the measure of comfort we enjoy in our Clubhouse. As O.C. Works & Buildings he has tackled re-painting, rebuilding and all the odd jobs that go to make life a little easier for members after the day's flying is done. The affairs and finances of the Club have been well looked after this year by our Secretary Eric Jarvis and Treasurer Dave Parsey. We should indeed be lucky if they were to serve for another year.

Summing everything up, we have had a very good year, several new members now flying solo, and the prospects of even better times to come next year. We look forward to seeing again many friends from other Clubs who know they will find a welcome with us, and it goes without saying that any gliding "bod" who has not yet seen our site will receive the same.

It now only remains for me to wish you all on behalf of the Southdown Gliding Club a Happy and Prosperous New Year.

K.H.A.

Royal Naval Gliding and Soaring Association



INFORMATION about the year's activities by the Association's five branch clubs will be found in the appropriate paragraph below.

In terms of the total number of circuits carried out activities have expanded considerably from just over 2,000 to 3,300. However, this increased total has been achieved by two clubs only, those at Gosport and Lossiemouth, both of which have nearly doubled their last year's figures. In fact, it must be regretfully admitted that the Portsmouth Naval Gliding Club and the Fulmar Gliding Club are the only two really active Naval Gliding Clubs remaining out of the eleven clubs originally formed in 1948.

It is not difficult to find the reason for this startling reduction in interest in the sport of gliding in the Navy. It stems directly from the fact that the number of persons with sufficient experience and enthusiasm to instruct is so small that it is almost surprising that any clubs exist at all. It is unfortunately true that there are in this country practically no professional naval aviators who are in the least interested in the sport and still less in instructing those non-aviators (both officers and ratings) who are keen to learn something of the art of flying. It so happens that several aviators who are interested have been appointed to the Far East. All the branch clubs are situated at Naval Air Stations and accordingly the majority of their members are naval aviation personnel, who spend their service lives maintaining aircraft and equipment without having a chance to fly. Participation in the sport of

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gliding, and so actually flying themselves, naturally helps to increase the interest of these personnel in the efficient maintenance of flying machines, and accordingly the sport should undoubtedly receive all possible encouragement.

During the Easter Leave period the Goodhart brothers spent 10 days at the French National Gliding Centre at Challes-les-Eaux with the express purpose (in which they succeeded) of gaining the minimum qualifications to be eligible to enter for the National Contests. As was reported in the Autumn issue a Mu-13a sailplane was borrowed from the Admiralty and came second to Philip Wills in the Contests making the R.N.G. and S.A. the champion club for 1950.

Portsmouth Naval Gliding Club

Flying started at the end of April with the arrival of the Slingsby T-21B two-seater, resplendent in silver and navy blue, with the R.N.G. & S.A. Burgee emblazoned on each bow. In addition to the two-seater, we have operated two British-built Grunaus and an Eon Primary. Despite unfavourable weather a total of just under 2,000 flights has been achieved—almost exactly double last year's figures. In order to reduce membership costs and so allow more junior naval ratings to take part in the sport, a monthly membership scheme was operated. This scheme was not entirely satisfactory as a proportion of the monthly members joined more for the thrill of a few flights than with the intention of seriously learning to fly, thus buying up flying time that could have been used to better advantage by the regular members.

Our site at Gosport has been quite remarkably devoid of uplift and the number of soaring flights can be counted on one hand. In order to give the more experienced members a taste of soaring, a camp was established at Inkpen during the summer leave period. Six members attended with a Grunau and a winch; a "C" certificate (the first and only one since the Club was formed last year) was obtained by Lieutenant Hunter. It soon became apparent, however, that the standard of skill in landing *in* a smallish field, instead of *on* a large, smooth airfield, was generally not high enough and much more spot-landing practice was decreed.

The Club provided the two pilots selected to represent the Royal Navy at the National Contests.

The Club is run by Lieutenant Commander Tony Goodhart assisted by Commissioned Pilot Cox.

Fulmar Gliding Club

Flying from the Naval air station at Lossiemouth, this club has achieved just over 1,100 circuits as compared with under 700 last year, using an ex-German Grunau and an Eon Primary.

The Club has been run by two enthusiastic engineer officers, Lieutenants Coulshaw and Leeson, neither of them professional aviators. They have devoted much time and energy in maintenance of the Club and its equipment, and all credit goes to them for having trained many naval aviation non-flying personnel in the art of gliding.

Gannet Gliding Club

Our branch club at Eglinton in Northern Ireland has done a certain amount of flying with their Eon Primary, but has suffered severely from "winch-trouble." A visit was paid, at the end of June, to the Ulster Gliding Club site at the foot of Benevenagh Mountain. The Irishmen were most hospitable and two members, Air Artificers Osborne and Samson, obtained their "C" certificates.

The Club is run by a non-aviator, Instructor Lieutenant Stubbins, and the club's continued existence is entirely due to his efforts.

Condor Gliding Club

This club, at the Naval air station at Arbroath, Angus, was re-formed in mid-July after long inactivity, and managed about 150 flights before the summer leave period; since when the airfield has been so sodden with rain water that it has not been possible to carry on. The Club is run by Captain (E) Oliver, one of the founder members of the R.N.G. & S.A.

Blackgap Gliding Club

A sad tale here, at the Naval air station at Stretton, Lancashire, of 30 naval ratings with an Eon Primary and two winches, but with nobody who is prepared to spare the time to instruct them.

Royal Engineers Flying Club, Gliding Flight

THE Flight is now firmly established at Detling Airfield, near Maidstone. This is largely due to the Royal Air Force and the R.A.F. Gliding and Soaring Association, who have assisted in a number of ways in building up the new base.

The present fleet consists of a primary, two Cadets and a high-performance sailplane. This is backed up by a strong array of winches and retrieving vehicles. There will soon be a well-equipped clubroom on the airfield and a resident engineer to look after the equipment.

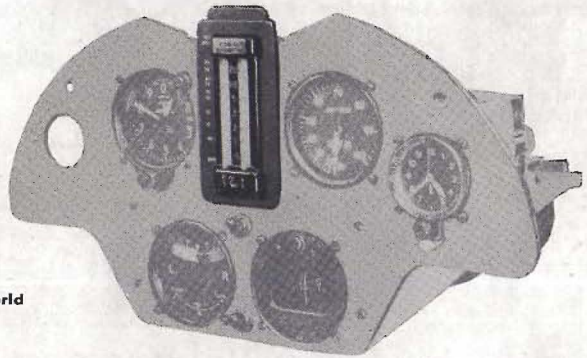
The main emphasis during the last year has been on ab-initio training, and the policy has been rewarded by a good number of "B" certificates. There are now enough enthusiasts to enable the club to undertake a more ambitious soaring programme, and many of them will have the opportunity of using the excellent facilities of the R.E. Gliding Club in Germany, with whom there is a close liaison. A successful start was made with aero-towing of the sailplane, and this may prove a major activity of the club, which is fortunate in possessing its own aircraft.

On 24th June the Royal Engineers' Flying Club held a successful and well-attended Air Day at Detling. The programme included demonstrations of ab-initio glider training, aero-towing, soaring, and joy rides in two-seater gliders, in addition to the flying and parachute displays.

Perak Flying Club

THE Club was established 17 years ago with a Government subsidy, but its fleet of aeroplanes was requisitioned and lost during the war, and now it cannot afford to buy new ones. So for the past year the Club has taken up gliding, for which the Kinta Valley was found particularly suitable. Many of the local youths who joined have already reached the soaring stage. On 16th October the Club staged a public demonstration with its fleet: an open Primary, an intermediate machine and a sailplane.

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Royal Air Force Gliding and Soaring Association

Annual General Meeting

OUR first Annual General Meeting was noteworthy for a very good attendance, and it is to be hoped that this is a pointer to a rapid spread of interest in gliding throughout the Service. The proposals for reorganisation of the Association were adopted unanimously, and mean that in future the Association will act only as the governing body for gliding in the R.A.F., and will no longer run a club itself. The Association's resources will now become available solely to get Clubs on their feet by providing them with loans, or by purchasing aircraft to be re-sold to them on a long-term repayment basis, the payments being spread over several years if necessary. Clubs wishing to take advantage of this arrangement should contact their Command Representative, through whom, it has been decided, all business with Clubs will in future be transacted. Likewise, all enthusiasts wishing, through lack of facilities in their own Command, to glide at a Club in another Command should ask their Command Representative to make the necessary arrangements.

Aircraft

Since the last issue of GLIDING the Association has acquired a Gull II, a high-performance two-seater, which is at present being re-conditioned by Messrs. Slingsby. In addition, the purchase of T-31s is being considered for re-sale to Clubs if the demand warrants it. The T-31 is a two-seater version of the Tutor; it has the advantages that the wings are interchangeable with the Tutor and that the pupil can go solo in the T-31, thus obviating a change of aircraft for his first solo flight. The Sedbergh and Prefect from Detling have been allotted to R.A.F. Bridgnorth Gliding Club, and it is hoped to see them flying from Long Mynd in the near future, thanks to a generous arrangement by the Midland Gliding Club. Mr. Slingsby's latest aircraft, the 18-metre Gull V, has had its prototype tests completed by Flt. Lt. Forbes at Detling. From first reports it appears that the aircraft compares most favourably with the Weihe, and the development of this aircraft will be watched with the utmost interest by the Association.

Flying Committee

Now that the R.A.F.G.S.A. is really getting under way, the newly-elected Flying Committee hopes to provide useful assistance to Clubs and Commands in various ways. First of all, a system of instructors' categories must be developed, as it is on good instruction that freedom from accidents depends, and the fewer accidents we have the more use we will get out of our available aircraft. Next in order of importance comes the promulgation of Flying Orders; such Orders will, however, be merely a guide to Clubs upon which to base their own. It is thought that the Flying Committee should start a regular circular to Command Representatives, with enough copies for distribution to Clubs, giving all the latest work of the Committee, such as, for example, the information we have received from the Central Meteorological Office on the incidence of standing waves at St. Auban. It should be possible eventually to incorporate the system of instructors' categories, the Flying Orders, a standardised Syllabus of Instruction and so on into one big "bible" which would be available to all affiliated Clubs.

New Clubs

The R.A.F.G.S.A. is delighted to welcome to our growing list of Clubs "The Moonrakers (R.A.F.) Gliding & Soaring Club," composed of enthusiasts from R.A.F. Stations Colerne, Compton Bassett, Hullavington, Lyneham, Melksham, Rudloe Manor and Yatesbury. The Association is also pleased to note that R.A.F. Upwood Gliding Club has now started active flying.

W.H.I.

Royal Aircraft Establishment Gliding Flight

LAST September Course No. 3 commenced training, and although our total complement was originally fixed at 40, we found the numbers had risen to 55. Thus it has been necessary to revise the figures to a maximum of 60 with an intake of 30 each year.

As each student is only with the Flight for two years, and most flying is done at week-ends and in the summer evenings, we may not make many outstanding contributions to advanced soaring in this country.

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The instructors might be able to do this, but a conscientious instructor is so often unable to take full advantage of the opportunity when it does occur. Perhaps, though, as we are training future scientists and engineers and bestowing on them a distinct appetite for soaring, we are contributing something to the common pool of the gliding movement.

The limited training time available calls for a good deal of enthusiam and hard work from the instructors, but fortunately a very keen and competent team of voluntary instructors has been built up. It includes Sqdn. Ldr. Bob Smyth, one of the R.A.E's most able test pilots, who may be flying a delta-wing jet one day and our Sedbergh the next; Flt. Lieut. Bill Bedford, A.F.C., formerly an Empire Test Pilots' School Instructor and now a test pilot at the Establishment, a most experienced pilot who holds the British height records for gliders; Tommy Hall, an ex-Fighter Command pilot with German soaring experience and now in Guided Weapons research; "Spike" Minterne, now in the Photographic Department at Farnborough, whose work has recently taken him to Australia; and Griff. Roberts, D.F.C., D.F.M., B.Sc., who also does valued work as adjutant in the "bumph" field. The servicing of our gliders is in the very capable hands of Albert Rouse.

Since the Flight was established in February, 1949, our main concentration has been on the training up to "C" Certificate standard. The acquisition of a Sedbergh, which is excellent for its job, has made us feel that the elementary and intermediate training is progressing satisfactorily and that now we should turn to more advanced soaring training. This important aspect is being developed by Flt. Lieut. Bedford, using the Kranich.

In November a party of us visited Redhill for a showing of Competition films. Owing to wrong information we missed the films but arrived at the "refreshments" stage. A most considerate type (presumably a Surrey G.C. member) put us on to a "very good thing," the Redhill special brew of "jungle juice." There may have been some "wolves" in the party but that juice just wasn't true! Before we were thrown out, there was at least one Rugby scrum over an empty beer case, and a revered E.T.P.S. man insisted on entertaining with some doubtful Egyptian ditties.

May I conclude on a more sober note by extending our Best Wishes for 1951 to all civilian and service gliding organisations.

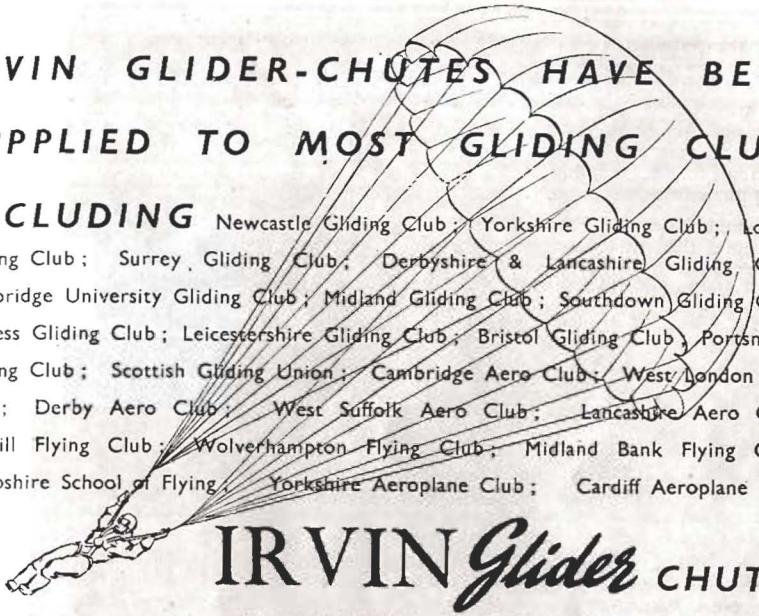
ALEX W. CAMERON,
O.C. GLIDING FLIGHT.

Midland Gliding Club

WE can start these notes with a report of our second "Silver C" this year. On 2nd September, John Hickling took our Olympia to a field some three miles due west of Great Malvern (36 miles). The wind was NW/20 with 5/8 Cu. For some inexplicable reason, he found difficulty in deciding which was *the* Cu., but eventually he found it, and with 5,200 ft. a.s.l. in hand, he pressed off towards Staverton, which he had declared as his goal. His altimeter unwound steadily until he arrived at Ludlow, where the green ball coyly showed itself. He circled up to 5,200 a.s.. again, and looked around the horizon for the Malvern Hills. To put it bluntly, he couldn't see them, and a mild panic ensued. Finally he calmed down onto 140° Mag., and looked for the next Cu. But no luck—8/8ths blue! So he decided to try for slope lift on the Malverns, which had meantime appeared from under Olympia's nose where they had been all the time. Luck was agin' him, because he reached Mother Earth three miles short of them. The lesson learnt was: "Don't rely on a single landmark, but have a compass course marked on your map, between your club and your goal, before entering the cockpit." The retrieve was a perfect nightmare, but David Ince is best qualified to tell about that.

The Club clocked 1,000 hrs. by 4th September. The third Club Camp started on the 9th and got away with a W/20 day on the 10th. The day started with Cu. building up all around, but these soon assumed a decayed look, and after lunch "It" arrived and in no time Theo Testar was at 7,100 ft. a.s.l. in the Eon Baby. The wave stretched from Myndtown to Craven Arms, and took Stan Jones, who was busy getting his "C" badge, to 3,100 ft. a.s.l. in a Tutor. September was easily the best month this year for us, 212½ hours being flown.

October.—We had our A.G.M., which was a lively affair, and we learnt with



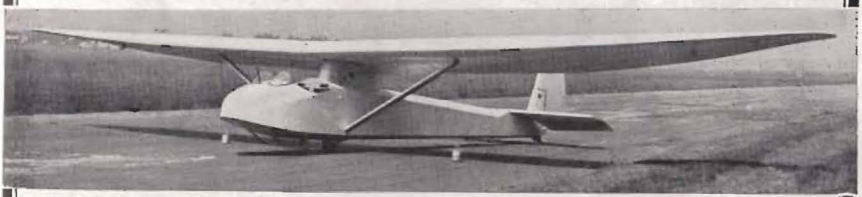
IRVIN GLIDER-CHUTES HAVE BEEN SUPPLIED TO MOST GLIDING CLUBS

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regret of the resignation of Charles Wingfield and Theo Testar from the posts of Chairman and C.F.I. respectively. Roger Thwaite was elected Chairman, and David Ince has taken the burden of training upon his shoulders. The month was not a good one as regards weather, but we flew 43 hrs. 30 mins.

November.—The 12th was the only soaring day this month, and was accompanied by a lenticular of Bishop-Field proportions, but no one got around to contacting it. On the 26th a few people who normally live under a sheet of acrilic resin (perspex to you) started wildly to circuit the Tutor, officially to try out the belly-hook, but actually to be able to say that they flew on that Sunday when all other forms of aviation were grounded due to fog widespread throughout the country. (We were above it!) This month we only flew 3 hrs. 30 mins.

2 × J.H.H.

London Gliding Club

To find out the comparative utilisation of the different machines in the club fleet, their flying times have been analysed and multiplied by the correct factor to give an estimation of the number of hours' flying during the whole year. The following table, giving comparative annual usage of the machines, is the result :

Prefect	329 hours
T-21 two-seater ..	231 ,,
Grunau Baby	208 ,,
Rice Olympia	208 ,,
Gull IV	185 ,,
Tutor IV	185 ,,
Blue Olympia	158 ,,
Tutor III	157 ,,
Dragonfly (T-21B) ..	96 ,,
Tutor V	65 ,,
Cadet 108 launches ..	7 ,,
Daglings 1300 launches	—

The above list includes two machines on loan. J. C. Rice's cream Olympia has come from the Leicester Club, whose members, if they have reached Olympia stage, may come over and fly it. The "Dragonfly" two-seater has been loaned by E. J. Furlong in return for maintenance, and is specially useful on good soaring days to help in getting through the long two-seater list. The blue Olympia has been obtained with the help of loans from club members.

Another acquisition is a Link trainer, which is already in use at a charge of 10s. an hour, though it needs a little tinkering before the instruments become reliable. Frank Foster is in charge of Link training.

The club has arranged for aero-tows to be available at Elstree again: telephone Elstree 1677.

Flying for September amounted to 287¼ hours, with 527 launches. Three "C" certificates were gained, and three "Silver C" durations flown; there were two cross-countries totalling 48 miles. The third instruction course of the year finished with seven "A" certificates, and the eighth pupil missed it by two seconds.

A visitor during the month was Professor A. V. Cid from Lisbon, who once built a water sailplane which he towed into the air behind a motor boat.

In October we did 189¼ hours flying, with 526 launches. Frank Foster flew his Rhönbussard to Cambridge on the 15th.

Visitors from many clubs came to our Guy Fawkes party on 4th November. Among the scrap to be burnt, it was intended to include the Green Wren, which has not flown since before the war and is no longer airworthy: but the owners objected, and are making external renovations to render it fit for exhibition, if not for flying This machine was built in 1933, and was at one time owned by the Cambridge Club, from whom the brothers Read acquired it.

A welcome visitor on 25th November was Per Meulengracht, from California, who has soared to 27,000 ft. in the famous standing wave at Bishop, in the Sierras. Everything there is on a large scale, and pupils on their first soaring flight have to be told not to go above 20,000 ft.! Mr. Meulengracht, who was on his way to revisit his native Denmark, brought with him several striking colour films of American soaring, taken at Torrey Pines, Elmira, Grand Prairie, and Bishop. The wave at the latter place is normally smooth, like all waves, but at certain levels there can be the most violent turbulence, in which Paul MacCready once suffered a downward acceleration of 3½ g.

On 20th February the London Gliding Club will be 21 years old; at least, that is the date on which it was officially inaugurated at a meeting in Bloomsbury in 1930, though the club was first mooted at the "Gliding Lunch" on 4th December, 1929,

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and on some undiscoverable date in January, 1930, a provisional Committee was formed with J. R. Ashwell-Cooke as Chairman and the late Stanely O. Bradshaw as Secretary. We are having our coming-of-age party on Saturday, 17th February, in the clubhouse.

Hereford Gliding Club

THIS club has just been formed. The secretary is Miss M. J. Grindley, 20/21, Newmarket Street, Hereford. The club is considering the purchase of an Avia 40-P sailplane, a French design, of which several examples were found in Germany at the end of the war. It has a span of 48 ft. 10 in., and flies at 31 m.p.h. for minimum sink, which is 2 ft. 1 in. per sec. It was first produced in 1935.

Before the war, the Midland Gliding Club had a branch at Hereford, and more recently the Hereford Aero Club has done some occasional gliding.

Derbyshire & Lancashire Gliding Club

THE Club fleet consists of seven aircraft: one Cadet, one Tutor, two Eon Babies, one Gull I, one Slingsby T-31 (two-seater Tutor) used exclusively for training, and one Sedbergh two-seater used for joy-riding and occasional training. We really regard the Cadet as an obsolete type, and have recently acquired a pair of Tutor wings and struts, so that before long we expect the list to read:—"No Cadets, Two Tutors—etc."

In addition to the above, which are Club property, we have within the club a number of Private Owners, operating a further eight aircraft: five Olympias, one Viking, one Kite I and one German Grunau.

Up to the end of September, club aircraft had flown 366 hours in 1,742 launches, and private aircraft 570 hours in 531 launches, giving a total flying time of 936 hours in 2,273 launches,—all this, of course, excluding National Competition Week. During the period under review 25 certificates have been taken: seven "A," seven "B," seven "C" and four "Silver C"; while three "Gold C" heights have been obtained, all in standing waves.

The Club height record has been increased to 14,250 feet, also in a wave, and these phenomena are now so comparatively common (at least eight different waves have been used during the first five months of 1950, to say nothing of those that got away) that we cannot understand why we did not accidentally run into more of them before the war.

The National Competitions were again held at Camphill this year, and have been fully reported elsewhere. Readers may, however, be pleased to hear that we again just managed to "clear our expenses" on the Competitions.

The largest building programme since the hangar has been embarked upon this year:—a 24 x 60 ft. Nissen hut, which is almost finished at the time of writing. Ostensibly this is a Bunk Room, but it looks like being used as Concert Hall, Cinema, and Theatre as well. Indeed, at the moment preparations are feverishly in train for the Christmas Pantomime, which is the main feature of our social activities this winter.

Bristol Gliding Club

OUR main activity this autumn has been an attempt to put in soaring time at our hill site at Roundway. To this end the Olympia and Grunau have been taken over there and a party of members goes out every Friday night to stay the week. So far the wind has not been too co-operative and we have had very few soaring days. On one of these at the beginning of October, J. Allen made our first cross-country from the site, 10 miles to Pewsey. On another, with a southerly wind, N. D. Batstone demonstrated that the South Slope is soarable by keeping the Olympia at 500 feet for nearly an hour, a most encouraging performance. Apart from this we have been experimenting with various winch runs and laying the cable over sundry ploughed fields, tracks and fences has enabled 1,100 ft. launches to be made in flat calm condition.

A number of improvements have been made to the site. A brightly coloured windsock has been hoisted, drains have been made, further windows installed and a doorway knocked through between the two cottages.

At Lulsgate our winter training programme started brightly enough, up to 65 launches a day being made, and a number of members of the newly-formed Bristol

University Gliding Club coming along to be trained. However, it suffered something of a setback when the Tutor landed into the only obstruction on the field. This happened to be the two-seater, and the result was detrimental to both aircraft.

J.N.C.

Bristol University Gliding Club

OUR group was formed among a nucleus of enthusiasts at Bristol last May, for the purpose of bringing together University members, both undergraduates and others, who are interested in gliding. We have affiliated to Bristol Gliding Club, who have generously put their facilities for flying and instruction at our disposal. Only the core of our membership has been operating during the summer vacation, but we have 28 members on our books, and expect to be fully active soon after the start of next session. Mr. J. R. Allen is our only "C" pilot at present, and our first purpose is to get as many members as possible flying and to "C" stage. The secretary is T. J. Patrick, University of Bristol Union, The Victoria Rooms, Bristol 8.

College of Aeronautics Gliding Club

THE site at Cranfield is not blessed with thermals, but with the wide expanse of aerodrome available it is ideal for ab-initio training on an Eon Primary, and thence to the Tutor. The academic course lasts for two years, so the main aim of the club is to foster interest in gliding by covering the first stages up to "C" certificate standard. By an arrangement with the London Gliding Club, "C's" are usually obtained at Dunstable.

This year, due to the number of enthusiasts in the club, the Grunau is being brought back into circulation with hopes of an odd cross-country, and Mr. Yates, who is of untiring assistance to the club, often airs the Olympia—all of which should lift the eyes of the beginner above thoughts of ground-slides.

The culmination of last year's activities was a three weeks' camp at Long Mynd in July. Despite the unfavourable weather, both Geoff Nixon and E. T. B. Smyth

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managed the endurance leg of their "Silver C." With the help of the Grunau it is hoped to have an even more successful camp this coming year.

Army Flying Club

DURING the past year, the Army Flying Club has spent quite a lot of its time looking round for a permanent home, and unfortunately a lot of good gliding time was lost in the subsequent moves. We started the year off at R.A.F. Odiham, where we had been based for some two years. However, the increased use by the R.A.F. of this aerodrome rather cramped our style and, on some week-ends during the summer, forced us to give up our gliding altogether. In an attempt to solve this problem, and at the same time to acquire a hill-site for the Club, we moved the centre of the Club's activities in March to the Newbury area, basing our slope-soaring on Inkpen Hill, near Coombe, and our "ab initio" training on a disused R.A.F. aerodrome at Welford, some eight miles outside Newbury. But this venture too was doomed to failure; the hill site proved to be too difficult for any but the more experienced pilots, and the aerodrome site too far away from the majority of members in the Aldershot district; the week-end attendance at Welford for "ab initio" training dropped to very small numbers. As a result of this, we were forced to look again in the Aldershot area for a suitable aerodrome on which to concentrate our activities; this we were lucky to find at Lasham, a very large disused R.A.F. aerodrome between Alton and Basingstoke. Here, at last, we have settled.

The conditions at Lasham are extremely good; we have free hangar and clubhouse accommodation, the aerodrome has extensive and well-kept grass areas—ideal for "ab initio" training, and we are the sole occupiers. Since we settled there in August this year, Bob Swinn, the resident instructor and maintenance engineer, has put in a tremendous amount of work to develop the club house facilities and dormy house accommodation. There is still a lot of work to be done in developing the clubhouse, decorating the rooms and generally improving the facilities. We hope that the majority of this will be complete by the spring.

Perhaps the greatest event recently has been the arrival of a new T-21B from Slingsby's. We have been able to do this through a very generous grant from the Nuffield Trust to the Armed Forces of the Crown. As a result of this, the Club is now gradually swinging over to dual "ab initio" instruction from the old solo training methods. We are still rather short of experienced 21B instructors, but are fortunate enough to have two very experienced glider pilots amongst the members, Major Tony Deane-Drummond, of the Surrey Club, and Lt. Col. N. J. Dickson, of the Gloucester Gliding Club. Owing to the present shortage of instructors, we are still forced to carry on a limited, and very carefully controlled, amount of solo training on the S.G.

The Club fleet now consists of a T-21B, an S.G. 38, a Grunau and an Olympia. A Cadet or a Tutor will be added to this before the end of the year.

We still have an option on the hill site at Inkpen, and also possess trailers for the Grunau and the Olympia, so that we are hoping to add some slope-soaring, either at the hill site or at other sites, to our activities next year.

With this fleet and with the facilities available at Lasham, which incidentally has also been proved to be an excellent site for thermal soaring in the summer months, we are looking forward to a year of real progress and expansion in 1951.

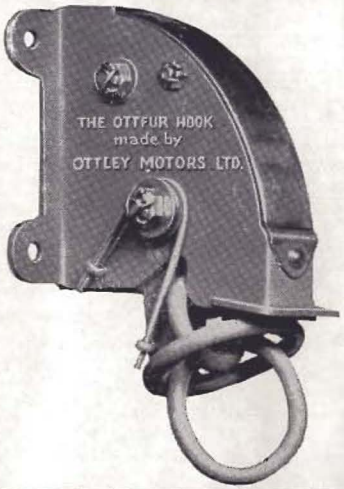
Aberdeen Gliding Group

THIS group has commenced activities by acquiring and rebuilding an old Hols der Teufel glider, which is believed to have once been the property of the Yorkshire Gliding Club. The type has an ancient history and dates from the time when sailplanes were designed only for minimum sink in slope currents. It was designed to fly in light winds, and has a stalling speed of only 18 m.p.h. Several were built in England about 1931-2, mostly by amateurs.

The rebuilding should be completed by the time this appears in print, and the group expects to start flying in the spring. The secretary is F. W. Christie, 6 Cherry Orchard, Rosehill, Aberdeen.

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APRIL—Post-war history of British Gliding (3/8d. post free)

JULY—International and National Gliding Competitions (2/8d. post free)

AUTUMN—Club news from 17 clubs, covering activities during the first half of 1950, and an exclusive account of Fl/Lt. Bedford's record breaking flight (2/8d. post free)

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