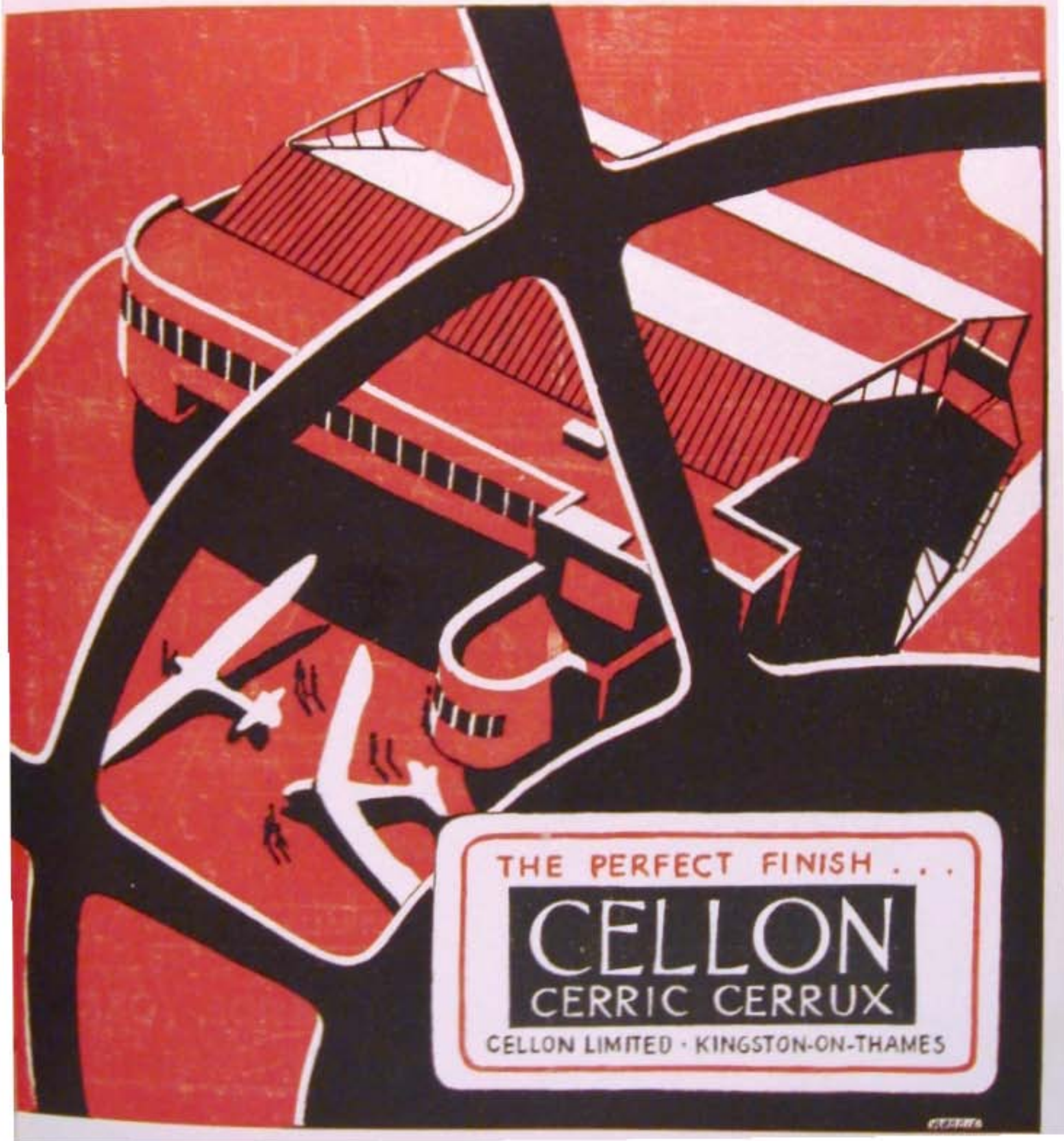
SAILPLANE AND GLIDER

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F.L. VERNON BLUNT, Editor
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Editorial Offices:
THANET HOUSE, 231 STRAND, W.C.2
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Vol. 12 No. 8 SEPTEMBER, 1944 Price 1/-

Why Not An EMPIRE SOARING ASSOCIATION?

A PROPITIOUS moment for which we had long been waiting now presents itself, for the uttering of an idea which we feel ought to be examined in the interests of British Gliding.

The news of the foundation of a Soaring Association of Canada, reported elsewhere in this number, prompts the suggestion that now is the time to begin to think of an Empire Soaring and Sailflying Association.

Before the war there were Gliding Associations in Britain, Australia, South Africa, India, and nowhere else in the Empire. True there were few clubs operating outside the territories mentioned, and almost all the Clubs, until the British Government gave their small subsidy in 1938, were struggling bands of poor enthusiasts, who made up by their enthusiasm and hard work what they lacked in cash, and (inevitable at the beginning) in experience and knowledge.

But the last five years have bound the Empire together through the Air, in more senses than one. But for the sacrifices and achievements of our Empire airmen, Great Britain would not stand to-day where it does, on the apparent threshold of an epic and epoch-marking victory. These Empire Airmen came from all the corners of the far-flung free British Empire, from Mother Country and Dominion, Colony and Dependency alike. Through the Empire training scheme, not only they, but the inhabitants of the places where they were trained became to some extent air-minded.

Through the enormous developments of aircraft, all parts of the Empire are now bound together by the air, whereas before they were separated by the slow moving seas. Australia in 48 hours will become a commonplace immediately after the war, and week-end trips to South Africa will be fashionable in the winter months of Great Britain, if the South Africans, realising the possibilities of their great and beautiful country, allow it to be so.

What more natural, therefore, than that those people, in all parts of the world, who are bound together by an abiding enthusiasm for the sport of Gliding and Soaring, or who have scientific or other interests if Gliding and Gliders, should get together in a single organisation whose aim is the good of all by the development of the sport all over the world? Contributors to these pages have suggested that in time it will be possible to Sailfly anywhere abroad with the use of a small auxiliary motor, which may be despised by the purist, but it must not be forgotten that there is in all human endeavours a human side, and that it is a normal thing to get together with those of a like mind for mutual comfort and support. Through such human contacts can come understanding. True, it is equally possible that differences as well as similarities can be accentuated by such encounters, but this time *Mankind has got to learn tolerance and understanding of the other person's point of view.* Otherwise the seeds of the next world war will be sown and will quickly flourish in the dark foetid cellars of underground movements. In the light of day they can be dealt with, suspicions disarmed, and ill-feeling warmed to friendliness, in the light of the sun, but only by men of good-will with some great common interest to break the barriers of language and custom.

Such an interest is shared by all those, who, throughout the world, practise Soaring and Sailflying. It might be possible, if it is thought desirable, and there are many reasons why it should, to form a sort of League of Nations of Soaring Associations, to encourage human endeavour, regulate standards, receive and collate the results of scientific enquiry, and use them for the benefit of Mankind as a whole, instead of in the narrow Nationalistic way in which some nations sought to test their pre-war achievements in this field.

These thoughts lie a long way ahead in the future but an interesting series of events has happened which cast a favourable light on these proposals.

Because it realises that Gliding and Soaring present the best possible method of becoming air-minded, for whatever purpose—national survival, trade, prestige, scientific achievement—the Argentine Government has recently increased its subsidy to the Gliding Clubs of the Argentine from £600 per annum (among some forty Clubs) to about £270,000 per annum. Its representative has arrived here to buy BRITISH Sailplanes and Gliders and their equipment, and there is also a request that this journal be translated into Spanish and sold in the South Americas.

What an opportunity for international understanding, and although, we say it as shouldn't, what a tribute to our small magazine. For this we are grateful and pleased.

British Soaring Contests—2

British Contests after the Revival

By A. E. SLATER.

AFTER the Itford Meeting of 1922, described last month, it was nearly nine years before Britain held a gliding contest at which any soaring was done. Up till the time the British Gliding Association was formed at the end of 1929, I can find no record even of an attempt to soar, except for a fatal accident in 1923 at Pewsey Hill in one of the Itford machines of the previous year.

Among the various gliding clubs formed early in 1930, one or two possessed secondary machines capable of soaring, but the first British "C" certificate was obtained in an open primary glider by C. H. Latimer-Needham, flying at the Itford site on June 7, 1930. This was on the occasion of a demonstration by the B.G.A. and the *Daily Express*. Other British pilots soared in secondaries, and Robert Kronfeld, in his historic Wien sailplane, performed the first British cross-country flight by soaring 50 miles along the South Downs nearly to Portsmouth, on June 15.

Inter-club matches were held between two clubs at Ivinghoe in July and between five clubs at Dithcling Beacon in October. There was little wind on either occasion, and only gliding flights were made. Similarly, at a meeting at the south end of Dovedale in June, 1931, only gliding was done by competitors, though a few other pilots gave soaring demonstrations from the top of Bunster Hill.

THE BALSDEAN MEETING

For the 1931 Competitions a site was chosen for its accessibility to the public rather than its suitability for soaring, in accordance with the policy of the B.G.A. of that time. Nevertheless the Downs at Balsdean, east of Brighton, did not consist entirely of gentle slopes, but included the steep-sided head of a valley over which L. C. Williams soared in Hiscox's "Hols" for 7 minutes. A party of gulls kept him company, and when he had to move to a different slope owing to a change in the wind, the gulls profited by his example and followed him there.



BRITISH NATIONAL CONTEST, 1932.
NEAR THE FURNESS CLUB.
The famous Black Combe may be seen faintly in the background.

The meeting took place during the first week-end in October, and during it a south-westerly wind blew in from the sea. A great deal of gliding was done before a sea mist blew up on the Sunday afternoon and enveloped the hill-tops. Three pilots then attempted "distance flights" by being launched into the mist and gliding downwind from the steep north-east escarpment into the valley of the Ouse below Lewes. The hill fell away so steeply that they reckoned on emerging below cloud-base before hitting anything.

Apart from the flying, there were other features of note. Four British-designed sailplanes made their competition *debut*: the "Tern," designed by N. S. Norway of Airspeed; "Crested Wren," by W. L. Manuel; "Scud I," by L. E. Baynes; and "B.A.C. IX," by C. H. Lowe-Wylde, who was also active throughout the meeting in selling auto-launched passenger-flights in his "B.A.C. VII" two-seater. Slingby's "Falcon I" was also demonstrated.

The contest was held in connection with a meeting in London of the "International Commission for the Study of Motorless Flight," several of whose leading personalities came over from Germany and visited Balsdean to see how far British soaring had progressed, while Wolf Hirth showed how the "Hols" should be handled.

The site was provided by Southern Soarers, a precursor of the present Southdown Gliding Club.

SOARING IN FURNESS

During 1932 the British Gliding Association was in such low water that it did not at first intend to hold a contest at all. But a few individuals took the initiative and arranged a meeting on a really good soaring site, to last from August 27 to September 4.

From the Furness Gliding Club's inspiring site at Moorside, above Askam-in-Furness, the steep slope

falls a thousand feet to the sea-level of the Duddon Estuary. In a west wind you can soar for miles up the estuary with the Irish Sea on your left and the mountains of the Lake District on your right. As you creep round each headland in the smooth sea breeze, new beauties come into view and a new shape of soaring slope challenges you to guess the probable position of the strongest lift. Twenty minutes along this route in the "Kassel 20," my first flight after getting the "C" certificate, gave me a bigger thrill than anything I have done since.

GROUP OWNED SAILPLANES

The "Kassel 20," acquired from Germany for £49 new, and the Kassel two-seater, bought from the Scarborough Club, set a fashion for group-owned private sailplanes which has been followed ever since with great benefit to British soaring, credit for which must go to the late David Dent's enterprise.

Five other machines took part in the soaring. F. N. Slingby's British Falcon, his first creation, built for his own private use before he became the leading British sailplane manufacturer, contributed nearly seven hours to the aggregate soaring time of 16 hrs. 20 mins. for the whole meeting. It formed the basis of design for his famous two-seater "Falcon III" of later years. There were also D. G. Hiscox's "Hols der Teufel," and the London Club's "Professor," which was the most efficient sailplane type then in the country—its prototype had done the world's first cumulus-soaring flight in the hands of Kronfeld in 1928. The only machines of purely British design to do any soaring were the Dagnall sailplane and a nacelled machine produced by the same firm. But a new British sailplane, the "Scud II," afterwards to become famous, did a few test glides.

BRITISH RECORDS

Soaring took place on four days out of the nine; for much of the remaining time the site was in cloud, and efforts to repair the few crashes were hampered by the refusal of the glue to dry. The two outstanding flights of the meeting were made by G. M. Buxton in the British Falcon. On August 30 he climbed to 1,700 feet; this would have been a British height record if his barograph had worked. And on the last day, October 4, he flew up to the head of the estuary, crossed over to the south end of Coniston Lake, soared along the mountain slopes bordering the east shore, and landed at Monk Park near the north end of the lake, having covered 13¼ miles in 2 hours 40 minutes and set up a British distance record.

This was the first British contest at which any considerable soaring was done since the Itford meeting of ten years earlier. It differed from Itford in two respects: firstly, all the machines entered were capable of soaring; and secondly, all the competitors except two kept up their active interest in soaring for many years afterwards, and three of them eventually secured the "Silver C."

AN INTERESTING AIR-SPEED INDICATOR

WHEN giving cadets launches varying from fast slides to low hops under conditions of rapid wind speed variation, it is sometimes difficult to judge the relative air-speed of the glider—perhaps 2,000 feet away at the end of the cable.

To help the winch driver, a semaphore arm has been mounted on the pylon of the primary training glider. Its angular position —9 o'clock, 12 o'clock—is controlled by the air flowing past it.

This keeps the winch driver informed at all times of any variation of wind speed (and hence glider speed), and enables him to adjust his throttle accordingly. The cadet is thus prevented from having excessive airspeed which, in the initial hop stage, can on occasion, be "exciting."

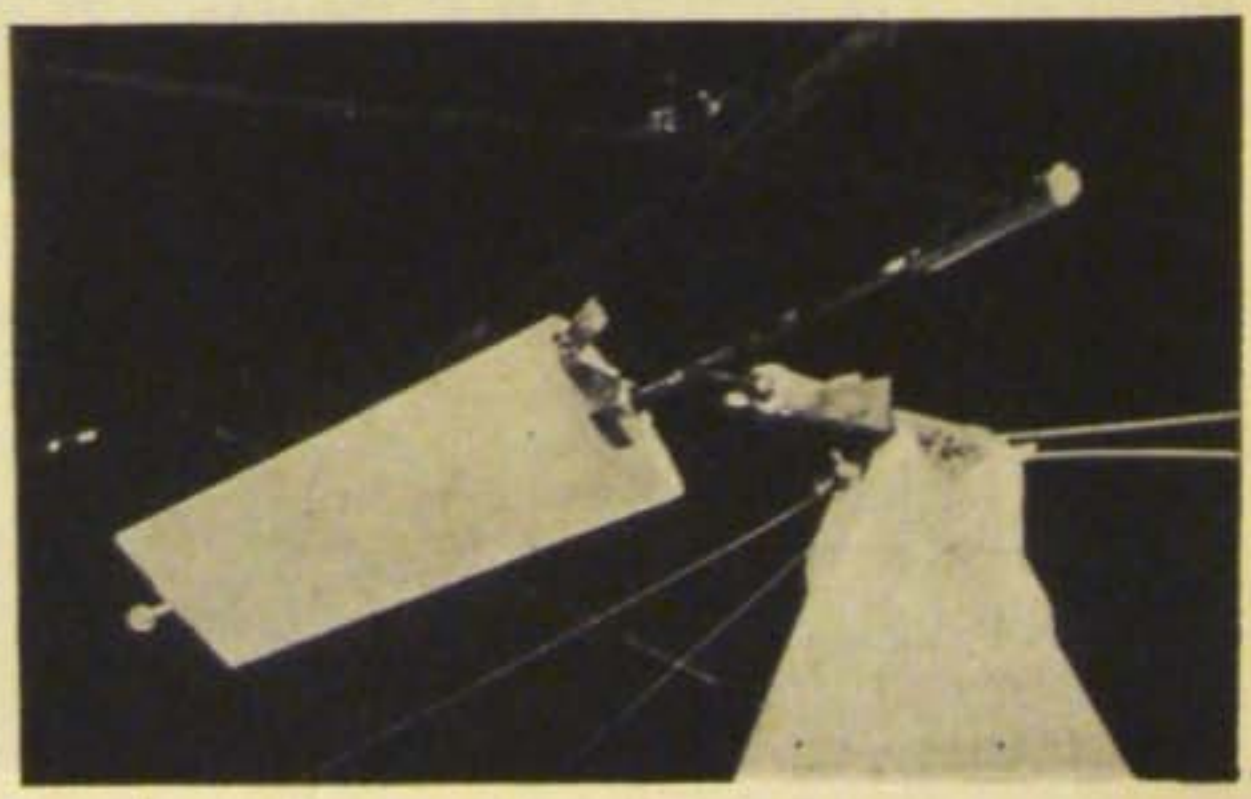
Basically, the arm consists of an aerofoil, 2 ft. by 6 ins., whose weight is balanced and whose lift, and consequent turning moment, works against a strong coil spring fixed at the centre of rotation.

PIVOTING AEROFOIL.

To avoid the effect of a square-law angular rotation of the arm, a refinement is added. The aerofoil pivots about a spanwise axis situated at about 0.6 of its chord and the basic incidence is, approximately, 45°. Under these conditions, the centre of pressure is forward of the pivot axis, and there is a tendency for the aerofoil, when under load, to increase its incidence —working against a control spring mounted on the pivot axis.

As the incidence increases with forward speed, the lift coefficient diminishes, the aerofoil being above the stall. The total lift load depends upon $C_1 \times V^2$, so that the reduction of C_1 with increased V tends to make the product $C_1 \times V^2$

(Continued on Page 5)



PIVOTING AEROFOIL

Pioneers of British Gliding—5

P. A. WILLS

IT is a fortunate thing that at the really critical point in any enterprise, one or two people nearly always turn up who, due solely to their personality and effort, completely alter the course of events.

In the early 1930's the British Gliding Movement was rapidly stagnating for lack of public support and active club members. The first great boom had worn itself out. Clubs had smashed their few assets and were unable to progress quickly enough for their members who had got bored with trundling downhill on an inefficient glider.

In Germany pilots seemed to achieve first-rate flights, but over here nothing much seemed to happen, and many people thought that gliding was finished.

PHILIP WILLS ROARS IN

It was on this scene of dying enthusiasm that the late G. Eric Collins arrived, followed closely by Philip Wills; and until the unfortunate death of the former, these two kept up a friendly competition which was the breath of life to the Movement. Possessing just the right qualities for the job Philip Wills roared in from the unknown with a suddenness that was startling, and proceeded to get everything straightened out; in other words he gave Gliding a good kick in the pants. With his fiery ambition, and singleness of purpose ruled by a shrewd and orderly business sense he had rapidly jumped into the first rank before most people could recover from their surprise.

The speed with which he got through the training and practice stages was no doubt helped by the several hundred hours of aeroplane flying which he already had logged, mostly as a private owner, and another advantage was a business which seemed to be conveniently slack whenever cumulus appeared in the sky, or the wind blew from the west. Certainly a good combination.

BLIND FLYING INSTRUMENTS

He early became the private owner of a Scud II and was again fortunate in having a first-class and permanent retrieving team—his wife. As he progressed, Scud II was exchanged for Hjordis, a British high performance sailplane in which he had a hand in the specification, and design. Hjordis was partly the result of a growing realisation that the first-class pilot must have both a first-class sailplane, and one which was equipped with full blind flying instruments which the pilot must be capable of using.

With Hjordis and his patiently won blind flying skill Philip Wills snatched the British Distance and Altitude records, competed in the



P. A. Wills in the cockpit of his Minimoa. *H. E. Starkie*

International Soaring Contests at the Wasserkuppe in Germany, where he and the rest of the British team put up a most creditable performance as private ventures against state-aided and militarily-equipped opponents. He then produced a film on sailflying which was shown extensively throughout the British Isles.

ENTER MINIMOA

At the start of 1938 Hjordis, which suffered from a rather breakable nose, was changed for a German Minimoa, then recognised as the finest high-performance general purpose sailplane in the world. With Minimoa, his wife, and his tremendous care in planning each flight, the tempo quickened, and Mini was whisked around the countryside like a frisky fighter; but some will say of this period in Philip Wills's career (and I think also the pilot himself) that his wife really deserved the credit. No sooner had she driven the Talbot and 30ft. trailer through the night along twisting country lanes, and got him back home again, then he had shot off to some other outlandish place at the far end of the country.

Another asset which this versatile pilot possessed is that of writing up his flights in both an entertaining and analytical manner, filling the layman with enthusiasm, and the lesser pilot with useful knowledge.

It would take more space than there is at present available to go fully through the most notable flights made by this pilot, so they are tabulated briefly below.

GLIDING CAREER

Started gliding during the early summer of 1933. By the end of July had commenced cross-country work with an upwind flight of 3¼ miles to Ivinghoe Beacon in the London Club Professor.

Entered for 1933 National competitions and won Distance, Altitude, and out-and-return prizes.

1934, April. Beat British Distance Record in Professor. 55.8 miles.

July. Became British Silver C holder No. 2, holding international No. 45. This award was then the highest obtainable.

1934. National Competitions. Won Distance prize for Class II sailplanes.

1935. National Competitions. Won Altitude and Out-and-Return flight prizes.

August. Recaptured British Distance Record from Collins with flight of 104 miles from Dunstable to Pakefield.

1936. National Competitions. Won Distance prize and De Havilland Cup (altitude).

1937. In February visited South Africa with Kirby Kite and made demonstration flights.

July. Member of the British Team at the International Competitions.

September. Placed first in National Competitions and also won Manio Cup and Wakefield Trophy for longest flight of year. Dunstable to Dover. 95 miles.

1938. April 17th. Beat his own Distance Record with flight of 110 miles, but this was also beaten on the same day by Christopher Nicholson with 119 miles.

April 18th. Flew 118 miles from Huish to Plympton, only one mile short of previous day's record.

April 30th. Smashed British Distance Record with 209 miles from Heston to St. Austell.

June. Broke British Height Record (held by Buxton since 1934 with 8,328 ft.), by flying blind in Cumulo-nimbus to 10,080 ft.

National Competitions, placed fourth. Won Wakefield Trophy and De Havilland Cup. Awarded International Gold C No. 2.

In September flew from Dunstable to Lympne, 87 miles, on second attempt to get across Channel.

1939. July. Broke Altitude Record nine days after he had lost it to N. MacClean, who climbed to 11,000 ft. in the Helm Wave. Wills's flight was again made in Cumulo-nimbus cloud, and he reached 14,170 ft.

National Competitions. Placed second, also winning De Havilland Cup and Seager Trophy.

SENIOR COMMANDER WILLS

Then came the war. Now P. A. Wills has become Senior Commander Wills, A.T.A., and although he may seem gilded and distant, his enthusiasm for flying has remained as real as ever. He knows, too, that the art of high performance soaring is still only in its early stages, and that there will be many fresh skies to conquer.

AN INTERESTING AIR SPEED INDICATOR

(*Continued from Page* 3).

effectively more proportional to V than to V^2.

In practice, it has been arranged that with the arm vertical, the glider is just not airborne, whatever the position of the elevator, but that at 2 o'clock, and after, it can fly.



NOTICE

SPECIAL CHRISTMAS CARDS FOR ATC GLIDING SCHOOLS

An offer has been made by a well known supplier to prepare a suitable Christmas Card for the use of ATC Cadets attending ATC Elementary Gliding Schools on terms which would enable them to be sold at a profit for the benefit of the Schools' Fund, if the indications are that a sufficient number will be ordered. The design will be a general one overprinted with the name of the School. Officers Commanding Glider Schools who are interested should address their enquiries in the first place to the Glider Press, Ltd., 68 Victoria St., S.W.1, marking the envelope "Christmas Cards".

MAN MADE THERMALS

By THEODORE BELLAK.

IT HAS been known for some time that when the sun has heated a certain area of ground and the temperature difference of the surrounding air was not great enough to cause the warmer air to break loose it would remain close to the ground until started upward by a wind. Peter Riedel was first to explore the possibilities of man-made motivation of such thermals.

A flight was made by Helmut Knopfle, of Stuttgart, during which he claims to have prolonged considerably the duration and distance of his flight through the self-production of thermals which enabled him to complete final requirement of his " Silver C " certificate. In August he was airplane towed to about 1,300 feet over the Hornberg. This was at 10.30 in the morning and he was flying a Grunau Baby, the performance of which is close to the Göppingen Wolf. As he was towed aloft he noticed that the air was quite rough, an indication that thermals would be plentiful. He planned to make a distance flight, as he had still to cover 50 kilometres for his " Silver C."

VILLAGE UPDRAFT

Immediately after releasing, he found he was climbing 8 feet per second. In twelve minutes he reached his first peak, as indicated by No. 1 on barograph diagram. Between peaks 1 and 2 he dived at 50 m.p.h. to cover as much distance as possible. Over a small village he discovered an updraft of 3 feet per second which he used to gain altitude. Soon he passed over a town of about 9,000 population and found a thermal lifting him at a rate of 2-3 feet per second. Immediately after passing over the town he found himself in a bad down-draft which dropped him at 6-9 feet per second.

Manoeuvring to fly over a concrete highway, he attempted to check his descent by finding rising air over the roadway, but this proved useless. Ahead he could see a village of about 500 population and by checking his altimeter he decided that he might be able to glide over it.

THE EXPERIMENT

Reaching the village, he found that his variometer showed zero as he flew over at not much over 100 feet altitude. Experience had taught him that at this low altitude it was necessary to look quickly for a landing place. Ahead lay a cornfield, and as he approached it he thought of the possibility of the self-made thermal. Conditions seemed about right, so saying to himself, " I might as well try it ! " he dived steeply over the edge of the field and then zoomed up in a wingover. Righting himself, he flew level momentarily to check his variometer. It registered a descent.

Immediately he dived again and pulled up in a steep wingover. This he repeated twice. As he came out of the wingovers he went into a spiral. From a reading of 3 feet per second down the variometer went to 2, then 1, then ½ a foot descent, moving steadily upward until it passed the zero mark and showed a climb of 1½ feet per second. He worked himself upward to 450 feet, where he reached the peak of his self-made thermal.

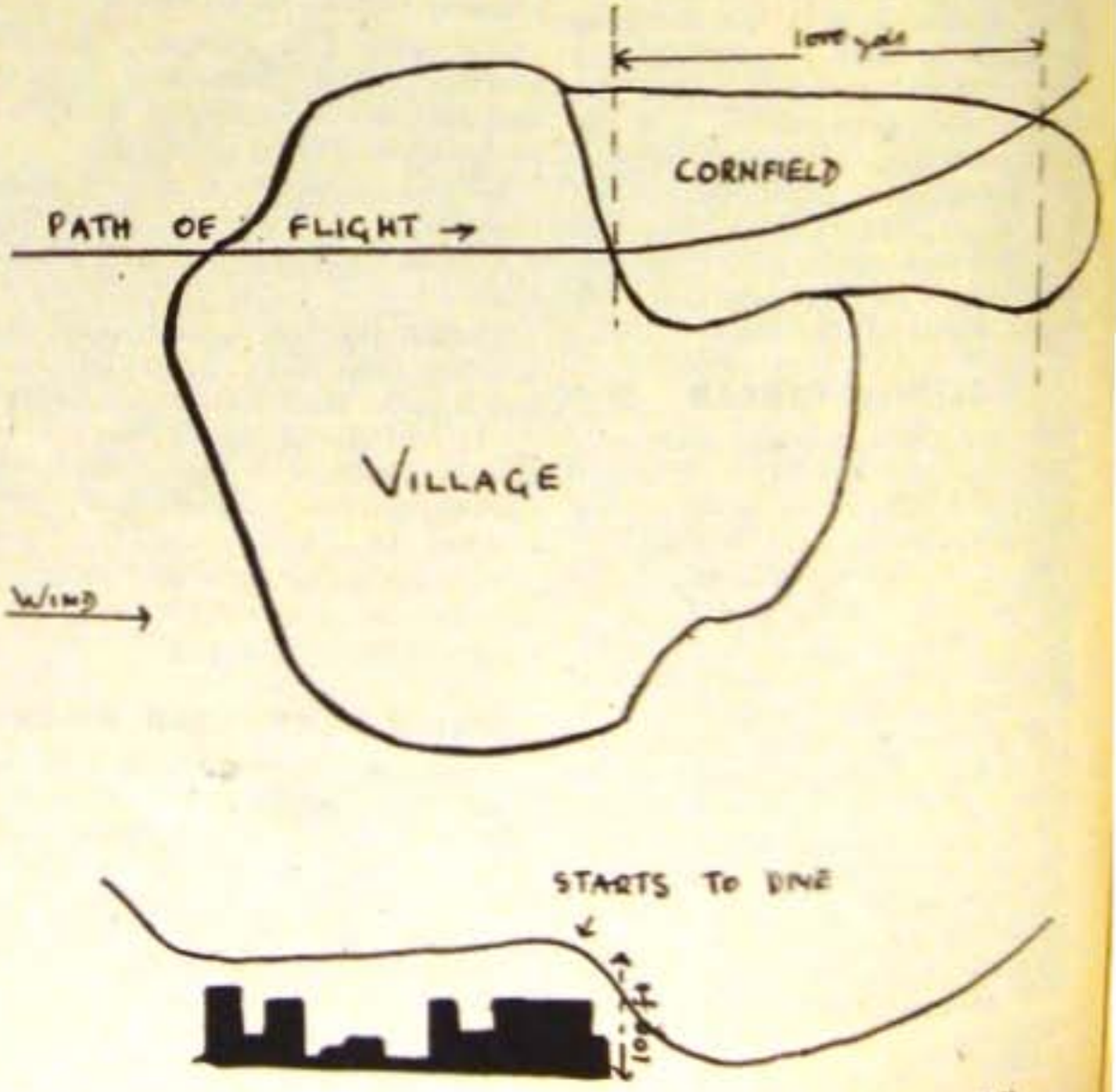
SUCCESS

Soon he was low over another field and repeated manoeuvres as before. He dropped closer to the field, which was filled with grazing sheep, and was rewarded with an upwind. This thermal bubble was strong enough to carry him up over a thousand feet. From this altitude it was easy to pick up thermals, on which he continued until he passed the required distance for his " Silver C."

After landing, Knopfle had time to think over the technique that he employed in starting his own thermals. It seemed convincing that after arriving over the first field, his variometer had registered the normal sinking speed after his wingover, and then after repeated diving and pulling up in wingovers, the thermals must have started to rise as indicated by the variometer. The second attempt and success proved to him that he had actually manufactured his own thermals.

IS THIS TRUE?

Other soaring pilots have had similar experiences, which seem to show that it is possible to prolong distance flights by stirring up thermals. I questioned Knopfle as to why he employed the dive,



(Continued on page 16).

Contacting Thermals by Smoke Observations

[On a day in 1938 when the Dunstable Cement Works chimney was directly up-wind from Dunstable Downs, members of the Imperial College Gliding Club carried out the interesting experiments described below. A summary of the results by Mr. Wilkinson is followed by a detailed description of the experiments by Mr. Naylor, one of the observers stationed on the hill-top to watch the smoke from the chimney.]

AN attempt was made on Easter Monday (April 18th, 1938) to follow visually the progress of thermals, by observation of the behaviour of smoke from a factory north of Dunstable Downs. Observers, posted on the Bowl, timed the interval between a disturbance taking place at the chimney and its arrival at the flying ground by watching singularities in the cloud shadows.

The nett results of the experiment, apart from practical experience in technique, were :—

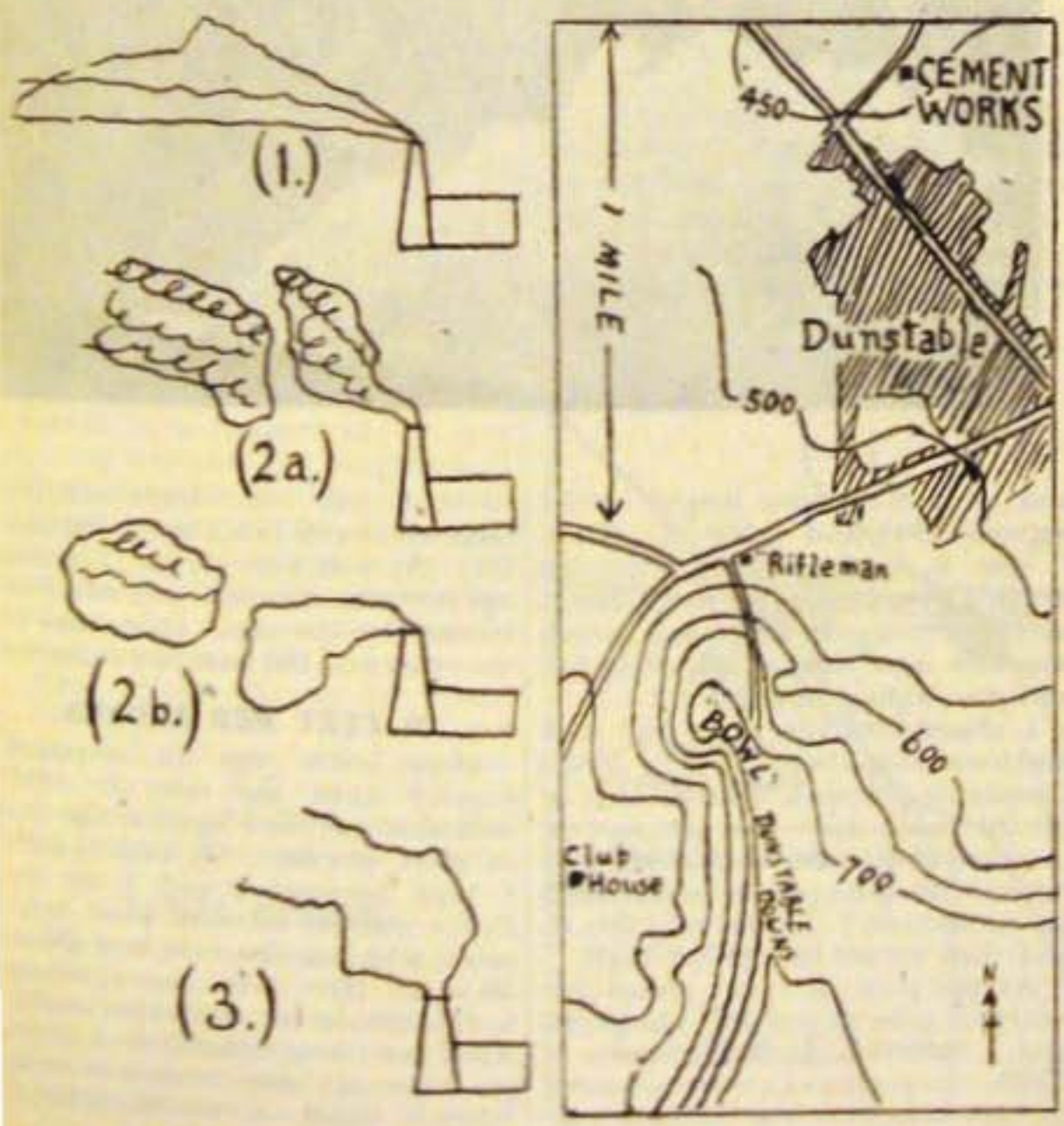
(*a*) It is definitely possible to catch thermals by assuming that they move overland with the main body of the air.

(*b*) On the day concerned the lift obtained was not powerful and was only sufficient to support the sailplane without gain in altitude (up-currents, therefore, being on the average 3 ft. per sec.). By this procedure, however, a flight of 10 minutes was made as compared with an average of 2—3 minutes obtained by indiscriminate launching in the morning.

(*c*) Disturbances at the factory took 4½—5 minutes to reach the Downs, being of half-minute duration as gauged from the smoke (quarter-mile diameter).

(*d*) Up-currents — strangely enough—were found not to coincide with the passage of promising looking clouds overhead ; in fact they often occurred when a blue patch or heterogeneous cloud mass was overhead.

K.G.W.



ANTI-CYCLONIC CONDITIONS

Anticyclonic conditions had been prevailing for about a week and the day of these attempts was typically anticyclonic.

The sky was practically covered with cumulus cloud—not very good specimens of cumulus, as they did not have clear-cut edges, and were slightly inter-connected. When the sun broke through, as it did more frequently later in the afternoon, it was warm, in spite of a cold wind of strength about 25 m.p.h.

Normally the smoke from the chimney was as in Fig. 1, but ocassionally as in Figs. 2a and 2b and Fig. 3. The last may have been due to a momentary change in wind direction—but was also due to rising air.

The " theory " was to wait until the movement of smoke was similar to that in Fig. 2a or Fig. 3, estimate how long the disturbance would take to reach us, and then give appropriate signals—one car light when it was on the way and two when we thought it had arrived —to the people below who were waiting to winch-launch a sailplane.

An upward (or downward) movement of the smoke over the chimney lasted anything up to a minute—on the average about half a minute —with one- to ten-minute intervals between.

EARLY MISTAKES

The main difficulty was to estimate the time the disturbance took to cover the distance. We first tried three minutes after favourable indications from the chimney, and the Grunau Baby, which was then winched, stayed up about the normal time for a descent after winching. We thought that the disturbance had already passed, so on the next attempt we allowed two and a quarter minutes. This met with results of a negative nature, much to the pilot's disgust, and he came down very quickly. We had seen considerable downward movements of air before the upward movements which we had timed, and he must have been launched into them.

TIMING SHADOWS

We then hit upon the bright idea of timing the passage of the shadow

(Continued on page 15)

14,170 FEET IN "MINIMOA"

British Height Record from Dunstable, July 1st, 1939

By P. A. WILLS.

(Reproduced by permission from "Aeronautics")



This photograph of Mr. Wills departing on his record altitude flight from Dunstable Downs on July 1st was given him by a member of the Royal Meteorological Society, whose members chose that day and place for their annual summer outing. The actual cloud which he used is seen beyond the Downs. Note the curious "feather" which projects from the top of the cloud near the left edge of the picture, and is visible also in the photos on page 10. The view is towards the north-east, and the cloud was over Luton.

ONE way and another I could not get to the club on July 1st until 1.30, by which time the beautiful cumulus which had been sailing over my bent head in London had given way to a rather featureless sky. So I had lunch and rigged with the aid of the Royal Meteorological Society, arrived on their annual outing, which this year had been arranged at Dunstable. Finally, it was 3.30 when I left the ground. In the meantime a front containing a number of cumulo-nimbus going to quite respectable heights had come into view from the north, moving slowly towards us, at right angles to the prevailing W.N.W. wind.

Just overhead the sky looked pretty stable, but there were obvious possibilities in the situation: keep going, keep an eye on the distant front, and take any opportunity of bridging the gap—seven miles or so—between the club site and the clouds. Right off the winch-launch I struck a thermal which took us up to 1,500 ft., and it might have been more, but I wanted to go north-east, not E.S.E. with the prevailing wind, so abandoned it and returned to the hill.

WAITING FOR LIFT

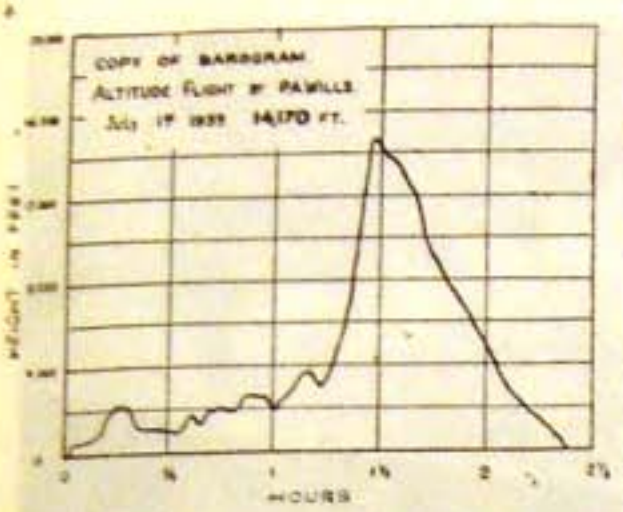
Then a local patch of stratus obscured the sun, and for twenty minutes 600 ft. above the hill was the order of the day. The returning sun struck first on the Zoo end of the slope, and flying that way thermal currents commenced again and for half-an-hour height varied between 800 and 1,500 ft. Then I saw a newly-forming cumulus drifting over Dunstable town, about half-way towards the front, which was now over the far side of Luton and developing mightily.

I abandoned the slope and flew northwards at about 1,500 ft. Over Dunstable I struck a large area of gently rising air. No amount of manoeuvring could work the lift up beyond 2—3 ft. per sec., so in this gentle fashion I climbed to 3,500 ft. and then set off for the big stuff.

As the wall of cloud ahead got nearer it grew in size and blackness, and I battered through an area of down-current into a gloom enhanced by contrast with the brilliant sunshine I had left. Underneath a large and extra black patch I struck lift. At 6 to 8 ft. per sec. I circled up into the concave bell which is formed by the rapid up-current in the otherwise flat base of a cumulus.

20 FEET PER SECOND

Once inside the lift increased rapidly until the rate of climb indicator jammed against the top at 20 ft. per sec. My rate of turn I kept between 2 and 3 on the Pullin electric turn-and-bank indicator, which means a circle of about 30 secs. How fast I was climbing I did not know until afterwards, when my barograph, dotting at 30 sec. intervals, shows two dots over 1,100 ft. apart—a rate of climb of



2,200 ft./min. would make even a "Hurricane" feel quite respectful.

The air was in general smooth, with the taut smoothness of a stretched violin string. One expected it to break violently at any moment, and every now and again the machine would suddenly give a number of violent but small shudders. The speed would creep up from 42 to 50 m.p.h. and I would straighten up momentarily, ease off the surplus speed, and put her again into the turn.

DANGEROUS FUNCTION

The barograph shows that the last 10,000 ft. of climb took only 7½ minutes—it seemed more. I have a theory that the dangerous part of these big cumulus is near the top, where the rising fountain of air turns outwards and downwards like the water at the top of a fountain jet. Consequently I determined to leave immediately the turbulence noticeably increased, even if this meant throwing away the last thousand feet or so.

At length the variometer needle unstuck itself from the top and returned to a beggarly 15 ft. per sec., and suddenly the roughness of the air increased. My altimeter showed about 15,000 ft. above take-off. I straightened up and with some difficulty held her straight until the compass needle settled down at N.W.

Now, before entering the cloud I had noticed that the front ran N.W.—S.E., hence the quickest way out was N.E. or S.W. I turned on to the N.E. mark and struggled out in torrents of wild air.

BUMPS CEASED

The bumps ceased and a dazzling glare flooded into the cockpit. Behind billowed the mountainous cloud from which I had come, and I estimated its crest as at least 1,500 ft. above me. Right and left behind me ran further mountains in the chain created by the front, separated by deep valleys. In all other directions was a tumbled vista of cloud tops about 7,000 ft below. Far to the north-east ahead I could see the peaks of a parallel range of cloud mountains, evidently a second front following on mine.

A broad ribbon of ice decorated the leading edge of my wings. It was about the width, and had precisely the serrated surface of one of those rubber nail brushes. It looked most un-aerodynamic. Long icicles pointing forwards decorated the pitot tubes, and all minor excrescences. If any chimney had hoved in sight I should have felt compelled to drop a stocking stuffed with my spare apple and acid drops down it.

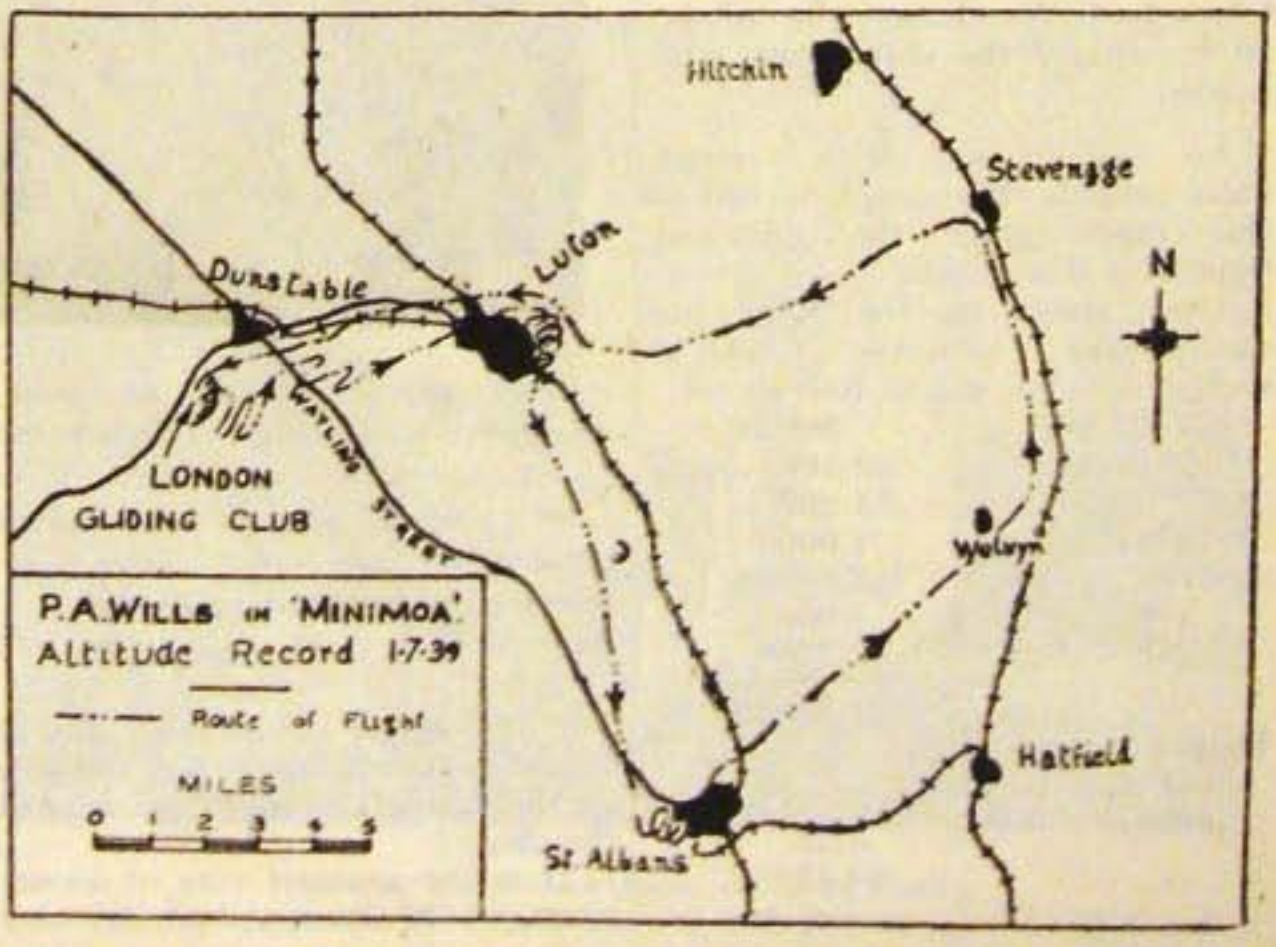
UNDESIRED GYMNASTICS

I did not know where I was. I felt muddled and rather exhausted. If I flew west back towards where I thought Dunstable was, I should have to go through the next Everest on the line and presumably suffer further highly undesired gymnastics. I could not see the ground except when directly above a few holes in the floor, and then in the shadow of the clouds it looked just a dark blue blur. Finally I cut S.W. through the valley between my mountain and the next and flew along the wall of cloud which was then on my right. I noticed that my sinking speed at 42 m.p.h. was 4 ft. per sec. against the normal 2.4 ft. per sec.; the combination of height and ice.

At about 12,000 ft. I spotted a town below, a faint network of white lines being new concrete roads showthrough the haze. I went round and round studying it and my map until a railway showed up running nearly N. At 10,000 ft. I saw the roof of the cathedral—St. Albans. Dunstable was about 16 miles to the north—right through the front. So I turned N.E. and flew along, hugging the cloud on my left. About now I began to feel a very severe pain between my eyes. It was a kind of nerve pain along the forehead, with an ache behind each eye. I rubbed my brow, took off my spectacles, shook my head, it got worse. I began to feel really worried for the first time—I had never heard of such a thing. Assuming it was due to increasing air pressure as we descended, I flattened out the glide as much as possible.

HEADACHE

My enforced N.E. course brought me over Welwyn, then I edged north along the railway to Stevenage. We were now down to 6,000 ft., so if we were to get home it was high time we got on our course. So we turned west and entered unwillingly into the cloud. After a few minutes a fine drizzle set in, and simultaneously Mini stalled on me—or at least the A.S.I. came back at 30 m.p.h. This was puzzling, she *felt* all right. Then



the A.S.I. came back to 15—10—zero, and I spotted it—its icicle had melted and blocked the pitot. I applied myself feverishly to the artificial horizon, an instrument I had previously honoured with much attention. But with my various aches this was too much, and I turned back east and came out of the cloud.

At 5,000 ft. it looked as if I might get west under the cloud base, so I turned again and scurried along in semi-visibility. Under the retreating front visibility was surprisingly poor, and I was relieved some time later to see Luton airport appear out of the mist about a mile to the N.W.

WIND CHANGED

I reached Luton at 1,500 ft., and it seemed hopeless to try and get back to the club from there, six miles away. But then I noticed the smoke from the chimneys was blowing from the *north-east* ! The front had passed over and brought a change of wind—having lifted me on high it now arranged kindly to blow me home.

I turned and followed the ridge of low hills that runs from Luton to Dunstable, and managed to reduce my rate of descent appreciably thereby. Dunstable drew nearer, passed a bare 600 ft. below, the back of the edge of our hill came nearer, it was going to be touch and go whether we cleared the power wires that run so thoughtfully along the top. The golf course went underneath, the power wires ditto. Glory be ! We cleared the hill by 50 ft., circled the club house, and landed.

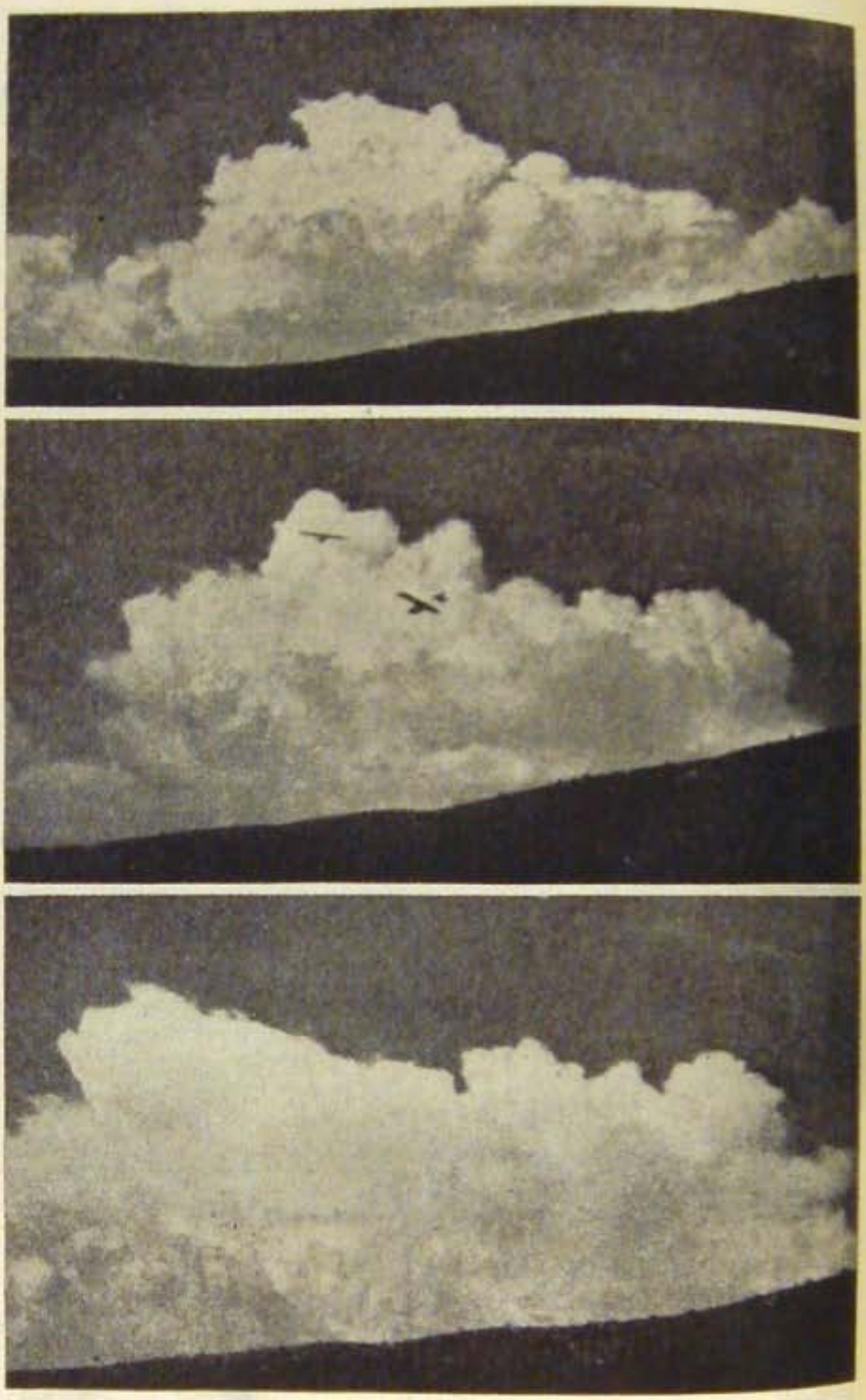
An examination of a second, more reliable, barograph record of this flight gives the following figures of this climb.

Time spent in the final up-current was 14 minutes. Climb in each 2 minutes was as follows :—

1st 2 mins.	.. 800	ft.
2nd ,,	.. 1,100	,,
3rd ,,	.. 1,200	,,
4th ,,	.. 2,000	,,
5th ,,	.. 2,650	,,
6th ,,	.. 3,000	,,
7th ,,	.. 770*	,,
	11,520	,,
Height at beginning of first minute (above point of release)	.. 2,650	,,
	14,170	,,

(* This figure is unreliable and is almost certainly more, but the pen of the barograph left the top of the chart.)

Thus the greatest rate of ascent averaged 25 ft. per sec. for one minute. The reason this barograph record was not entirely usable for the official calibration was that the needle went off the top of the chart just before the end of the climb.



Three views of the cloud mass used by Mr. Wills, taken at 3.45, 3.55 and 4.3 respectively, reading from top to bottom. It is hard at first to identify any particular portion of cloud in all three pictures, but the clue is provided by the " feather," seen also in the photo on the opposite page. This shows that the whole mass was rolling over from right to left, while at the same time growing and slightly approaching. In an offshoot from this cloud further to the west, G. H. Stephenson climbed in his " Gull " to over 7,000 feet.

GLIDING CLUBS IN THE ARGENTINE

WHEN Simpson took me up twice running in the Falcon five years ago I had no idea I had been infected so deeply by the gliding bug that it would absorb my whole life from then on. During all the twelve years spent in China I had been subconsciously waiting for a chance to fly aeroplanes, and only arrived at gliders by the usual route of having no money left when we came home. There was only time for a slide or two at Dunstable before we were sent to the Argentine, and three weeks after we arrived there I was making my debut in the Club Albatros. My family complains bitterly that they have never seen me since.



MRS. PLATT.

HOW TO LEARN SPANISH

Learning to fly in a foreign country where neither you nor the instructor have a word in common is a most interesting experience. It takes a little longer, perhaps, but like a baby learning to walk and talk, words and actions become so deeply associated that you learn through ears and eyes and sense of touch simultaneously and permanently. And as your life may depend on your knowledge of Spanish, you learn Spanish as well, quickly and thoroughly. This must have been the experience of many people who studied gliding in Germany before the war, and I imagine they also found, as I did, that a common interest in sport is a magnificent way to further international relations. In the Albatros alone we have French, German, Swiss, Spanish, Italians and a sprinkling of Central Europeans, all in an Argentine Club founded and run by and for Argentines. There is a definite rule that we neither talk politics nor listen to radio news while in the Club, and on that basis we have preserved a complete and most friendly neutrality throughout the last five years. The rule came into being directly through the only argument we have ever had. On the night before the "Graf Spee" sunk herself three Germans and I (sole representative of England) had a three hour discussion in very halting Spanish on the rights of whether or no Great Britain should use three little ships to attack one big one. The youngest Nazi finally brought out a "Heil," whereupon I am afraid I lost my temper and spanked him across my knee. It was very undignified but most effective, and we have been quite friendly ever since—but the rule was posted up next day.

NOT GERMAN

On that same question of German membership the Club has been suspected many times of being German, but that is quite untrue. Anybody of any nationality may belong, provided they behave reasonably. The Club was founded in 1931, and one of the original founders, Senor Finochietti, is now Director of Motorless Flight in the Argentine Air Ministry and Chief Instructor of the Albatros. In those thirteen years the Club has achieved forty subsidiary Clubs scattered over the country and a large number of very enthusiastic sailplane pilots. There, as everywhere else, the gliding fraternity have always had to struggle along against official lack of enthusiasm and personal lack of funds. Many of the Clubs are still without even a primary because we have to build everything whenever and wherever we can scrape together time, materials and money. But in Merlo we now have five Rhonbussards, five Grunan Babys, three



TYPICAL ARGENTINE COUNTRY.



GLIDING CLUB ALBATROS, BUENOS AIRES.
Alfredo L. Finochietti (Chief Instrnctor) and Robert M. Stanley U.S.A.

THE SLINGSBY "PETREL"

SHORTLY before the war a new High Performance Sailplane made its appearance and put up performances comparable with those of the best German Sailplanes of similar class.

It was designed and built by Slingsbys to the order of Mr. Frank Charles, to whose special requirements the cockpit cover shown in the illustrations was made. Subsequent models incorporated the cockpit cover design shown on the drawing. The elevator was either of the pendulum type or had the fixed fin, as desired.

Dimensions.

As shown on the drawing these are in millimetres for the benefit of those countries which follow the metric system. In English units they are :—

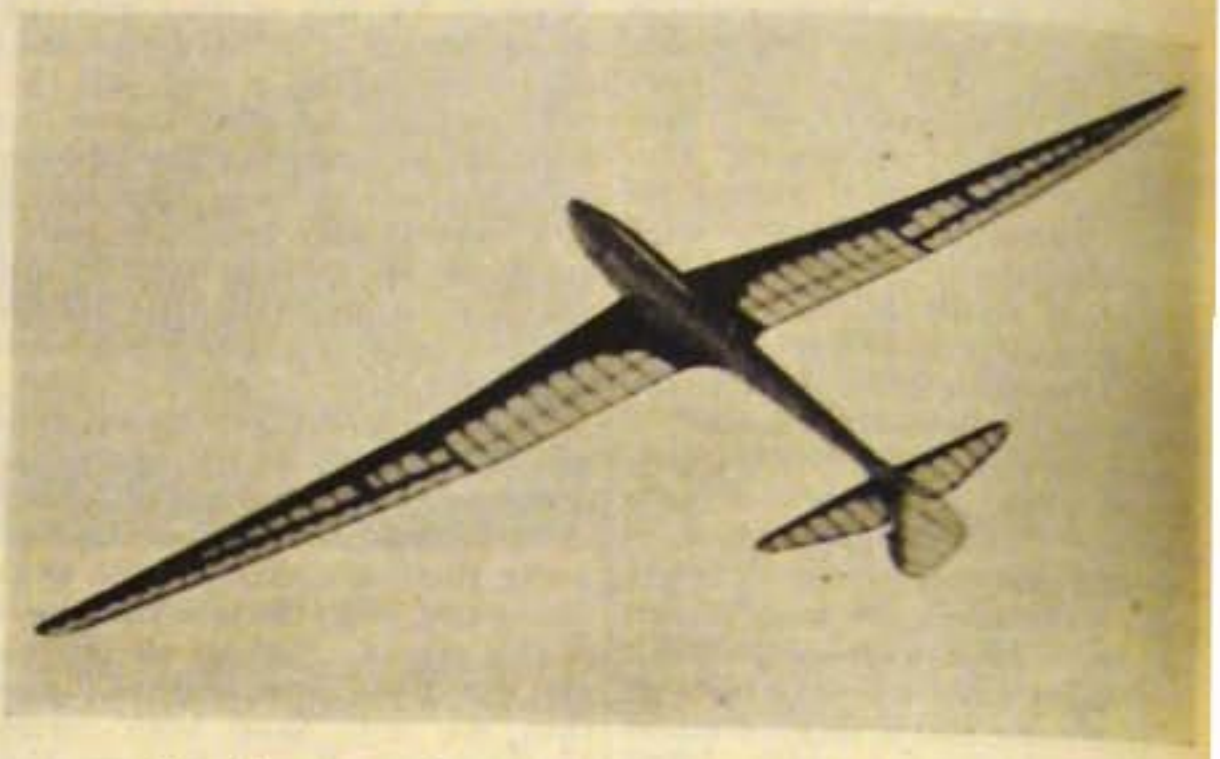
Span. 56ft. 11ins.
Length. 23ft. 9ins.
Span of tail. 11ft. 7½ins.
Wing cord. 6ft. ½in. at root. 2½ins. at tip.
Maximum width of fuselage. 1ft. 10½ins.

Mr. Charles flew his Sailplane on its test flight for the benefit of the B.G.A. on February 19th, 1939, at the Furness Club's site in the presence of the British Gliding Association Inspector, Mr. Butterfield, who described its behaviour and preformance with that of a Kirby Kite which was in the air at the same time.

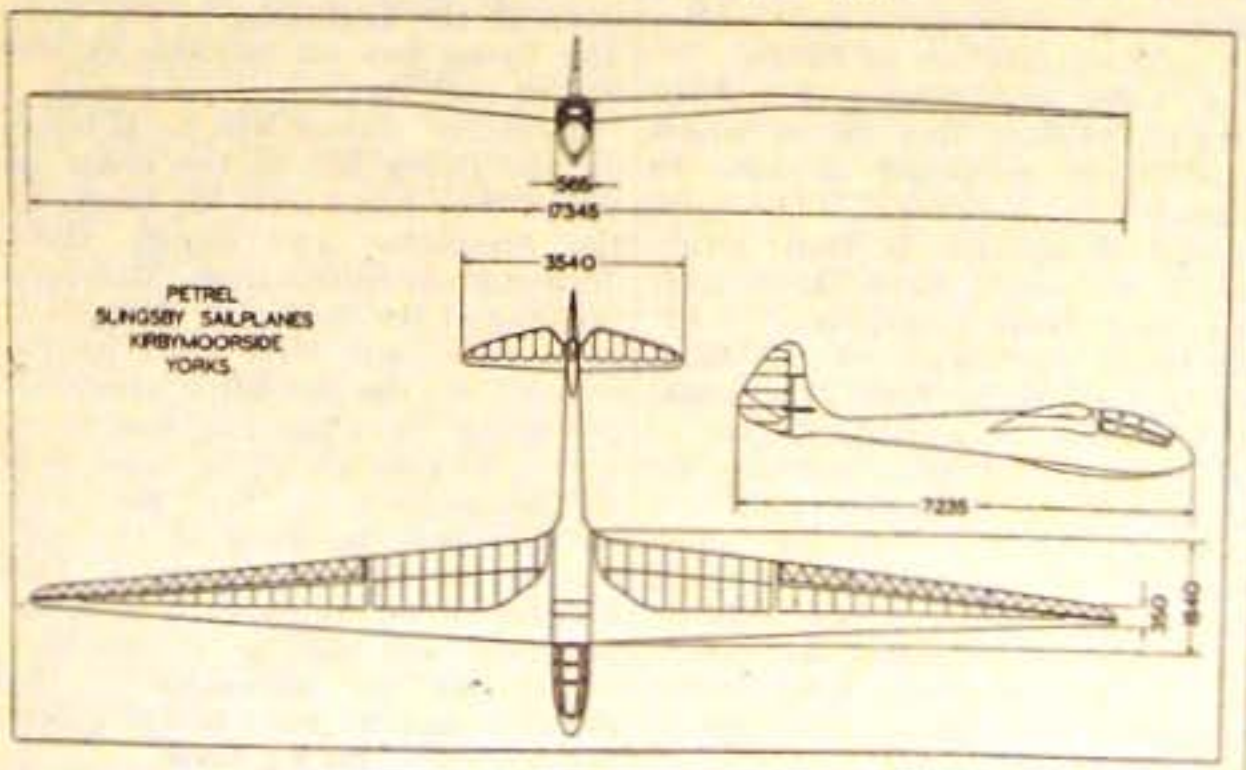
TEST REPORT

Mr. Butterfield afterwards described the events in a letter, the bulk of which we reproduce herewith :—

" . . . . The wind was blowing from the west and the day was bright and sunny when Redshaw took off in the Kirby Kite at 1.15 p.m. Charles followed in the Petrel at about 1.30 p.m. Both pilots flew very sedately, nursing every bit of lift, and it was an extremely interesting contest to watch from the ground. There was no fooling around, and if one found an extra good region of lift the other immediately shifted to that region ; hence we had every opportunity to compare performances, as both pilots exhibited text-book technique and gave a polished display of winning height.



THE GRACEFUL LINES OF THE SLINGSBY "PETREL."



DIMENSIONS IN MILLIMETRES.

" In 15 minutes the Petrel was twice as high as the Kite and had no difficulty in regaining this supremacy when operating in the same region of lift. The Petrel also proved its capacity to move quickly from one region to another with remarkably small loss of height ; at times she appeared to be flown very slowly indeed, and an inverted plan view reminded one of Collins's Rhonadler at its best.

" There was just a little cloud about and each pilot tried circling under these wisps, but undoubtedly the best lift was obtained by circling in hill lift. At the end of an hour both machines were landed perfectly on the hill top adjacent to the hangar and the pilots compared notes.

NO SPIN

" Charles had been to 1,300 ft. above take-off and Redshaw to 800 ft. Charles reported that the Petrel stalls at 29 m.p.h. on his A.S.I. and just falls back into a glide like a Falcon does, there being no tendency to drop a wing-tip, hence no tendency to spin. He has not, of course, deliberately crossed the controls to make her spin, but has dived her until the needle passed beyond the 80 m.p.h. mark, which is the limit of graduations on the dial. The machine can be circled beautifully in perhaps the tightest circles I've ever seen.

" At 3.30 p.m. both machines took off again. Charles declared



MR. FRANK CHARLES' "PETREL."

that if he reached 2,000 ft. above the site he would glide down-wind to Goadsbarrow on Morecambe Bay, 8 miles distant, where the trailer was to pick him up. There was not a cloud in the sky, and the wind had either dropped or steadied; it was devoid of gusts on the hill. In 20 minutes he had reached 2,300 ft. and Redshaw was not 200 ft. above start when Charles set off on a dead straight course for his goal. He arrived at Goadsbarrow with a loss of only 500 ft. He did no circling and says that the green ball (of the variometer) was never showing.

AMAZING SINKING SPEED

Goadsbarrow is at sea level and the site where the altimeter was set at zero is 800 ft. above mean sea level, so he would be at 2,800 above M.S.L. when over the beach at Goadsbarrow. So he carried on over the foreshore to Rampside and back again to a nice landing on the beach at Goadsbarrow.

"The proof of the pudding is in the eating, so I append the following figures :—

Site to Goadsbarrow, distance 7 miles = 36,960 ft.

Time, 7.5 minutes = 450 seconds.

Ground speed, 55.98 m.p.h. average.

Wind speed, 10 m.p.h. average.

Flying speed, 45.98 m.p.h. average.

Sinking speed = 1.11 ft. per sec.

"Truly a remarkable performance even if we assume that the air through which he passed had a slight upward component . . . One fact is clear : that on such a day, with such a machine, in the hands of a pilot of Charles's calibre, it is possible to travel 35 miles from a height of 2,500 ft."

It was afterwards found that the Petrel was unspinnable, which made it a very popular machine in British Sailplane and Soaring circles. A typical flight in a Petrel was described in the June 1944 issue of SAILPLANE, page 12, by "Busy Bee," who did some war-time soaring by special request of the Army A.-A. Authorities.

No doubt in time the performance of this purely British machine will be surpassed, but it will only be by a much advanced design.



REAR VIEW.

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CONTACTING THERMALS BY SMOKE OBSERVATIONS

(Continued from page 7)

of a cloud from the chimney to us, and it took four and a quarter minutes. So on the next launch (K.G.W. in a Kirby Kite) we gave this time interval after seeing good smoke indications—we had to wait nearly a quarter of an hour for them. This was much more successful, and the pilot stayed up for about twice the normal time, and apparently—by turning down wind just before another one, which we had timed, was due to arrive—missed staying up longer.

On the fourth launch (the Kite's second) we gave a five-minute interval, and the results were not quite so good as those of the previous launch.

We noticed that, at about the time we gave the signals to say "it has arrived," the wind strength decreased a great deal, with occasional gusts.

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SKILLED CRAFTSMANSHIP

ROYAL AERO CLUB
GLIDING CERTIFICATES

THE following Gliding Certificates have been issued by The Royal Aero Club during the past month :—

		Gliding School	*Date taken*
	"A" Certificates (33)		
1879	Peter Cliffe	183 E.G.S., Woodford	17.6.44
1880	Dennis Raymond Counsell	W.65 E.G.S., Cardiff	17.6.44
1881	Stanley Eric Moore ..	M.45 E.G.S., Meir	19.5.44
1882	William John Smart ..	W.65 E.G.S., Cardiff	25.6.44
1883	Riobert John George Hall	167 E.G.S., Woking	24.6.44
1884	Nelson Howes Chipperfield	W.65 E.G.S., Cardiff	17.6.44
1885	Thomas Coates	183 E.G.S., Woodford	27. 5.44
1886	Christopher John Leicester Greenhow	C.123 E.G.S., Bray	7.5.44
1887	Peter Granton Williams ..	W.65 E.G.S., Cardiff	25.6.44
1888	Roger Eric Illtydd Jones ..	W.70 E.G.S., Swansea	6.4.44
1889	Roy Ernest Cross ..	C.122 E.G.S., Harrow	10.6.44
1890	Owen Irvin Smith ..	N.E.26 E.G.S., Greatham ..	18.6.44
1891	Arthur Waind Staples ..	Ditto	25.6.44
1892	Roland David Thomas Percival	Ditto	5. 3.44
1893	Reginald Edward Thomas Fox	W.65 E.G.S., Cardiff	27.5.44
1894	Derek Alan Baker ..	C.122 E.G.S., Harrow	28.5.44
1895	Graham Walter Scott ..	Ditto	28.5.44
1896	Francis James Sheldrake ..	No. 187 E.G.S., Stretton ..	14.6.44
1897	Alistair Robin Worters ..	167 E.G.S., Woking	11.6.44
1898	John Edward Charles Taylor	Ditto	24.6.44
1899	Ernest John Strangeway ..	N.E.23 E.G.S., Yeadon	5.2.44
1900	William Walter Gilham ..	167 E.G.S., Woking	25.6.44
1901	Paul Eric Lionel Whittle	M.42 E.G.S., Loughborough ..	25.5.44
1902	William George Francis Howlett	Ditto	25.5.44
19p3			××
1903	David Denley	Ditto	25.5.44
1904	Gerald Ernest Stevenson ..	Ditto	25.5.44
1905	Peter Raymond Bell ..	167 E.G.S., Woking	8.7.44
1906	John Alistair Littlechild ..	C.123 E.G.S., Bray	2.7.44
1907	Paul Anthony Welford ..	Ditto	8.7.44
1908	Joseph Hassall	M.41 E.G.S., Knowle	12.7.44
1909	Trevor Law Huxtable ..	W.65 E.G.S., Cardiff	27.5.44
1910	Ernest George Percy Jeffery	166 E.G.S., Ashford	16.7.44
1911	John Baxendale	S.W.81 E.G.S., Yeovil	26.3.44
	"B" Certificates (10)		
1884	Nelson Howes Chipperfield	W.65 E.G.S., Cardiff	18.6.44
1885	Thomas Coates	183 E.G.S., Woodford	28.5.44
1890	Owen Irvin Smith ..	N.E.26 E.G.S., Greatham ..	20.6.44
1891	Arthur Waind Staples ..	Ditto	2.7.44
1893	Reginald Edward Thomas Fox	W.65 E.G.S., Cardiff	22.6.44
1897	Alistair Robin Worters ..	167 E.G.S., Woking	9.7.44
1900	William Walter Gilham ..	Ditto	25.6.44
1756	Francis Leslie Fitzwilliam Davidson	C.121 E.G.S., Halton	16.7.44
1908	Joseph Hassall	M.41 E.G.S., Knowle	13.7.44
1909	Trevor Law Huxtable ..	W.65 E.G.S., Cardiff	1.7.44

LETTER TO THE EDITOR

825, R.N. Air Squadron,
c/o G.P.O., London.
24/7/44.

DEAR SIR,

I was delighted the other day to discover that the SAILPLANE resumed publication early this year and should like to wish the journal every success in this new phase of its existence.

As a pre-war member of the Imperial College Branch of the London Gliding Club I have many happy memories of soaring at Dunstable, both before the war and in wartime, until civilian gliding was stopped in May, 1940. I am most anxious to remain in touch with the Gliding Movement, so should like to become a regular subscriber to your paper.

Except for a few days last January which I spent with the A.T.C. Gliding School at Stapleford Tawney, I have been completely out of touch with all gliding activities since 1940. My present job as a pilot on an aircraft carrier of the Fleet Air Arm does not—alas !—offer any scope for gliding but I am determined to take it up again just as soon as I can.

Incidentally, I should like to say how much I was impressed by the enthusiasm shown at the A.T.C. School I visited by its C.O., F/L. Warler, and his instructors, as well as by the Cadets themselves. If, as I expect it is, this enthusiasm is typical of that at the many gliding centres now operating in this country the future of British gliding looks bright indeed.

Again, best wishes for the SAILPLANE's future. May it soon be able to record British achievements in soaring in a world at peace where gliding is recognized as the finest sport there is.

Yours sincerely,
PETER N. BROOKS,
Sub-Lieut. (A.), R.N.V.R.

MAN MADE THERMALS

(Continued from Page 6)

zoom, and wingover technique, and he told me that the dive would create a small amount of vacuum behind the ship and zooming up would draw air behind it upward.

It would seem that here is evidence of meterological possibilities that are worthy of careful study and research. However, as is obvious to most pilots, the manoeuvres employed by the pilot in this account should not be attempted except by an experienced pilot who is thoroughly familiar with his ship.

(Acknowledgments to *Soaring*—U.S. official magazine).

SUBSCRIPTIONS

The circulation of *Sailplane and Glider* is limited by its paper quota. This is the reason for the reduction in size, and the thinner and therefore lighter paper. The publishers can dispose of far more copies than can be printed. To be sure of your copy, therefore, it is necessary to take out an Annual Subscription of 13/- post free for twelve numbers. Publication date is the 25th of the month dated the succeeding month. Cheques, Money Orders, etc., payable to *Sailplane and Glider* and crossed

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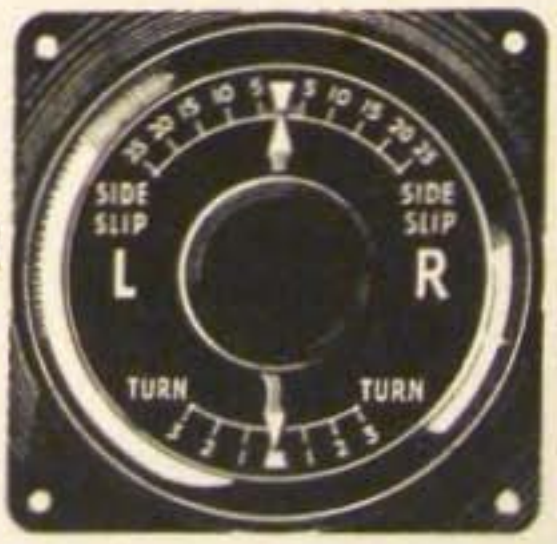
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HON. REPORT NUMBER TWO

"Please, illustrious setting Son of Heaven, herewith further report how cunning Hubbards of Luton outwit our plans to cripple British war industry by taking rubber plantations. As already reported, objectionable Hubbards with scientific treatment of felt immediately provide next best thing to rubber for Aircraft, Marine and Engineering requirements and call same MECHOFELT. Now Hubbards make clever with Mechofelt to give greater flexibility and resilience to the felt. This special make they call MECHOSEAL of high durability."



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