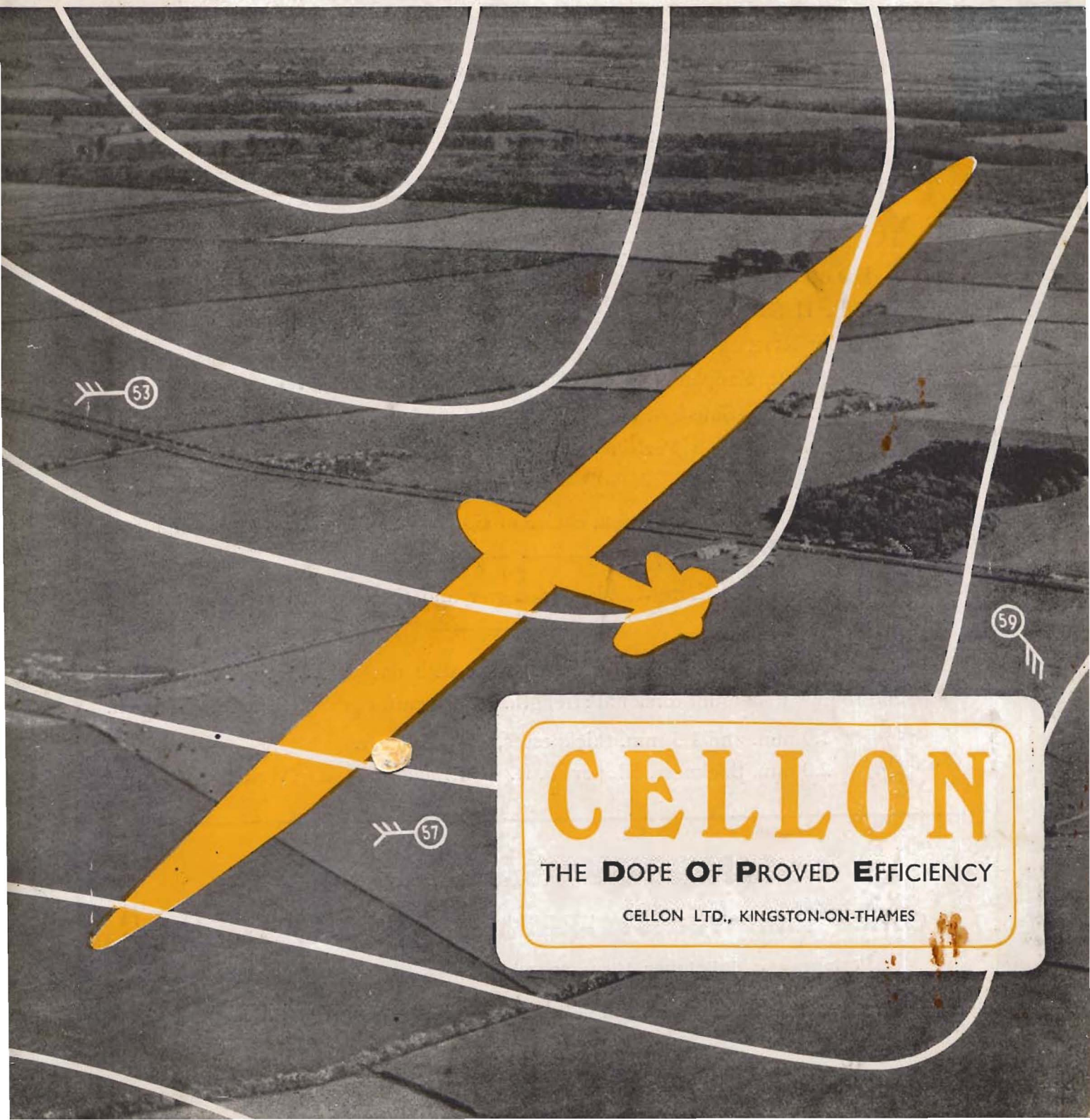
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Official Organ of the British Gliding Association

EDITED BY ALAN E. SLATER



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THE SAILPLANE *and* GLIDER

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Editorial Offices: 13, VICTORIA STREET, LONDON, S.W.1 Telephone: ABBey 2615-6-7

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Thermals from Factory Chimneys

TWO miles north by east of the London Gliding Club's launching point on Dunstable Downs is the tall chimney of the Dunstable works of the Associated Portland Cement Manufacturers, Ltd. For many years the white smoke which gushes forth from it all day long has been a most useful indicator to club members, not only of the force and direction of the wind, but especially of its turbulence and the presence or otherwise of up-currents. In the November, 1938, issue of THE SAILPLANE we published a photograph of cumulus-like cloud formed in the smoke on an August evening, mentioning that Mr. Ivanoff had twice during the previous year found lift at 3 feet per second in the smoke. As a result we have received the following letter from a member of the Hull Gliding Club :—

SIR,

The photograph in the November issue of THE SAILPLANE of smoke rising from the Dunstable cement works is of considerable interest. It may also interest your readers, especially those of the London Club, to know that the smoke, which also contains a large quantity of dust, comes directly from a kiln, the inside temperature of which is in the neighbourhood of 2800° F.

It should, therefore, be possible to obtain lift in this smoke at any time of the year.

R. E. HAVERCROFT.

The facts given in this letter aroused an appetite for more, with the hope of ascertaining whether the cement works smoke could of itself provide sufficient lift for a sailplane to get up in. So we wrote to the manager of the works, quoting from the above letter, and asking him if he could give us the dimensions of the chimney and the temperature of the smoke as it issued therefrom. He very kindly sent the following reply :—

DEAR SIR,

I thank you for your letter of the 19th inst., enclosing a copy of THE SAILPLANE. The remarks regarding our chimney are substantially correct. The chimney O.D. at base is 413 and rises 300 feet; the internal diameter at top is 10 feet. The gases are clean, having passed through electrostatic precipitators.

The temperature of the gas, which is heavily charged with moisture, leaving the chimney is approximately 300°—350° F. At this temperature the volume of gas being emitted is approximately 120,000 cubic feet per minute. The 2,800° F. which you refer to is the burning zone temperature of the rotary kilns.

I hope these few notes will be of general interest to your journal.

Yours faithfully,

F. V. MORGAN.

Armed with these figures, one can now set about investigating what happens in this artificial thermal current. If a sailplane of intermediate type goes up at 3 ft. per second, the strength of the up-current must be about 6 ft. per second. Assuming the sailplane to be doing fairly tight circles just within the smoke, the thermal would have a diameter of about 250 ft., and consequently an area of about 50,000 square ft. So the amount of air going up is 300,000 cubic ft. per second. Now this is 150 times as much as is coming out of the chimney, so that the original smoke must have been diluted 150 times. Consequently the difference in temperature between it and the surrounding air, about 270°, is reduced to 1.8° F. or 1° C., and it is significant that German meteorologists who have studied the question say that a difference of one degree centigrade between neighbouring bodies of air is enough to start a thermal except very close to the ground.

The most remarkable fact shown by these figures is the extent to which the hot air is diluted before it has risen even 1,000 ft. from the chimney-top, and we suggest that this may throw light on the development of natural thermals from heated ground. On most hot sunny days there is a layer of intensely heated air near the ground which is prevented by viscosity from breaking away until, according to common belief, some disturbance makes a "hole" in its "skin" through which it can escape. But this layer is so thin that it could hardly provide enough air to make a really useful thermal. Does it, then, get diluted on the way up, and is this why thermals can rarely be used within 300 ft. of the ground?

According to the alternative and usually accepted "bubble" theory, a thermal consists of the same mass of air from the time it leaves the ground to the time it peters out a few thousand feet up, and the reason it cannot be used close to the ground is that it takes time to accelerate to an upward velocity sufficient to lift a sailplane.

It is worthy of remark that Mr. Robert Kronfeld has expressed disbelief in the "bubble" theory; he pictures a thermal as a stream of air which suddenly starts from one place, continues for a period of a quarter to half an hour or so, and then as suddenly stops. Here is a matter for speculation. Perhaps the truth lies somewhere between the two theories.

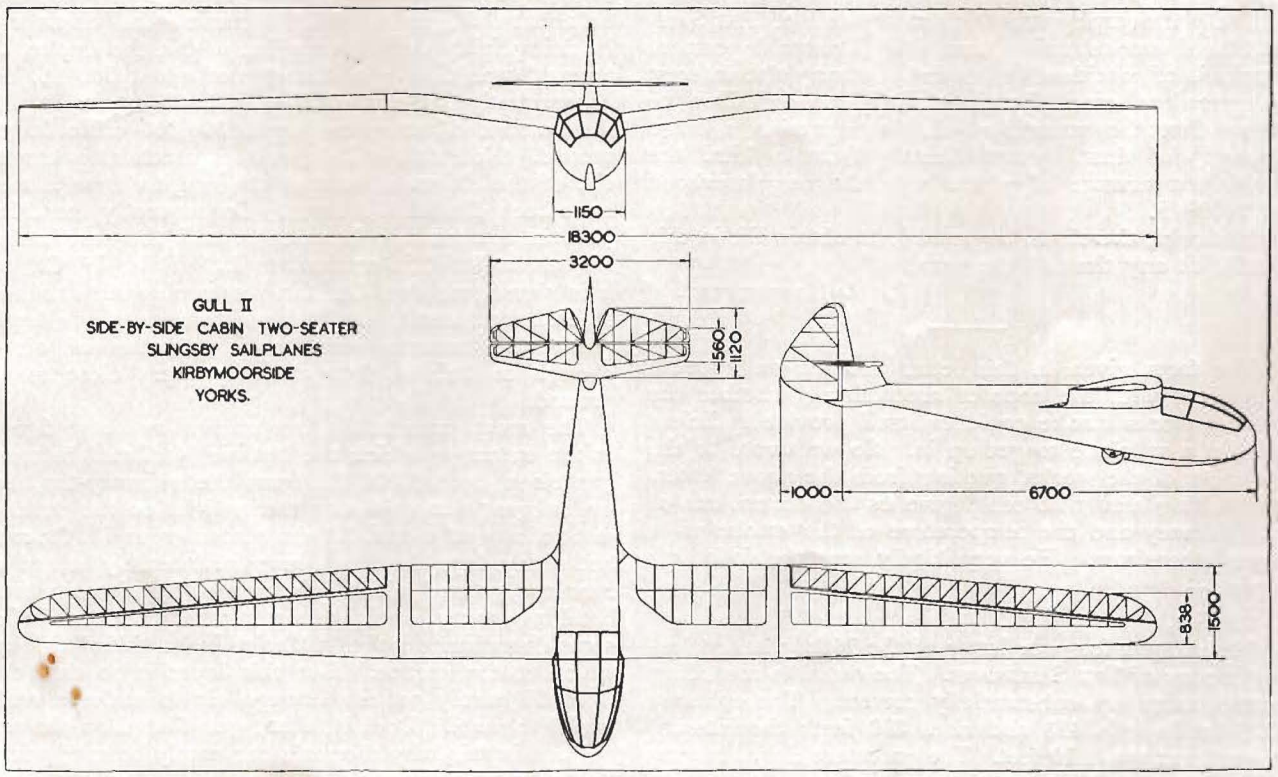
As to the Dunstable cement works thermal, it is likely that more will be learned about it shortly, for a group of London Club members, led by Mr. Hiscox, is buying a private launching winch with the idea of exploring local thermal conditions.

In view of the interest aroused in this subject, we are publishing this month an article describing how efforts were made at Dunstable Downs last summer to catch thermals coming from the direction of the cement works. This is, of course, rather a different matter from that discussed above, since the actual smoke from the chimney would have gone up out of reach by the time it crossed the Downs. Whether these thermals were started by the cement works, or whether they were already in existence and merely collected the smoke on their way, the fact should be noted that they apparently continued to be fed from regions far from their origin. This is what happened in a strong wind; it is only on comparatively calm days that entirely artificial thermals rise from the cement works.

There is also a cement works chimney within reach of the Cambridge Gliding Club, and on May 10th last year Mr. John Pringle flew "for a long time" at 800 ft. in the smoke arising from it, which was so thick that he had to use his turn-and-bank indicator.

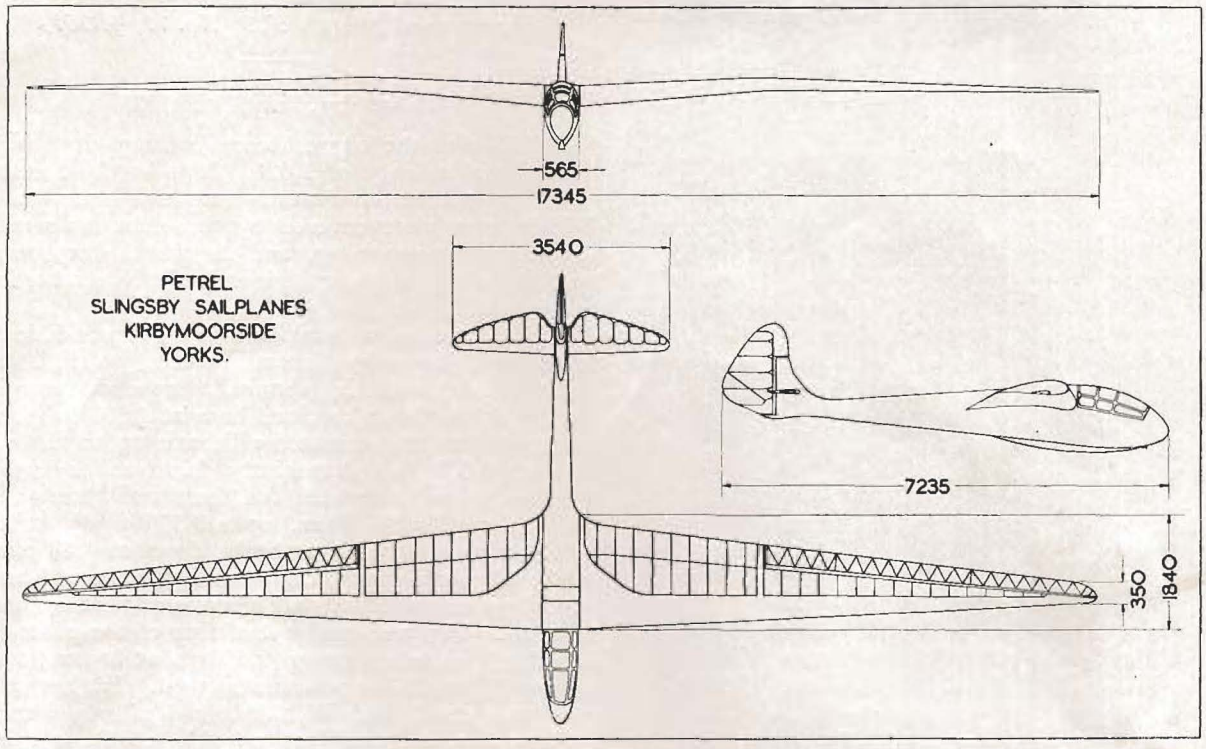
Finally, here is an example of an artificial thermal, complete with cumulus cloud, arising from a different kind of works. Mr. A. E. Moon, writing from Hastings, has had the following letter published in the *Meteorological Magazine* for December, 1938:—

"At 7 h. 10 m. on August 11th a small cumulus cloud was observed developing on the top of a column of smoke and steam rising from the chimneys and condensers of Broomgrove electricity power station which lies due west and at a distance of about 1,000 yards from my observation point. The surface wind at the time was calm. The cloud began to form a little below 2,000 ft. and extended upwards to at least 3,000 ft. Although the surface wind was calm the smoke and steam was rising rapidly up to the base of the cloud due, no doubt, to the convection caused by heat from the chimneys and the relatively hot water in the condenser towers. As the cloud slowly moved away from the area it dispersed and other small patches of cloud formed, but were more in the nature of fracto-stratus. . . . There was no similar cloud at the time anywhere else. . . . Cumulus clouds did not appear until a little before 9 h. when they soon assumed towering masses. . . . Similar slight cloud formations have been observed from time to time as the result of rising steam from the power station (nearly always in the early morning with calm air), but they never assumed tall and well developed cumuli as that observed on this particular day."



GULL II
SIDE-BY-SIDE CABIN TWO-SEATER
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KIRBYMOORSIDE
YORKS.

Two New Slingsby Sailplanes



The "Gull II"

THE GULL II is a side-by-side cabin two-seater sailplane, designed by F. N. Slingsby, of Slingsby Sailplanes, Kirbymoorside, Yorks. It is now under construction, and the prototype is to be ready for flight tests next April.

The wing is in three parts for easy assembly and transport, the connections being near the aileron roots. The aileron controls connect automatically on assembly, and adjustable differential action is incorporated in the mechanism. "Spectacle" type hand controls branching from a central column are provided for both pilots.

The wing sections are: NACA 4418 for the centre section and extension roots, merging to R.A.F. 34 at the tip section.

A single air wheel with internal expanding brake is fitted in the landing gear. "Lift spoilers" will be fitted to the production type.

The estimated weight of the machine, empty, is 530 lbs.; and fully loaded, 920 lbs.; giving a wing loading of 3.65 lbs. per square foot.

The dimensions given on the general arrangement drawings, reproduced on the opposite page, are, in English units:—

Span: 60 ft. 0 in.

Length: 21 ft. 11¾ ins. to rudder post, plus 3 ft. 3½ ins. for rudder.

Tail span: 10 ft. 6 ins.

Wing chord: 4 ft. 11 ins. at root; 2 ft. 9 ins. at tip.

Maximum width of fuselage: 3 ft. 9¼ ins.

The "Petrel"

The PETREL is a high performace sailplane produced by Slingsby Sailplanes, of Kirbymoorside, Yorks. General arrangement drawings are shown above.

The first machine is completed and has been delivered to Mr. Frank Charles, of the Furness Gliding Club. Flight tests to date have proved very satisfactory. The machine has a remarkably low sinking speed throughout the speed range.

"Lift spoilers" will be fitted to the production types.

The dimensions are given in millimetres on the drawings. Translated into English units they are:—

Span: 56 ft. 11 ins.

Length: 23 ft. 9 ins.

Span of tail: 11 ft. 7½ ins.

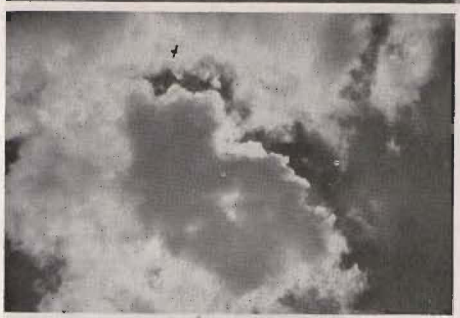
Wing chord: 6 ft. ½ in. at root; 12¾ ins. at tip.

Maximum width of fuselage: 1 ft. 10¼ ins.

An Indian Opportunity

Mr. R. Bajaz, of 79, St. Paul's Churchyard, London, E.C.4, writes to say that he is looking for an expert who will go to India to act as gliding instructor; he must also be able to build gliders if necessary. Mr. Bajaz is making this enquiry on behalf of private firms in India who are interested in the matter.





10.45 a.m. looking S.

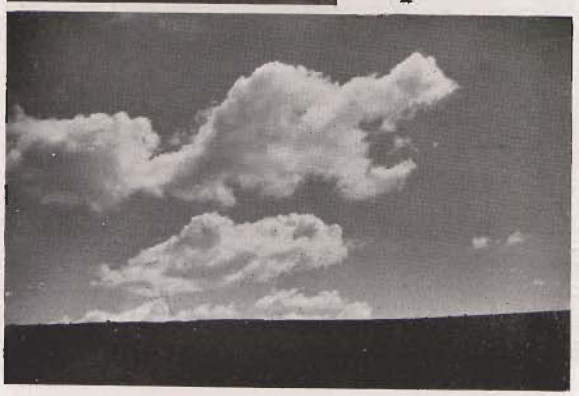


10.50 a.m.

Dunstable Downs: Wednesday, July 13th. 1938.

10.55 a.m. looking E.S.E.

11.0 a.m. looking E.S.E.



Cross-Country Flights at the National Contest

(continued from Vol. 9, No. 11, p. 261)

Wednesday, July 13th, 1938.

THIS was the biggest cross-country day, with a total mileage of 1,026. It is hardly necessary to publish a weather map this time, as the British Isles were covered by the same "air mass" as the previous evening, and its past history can be seen in the series of maps given in the November issue on page 261.

The meteorological aeroplane ascent from Mildenhall at 11 hrs. (noon by Summer Time, which is used throughout this article) showed a lapse rate equal to the dry adiabatic up to cloud base at 4,060 ft.; it was then equal to the saturated adiabatic up to the cloud tops at 6,050 ft. Apparently this was as high as the "polar air" extended, for there was then an isothermal layer (at 38° Fahr.) up to 9,500 ft. P. A. Wills said that this stable layer broke down at 4.30 p.m.

The wind there at noon was only between 6 and 9 m.p.h. up to 3,300 ft., and blew from west by north. Lympne, which was the goal of four of the pilots, had a distinct sea breeze up to 1,600 ft. at 3 p.m., which blew at 16 m.p.h. from south by west. Higher up the wind was about from W.N.W., and of only 6 m.p.h.

Slope soaring was just possible at Dunstable at times, but two pilots who tried to get away in the morning by starting from the slope could not rise above 600 ft. in thermals; while they were trying to, however, there was good lift under the clouds in which other pilots were getting away after aero-towed starts. Though the cloud lift was undoubtedly being fed by thermals from the ground (several pilots were finding reliable lift from towns), there seemed to be an unbridgeable gap across which the lift was too weak to raise a sailplane; but the gap cannot have been very wide, for the H–17, after an aero-tow, was down to 1,100 ft. over Dunstable at noon, and Pasold's BUSSARD down to 1,000 ft. a little earlier, yet both got up again.

In the afternoon Burnett, Brown and Thompson got away from the slope and both FALCON III's could have done so too. But all the other cross-country pilots started by aero-tow.

The first sign of cumulus in the sky was at 9.30 a.m. How soon the lift became good enough for getting away cannot be stated, as it was plenty good enough by 10.45 when aero-towing started; in fact, of 19 aero-tows made in the first hour and a half, all but two resulted in cross-country flights. Mrs. Price was first off, got under a good cloud at once, dashed off under a line of similar clouds, and was never again seen by other pilots.

The series of photographs in the adjoining column shows the clouds over Dunstable Downs at the time the first cross-country flights started on July 13th. Clouds tended to form in rows parallel to the wind direction, but not in connected "streets." Mrs. Price, who was first off in her "Rhonbussard," is seen in the second photo shortly after casting off from the aero-tow. The third shows the row of clouds under which she went rapidly away, and in the fourth photo the identical clouds are seen further off, five minutes later. Note the raggedness of the edges of the nearest cloud, which nevertheless gave good lift.

List of Cross-country Flights on Wednesday, July 13th, 1938.

Pilot	*Aircraft*	*Launched*	*Landed*	*Landing Place*	*Distance*
Mrs. J. Price	RHÖNBUSSARD	10.43	—	Near Sittingbourne, Kent (Goal: Lympne)	64
R. M. Smart	KIRBY KITE	10.52	14.07	Weathersfield	44
I. Pasold	RHÖNBUSSARD	11.01	14.41	Ipswich (Goal)	74
K. G. Wilkinson	KIRBY KITE	11.03	13.35	Fulbourn Road, near Cambridge	39
J. S. Fox	RHÖNADLER	11.11	16.00	Norwich (Goal)	95
E. Swale	KIRBY KITE	11.16	—	Luton Aerodrome	5
C. Nicholson	RHÖNSPERBER	11.18	16.35	Lympne (Goal)	88
D. F. Greig	KIRBY KITE	11.20	—	Luton Aerodrome	5
J. E. Simpson	KIRBY KITE	11.25	13.30	Cambridge Airport	38
O. H. Furlong	CAMBRIDGE II	11.30	13.30	Little Easton, near Thaxted	35
L. R. Robertson	RHÖNBUSSARD	11.34	—	Debden Aerodrome, near Saffron Walden	34
F. T. Gardiner	H-17	11.40	15.00	Wyverstone, near Stowmarket	73
G. W. Pirie	CAMBRIDGE I	11.50	—	Hadstock, near Saffron Walden	37
F. J. Davies	KIRBY KITE	11.52	—	Hadstock, near Saffron Walden	37
P. M. Watt	KING KITE	11.55	—	Cranbrook, Kent (Goal: Lympne)	72
S. D. Dickson	GRUNAU BABY	12.02	—	Near Markyate	5
Miss A. C. Edmonds	GRUNAU BABY	—	—	Near Markyate	5
E. Thomas	CONDOR	12.16	—	Near Baldock	17
P. A. Wills	MINIMOA	12.40	—	Sheldwick, near Faversham, Kent (Goal: Lympne)	76
G. O. Smith	KIRBY GULL	13.30	—	Luton Aerodrome	5
N. W. Burnett	GRUNAU BABY	13.37	15.00	Knebworth	14
L. C. Withall	RHÖNBUSSARD	13.49	—	Bocking, near Braintree	48
R. C. G. Slazenger	KIRBY KITE	13.58	—	Bassingbourne, near Royston	25
P. Brown	KIRBY KITE	14.08	—	East of Dunstable	5
J. Parker	GRUNAU BABY	14.23	—	Luton Aerodrome	5
G. H. Stephenson	KIRBY KITE	14.31	—	Stevenage	17
Miss A. Johnson	KIRBY KITE	14.42	15.10	Near Royston	23
G. M. Thompson	GRUNAU BABY	16.02	—	Near Royston	28

Smart went off soon after; he ambled along for three hours and found that conditions, though good at first, gradually deteriorated, though he never got very low till the end, and reached a maximum of 4,600 ft.

From 11.01 to 11.50 a bunch of twelve pilots went off, all of whom, except two, kept accosting each other and sharing thermals. The two were Slazenger, who cast off too low, thinking he had got something good when he hadn't, and Nicholson, who made off for his Kentish goal and neither saw nor was seen by anybody else in the sky.

The remaining ten have furnished so many reports of each other's doings that it seems possible to guess why the distances they achieved varied between such diverse figures as 7 and 95 miles.

Pasold released into good lift right away; Wilkinson released two minutes later in a down-current, but saw Pasold and went to join him. But when Pasold rose into a cloud, Wilkinson thought it time they parted, and made off for Luton. Here he outclimbed a KITE (Smart or Swale?), going up at 6 to 8 ft. per second. After that there were plenty of clouds on his route, most of which worked well, until beyond Baldock where he made two false casts. Here height was lost from 1,000 to 600 ft. in spite of trying corn and ploughed fields, until a big cornfield sent him up again to cloud base and beyond. Then lift became hard to find again, and he "foolishly left" a patch he had found at 3,000 ft.; this finally brought him down to a landing beside his trailer, whose team had kept him in sight nearly all the way.

Swale saw a BUSSARD (Pasold?) doing well under a cloud at Luton, and tried to join it, but arrived too low to catch the lift.

Fox also failed to find lift over Luton in spite of seeing three machines above him under a cloud; but he found a thermal to the south and was saved.

Simpson was continually meeting sailplanes. He was signalled off the aero-tow in a down-current, but



Another ragged-edged cloud which gave good lift. The photo, taken at 11.43 a.m., shows two sailplanes, one of which has just cast off from the aero-tow. Their identity is uncertain, but at this time O. H. Furlong, L. R. Robertson and F. T. Gardiner had just been launched.

caught sight of Greig circling and, of course, joined him. They climbed together to 3,000 ft. under a cloud; Greig then flew off down-wind but failed to find any more lift and had to land. The cross-country pilot is always faced with this dilemma: Shall he go on, in the hope of being able to get further in the end before the thermals give out; or shall he play for safety and stick to a good thing when he has found it, and just let the wind carry him along? Wilkinson and Simpson both went the same distance in about the same time; but whereas Simpson did his lingering at high levels, Wilkinson was held up by prolonged struggles to regain lost height.

Simpson was still in his first thermal when Furlong joined him; this was Furlong's second, he having got his first cloud immediately from the aero-tow.

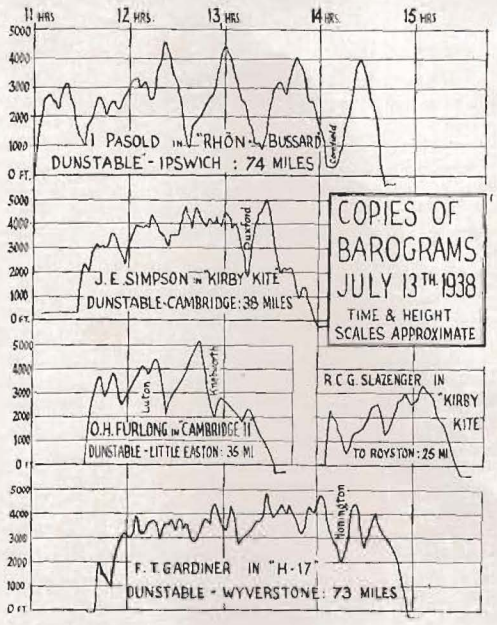
Simpson now at last left his first cloud for a glide across Luton, in the course of which Robertson, in a BUSSARD, overtook him. They both found more lift just beyond the town, and climbed together on opposite sides of the same circle. What made Simpson leave this area of lift was the fear, after having risen into the cloud, of encountering the BUSSARD in it too.

Furlong's second cloud, first found by Greig at 11.20, was still going strong half an hour later, when Furlong was drifting over Luton with its help. Here he was joined by Gardiner. This was Gardiner's second cloud; his first he had got over Dunstable, after losing 900 ft. of height from the aero-tow. The two now stayed under the same cloud for about half an hour; this would make the life of the cloud a whole hour long, which seems excessive, though it must be admitted that Furlong is not sure whether this was still his second cloud or a third.

Some blind flying was done by Furlong in his fourth cloud; under his fifth, beyond Knebworth, he encountered an unknown sailplane which was 500 ft. higher up, but he could make little of the lift. His sixth proved a dud, and so he was finally let down.

Simpson got stuck at Hitchin owing to blue sky beyond the town, until Pirie, who had left Dunstable 20 minutes later, came along and showed him a thermal which carried the two of them to Royston. Here the air was going down at about 10 ft. per second, and it is interesting that the maximum rate of climb found by pilots this day was of the same order of magnitude. Simpson recovered at Duxford, went on to Cambridge, and played around there for half an hour before landing.

Gardiner, after Hitchin, proceeded from cloud to cloud, each time circling up to the base, which by 2 o'clock had risen to 5,000 ft. He was surprised to find that his H–17, the smallest sailplane at the meeting, only lost about 500 ft. between clouds. At this time he caught sight of Pasold's BUSSARD about ten miles down-wind, and kept it in sight for another half hour. But at this point the clouds on the route to his goal looked unpromising, so he abandoned it and made for the best-looking clouds, wherever they were, taking care to approach them directly down-wind. The barogram shows that, apart from an awkward drop at Honington, Gardiner kept his H–17 close under the clouds the whole way.



In the afternoon the lift was less good, as can be seen from the reproduction of Slazenger's barograph. Among the later flights this day, that of Withall is outstanding. He lost height after an aero-towed launch, and got below the top of the Downs until a FALCON III showed him the way up again. He reached 4,700 ft., but most of the flight consisted of a low-level struggle, sometimes at only 400 ft., making use of every village, bonfire, cottage, copse and slope (in the words of his partner), until he finally landed, by strange chance, besides a vicarage whose incumbent, having a German wife, knew the Wasserkuppe well.

It is most instructive to compare Pasold's barogram with Gardiner's. Both pilots flew over almost the same route at almost the same time, yet what a difference in shape! It appears that Pasold made use of his BUSSARD's speed range to push ahead after each area of lift had been climbed. Yet his average speed works out at slightly less than Gardiner's. Which makes one wonder whether there is anything in individual technique after all!

Fox's flight is described by him in a separate article.

Of the four pilots who went cross-wind into Kent in search of Lympne, two have written the verbatim accounts which follow. Mrs. Price smelt gas when she was circling somewhere to the east of Broxbourne aerodrome; yet the only gasometer she could see was a long way up-wind. She found good lift on either side of the Thames, as on her flight from Reigate to Frinton last June. But the haze became extremely thick here, and she could only see the ground directly below. At Gravesend Mrs. Price was down to within 300 ft. of the ground when a thermal off the aerodrome saved her.

P. A. Wills was late starting, owing to an unsuccessful attempt to get up from a winch launch. He got along well until over East Malling, where he had 5,000 ft. (enough for a glide to Lympne), but then lost this precious height in a down-draught. Being now on the edge of the large area of blue sky mentioned by Nicholson, he could get no further.

The Manio Cup Flight

DUNSTABLE TO LYMPNE, JULY 13th, 1938

By C. NICHOLSON

AFTER a sturdy aero-tow to 2,000 feet behind Mrs. Crossley's "Avro" I cast off over the Bowl under an ideal-looking sky in a westerly wind.

My first thermal faded on me after a patchy climb of 800 feet, leaving the clouds still 2,000 feet overhead, and I would gladly have turned back to the hill if the competition rules had allowed. As it was, I was precipitated into the first of the day's struggles. It took me an hour to reach cloud base just beyond St. Albans.

During those sticky sixty minutes I was forcibly reminded of a day a little less than a year before, when Philip Wills went to Dover, whilst I, under precisely similar conditions, scraped into Hendon. I encouraged myself by remembering his remark—something about "slipping over into the Thames Valley to find square miles of up-going air."

The reservoir near Waltham Abbey passed slowly 4,000 feet beneath. The conditions seemed to be getting better and better. In the really active stratum stretching from 1,800 feet below cloud-base every thermal was of generous size, and a little positioning would give 10 feet a second or over.

But a few minutes later, over Romford, with its neatly aligned yellow trainers, I ceased abruptly telling myself that this cross-wind goal flying could be dead easy, that I was already half-way to Lympne, plumb on our course, and about to "slip over into the Thames Valley," for, while only a few miles ahead, the river was invisible.

Sure enough, as I turned on to a more southerly course, having "rounded" London, the air lost its few remaining signs of turbulence and the SPERBER started sinking at a determined 7 to 10 feet a second.

By this time my optimism (which is unquenchable above 3,500) had cooled off sufficiently to let me think; I found myself in the thick of the murk which was drifting off the city, the horizon had disappeared, and the blue cumulus-strewn sky had given way to a dull formless uniformity.

A flat monotone arm of the Thames detaches itself from the dim landscape as the machine surges towards it; the Medway follows a little later, with its prohibited area only just to starboard. We now seem to be going down rather faster than along.

The discouraging thing about this sort of situation is, of course, that one has nothing to go for, no reason to turn to one side or the other, and every reason for kicking oneself for not turning back a quarter of an hour earlier.

Gravesend is ten miles upwind and Eastchurch the same distance downwind. In the vain hope of reaching the latter I abandon all cross-wind ambitions and begin turning east. As I do so the machine shivers and the variometer partially recovers itself.

A little later, at long last, I persuade the green ball off its seating for at least part of a circle. High time too, for the ground is less than 600 feet below.

My circling is terrible. The horizon is still missing and, in an effort to steady down, I switch on the electric turn-and-bank. As my eye follows the long tapering lowered wing, the steel grey of the leading edge tones exactly with the water and reappears as it sweeps across the cut-up land bordering the Medway.

I dare not shift the position of the machine more than a microscopic amount on each gyration. Searching for a datum-mark below, I spot a man and a bonfire on a tiny peninsula. Each correction takes the machine nearer the smoke until eventually, as we enter it, the variometer, for the first time for hours and hours and hours (anyway half-an-hour), shows rise all the way round. The next time I look down the ground is two thousand feet below; right on the edge of a cone of vision bounded by mist, a pigmy figure still tends its fire.

I can now start to distinguish cloud forms above. The machine gives a proper heave, and in a matter of moments I have her well on her side again and going up at 5 feet a second.

It was good for the soul to swim out into clear air somewhere just south of Faversham. One's change of attitude on these occasions has to be experienced to be believed. After three-and-a-half hours in the air, down-wind of my course, with few clouds about and those of rather doubtful intentions, none too high, and sinking in a healthy down-draught, I admit to feeling GRAND.

The thermals I managed to make use of in this third and last stage of the fly were, as the barogram confirmed, widely spaced. What clouds there were seemed always to be in the wrong direction. A series of cross-wind struggles landed me up at 1,500 feet over a white crown carved into the side of the North Downs. I tried feverishly to find it on my quarter-inch map. I've since located it, clearly marked, close to Wye.

The sky is now entirely clear. No! not entirely. A mile out over the Weald of Kent I think I can detect against the intense blue the first mists of a forming cloud. I take all the trouble I know how to approach the wraith from directly down-wind, and in no time the SPERBER is singing round in by far the easiest, smoothest, most opportune thermal ever. At 2,300 feet I am in the midst of its thin untroubled vapours.

I can see the sea and, obviously beyond reach, something suspiciously like an aerodrome. There's no going higher, every turn takes me further east, so I must go on. It's now only a question of which aerodrome it is, and how far short of it I shall land.

The thrills of the next few minutes are reserved by the gods for the inexperienced—the complete navigator and competent judge of gliding angle and distance can have none of them.

The town a bit to the left, the foreshortened curve of the bay, that aerodrome . . . it might be Lympne, it might happen to me—even during competition week!

How misleading in some respects is a barogram! The ridiculously short descent connecting the last peak to the dots represents my biggest thrill yet.

The variometer reads just over 2 feet per second down at 40. I put the speed gradually up to 55 and

the sink hardly increases at all. I check up on the other variometer (a Collins) and it tells the same story. We're covering the ground properly, even across wind.

I can just see the lie of the hangars, and it's unlikely to be an R.A.F. 'drome for they're in line. I think we're going to make it—I'm pretty sure we're going to make it! The next time I look at the A.S.I. we're doing 70. I let the stick go forward a little as I turn right and then gently left on to the regulation circuit. The A.S.I. is calibrated up to 90, but the hand is well beyond as the SPERBER with her usual lack of fuss rounds Lympne at about 110.

* * * *

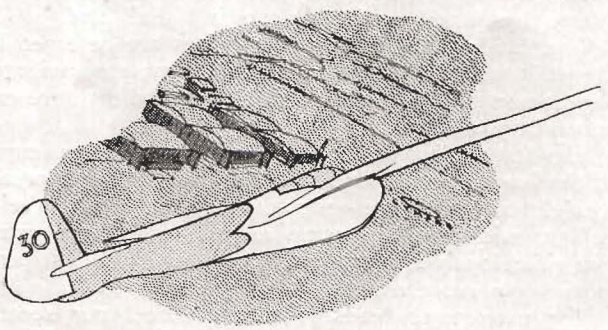
The distance from Dunstable to Lympne is 87 miles. I landed at 4.35, which gives an average speed of 16.3 m.p.h.—which also makes one think a bit. . . .

It is just on three years since the SPERBER arrived at Dunstable. One heard a lot at that time about her unsuitability for England—too fast, too poor a sinking speed, too difficult to land, etc., etc. Now that she's been tamed and has proved her ability to stay aloft with the rest in light hill winds and poor cloud conditions we are starting to wonder how she really should be flown.

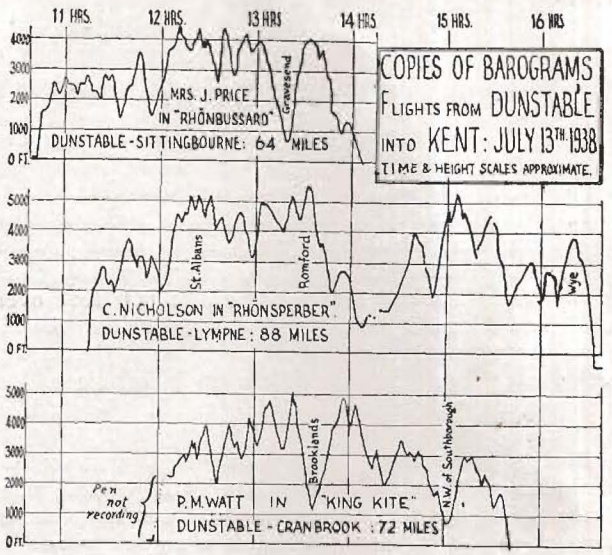
In this year's competitions she was treated in a manner most unflattering to her penetration. P. M. Watt, on the other hand, used the KING KITE very differently—compare, for example, the respective barograms for Monday's flying in the November issue of THE SAILPLANE. But later in the year Dewsbery, in the SPERBER, on his 128-mile journey to Faversham, did a straight glide of 15 miles and connected without difficulty to his cloud at the other end. There is no point in owning a first-class machine unless one can learn to imitate the acuteness of observation and flexibility of mind that characterises a Dittmar or a Hofmann.

Anyone can have a hearty laugh at my expense over the wild miscalculations of the last few minutes of the flight which I've tried to describe above, for I arrived over Lympne with more than 2,000 feet in hand. My excuse is that for 5¼ hours I had never flown the machine straight without the red ball more than half-way up its tube. The SPERBER's gliding angle in evening air seemed incredible.

As for the queer relation between forward speed and sink on this occasion, I can only refer you to the account of a SPERBER pilot in the American 1937 competitions. He found exactly the same thing up to about 50–55 m.p.h., and I've noticed it on a number of other less emotional flights. Perhaps, being glider pilots, we're both mad.



[*Drawing by C. Nicholson.*



Dunstable to Cranbrook

[*The following account is extracted from a letter in which Squadron-Leader P. M. Watt describes how, on July 13th, he took the "King Kite" on a cross-wind flight from Bedfordshire to Kent via the west of London.*]

I decided to go round the west of London, keeping well clear in case the wind strengthened and drifted me over the middle of it. The route was chosen because I knew the country, and the lift did not extend into the clouds; this would leave me with an uncomfortable feeling over town.

The "valleys" on the barogram are deliberate cruises from one cloud to the next, except for the large drop which occurred from Woking back to Brooklands, where I knew there was lift because somebody had started a fire at the west end of the aerodrome. Before I got to the smoke, however, a thermal rescued me, so I took advantage of it in case there was nothing doing at the aerodrome. When I felt at a safe height again I moved over to the smoke, and got carried just into cloud base, where the lift petered out.

A few clouds round Reigate helped me, and then I got into trouble again about two miles N.W. of Southborough. A couple of labourers were burning rubbish in a field, and I had 5 ft. per sec. served up to me, from about 400 ft. off the ground.

After a little desultory poking about I sank at Cranbrook, landing in what looked like a perfect field, but it was covered with very old, very hard mole-hills. Cranbrook Grammar School turned out in force and helped to put the K.K. away in the yard at Great Swifts, Captain V. Cazalet's place, where the staff looked after us very well indeed. The owner was away at the time, but they spared themselves no trouble, and gave the retrieving party a meal quite late at night.

The route flown over on this occasion measured 100 miles, but the straight line distance was only 72. With better lift in clouds I would have gone over London, and would have had a better chance of reaching my goal at Lympne.

P. M. WATT.

Longest British Goal Flight

NO matter how many cross-country flights one makes, one always learns something new every time, and the more difficult conditions are the more one learns.

This flight was full of interest, from beginning to end. Firstly, one of my never-failing sources of lift, a town, failed me badly. I saw three other competitors about 3,000 ft. above me over Luton under a nice cloud, and I thought the day for me was done. Then at last I got a gentle one, away to the right of the town.

At long last I reached Duxford—32 miles—and I had rashly announced nearly a 100-mile goal. Here the cloud-shadows were so languid that direction meant nothing at all, and one could as easily have flown due north, south, east or west. I watched the same shadow in the same field during the whole of a 3,000 ft. climb.

I now had a big decision to make. Straight along, on my course, the whole country was in deep shadow, while up north there were large patches of intermittent sunshine. The decision lay either between dud conditions ahead, or between a long painful detour to keep afloat. The possibility of going up north of the Wash (if Norwich proved impossible) made me set my teeth and turn due north. Three-quarters of an hour later I was flying over Ely, having gone 15 miles extra for nothing, but having found good sunshine and thermals.

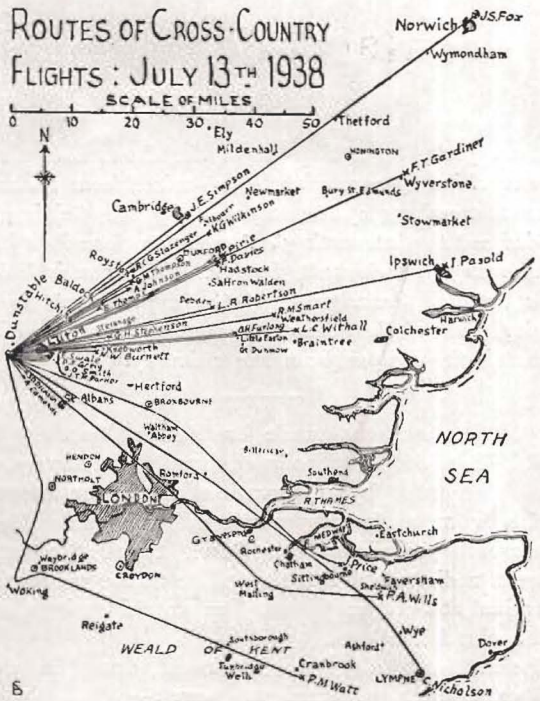
Over Ely I was tempted to abandon my goal and go north; but to gain the same number of points I knew I should have to fly about 135 miles, and this without any assistance from the wind. I had also developed an unpleasant headache and wanted to get anywhere as quickly as I could.

I set a compass-course for Norwich, but found I was soon arriving back near Mildenhall; so there must have been more north in the wind-drift than I had anticipated—or was it my bad flying?

Lift was getting meagre so I settled down to some serious cloud-flying to make the maximum possible height out of all lift within reach. Beyond Mildenhall I went into one large cloud covering a very considerable area. My circles got very muddled but the variometer still showed plus. My headache got more muddled still and the air began to get restive, so I straightened up on the turn needle, flew along and found I was heading due west into the bosom of the cloud instead of due east to its nearest edge. After some rushings and roarings while counting "twelve" in a "Rate Two Turn" I finally (by luck more than by muddled management) got the compass steady on "East." After what had seemed a desperate eternity—actually 14 mins. according to my barograph—I emerged into visibility 7,100 ft. above sea level, and almost as many feet above the low-lying ground beneath me.

No sooner was I out of one cloud than I had to go into the next, but this time I went straight through, gaining very little height on the way. Beyond this second cloud there was nothing to do but fly straight on in cool shadow.

When down again at 3,000 ft. I noticed one solitary small patch of sunshine, and it happened to be resting languidly on three adjacent ploughed fields, so I burnt my boats and gambled. I reached those fields at



2,400 ft., and made up my mind to stay over them until I landed—or went up again. About five minutes later, at 1,900 ft., the expected thermal came up strongly, and temporarily saved the perilous situation.

Further on I learnt something else, and did another manœuvre which I never remember doing before. The air became restive but there was no indication of lift, and so I flew on. Height was now imperative to my success, so I gambled again. I turned back and swung round in two devious sweeping circles. Luck was with me and, sure enough, I found the cause of the soda-water air I had passed through.

The railway-curves below now showed me, to my great surprise, that I was approaching Wymondham and was only ten or twelve miles from my goal. Then I saw Norwich (for the first time in my life) and became desperately uneasy. The land below me was in shadow, offering poor hope of good lift, and I steadily approached the city—a *sea* of roofs and houses—with no height in hand, and the aerodrome obstinately on the far side. To go on either meant success, or £??,000 in damages. To go round the city and miss the opportunity would be maddening to the last degree, besides just losing a record goal-flight and (more important to my venerable RHÖNADLER team) a good score of 241 points. By some miracle, just before Norwich a gentle thermal carried me from 800 ft. to 2,000 ft.

After five minutes or so a large patch of sunshine began slowly to spread itself over Norwich's northern corner. It soon warmed things up again, and I had half an hour's care-free fun over the now friendly sea of red houses, chasing round and round with two still more friendly aeroplanes which came up from the aerodrome to escort me in. I was so tired out when I landed that I made a stupid sort of approach and nearly undershot the whole aerodrome; but I was welcomed like a king, and treated royally by the Norwich Gliding Club. I had taken 4¼ hours to cover the distance, and was in the air for nearly five hours. J. S. Fox.

Contacting Thermals by Smoke Observations

[*Last year, on a day 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 mins. obtained by indiscriminate launching in the morning.

(*c*) Disturbances at the factory took 4½—5 mins. 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.

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 occasionally 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.

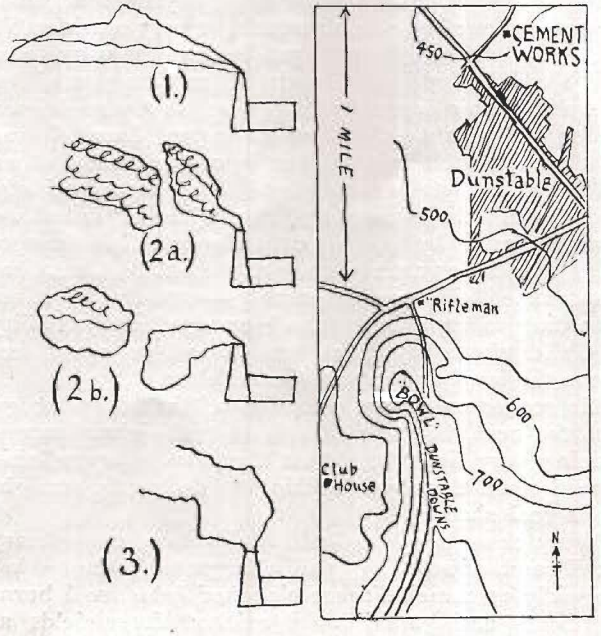
An upward (or downward) movement of the smoke over the chimney lasted anything up to a minute—on the average about half a minute—with one- to ten-minute intervals between.

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.

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



Correspondence

Safety Factors

SIR,

It is hardly likely that I am right and all the technical brains wrong, but I should much like instruction on the question of safety factors, which is beginning to loom large now that our more advanced pilots are becoming definitely cloudworthy.

I think everybody realises now that flying in large clouds entails some risk, and a considerable number of machines have broken up in clouds in Germany. The general answer of the designer to this seems to have been to increase the C.P. forward factor to figures which to me seem absurd.

I understand that this factor is of importance for slow flying into gusts. Thus if the C.P. forward factor is increased from 8 to, say, 12, as it actually has been in some cases, it is presumably possible to fly into gusts of such violence that the machine will placidly land thereafter intact, with the pilot's neck broken. I have yet to discover that such conditions exist, and anyway personally I should prefer my machine to break before my neck, otherwise it hardly seems worth while carrying a parachute.

The curious thing is that, from all accounts I have read, no single breakage in clouds has ever occurred from this reason. In fact it is exceedingly rare to encounter vertical accelerations at normal flying speeds of even 1 *g*, as I discovered when carrying an accelerometer some while ago.

Every case of breakage of which I have heard seems to be due to the wings twisting off in a high-speed dive, either right way up or inverted; or to the tips breaking off in high-speed inverted flight.

What are the factors at present required of sailplanes to cover this case? The enormous main-spar strength and consequent additional weight to obtain C.P. forward factors are certainly of no aid; witness the German machine that emerged this year from a storm-cloud with the main spars triumphantly but gauntly intact, the wings having twisted clean off them.

I suggest that a C.P. forward factor of 8 is ample for all purposes, and that a good stout leading edge of diagonal plywood is of more value for cloud-flying than any increase on this figure can possibly be.

But there is another consideration more important to my mind which has not even started to exercise the minds of the technical committees, and this is stability.

Once one gets into a mess in a cloud things happen with great rapidity. In a high-speed spiral dive the speed of a sailplane mounts so rapidly that the difference between a factor of x or $2x$ may merely be that the break-up is delayed for a few seconds, and one's exit from the machine, when it does occur, will be correspondingly more precipitate.

Personally if I must abandon ship I should prefer to do it as little like a human cannon-ball as possible, as I may not retain the presence of mind necessary to delay pulling the release cord of my parachute whilst I slow down in my fall to a speed at which it is desirable to do so.

The moral seems to be that, for cloud-flying, stability is more important even than strength. Once in the mess, no machine can be built strong enough to withstand what may happen; so the answer is: make a machine as stable as possible and so reduce the likelihood of ever getting into one. I would far rather go into a cloud in, say, a debilitated MINIMOA with a factor of 6 than, say, a WESTPREUSSEN (which was a notoriously unstable machine) with a factor of 12 or indeed of 20. (I pick foreign names to avoid heartburnings.)

A further answer might be air brakes which might automatically come on at, say, 130 m.p.h., and limit one's speed to a safe one.

But at present it appears to me that manufacturers are being forced to build unnecessarily heavy machines simply to conform to factors which are of no practical use. And as I believe that there is some talk of British factors of safety being increased again, a discussion on the subject now may be useful.

PHILIP WILLS

[This letter was received before the publication of Mr. J. A. Allan's letter on the same subject last month.—ED.]

The "Nyborg" Sailplane

SIR,

I was much interested by the performance figures and calculations given by Mr. Nyborg of his machine in the October SAILPLANE. There are, however, some statements made which are not borne out by contemporary aerodynamic practice, the most outstanding point being the very high lift coefficient claimed.

I have tabulated below the lift coefficient for the various speeds, and if we accept Mr. Nyborg's statement that the machine has been air-borne at below 40 m.p.h., it will be seen that a C.L. greater than 2.14 must have been obtained.

Now the nearest section to Mr. Nyborg's is NACA 6212 and this has a C.L. max. of 1.71, which figure gives a flying speed of 48 m.p.h. If one makes allowance for the reduction in Reynolds number from 3,000,000 to 600,000, then a reduction from C.L. 1.71 to about C.L. 1.5 would be expected; this would increase the minimum flying speed to about 52 m.p.h. as against a claimed "below 40 m.p.h."

Has Mr. Nyborg a rational explanation to offer for the exceptional performance of his wing?

M.G.C.

V. m.p.h.	V. ft. per sec.	C.L. $= \frac{W}{\cdot 0012 \times S \times V^2} = \frac{8400}{V^2}$
60	88	.97
55	81	1.14
50	73.5	1.4
45	66	1.72
40	59	2.15
35	51.5	2.8

SIR,

I should like, if I may, to make a brief contribution to the NYBORG sailplane dispute.

The unsolved problem appears to be how to reconcile the performance figures obtained on the one hand by Mr. Saffery and Mr. Nyborg from ground-hops, and on the other by Mr. Slazenger from his aero-tows. The former deduced sinking speeds of 2 to 4 ft./sec., while the latter found a minimum sinking speed of 8 ft./sec.

It seems to me that the discrepancy can largely be explained by Mr. Nyborg's assumption that the cushioning effect of the ground may be neglected. This effect can be calculated in a straightforward manner, the method being to imagine the interference of the ground as being caused instead by the presence of a "vortex ghost" flying along like a mirror image of the sailplane beneath the ground. If the distance of the sailplane from the ground (and hence from its ghost) is small compared with the wing-span, an approximation may be applied without resort to mathematics; for the self-induced vertical air velocities along the span will be almost neutralised by the opposite velocities induced by the ghost. Hence when a sailplane flies close to the ground its induced drag almost disappears.

Now at the forward speed giving the best gliding angle, induced drag accounts for half of the total; and at lower speeds for considerably more. In an article in THE SAILPLANE of January 20th, 1933, Mr. Nyborg estimates that his sailplane attains its best gliding angle at about 60 m.p.h.; and the flying results suggest that this estimate is, if anything, low. Hence over the speed-range (from 60 m.p.h. downwards) used on the ground-hop tests, well over half the drag would be induced; but by carrying out the tests within 3 feet of the ground Mr. Nyborg eliminates this item, and so artificially halves the air resistance offered to the sailplane. The sinking speeds deduced should therefore be multiplied by about 2, or perhaps more, to give the true values.

The magnitude of this cushioning effect will be appreciated by those who have seen the late G. E. Collins skimming along the ground in the RHÖNADLER.

KEITH TURNER.

Subsidy Grants

SIR,

I do not quite understand the reason for my good friend, Mr. Hardwick's letter about subsidy administration in your last issue, but there is one very important point which he does not make at all clear—possibly because he thinks it is already universally known and acknowledged.

Mr. Hardwick is correct in saying that the Air Ministry left the detailed administration of the subsidy to the British Gliding Association, but he fails to state that, acting under this authority, the B.G.A. established the principle of allocating the subsidy more or less in proportion to certificates gained in the previous year by each club.

When I say "more or less" I do not mean that there has been casualness or inequity in the application of the above principle. Statistics were actually worked out (obviously on a basis of the previous year's certificates, because nobody without the gift of clairvoyance could work out statistics on the current year's certificates), and if a club exceeded its allocation on a certificate basis to the prejudice of the legitimate claims of other clubs it was very quickly told so.

The above principle, which has been the basis of the security of the clubs' estimates since the inception of the subsidy in 1935, had not been repudiated at any rate up till *August, 1938*. Certainly clubs which sent in their subsidy estimate for the year as late as *May, 1938*, and indicated that they were going ahead with commitments based on the established "proportion principle," received from the B.G.A. an acknowledgment without any suggestion that the principle was to be interfered with for the current year's subsidy.

I have confined myself above to a statement of *fact* which appears to have a direct bearing on the subject of Mr. Hardwick's letter, and the omission of which might conceivably cause his letter to be unintentionally misleading.

I do not in this letter propose to discuss matters of *opinion* such as the merits or otherwise of the above principle of subsidy administration, or the method to be followed in the future, and I also purposely avoid comment on the administration of the subsidy since August last. These are subjects about which there is room for argument, and I am told (and it is well for your readers to know) that these and other subsidy matters are to be the subject of official investigation at a meeting in the immediate future.

May I suggest, Sir, that any controversial correspondence or action be postponed until the Subsidy Committee have had a chance to hold this meeting, when neither may be necessary? This would seem to be a graceful and helpful act, and in any case neither bouquets nor gunpowder will lose their effectiveness in the meantime.

NORMAN H. SHARPE,
Apperley Bridge, Nr. Bradford, Yorks.

Coming Events

Club Parties.

The Annual General Meeting of the Southdown Gliding Club on Sunday, January 22nd, will be followed by a Social Evening at the Third Avenue Club, Hove.

The Derbyshire and Lancashire Gliding Club is holding a dance on Saturday, January 28th. Particulars are given in the Club News.

The Yorkshire Gliding Club has a dinner and dance on Saturday, February 4th, at the Golden Fleece, Thirsk.

* * *

Yorkshire Instruction Courses.

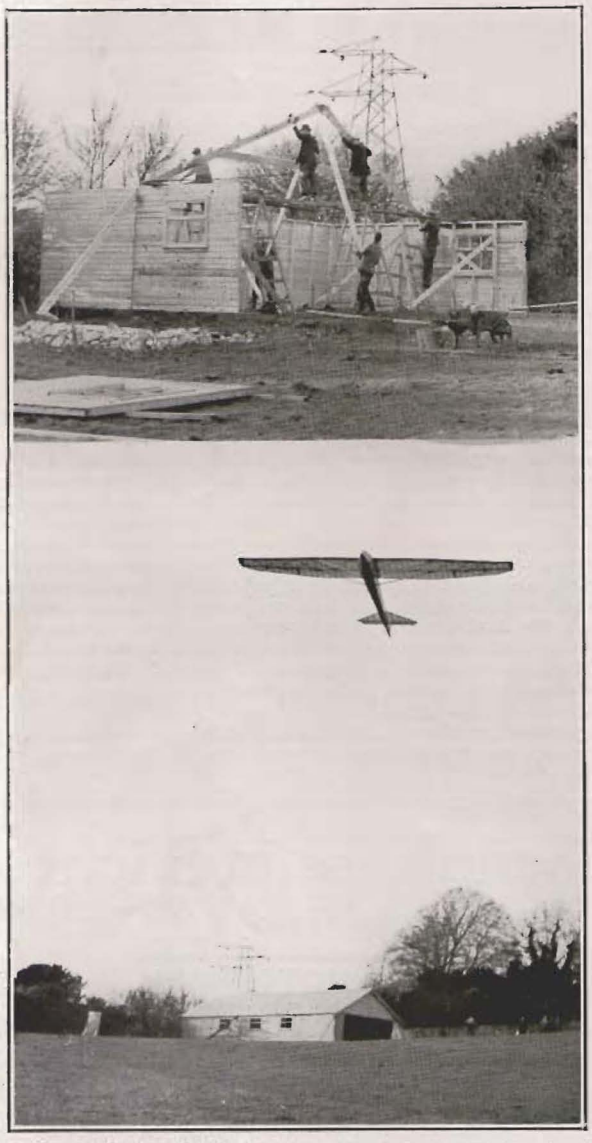
In the Yorkshire Gliding Club's Calendar, just received, the following courses are announced:—

Whitsuntide Instruction Course, May 28th to June 3rd.

Advanced Flying Course, July 30th to August 6th.

Complete Instruction Courses: No. 1, August 13th to 26th; No. 2, September 3rd to 16th.

News from the Clubs



The Surrey Gliding Club's hangar, seen under construction in the upper photo, is now completed, as shown below, where the club's "Kirby Tutor" is seen having a winch launch.

Surrey Gliding Club

December 10th-11th.—The transfer of club belongings from the barn to the new hangar was completed, and everyone was thankful to be finished with the eternal de-rigging of the PRIMARY. Their thankfulness was short lived, however, as someone soon after tried to do a stalled turn off a ground hop, and consequently a wing had to be changed.

J. H. Gill got the first winch "A" of the club, and on Sunday the club's new TUTOR was given a ride around by A. Edmonds, after which several people tried to soar it although the wind was rather too easterly.

December 17th-18th.—Horribly cold, but enough members turned up to do long hops on the PRIMARY. The day ended with a night flight by A. G. Douglas in an attempt on 45 seconds. The only part of the flight that anyone knew about was that someone heard him land.

Sunday was too gusty and far too cold to do anything but three very interesting ground hops, so we packed up and the gallant crowd of members who had turned up attacked the mountain of earth inside the hangar and by dark the floor was beautifully flat.

Derbyshire and Lancashire Gliding Club

Annual Dance.—This was announced in last month's issue as taking place on January 28th, 1939, but the date has been altered to Saturday, February 11th. The place is The Marquess of Granby, Bamford, and the time 7.30 p.m.

December.—The weather gods have certainly visited us with vengeance this autumn and winter, and only a small amount of flying has been possible again this month.

A number of hardy individuals decided to spend Christmas at Camphill, despite the fact that our steward and his wife were on holiday. They fed themselves so well that a turkey and goose are reputed to have disappeared at one sitting, at which there were not more than a dozen people. The Boxing Day distribution of gifts from the Christmas Tree was a great success.

Saturday, December 3rd.—Wind N.W., 15 m.p.h. At last a pleasant afternoon with a soaring wind to break our long sequence of bad weather. When the sky cleared just after 3 p.m., the lift improved from 400 to 1,000 feet, and the impression gained was that this lift was thermal in character; for as soon as the sun set the lift disappeared almost completely, although the wind remained unchanged.

Sunday, December 4th.—Wind S., 20 m.p.h. To-day the weather reverted to its normal for the past month, with low cloud on the hill preventing soaring. We were spared the pouring rain, however, until the evening. Low altitude training was carried on, the only incident being that the ground came up and hit the NACELLE rather hard.

Week-end, December 10th-11th.—Wind S., 15-20 m.p.h., with low cloud again. However, cloud was just high enough at times to allow a few training circuits, and Harris brought off a good "A." The MINIMOA and KESTREL attempted to soar on the south slope, but the wind wasn't quite strong enough. We hear that Hardy has taken up a share in the KESTREL, and we wish him all success. We were visited on Sunday by several members of Messrs. Hobson's Aircraft Components, of Oldham, who are hoping to form a gliding club there; we understand that their preliminary meeting was attended by 300. Saturday afternoon was profitably spent in putting a new full-length wire on the winch. We have felt the need of this for some time.

Week-end, December 17-18th.—Wind S.E., 30 m.p.h., with some driving snow, and bitterly cold—so cold that one's own clothing became stiff and frozen in parts. Outdoor activity was confined to wall-removing and road-making, superintended by the indefatigable L. R. Robertson, who is officer of all outside works, but it was not possible to keep warm even at this hard work. Meanwhile, Rita Rowlands had taken charge of the decoration of the Club House for Christmas, and made a very cheerful show of it, with Christmas Tree, mistletoe and all.

Sunday, December 25th.—Wind N., 5 m.p.h., dropping. Camphill under a thick covering of frozen snow presented a Christmas card effect. In spite of the day's festivities, several members were present, and winch training took place. Next day the wind was S.E., 30 m.p.h., with low cloud and sleet.

Tuesday, December 27th.—Wind N.W., 30 m.p.h., with gusts up to 45 m.p.h. A possible soaring day at last, so off went Smith in a G.B. to have a look at it. He was soon followed by the RHÖNBUSSARD, MINIMOA, and several others. Cloud base varied from 1,200 feet to 1,800 feet, and during the morning considerable thermal activity was noticed, no doubt due to the mass of polar air which was passing over. Those who flew reported extremely rough conditions, with sink at the rate of 10-15 feet per second, lasting for 30 seconds. Fortunately, in between these periods most machines were up at 1,000 feet or more, but even then some pilot's hearts worked a little overtime as they wondered whether they would get back on top at all.

Saturday, December 31st.—Wind W.S.W., 15 m.p.h., dropping to nothing. Soaring at first, followed by training. A. Verity was deceived by a sticking A.S.I. in the GULL into flying too slowly, and in the middle of a turn at 200 feet over the N.W. slope, he dropped smoothly into a spin. He recovered just as smoothly at 100 feet, and zoomed over the tree tops back on to the landing ground. It was his first spin, but none could have made a prettier show.

Summary of Flying During December.—Bungy launches, 50. Winch launches, 58. Flying time: 6 hrs. 11 mins. Certificates: 1 "A."

Yorkshire Gliding Club

December, 1938.—Harking back to last December brings no comfort. All we recorded was anger and dismay, froze in snow-drifts and staggered in fog! This December, in spite of meteorological manifestations (not the kind Doc. Slater writes about) we have actually done some flying. In possible and impossible weather pleasing numbers have mustered at the club-house, and we hope with the dirtiest if not the coldest part of the weather behind us, that this year will be remembered as the first one when "all-the-year-round facilities" have, really and truly, been needed and used.

There will be another dinner dance at the Golden Fleece, Thirsk, on February 4th, and we hope that friends from afar will please reserve their tickets and accommodation early, as numbers have to be limited, and we hate disappointing people. Applications for tickets should be sent to Mr. A. M. Verity, 139, Norman Lane, Bradford.

Flying this month is as follows:—

December 2nd.—S.W. wind, 10 m.p.h. Fisher, being near at hand, managed an hour's comfortable hill-soaring before darkness fell.

December 3rd.—N.W. wind, 20 m.p.h., decreasing to nil. Barker, Fisher, Lucas, Pick (A. O.), Gibson, Hancock, Neilan, Sharpe, and Morton, in GRUNAUS, KITES, TUTOR, and FALCON III, made the most of pleasant conditions—six hours all told. One of the days that convinced the unbeliever that gliding and soaring really is an "all-the-year-round" affair!

December 4th.—The wind having gone round to the south-east, only training and practice was possible. Weather conditions were impossible until the 14th, and in the meantime the wheels had been fitted to the open DAGLING, and Pearson made a test, rumbling merrily across the field and getting a priceless mud bath for his pains! We are making a series of tests of this method, which has been very successful at other clubs, and, if all is satisfactory, it will supersede the "winch-bungy-hop" system now in use. There being very little wind, Pearson had a couple of winch-circuits in the GRUNAU to dry off! Several members and three visitors from Midland Club week-ended the following Saturday and Sunday, but flying was, in view of weather conditions, out of the question.

December 27th.—North-west wind, 20 m.p.h. W. Sharpe, Pick, and Pearson put up an hour and twenty minutes between them, Pick reaching 1,400 feet in the hill-lift.

December 30th.—Westerly wind. Fisher had the ridge to himself for an hour.

Probably a bigger total of flying time than last December, but, most important of all, we can say that every possible day was made use of in some way, which, of course, denotes progress. Plans for next year's Instruction Camps and meetings have been discussed, and it is our intention to break some new ground in that direction. Our programme will be advertised in the usual way in due course, and in the meantime will anyone interested please note that Mr. Henry Blakeston, who has acted as Camp Secretary from the beginning of such things, has decided to take a well-earned rest from his labours? The 1939 camp arrangements will be in the hands of Mr. G. A. Hinchliffe, "Netherfield," Mill Lane, Bardsey, Nr. Leeds, who will be pleased to deal with any enquiries from now on.

We have had many "tailpieces" suggested this month, but unfortunately they are not, any of them, suitable for the chaste columns of this eminent publication. By way of a change, the following quotation is delicately appropriate:—

> "Thither came Uriel, gliding through the even
> On a sunbeam, swift as a shooting star
> In autumn thwarts the night, when vapours fired
> Impress the air."
>
> MILTON, *Paradise Lost*. II. 555-558.

Durham County Branch.

The usual training took place during the first fortnight in December. Unfortunately the NACELLED DAGLING was slightly damaged owing to the pilot endeavouring to land on top of a stone wall. We were snowed up the last fortnight and we are just now standing-to waiting for the weather to clear.

As soon as convenient we propose commencing a recruiting scheme. It is suggested that we hire a public building, and with the help of our friend, Flight-Lieut. Shaw, we hope to interest the public with a film display and an address on gliding.

Newcastle Gliding Club

In spite of our long absence from the journalistic field we are pleased to report that we are still in the land of the living.

Interest this last month or two has been largely concentrated on the Hartside Range, and on December 27th a small party took the club GRUNAU for an airing. After a convincing demonstration of what not to do, McLean, in a north-west wind of moderate strength, attempted his first cross-country and succeeded in reaching his goal (Brough) some 20 miles away. With the mediocre conditions obtaining at the time and taken in conjunction with Allen's flight of a week or two previously, when he was up to 4,000 feet and down again within the hour, it seems this site had "a little something the others haven't got." We are hoping in the next week or two to be in a position to explore its potentialities more thoroughly.

Equipment at Cramlington is now comparatively comprehensive again and training will be accelerated in consequence.

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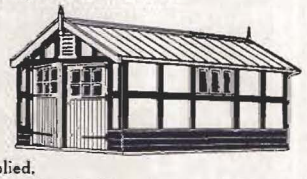


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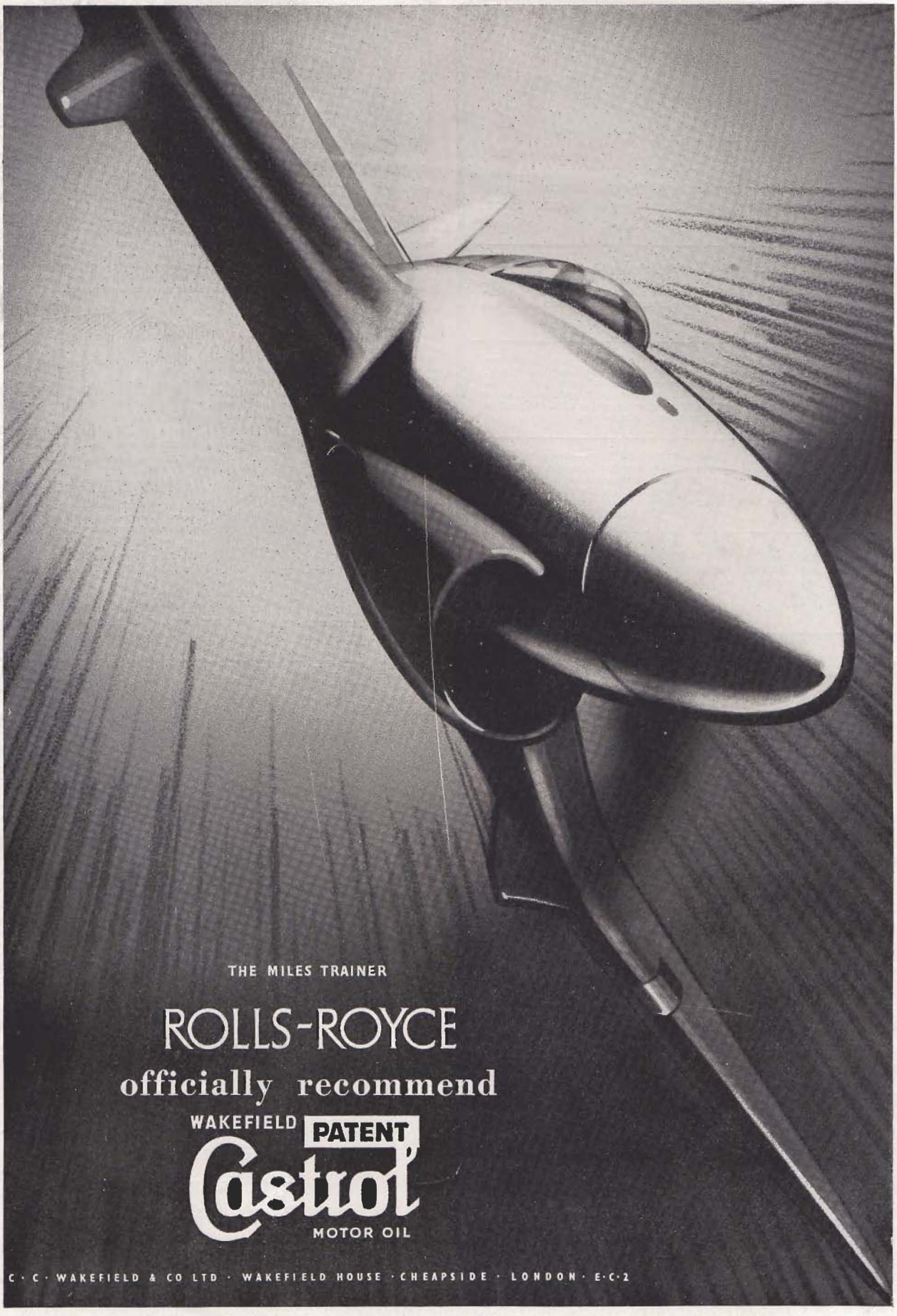
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