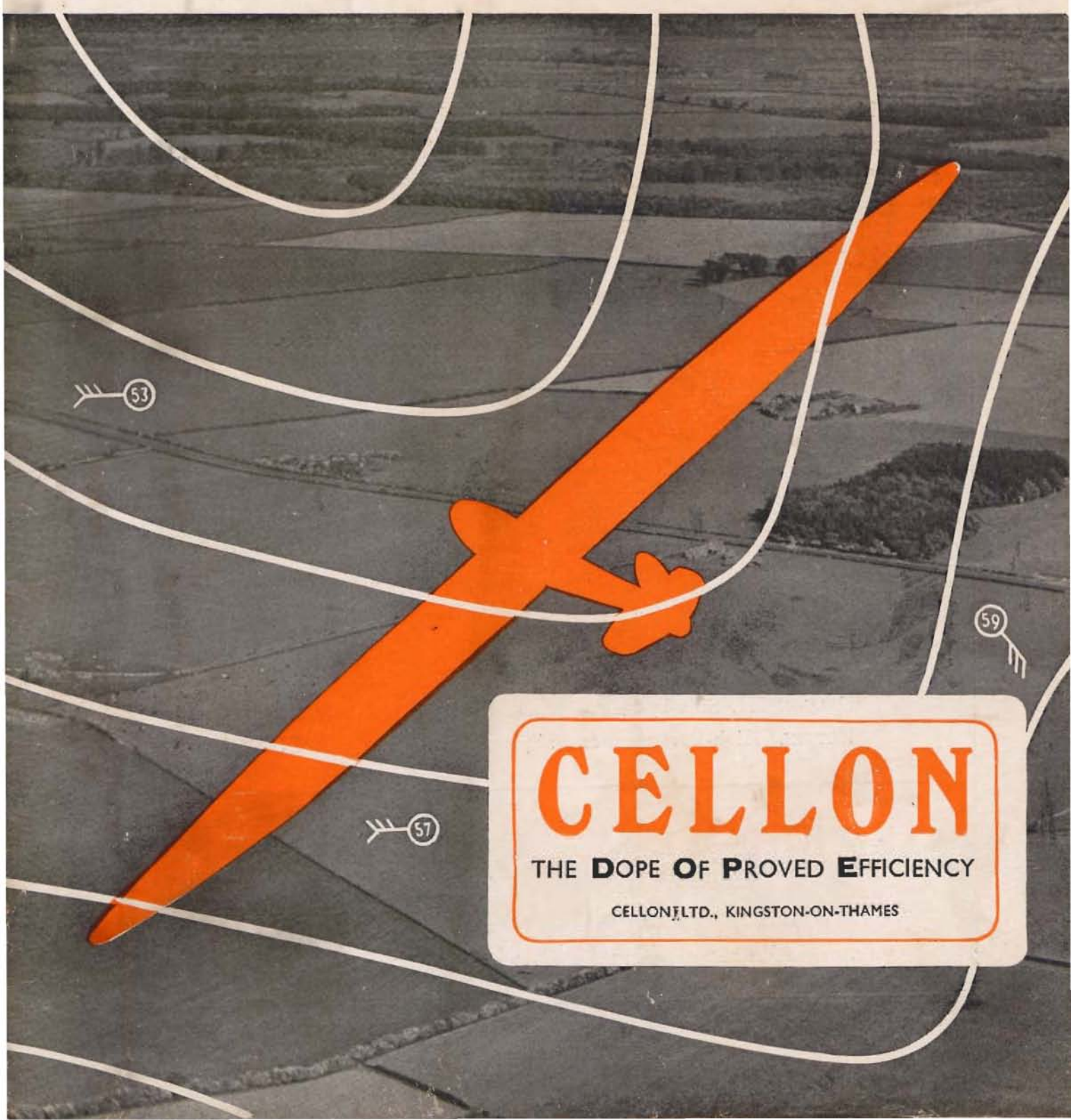
SAILPLANE AND GLIDER

APRIL
1939
Vol. 10 No. 4

Published Monthly
PRICE - - 1/-
Editorial Offices:
13, Victoria St., S.W.1

Official Organ of the British Gliding Association

EDITED BY ALAN E. SLATER



THE SAILPLANE *and* GLIDER

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

Vol. 10 No. 4 APRIL, 1939 Published Monthly—Price 1/-

April Weather

FROM April 7th to 10th members of the London, Derbyshire and Lancashire, and Midland Gliding Clubs will be spending their Easter holidays as guests of Sir W. Lindsay Everard at his private aerodrome at Ratcliffe, north of Leicester. Which way is the wind going to blow?

Quite a number of people seem to have answered this question already. They are not expecting the prevailing wind of the British Isles, which is west-south-west and would soon bring cross-country pilots to the sea at a corner of the Wash, 46 miles away. Nor a due west wind, which would give a run of 120 miles to the east coast. Nor a wind from S.S.E., which has the longest overland run of all—420 miles to John o' Groats—but is unlikely to take a sailplane with it, as such a wind usually heralds an Atlantic depression and stable air.

What is hoped for, and apparently expected, is a north-east wind, blowing towards Land's End, 270 miles away. For this reason pilots are deserting their own west-facing sites and flocking to Leicester. In fact, Philip Brown, of Derby, has gone one better and has already taken his MINIMOA still further eastwards to Norwich, where, according to the local papers, he is going to stay until a north-easter comes along to take him 350 miles to Land's End. Others, less sure of their prognostic ability, are going to the Cambridge Club's meeting from April 2nd to 16th in Wiltshire, where westerly winds also will give a good long run and there are other slopes besides the north-easterly one at Inkpen to start from.

The "Blackthorn Winter"

Last year Philip Wills, in an article describing how he raised the British distance record to 209 miles in a north-easterly wind at the end of April, wrote in THE SAILPLANE: "I have personally noted that in each of the past four years we have had, between March 20th and April 30th, a spell of highly unstable north-east winds." And Dudley Hiscox, who is one of the organisers of the Leicester meeting, bases his optimism on the fact that for the past six years these spells have come, most conveniently, at Easter. As Easter is a Movable Feast, depending for its date on the time of full moon, it looks as if the moon really does influence the weather, though this has been disproved by scientists and is nowadays believed by nobody but the general public.

To show what the wind has been doing during the past six Easters, including the whole of April and that part of March in which Easter may fall, we have prepared the diagram which appears on the next page but one.

In this diagram the strip showing the wind direction for each year has the westerly half of the compass above and the easterly below, according to convention. So that winds associated with depressions coming in from the Atlantic are in the top half of the strip, and a line joining the entries should look much the same as a barometer record, falling for a backing of the wind as the depression approaches and rising with a veer of wind after it has gone by. North-easterly winds, which concern us at the moment, appear at the bottom of each strip, and it will be seen that these have occurred at, or just after, Easter in each of the six years. The data are those for London, which are available in convenient form; to enter up those for other parts of England would mean looking up 260 weather charts for each station. But the winds in London are seldom very different from those elsewhere in England except in calm weather; for instance, on Easter Sunday, 1936, when cross-country flights were made from Derbyshire in a strong north-east wind, it was light and northerly in London, while in the Channel Islands the Jersey Gliding Club experienced a dead calm.

The period of cold weather brought by northerly winds at this time of the year is known to tradition as the "Blackthorn Winter." The blackthorn (*prunus spinosa*), common in hedges and copses throughout the British Isles, comes into flower before the leaves appear; its average flowering date is April 11th, though the date is nearly two weeks earlier in south-west England and a fortnight later in the east of Scotland. Tradition has it that a spell of wintry weather always arrives a short time after the flowering of the blackthorn. There is a similar tradition as to cold spells in the middle of April on the Continent of Europe.

Sir Napier Shaw, writing to *The Times* in 1931, explained it as probably due to the fact that "between

January and July ten billion tons of air are transferred from the northern hemisphere to the southern," and that "the escaping air starts cold and will hug the surface." As it cannot get over the Eurasian continent, he says, it has to find a way round. He points out that the north-east trade winds carrying northern air to the equator are strongest in April, and concludes that "the 'Blackthorn Winter' arises from the transfer southward of the surplus air of the Polar regions, cold when it passes us."

Buchan's Cold Spell

In 1928 a Bill for fixing the date of Easter, promoted by Lord Desborough, found its way to the Statute Book, though only on condition that it would be suspended until the consent of the Churches should be obtained. He fixed on the Sunday after the second Saturday in April, which would place Easter Sunday between April 9th and 15th, inclusive, each year. Whereupon it was pointed out by some meteorologists that this period coincided with a "Buchan's cold spell," and a great argument was started on the question whether the late Dr. Alexander Buchan knew what he was talking about in the year 1867 when he published his list of cold and warm periods which, he said, interrupted the normally gradual change of average temperature throughout the year. Here is a list of them:—

Cold Periods	*Warm Periods*
1. February 7th—10th.	1. July 12th—15th.
2. April 11th—14th.	2. August 12th—15th.
3. May 9th—14th.	3. December 3rd—9th.
4. June 29th—July 4th.	
5. August 6th—11th.	
6. November 6th—12th.	

Buchan based these periods on a study of the temperatures at Milne-Graden, in Berwickshire, during ten years only. When, later, he had investigated a much longer period of time, he came to the conclusion that, though these periods existed, they were not regular in their occurrence, and that the exact time each one began varied from year to year. But he found, nevertheless, a tendency for them to occur at about the same date in immediately consecutive years. It will be seen from our diagram that there has been hardly any tendency of this kind since 1933, assuming the cold periods to be due to northerly winds. That northerly winds were the cause was by no means assumed by Buchan till he had made a long and tedious research among past statistics, after which he announced that this was the case. "In the light of modern knowledge," says E. L. Hawke in his book, *Buchan's Days*, "this is rather like saying that a man is drunk because he has had too much to drink."

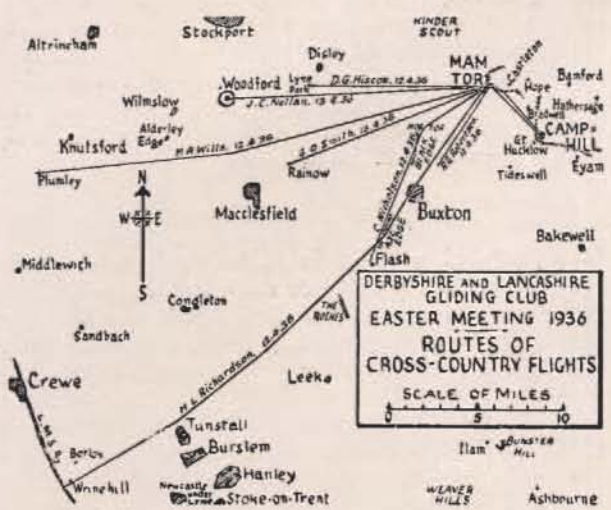
The book mentioned (published by Lovat Dickson at 5s.), from which we have obtained most of this information, is by the Secretary of the Royal Meteorological Society, who incidentally lives within two miles of the London Gliding Club. Mr. Hawke shows that the "Blackthorn winter" of mid-April is one of the most reliable of Buchan's periods, and proves it by giving the average daily temperatures over a period of 65 years from 1841 to 1905. We have entered these figures at the bottom of the diagram, and it will be seen that the normal seasonal rise of temperature is interrupted on April 9th by a drop of one degree which is maintained for at least five days. This is good enough evidence considering that the exact date varies from year to year. In fact Buchan found that, over a period of 50 years, the onset of his "second cold period" varied only between April 6th and 12th, "and in all cases it continued cold for about three or four days."

Soaring in Past Aprils

The diagram of past wind directions will probably start a train of reminiscence for most readers in the British Isles. What were they doing that April, and especially during those Easter holidays? Perhaps we might jog their memory.

In 1933 north-east winds set in on Easter Monday, and the only clubs with suitable sites were the Southdown, which did quite a lot of soaring over their old Steep Down site at Lancing; the Furness, which had made an expedition to Black Combe; and the Ulster,

A snowstorm approaching Mam Tor, Derbyshire, from the north-east on Easter Sunday, 1936, during the "Blackthorn winter" or "Buchan's Cold Spell." Unlike the typical April shower, which is comparatively restricted in area, this storm was an extensive "cold front," for H. L. Richardson connected with the up-current in front of it and took his "White Wren" 33 miles to the south-west.



Easter, 1936, like all Easters of the past six years, brought north-easterly winds, with the results shown above.

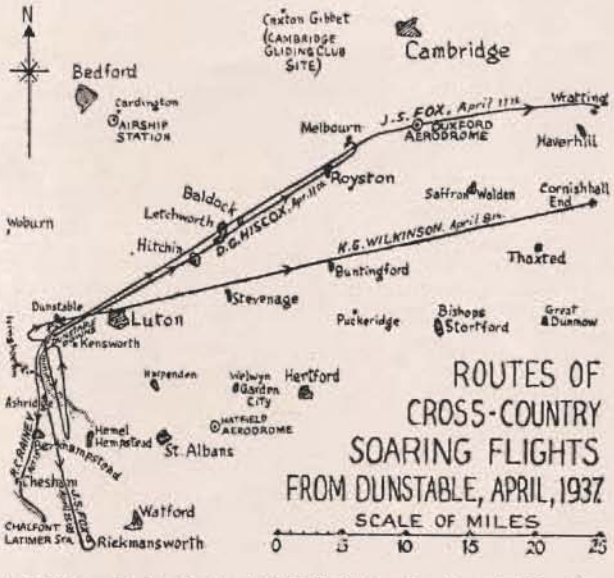
whose KASSEL 20 soared for some miles along the cliffs of the east coast of Ireland and got up 750 ft. Two days before, at Dunstable, Mr. Hardwick (now president of the Midland Club, which didn't exist then) got his "A"; so did Geoffrey Bell, who has helped to make the latest gliding film, but at that time thought he was going to grow up a meteorologist.

A week before that, at Dunstable, Philip Wills was complimented (or chided) in the London Club news for his "unique PRÜFLING landings on assorted and highly unusual parts of the landscape," while a young pilot who shall be nameless (he has now a "Silver C") took another PRÜFLING into the eddy behind the Bowl and turned completely upside down in the air.

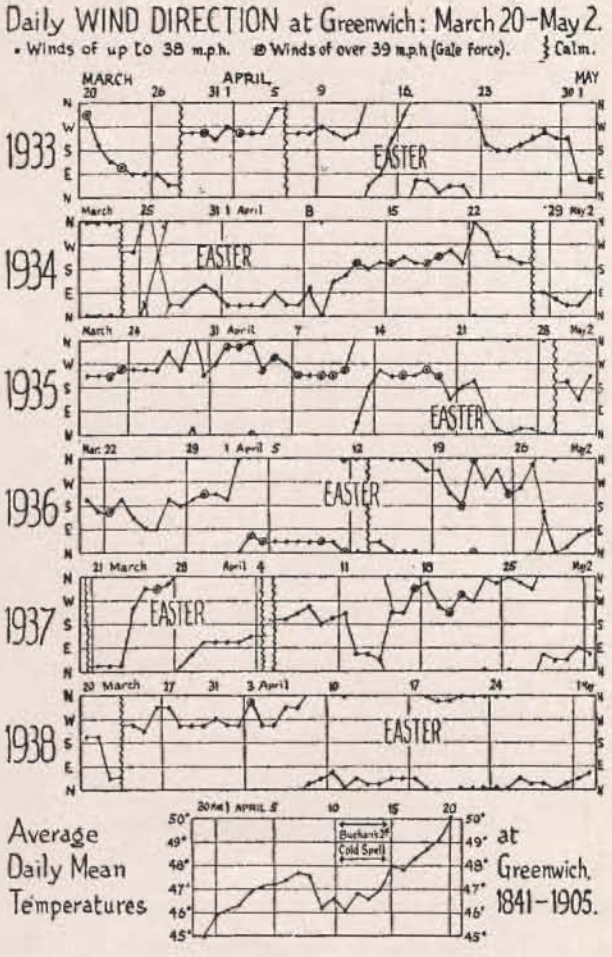
Easter, 1934, came in the middle of a fortnight of almost continuous north-easterlies, and the Bradford Club (which has now blossomed into the Yorkshire Gliding Club) chose this time to come to Dunstable *en masse* in search of soaring certificates. They would have done better to visit the Southdown Club, where there was perfect soaring for three days, and on Easter Sunday pilots looked down on the neighbouring aerodrome where flying had been prohibited on account of the "dangerously high wind."

In 1935 the north-east winds were a little late; Easter had south winds, in which the historic GOLDEN WREN soared in company with a RHÖNBUSSARD at Eyam Edge in Derbyshire, which was then nobody's site. Later in the month the famous RHÖNADLER (still going strong) arrived from Germany, and on the 22nd Eric Collins took it 53 miles to Southend, thereby earning the first British "Silver C."

Round about Easter, 1936, there were north-east or north winds for over two weeks on end. The newly formed (or newly amalgamated) Derbyshire and Lancashire Club had its inaugural meeting, and flying had to be done from Mam Tor, punctuated by snow showers. By using one of these, which had a "cold front" character, H. L. Richardson flew 33 miles.



In 1937, on the day Buchan's Cold Spell was due, the wind blew from W.S.W. as this map shows. When northerly winds arrived a fortnight later, they were so unstable that pilots got across country by picking up thermals from winch launches.



This table should settle a great many arguments. But we defy anyone to prophesy the winds of April, 1939, by the method of "extrapolation."

April Showers

We might say a word or two here about "April showers." When cumulus clouds grow into cumulo-nimbus and produce showers, the usual cause is abnormally cold air at high altitudes which, being cold, is very ready to make way for up-currents. But the remarkable thing about an April shower is that the cloud does not need to be very thick to produce quite a heavy downpour or snowstorm; in the summer, on the contrary, cumulus masses can build up to much greater heights without disgorging rain.

The only theory which accounts for this at all satisfactorily is that propounded by Bergeron as recently as 1933. Bergeron holds that *large* raindrops can only form when there are snowflakes or ice crystals present among the tiny water droplets of the cloud. The ice forms a nucleus on which water vapour is encouraged to condense, and this water vapour is actually supplied by the evaporation of the surrounding water droplets. The reason, which readers well versed in physics will understand, is that the "saturation vapour pressure" over the water droplets is greater than that over the ice crystals.

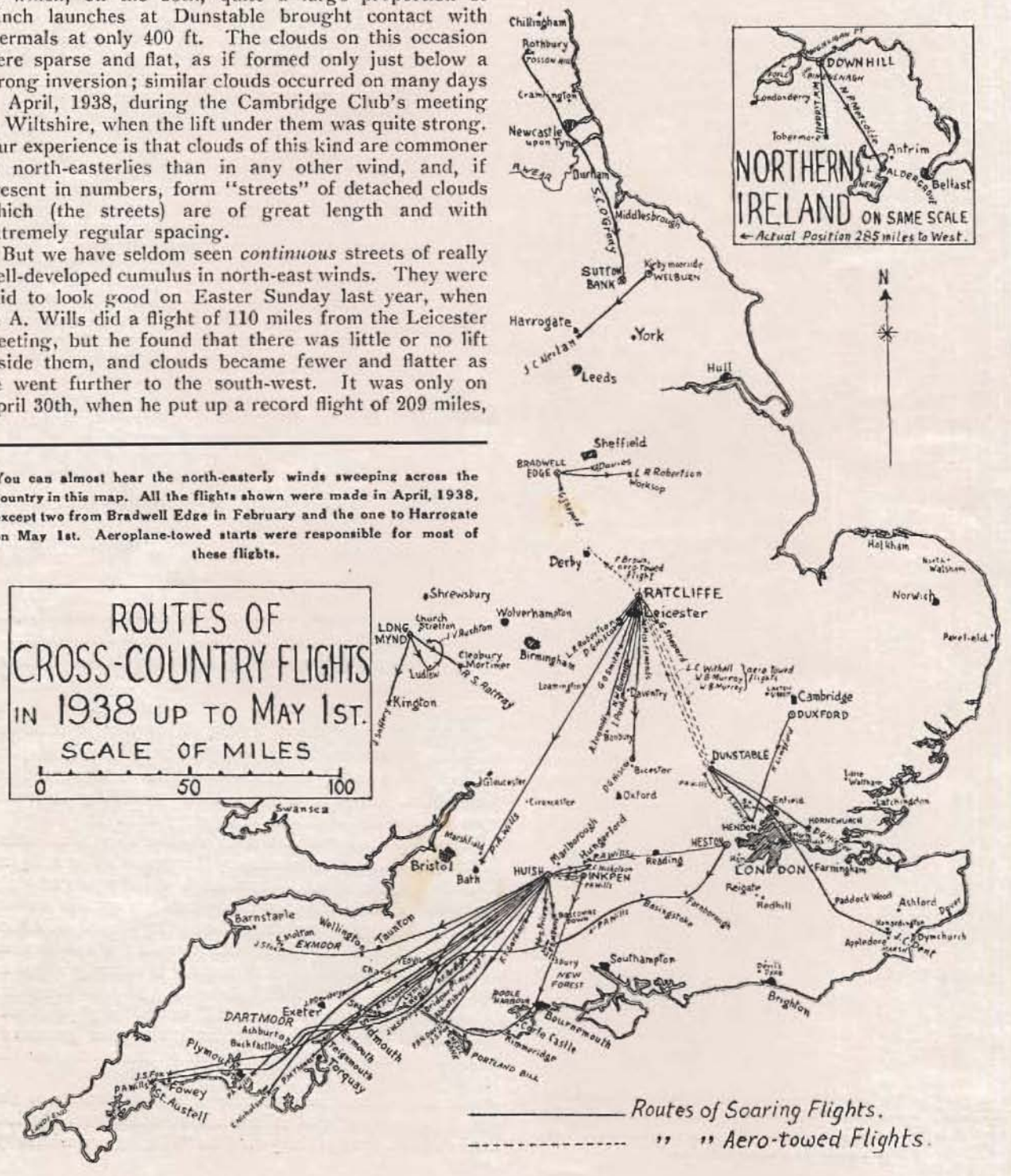
What favours the presence of ice and snow in the cloud is the coldness of the air at comparatively low levels at this time of the year (the "Blackthorn winter").

That this is so is shown by the character of the cloud. When a shower cloud develops an "anvil" at its top, it is a sign that it is becoming "frozen." April showers, as G. A. Clarke says in his book, *Clouds*, often consist almost entirely of "anvil."

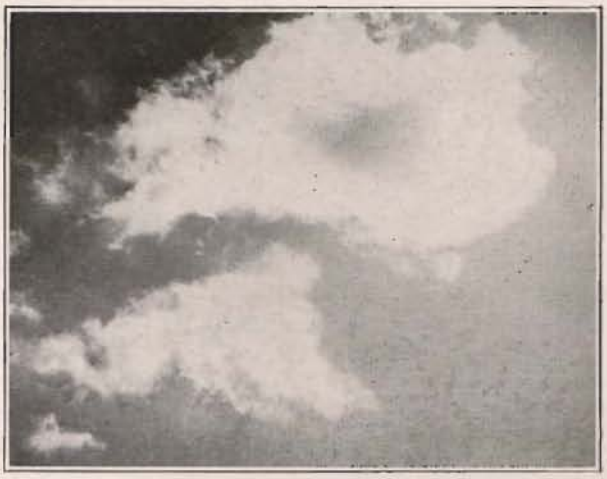
Easter, 1937, was early. It had northerly winds which went round to the east later, giving north-easterlies only on Sunday and Monday. Their chief use was to enable pilots at the Cambridge Club's camp to fly along the Purbeck range of hills in Dorset. At the end of the month north and north-east winds returned; they were light, and brought unstable air in which, on the 25th, quite a large proportion of winch launches at Dunstable brought contact with thermals at only 400 ft. The clouds on this occasion were sparse and flat, as if formed only just below a strong inversion; similar clouds occurred on many days in April, 1938, during the Cambridge Club's meeting in Wiltshire, when the lift under them was quite strong. Our experience is that clouds of this kind are commoner in north-easterlies than in any other wind, and, if present in numbers, form "streets" of detached clouds which (the streets) are of great length and with extremely regular spacing.

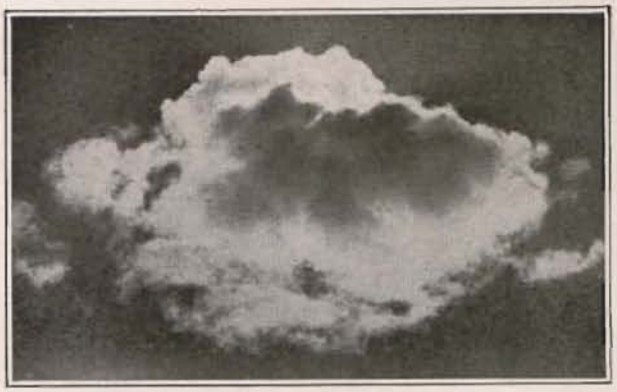
But we have seldom seen *continuous* streets of really well-developed cumulus in north-east winds. They were said to look good on Easter Sunday last year, when P. A. Wills did a flight of 110 miles from the Leicester meeting, but he found that there was little or no lift inside them, and clouds became fewer and flatter as he went further to the south-west. It was only on April 30th, when he put up a record flight of 209 miles, that Mr. Wills found really good cloud streets in a north-east wind. That morning at Heston, he wrote, "the sky looked marvellous. Tremendous streets ran up and down wind as far as the eye could see."

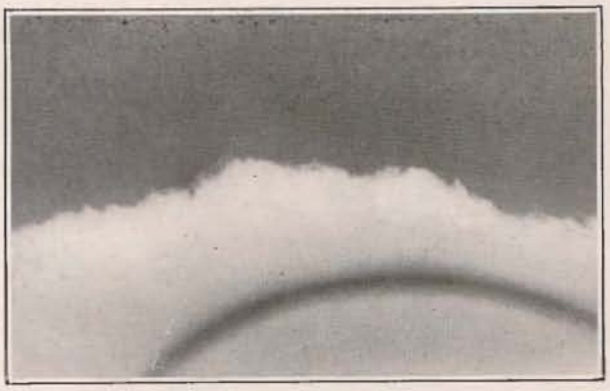
Finally, we may quote from the summary of the weather of April, 1938, published by the Meteorological Office: "The main feature of the weather of April was the absolute drought experienced over a wide area in the southern half of England." Also: "Sunshine totals were slightly below the average along the east coasts of Scotland and England where, particularly in



You can almost hear the north-easterly winds sweeping across the country in this map. All the flights shown were made in April, 1938, except two from Bradwell Edge in February and the one to Harrogate on May 1st. Aeroplane-towed starts were responsible for most of these flights.







Examples of cumulus clouds in light northerly or north-easterly winds. Though thin and sparsely distributed, they often signify strong thermal currents below. The upper photo shows clouds at the top of a thermal which J. S. Fox caught off a winch launch at Dunstable, on April 25th, 1937 (his "Rhönadler" can be seen near the lower edge). The middle photo was taken on the morning of April 10th, 1938, just as the same pilot was starting on a flight of 91 miles from Wiltshire; and the lower one was taken by Mr. Fox himself while he was setting up a British distance record of 144 miles on April 18th, 1938, by flying from Wiltshire to Cornwall.

the latter half of the month, cloudy skies were experienced in the northerly air stream." The first of these statements accounts for the good thermals which resulted in over 2,000 miles of cross-country soaring being done in Britain during the month. The second explains why the Cambridge Club's meeting in Wiltshire had bright skies and sparse clouds, while at Leicester the sky was usually overcast.

From Here and There

Soaring Birds.—At the annual meeting of the Association of Bird Watchers and Wardens on March 24th, it was stated that only about 17 kites now exist in central Wales. Inbreeding was suggested as a cause of their threatened extinction, and the same cause is expected to decide the fate of the Californian condor, of which only between 40 and 50 wild specimens exist to-day.

* * *

F.R.S.—At the meeting of the Royal Society held on March 16th, Professor D. Brunt, who is chairman of the British Gliding Association and professor of meteorology at the Imperial College of Science, was elected a fellow of the society. Among other newly elected fellows is Professor B. Melville Jones, of Cambridge; it was he who, ten years ago, gave a memorable lecture advocating the streamlining of commercial aeroplanes, which at that time, he showed, were wasting two-thirds of their power in creating useless turbulence.

* * *

Soaring into Oblivion.—The pilot Erich Klöckner, of the Soaring Research Group at Prien, on the Chiem Lake, has climbed to 7,000 metres (23,000 ft.), according to *Flugsport*. He was aero-towed from Oberbinzau in a stormy wind, cast off over Mitterfill, and rose until, at the height stated, the oxygen apparatus froze up and he became unconscious. He then fell to 4,500 metres, regained consciousness, and landed near Seefelde. As it is stated that he was engaged in research into Foehn winds, it looks as if he was soaring in a stationary air wave in lee of the Alps.

* * *

Olympic Games.—Everything possible is being done to have motorless flight included in the Olympic Games in Finland in 1940, but a final decision has yet to be made. If it should be so included, competitors would attend the opening of the Games at Helsinki on July 20th, 1940, and proceed to the gliding centre at Jämijärvi for the competitions, which would start on July 22nd and possibly continue till August 4th. The tests of sailplane types for the Games were made in Italy in February by pilots of several nations, with the result that the German type Meise was chosen as the most suitable. We will give particulars and illustrations of this machine in a later issue.

* * *

Ten Years Ago.—On April 14th, 1929, Robert Kronfeld started from the Wasserkuppe at 3.30 p.m. in a N.N.W. wind of 11 m.p.h. and, after half an hour, saw a cumulus cloud, made for it, and climbed to 1,275 metres (4,183 ft.). It would have been a world's height record but for the fact that he was over 2,000 metres above sea level, and his barograph only read to 2,000 metres. On April 24th Johannes Nehring soared from Malchen along the Bergstrasse (a chain of hills on the east bank of the Rhine) to Bruchsal, putting up a world's distance record of 72 km. (44¾ miles). He started at 2.30 p.m. and landed 4.20, and on the way rose under a cumulus to 1,209 metres (3,967 ft.)—an official world's height record.

Coming Events

Club Meetings

FRIDAY, APRIL 7TH, TO MONDAY, APRIL 10TH.—Aerotowing meeting at Ratcliffe Aerodrome, Leicester, by kind permission of Sir W. Lindsay Everard, M.P. London, Derbyshire and Lancashire, and Midland Gliding Clubs.

APRIL 2ND TO 16TH.—Cambridge University Gliding Club at Draycot, Pewsey, Wilts.

MAY 27TH TO 29TH, or longer (Whitsun holiday).—Surrey Gliding Club, Reigate. Cross-country meeting.

National Contests

BRITAIN.—Saturday, July 8th, to Sunday, July 16th, at Bradwell Edge, Great Hucklow, Derbyshire.

U.S.A.—June 24th to July 9th, at Elmira, N.Y.

GERMANY.—July 23rd to August 6th, at Wasserkuppe, Rhön Mountains. Contest for two-seater sailplanes: June 25th to July 9th, at Hanover. Goal flight tour: June 18th to July 2nd.

International Meetings

POLAND.—May 14th to 20th, at Katowice and Warsaw, organised by the International Commission for the Study of Motorless Flight. Conference and flying meeting.

Instruction Courses

Courses for gliding instruction, open to non-members, are held by the following clubs:—

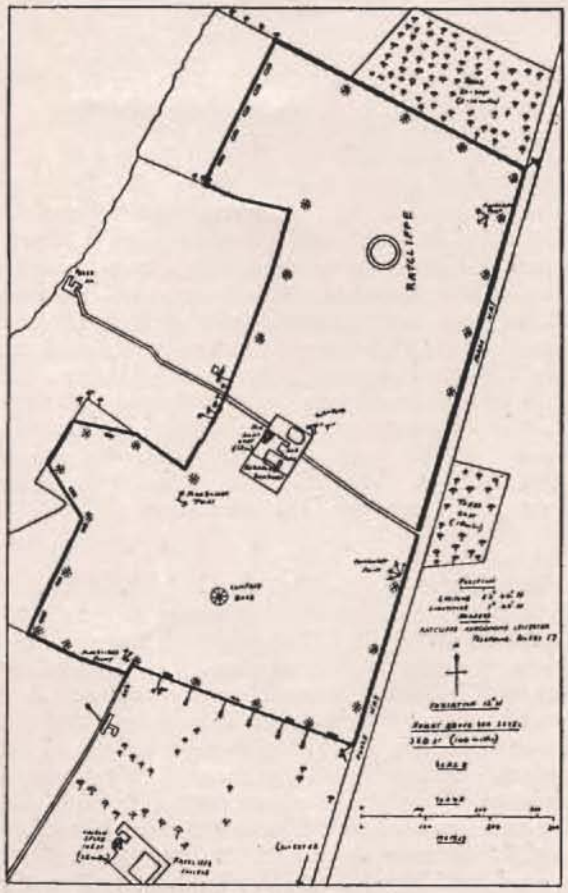
London Gliding Club: April 7—16, May 5—14, June 2—11, July 7—16, August 4—18, September 8—17. Particulars from the Manager, London Gliding Club, Dunstable, Beds.

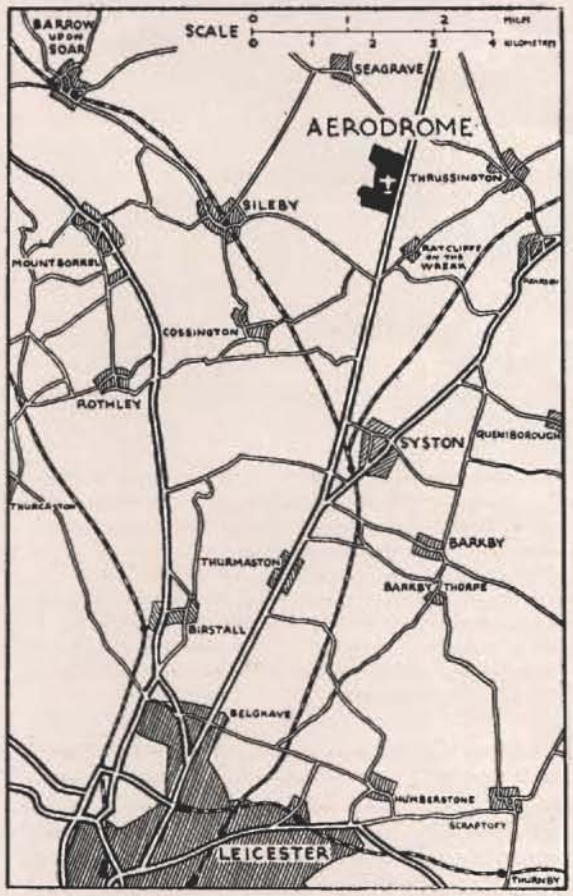
Yorkshire Gliding Club: May 28—June 3, August 13—26, September 3—16. Also an advanced course from July 30 to August 6. Particulars from G. A. Hinchcliffe, Netherfield, Mill Lane, Bardsey, nr. Leeds, Yorks.

Derbyshire and Lancashire Gliding Club: September 2—16. Apply to Camp Secretary, 17, Sackville Street, Manchester 1.

Midland Gliding Club: April 7—15, May 27—June 4, August 5—13, August 19—27 (Public Schools Camp). Particulars from R. N. Thwaite, 39, Silhill Hall Road, Solihull, Birmingham.

Surrey Gliding Club: July 15—30. Particulars from the Secretary, Buckland, Betchworth, Surrey.





These maps of Sir W. Lindsay Everard's private aerodrome should enable those who attend the Easter meeting to arrive safely either by road or by air.

Gliding Certificates

The following gliding certificates, for which qualifying flights were made on the dates shown, were granted by the Royal Aero Club on March 20th:—

"A" Certificates

No.	*Name.*	*Club.*	*Date.*
1216	J. H. Gill	Surrey	10.12.38
1217	J. A. Lyon	Cambridge ...	17.2.39
1218	H. G. W. Hamilton ...	Cambridge ...	20.2.39
1219	F. A. Grantham ...	Southdown ...	6.8.38
1220	O. P. Jones	Surrey	6.3.39
1221	J. H. Lewis	London	18.2.39
1222	R. S. Peill	London	18.2.39
1223	C. G. Dorman	Oxford	4.12.38
1224	Vera E. Strodl	Oxford	18.9.38
1225	H. J. Kirkpatrick ...	Oxford	26.2.39

"B" Certificates

No.	*Name*	*Club.*	*Date*
1198	D. J. C. Pinckney ...	Cambridge ...	5.2.39
1062	E. Straus	London	19.2.39
1068	H. G. Wheatcroft ...	London	18.2.39
829	K. H. Lee	London	18.2.39
1015	P. Davie	London	18.2.39
1219	F. A. Grantham ...	Southdown ...	23.10.38
1092	R. E. H. Fender ...	London	19.2.39
1222	R. S. Peill	London	19.2.39
1221	J. H. Lewis	London	19.2.39
1209	J. H. Vickers	Oxford	9.3.39
1218	H. G. W. Hamilton ...	Cambridge ...	16.3.39
1225	H. J. Kirkpatrick ...	Oxford	26.2.39
1224	Vera E. Strodl	Oxford	18.9.39

"C" Certificates

No.	*Name.*	*Club.*	*Date.*
1017	C. J. Arnold	London	15.2.39
1193	W. McD. Morison ...	Cambridge ...	26.2.39
877	W. B. Ellis	Newcastle ...	30.1.39
926	O. R. Cramer	London	26.2.39
1191	A. R. Turpin	Surrey	5.3.39
1189	A. G. Douglas	Surrey	4.3.39
1222	R. S. Peill	London	26.2.39
1023	G. Ryle	Oxford	9.2.39
1219	F. A. Grantham ...	Southdown ...	12.2.39

For the first time in history (as far as we know) the list contains the name of an Imperial Airways pilot. He is Captain O. P. Jones, who learned to fly 21 years ago, served with the R.F.C. and R.A.F., and joined Sir Alan Cobham's Display in 1920 and Instone Air Lines (now merged in Imperial Airways) in 1922. His flying record up to October, 1937, was 1,340,000 miles and 13,395 flying hours. As Captains Youell and Horsey, also of Imperial Airways, have likewise joined the Surrey Gliding Club, perhaps there will soon be a soaring club at Croydon similar to that of the German Lufthansa at Berlin.

Mr. Gilbert Ryle, who now has his "C," was one of the founders of the Oxford University and City Gliding Club last year, when he was Oxford's Junior Proctor. Mr. A. Graham Douglas, the Surrey Club's first pupil, has now, with his "C" certificate, got even with his fiancée, the club secretary, and it remains to be seen which will attain the "Silver C" first.

So far this year the numbers earned by the different clubs are: Cambridge, 16 (including 1 "C"); London, 13 (3 "C"); Oxford, 7 (2 "C"); Surrey, 6 (3 "C"); Newcastle, 4 (1 "C"); Southdown, 1 "C"; Derbyshire and Lancashire, 1; Midland, 1.

Kronfeld Lectures

Robert Kronfeld, who startled the world ten years ago by showing the great possibilities of soaring flight, is seen in the centre of this photograph taken last Spring when he visited the London Gliding Club. Also in the picture are, on his right, John Saffery and Miss M. S. Thring, and in the foreground, the late Captain R. S. Rattray.

A LECTURE on "Gliding and Soaring" was given by Mr. Robert Kronfeld to the Royal Society of Arts on February 8th. Much of what he said would be familiar to readers of THE SAILPLANE, who will be chiefly interested to know how Mr. Kronfeld, as manager to the Oxford Gliding Club, has achieved such striking results.

He attributes his success chiefly to the use of a winch on a flat field instead of training pupils on a hill site, which, he says, is apt to lead to much crashery. With a winch, progress can be more evenly graduated, and the winch driver can often extricate a pupil from difficulties by varying the touring speed. In addition, Kronfeld uses his invention of the horizon bar on every primary machine; this is an upright rod sticking up from the extreme nose and carrying a cross-piece which can be adjusted to suit the height of the pupil's eyes. By keeping this on the horizon a pilot merely flies as if he were aiming a gun.

Pupils are not allowed on secondary machines until they can make spot landings (to within 30 yards) and turns round a given point. To enable a pilot at this stage to soar over a hill, it is then only necessary to mark the soaring area with flags.

Kronfeld believes that "the future of gliding will depend very much on whether gliding can systematically be used with success as preliminary instruction for aeroplane pilots." This sounds odd, coming from one who, more than any other man, established soaring flight as a worthy end in itself. However, his present creed leads him to complain that sailplane controls are not sensitive enough; they should give the pilot a feel so like an aeroplane.

"A modern gliding club," in Kronfeld's opinion, "should operate from a flat field by means of winch towing and aero-towing. If the club is exceptionally lucky, a field might be found on the top or bottom of a soarable hill. This would do away with the necessity of an aeroplane." So the poor old hill may have its uses after all!

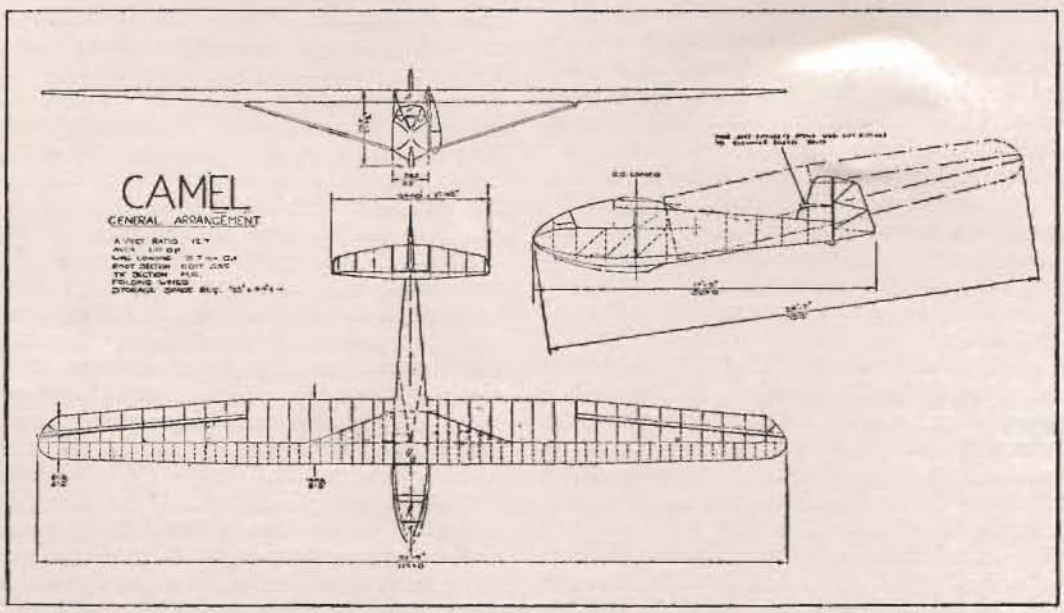
The "Camel"

By J. S. SPROULE

DURING the winter of 1937–8 Ivanoff and myself decided to design a medium performance sailplane. After much vociferous discussion we finally decided that we wanted small span, pleasing line, cheapness, good controls and speed range. For good measure—and perhaps to show off a little—we would throw in the desirable features of quick assembly and wing-folding. Mr. Smith, of Southampton, was of much assistance when we finally got going on the design—in connection with the stressing—and Ivanoff and myself would like to record our appreciation for all the trouble he took.

The CAMEL is of the torsion-resisting leading edge, single spar and lift strut formula. The wings do not meet on a narrow neck as on most machines of this layout, but meet the fuselage at its full width. The wing-fuselage junction was the subject of much careful thought, the underside of the root wing section being flattened to avoid any undesirable burbles. Also, as the fuselage sides were kept parallel with one another at this point, we feel we have done our best over this question.

The fuselage is slab-sided for cheapness but, we fondly hope, quite easy on the general eye. The bulkheads have no corner blocks, the ply gussets, etc., being of suitable thickness, as this is much cheaper



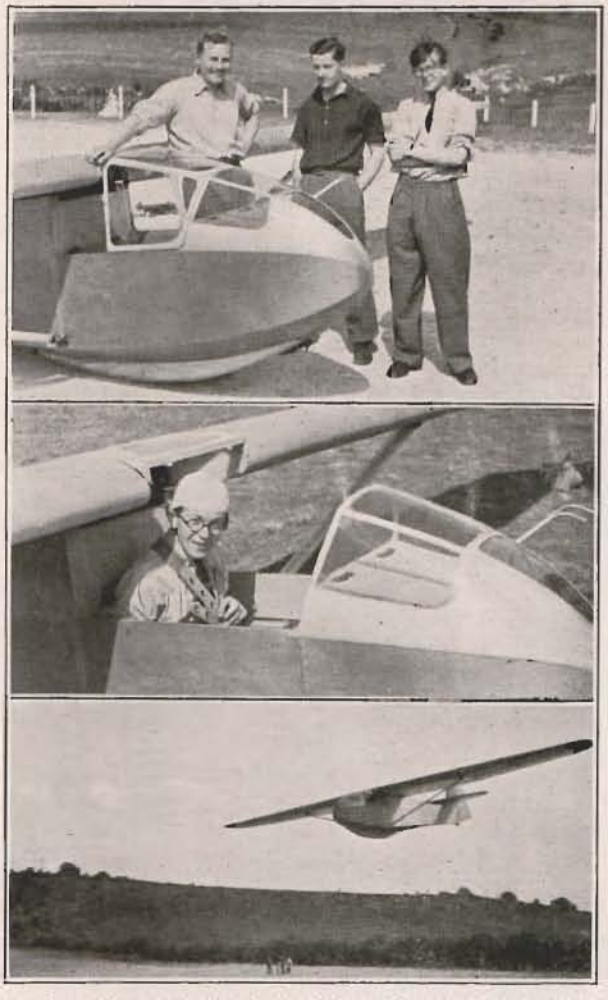
General arrangement drawings of the "Camel" which was constructed by Scott Light Aircraft, of Dunstable. The span of the first machine is slightly larger than that shown in the drawing, being 35 ft. 8 ins.

than the labour of fitting wood into the various corners.

The steel tube struts meet the wings at balsa "blobs," as the attachment fittings are carried well below the wing, to reduce interference. The flattening of the wing section, as mentioned above, has the added advantage of giving a deeper rear "sparlet" to bolt the wing-fuselage attachment fittings to. The wing folding fittings at this point are extremely robust and simple, and the additional weight of this feature is about 5 lbs.

Folding procedure is as follows :—

The tailplane is removed by releasing its quick release bolts. A section of decking is removed from the fuselage top. The wing lift strut is released from the wing at the top end, and the strut is swung back alongside the fuselage, to engage in a small catch on the lower longeron. The wing is then released at the main spar root and raked back until the leading edge is clear of the fuselage. It is then lowered and the wing is folded back flat along the fuselage, the strut lift fitting engaging by means of a small jury fitting to the appropriate elevator quick-release at the tail. The procedure is identical in the case of the other wing, and the entire operation takes about three minutes.



Top, from left to right: A. Ivanoff, T. T. Davies, and J. S. Sproule, the owners of the "Camel." The centre picture shows that the cockpit is both roomy and easy to get out of in a hurry. Below is the machine on one of its first test hops.

The fully enclosed cockpit top continues in unbroken line from the wing, right down to the nose. The cockpit (from which there is a surprisingly complete view) was designed for rapid exit. The hinged top of the two transparent swinging panels are all secured by a common quick release. There is no parachute box to jam a back-type parachute pack.

The tailplane is of the balanced variety, and is carried high on the fin. This is an aid to spin recovery as well as making an easier job of holding back on bungy launches.

The strength factors are 11 for the c.p.f. case, and 6 for inverted flying. There is a factor of 2 at 160 m.p.h. The speed at which aileron reversal would occur is 174 m.p.h.

The CAMEL stalls at 30–32 m.p.h. according to pilot, and this is unaccompanied by any vicious tendencies.

The wing root section is Göttingen 535 flattened on the underside, merging into 535 proper three ribs out and continuing thus to the aileron roots. From here the Göttingen 535 merges into Göttingen 389 at the tip. The datum lines of these sections gives 3.6° aerodynamic wash-out.

Optimum sinking speed (checked by Slater-Cobb) is 2.85 ft. per second at 35 m.p.h. A sinking speed of 6 ft. per second occurs at 65–70 m.p.h. The CAMEL has so far been dived up to 80 m.p.h., opportunity for going faster not having yet presented itself.

The CAMEL is very amusing indeed to fly, control being extremely positive and aeroplane-like without being in any way "jumpy," as one might expect in a small machine. Turns can be made on rudder or aileron alone, and the elevator is, rather unexpectedly, very mild for a full floating type. The machine is pleasantly stable longitudinally and betrays no signs of hunting on the winch climb.

The machine has been flown in all sorts and strengths of winds throughout the last winter, and the syndicate, which includes T. T. Davies, is looking forward to the summer and its thermals. It *would* be nice to land it in France, where all the other "Camels" were, but nice things like that *never* happen!

This Gliding

A BORED YORKSHIRE GLIDER MANUFACTURER is being interviewed by the Press.

REPORTER: "What is the use of gliding—I mean to say, why do people do it? There must be some appeal?"

B.Y.G.M.: "That's an easy one."

REPORTER: "Oh, I should have thought the idea was to give the Youth of Britain air sense."

B.Y.G.M.: "Maybe; but have you ever stood on the edge of a high cliff and felt the urge to spread out your arms and soar gracefully over the country below?"

REPORTER: "Yes, yes, now you mention it I have felt like that!"

B.Y.G.M.: "Well, gliding allows you to do it more than just once; even if only a few times more than just once the Coroner will not say rude things about you."

On Bathwater

By CORUNUS

THE world is divided broadly speaking into two types of minds: those which wonder why the bathwater always spins out of the plug the same way round (indeed why does it spin at all?) and those who don't. At school they were called Moderns and Classics.

The sport of sailplaning, however, attracts all sorts, so let me say that even if you are a classic it is worth studying this problem a little closer.

Before we go further, a word of warning. Many of the keenest enquirers have been nearly driven to drink on observing the bathwater apparently going out the wrong way round after all. (The right way is anti-clockwise in the northern hemisphere, clockwise in the southern hemisphere.) This may be due to one of the following causes:—

(*a*) Often, I am told, it may be an optical illusion, which can be destroyed by dropping, say, a spot of lather on the swirling surface of the funnel, which spot can then be followed round with the eye.

(*b*) You started off with the water in initial motion the wrong way.

(*c*) The bath isn't big enough and introduces undesirable local topographic features. This can easily be cured by buying another one of at least twice the size. To be quite sure of results the bath should be some hundreds of yards across with the plug in the centre.

(*d*) The earth has stopped rotating.

* * * * *

In the subsequent endeavours to explain this complex matter one may seem to dodge about at times in rather a kaleidoscopic way, but be patient. True indeed is the old saying that bathwater runs deep.

* * * * *

The reader may be under the delusion that if he caused a frictionless body to be launched in any direction at, say, 80 m.p.h., it would pass out of his sight in a straight line and, if he waited long enough, it would eventually reappear on the opposite horizon and hit him on the back of the head. Nothing could be farther from the truth. Even the first half is only logical if you are a Flat-earther, and one may as well tell our Flat-earth readers that it is not worth their while to read on.

To put our remaining subscriber in his place, we will now give a diagram of what actually *would* happen in the above circumstances.

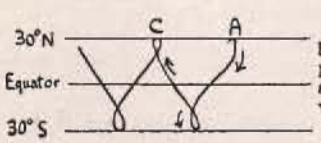


FIG.1.- Path of a body projected due east on a rotating sphere with velocity of 80 m.p.h.

Body's velocity in space at A is 80+898 m.p.h.to the east, owing to rotation of the globe. It will curve immediately to the right, cross the equator with a westward velocity of 190 m.p.h.in a direction W 68° S, continue south turning left, form a loop at B and return again to 30°N at C, & so on.

Ha ha!

* * * * *

Let us now take a couple of oblate spheroids as follows:—

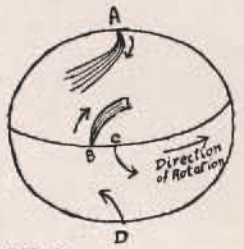


FIG.2

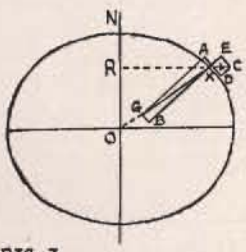


FIG.3

(FIGS 1,2 & 3 after Griffiths Taylor.)

FIG. 2.—The globe rotates from west to east. If one stands on the equator one is moving from W. to E. at 1,000 m.p.h. If one stands at the Pole one is not. This is why penguins look so placid.

If Fig. 2 is a model of this, duly rotating, and one were to pour a dollop of treacle on the North Pole (point A), it would, as it flowed down, be continually encountering a surface moving with an increasing angular velocity: in fact, it would tend to get left behind all the time, and would follow the path shown, curving to its *right*.

The same thing happens, the other way round, if the treacle were to move upward from the equator (point B). Here it will flow on to continually slower-moving territory, so will tend to catch up, i.e. it will also turn *right*.

A glance at the flows C and D on the same diagram will show at once that for the same reasons, in the southern hemisphere, the treacle will turn *left*.

So much for objects moving north or south. Pretty simple, but the next bit is much more tricky.

FIG. 3.—The Earth is not an exact sphere, but an oblate spheroid with its north–south diameter 27 miles shorter than its east–west one, because the centrifugal force acting on it at the Equator and not at the Poles stretches it to that shape. If it were to spin faster, it would become fatter and flatter; if it were to stop it would click back presumably to a perfect sphere, and save one the trouble of writing (and reading) this article.

If you are standing at any point X (Fig. 3), two forces are acting on you: gravity keeps you down, centrifugal force tends to throw you up. *Neither force acts at right angles to the surface.*

A glance at Fig. 3 shows that, the earth being an oblate spheroid, the gravitational attraction OX is *not* perpendicular to the surface. It can be resolved into two components, a perpendicularly downward one GX, and a northward-pulling one AX.

Centrifugal force acts at right-angles to the axis of rotation, from point R. Its direction and value is represented by XC, which in turn can be resolved into

XE, upwards, and XD to the south. When X is at rest, XA must equal XD.

But ho ho! if X moves, say, to the east. It is now rotating about R at a quicker rate than before, the value of XC increases, the southward-pulling component XD increases, gravity remains unaltered, so the eastward-moving X is pulled round towards the south, i.e. to its *right*. If X moves west, XD *decreases*, the northwards gravity component pulls it round towards the north, i.e. again to the *right*.

If one puts X in the southern hemisphere and does all this again it works out that, X moving either east or west is pulled round to its *left*. Now have a shot at Fig. 1 again.

Put Figs. 2 and 3 together and we get:—

FERREL'S LAW.—All bodies moving in the northern hemisphere tend to deviate to the right; in the southern hemisphere to the left.

* * * * *

Pause whilst we take a couple of oblate spheroids.

* * * * *

To return to the bathroom. Elevate the plug and you create an area of low pressure L (Fig. 4). It must have puzzled you before (unless you were already a Ferrelite) that when such areas appear on the weather map the air doesn't simply rush in from all sides and fill them up.

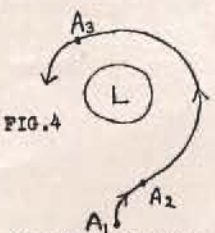


FIG.4

FIG.4.- Direction of rotation of winds round area of low pressure in northern hemisphere.

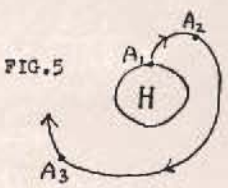


FIG.5

FIG.5.- Direction of rotation of winds round area of high pressure in northern hemisphere.

Let us take a particle at A. It starts to rush, but immediately it begins to move Ferrel comes in and starts turning it right (in the northern hemisphere) as at A_2. Now it is subject to two forces. If the attraction of L momentarily increases, so does A's velocity, Ferrel increases, and A swings out again. If Ferrel pulls A further away from L, pressure at L decreases still further. So equilibrium is reached, and A moves in a circle round L, along the isobars instead of, as one would expect, at right angles to them.

Now make L an H (Fig. 5). A starts to move out from the high pressure area, is swung right to A_2, and so on. In each case the high or low pressure area becomes encased in revolving winds and look as if they might well persist indefinitely. But, at ground level, the wind-speed will be retarded by ground friction, so here Ferrel will weaken and, in Fig. 4, the surface wind will blow obliquely into the area of low pressure. Thus there is in fact a leak at ground level into or out of these otherwise watertight systems.

This, of course, explains the veer of wind with height which is a common problem of the sailplane pilot. It will be noticed that this veer will be greater on high-wind days than low-wind ones, as ground friction will then be greater.

I know Hugh Bergel has been waiting to ask: *Do thermals rotate?* On the face of it, Ferrel is too slow and slight to cause the rotation of so small a system as a thermal. But one has constantly seen dust-devils, and pictures of waterspouts, all rotating madly, and the inference is very attractive that thermals do the same. This would mean that a thermal, once started, was endowed with a sort of vacuum-cleaning power, whereby new air could only be sucked in to the thermal along the ground levels. This would answer one of the difficulties of the present theory, which is: How does a thermal go on for so long, once it starts?

The idea previously mooted, that the hot air had a sort of capillary attraction which allowed millions of small bubbles to form which were all released when the system became overcharged, has never seemed to me very satisfactory. It seems much more likely that, once an up-current starts, it actually sucks in new supplies of air at the ground level, from all sides, and thus is supplied with large quantities of warm air; whilst at higher levels the intake of cold air is restricted by auto-rotation.

Ho hum!

Soaring

The silent wing, the blissful peace, no sound
But of that stream whose course we seem to trace,
That of the wind, whose sibilant soft breath
Follows our flight, sustains us in the air,
Searching the broad expanse for rising springs,
Swooping and circling on untiring wings.

D.L.P.

"Prelude to Flight"

This film will be shown at the following places commencing on the dates given:—

April	3	... Waldorf	...	... Sparkbrook
,,	6	... Beresford	...	... Liverpool
,,	6	... Ritz	...	... Brighouse
,,	10	... Palace	...	... Cinderford
,,	17	... Cinema Royal	...	... Halifax
,,	20	... Reo	...	... Fazackerly
,,	27	... Troc	...	... New Brighton

The distributors of the film are: Technique Distributors, Ltd., 93-95, Wardour Street, London, W.1.

Artificial Thermals in Australia

SMOKE, whether from factories or from fires, can indicate the position of thermals of two kinds: those which are created by the smoke, and those which have some other source but gather in the smoke as they pass by. Smoke which rises because it is hot may nevertheless form only a small part of the thermal which it creates, for it may drag in other hot air near the ground which has been ready to go up for some time but has been waiting for something to start it off —the so-called "trigger" action.

Mr. P. J. Pratt, who runs the Geelong Gliding and Flying School near Melbourne, Australia (and has been gliding at Geelong now for ten years), sends a photograph showing a mass of cumulus clouds which have all been created artificially. He writes:—

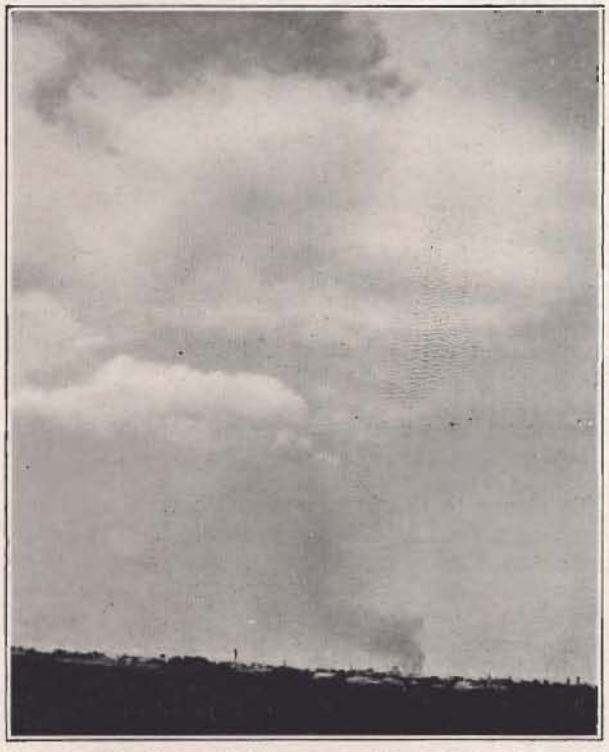
"The enclosed photo may interest your paper in connection with the article in your January issue last, 'Thermals from Factory Chimneys.' The smoke is from a fire in burning off the reeds from Reedy Lake during the dry season, and is easily followed up to the clouds that formed in an otherwise clear sky. It was for this reason the photograph was taken. The lake is about 5 miles away from the aerodrome where the photo was taken, and is about 3,000 acres in extent."

There is another kind of artificial thermal to be seen in Australia—the smoke signal used by the aborigines. Few white men know exactly how it is produced, so the account given by Fred Blakeley in a recent book called *Hard Liberty* (published by Harrap & Co.) is of special interest. These smoke signals can be made by their creators to assume various forms, evidently according to a secret code, and the author says he has seen them in long vertical columns rising to two thousand feet. The favourite time for making them is the early morning, just before sunrise, when the air is very stable. This means, not only that the air is unusually clear (for there is no turbulence to produce haze), but that the dense layer of cold air near the ground causes light rays to bend down so that objects can be seen which should by rights be below the horizon.

The commonest signal, a single straight column, is often used at other times of day when conditions are favourable, which is not always the case. But for more complicated messages the early morning is the time, so it was then that the author paid most attention to them, for, he says, "it would be then that a gathering might be signalled, when the cool damp air of morning would hold the lengthy message. At such a time these experts can make a dotted line of clouds stand several thousand feet in the air. . . . I had once seen such a signal, a dotted line hanging in the sky, made of eleven clouds, and carrying, I believe, an important message. A small cloud came first, then, after a space, a large one, then a space, then a small cloud, and so on, to the end of the line."

As to the way in which these smoke patterns are created, the author writes:—

"The day before the ceremony is given to preparation. It is the work of several men to clear the ground and stack the foundations properly. This foundation is ten to fifteen feet across, and is a layer of fair-sized



The smoke from burning reeds, seen in this photo, has caused the cumulus clouds to form in a previously clear sky.

[Photo by P. J. Pratt, Geelong, Victoria

logs on which is piled plenty of smaller wood. Great bundles of light kindling sticks are gathered—perhaps the stems of kangaroo or bamboo grass, both of which are most inflammable. . . . Women also gather the green bush from what is known to white men as broom, turpentine, kerosene or hickory bush; but 'turpentine' will best describe it, for the dense foliage is sticky, and when crushed together will remain in a compressed mass, smelling of turpentine.

"When the foundation fire is well alight this bush is placed upon it, and a dense black smoke goes up till a sufficient cloud is made for the first figure of the signal. Then the elders of the tribe with long poles lift the smoking bush, letting the air draw through it with such force that the flames rush up with the effect of an explosion. The younger men, who have been standing by in readiness, now throw bundles of light kindling on the fire, and this goes up in high-leaping flames which reach an altitude of fifty feet. So is created a vacuum, a current of heat to drive the cloud aloft into the sky. It is only when close to the signal fires that one sees how the heat forces a passage through the smoke-cloud and makes of it a huge smoke-ring which rises rapidly, expanding as it soars.

"When the ring or cloud is high enough fresh bush is placed upon the fire, and according to the number of clouds required the process is repeated, and at intervals sufficient to space the symbols with significance. . . .

"To send up the straight vertical column a similar foundation fire is used, but the green bush is only placed

around the circumference of the fire while the centre is kept supplied with the light kindling that makes a hot current up the centre of the column. It is, no doubt, this heated current which forms the structure of the column and keeps it straight. I have seen such a one to hang in perfect shape on a favourable day for longer than an hour."

The rising current with a specially vigorous core is not unknown to sailplane pilots, and there have been instances such as that when Richard DuPont, in America, climbed through and above a number of sailplanes in a thermal by making tighter circles than the rest in its middle. According to Wolf Hirth, it is in fast-rising thermals that such a central core is found.

This book was discovered and recommended by our contributor "Die-Hard," not only as a thrilling adventure story of three men who cycled across Australia from south to north, but for the many references to things which would interest a sailplane pilot. For instance, there are those concentrated thermals, the dancing "willy-willies," known as dust-devils in other parts of the world, which take up the colours of their "ballroom floor," be it black, red or yellow. There were, says Fred Blakeley, plenty of them on the north side of the large sand belt which occupies the middle of the continent, but on the south side there were none on the sand, though there were some on the adjoining timber and vegetation belt.

Once, when camping on the south side of the sand belt, he noticed that pieces of grass were dropping all round, and continued to drop throughout the day. When he lit a fire the smoke merely spread over the ground "like a creeping fog." But another time, when he was 600 miles farther to the north, he writes: "I noticed that dried grass and 'down' of pussy-cat tails, whorls of umbrella grass, and all such light and floating matter rose in the air, went up and out of sight. Examining the scraps borne on this up-draught, I noticed that they were similar to those which had descended in the south, and this set me wondering."

Correspondence

Do Thermals Rotate?

In the course of a letter from Waikerie, South Australia, Mr. E. R. BARRATT writes:—

I watched five pelicans circling in the same thermal; two were doing right turns and three left turns. The three doing left turns were doing practically two turns to the others' one, and soon outclimbed the two doing the right turns, but it was not very long before the two changed over to left turns and soon made up the leeway.

Of all whirlwinds—and we have many in this country—that I have observed I have seen none that turn clockwise (viewed from above). The air currents here would have no local interference such as hills.

[These observations seem to dispose of the idea that the rotation of thermals is caused by the rotation of the earth, for in the southern hemisphere the direction of rotation due to this cause should be clockwise. An article discussing the question was published in THE SAILPLANE for November, 1936, and an observation very similar to the above, made by Mr. I. G. Robertson in Malaya, was published in July, 1937. Mr. Robertson saw five birds going one way round in a thermal and eight going the other way round. The five birds did about two circles to every one done by the eight, until the five changed the direction of their turns. Mr. Barratt's birds behaved in precisely the opposite way and, contrary to accepted ideas, seemed to do better when going round the same way as the thermal. ED.]

Reviews

Civil Aviation as a Career. By T. STANHOPE SPRIGG. George Newnes, Ltd., London. Price 5s.

The title of this book is somewhat pretentious, for it does not give the various careers open to aviators. What it sets out to do, and does efficiently and thoroughly, is to describe the various licences and certificates, pilots' and otherwise, in connection with aviation (or aeronautics, for airships and balloons are included), the syllabuses of the various examinations, the training facilities available, and many other useful particulars. The final chapter deals with gliding certificates, but omits the "Silver C." It does not indicate to what careers the possession of a gliding certificate will lead. In an appendix is a list of gliding clubs taken from THE SAILPLANE of February, 1937.

According to the syllabus, a "B" licence power pilot must know about vertical currents, and a second class navigator must also understand stability and instability and have "elementary knowledge of conditions associated with fronts." A first-class navigator must be capable of "recognition of different air masses" on synoptic charts, so Byers' *Synoptic and Aeronautical Meteorology* might have been included in the list of books recommended, as it is the only book of consequence on the subject in the English language.

Pilot's "A" Licence. Compiled by JOHN LEEMING. Eighth and Revised Edition. Sir Isaac Pitman & Sons, Ltd., London. Price 3s. 6d.

This is the latest edition of a well-known and very useful book. Under the heading "Technical Examination," the largest section of the book, are several items of information that a glider pilot should know. For instance:—

A series of bursts of orange smoke is a warning signal that you are in the vicinity of a prohibited area and should change your course.

Flying machines and airships shall always give way to gliders and to balloons, fixed or free. (But what Mr. Pasold would like to know is who should give way when gliders, free, meet balloons, fixed.)

Two hundred yards is the minimum laid down as a safe distance at which to pass other aircraft. (What about slope-soaring?)

Flying machines and gliders are prohibited from engaging in aerial acrobatics in the vincinity of aerodromes at a distance of less than 4,000 yards from the nearest point of the perimeter of the aerodrome, unless they are flying at above 6,000 ft. A side-slip approach is not an acrobatic landing.

The "Golden Eagle" Sailplane

An Australian Design

The GOLDEN EAGLE sailplane was designed in 1934 by Mr. H. G. Richardson, President and Chief Instructor of the Gliding Club of Victoria.

The GOLDEN EAGLE has a wing span of 45 feet, a wing area of 155 sq. feet, and weighs 320 lbs. empty. The aspect ratio is 13; the wing loading, allowing 200 lbs. additional loading, 3.3 lbs. per sq. foot. Gliding angle is 1 in 18 and sinking speed 3 feet per second.

The GOLDEN EAGLE is a single-strutted gull-wing design. The wing has a large box spar and a light secondary spar. The ailerons are differential in operation, with a ratio of 2 – 1.

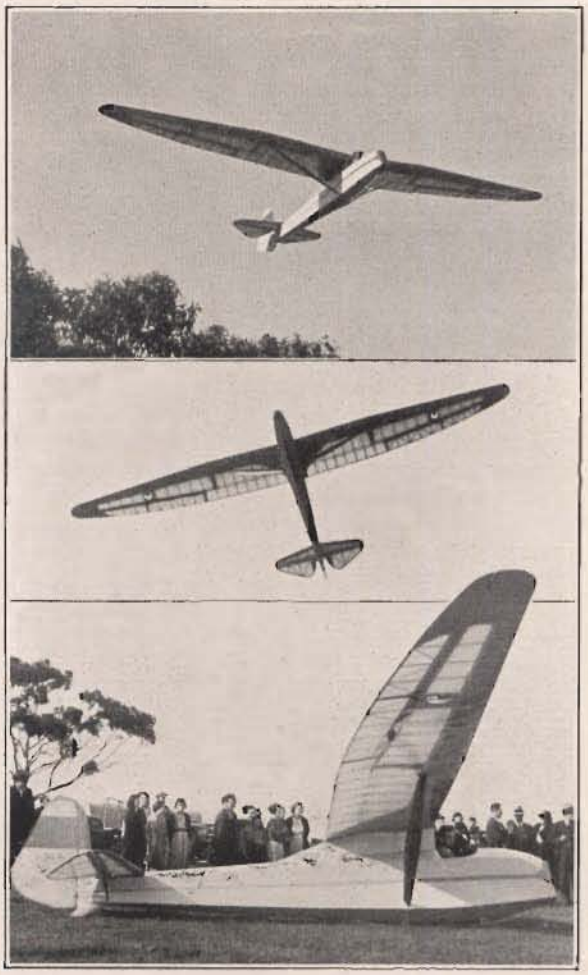
The fuselage is hexagonal in section and plywood-covered.

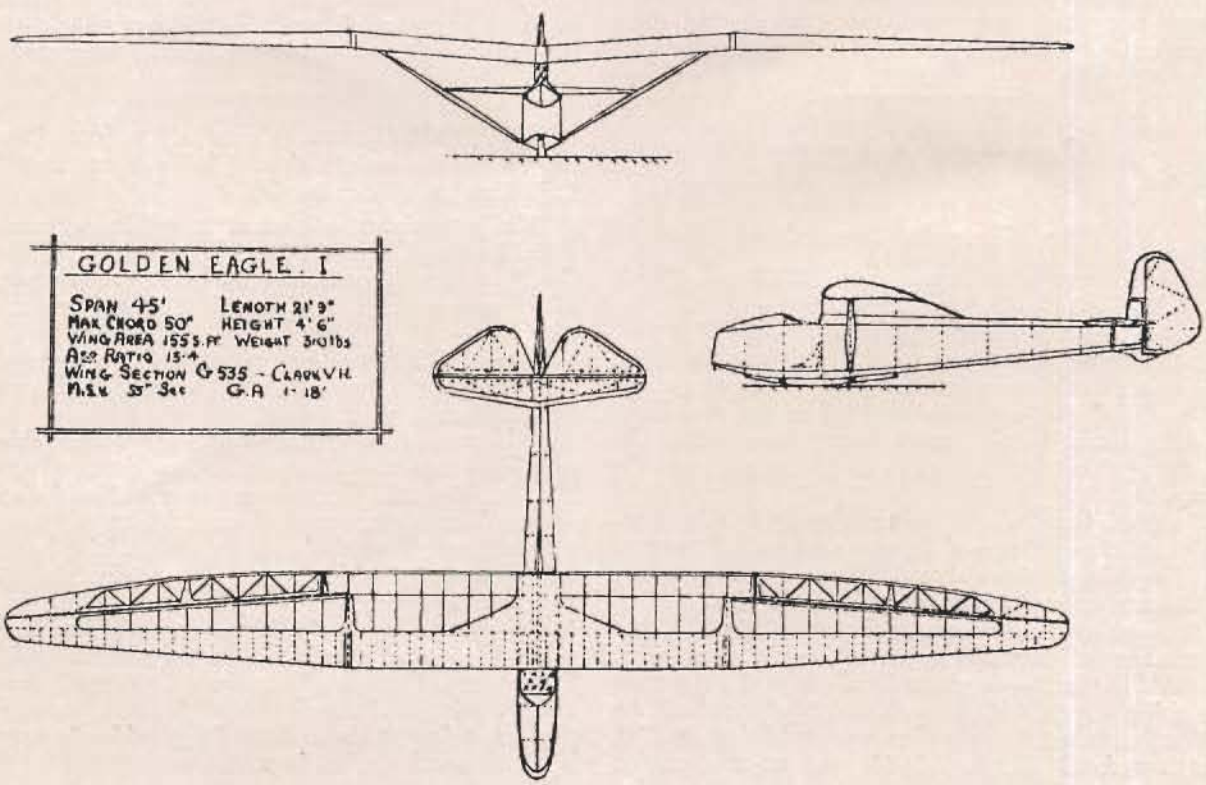
The tail-unit is of normal type and construction.

The machine was test-flown on September 20th and October 3rd, 1937, with the GRUNAU BABY II owned by the Gliding Club of Victoria. The machine appears to have a performance equal to that of the GRUNAU, but seems to have a better speed range. It was soared again that year for periods of up to half an hour.

The accompanying photographs show the GOLDEN EAGLE at Laverton. Note the trailer in the background in the lower picture; this is claimed to be the only sailplane trailer in Australia, and the only one of its type in the country. It was built by the designer of the machine.

The Gliding Club of Victoria was founded in 1929. Among its founders were H. E. Hervey and L. C. Withall, now of the London Gliding Club.





Glider Engineers' Certificates

LAST autumn the Air Registration Board established a "Certificate of Competence as Glider Ground Engineer," and on October 28th the Technical Committee of the British Gliding Association made a rule that both B.G.A. Inspectors and Club Ground Engineers must possess this new certificate. The duty of a B.G.A. Inspector is to carry out all Certificate of Airworthiness inspections on construction and renewals of aircraft, while a Club Ground Engineer, whom a club must possess in order to get subsidy, has to supervise the maintenance of the club's flying equipment, and certify that any equipment obtained with subsidy help has been received in satisfactory condition. His job may be either part-time or whole-time.

The first eleven of these new certificates have now been issued and confirmed by the B.G.A., and we give below the names of their recipients, which may be of historical interest when their number has grown into hundreds. Miss Dorothy Spicer, who has No. 1, has been well known as an aeroplane engineer for some years, and now has a post in the Air Ministry.

We also reproduce the Air Registration Board's leaflet giving the qualifications required of applicants for the certificate, and a syllabus of the examination, which is oral.

And, finally, since all this information should be of special interest to those of our readers who operate gliders without a specially qualified ground engineer, we reproduce a specimen of the "Daily Flying Certificate" as used by several of the leading British clubs. One of these has to be signed up each day for every machine flown before it is allowed into the air. It may only be signed by the club ground engineer or certain approved club members, or, in the case of a private group owning a machine, by an approved member of the group. The certificate has to be carried in the machine while it is being flown, and a carbon copy is retained at the club so that, if anything should go wrong due to inadequate inspection, the club will discover the culprit. (The form is reproduced at the foot of the next page.)

Glider Engineers' Certificate of Competence

No.	*Name*	*Club or Firm*	*Date of Issue*
1.	D. N. Spicer	... ...	29.9.38
2.	A. G. Payne	Cambridge Univ. Gliding Club	29.9.38
3.	M. H. Maufe	Bristol Gliding Club ...	1.11.38
4.	W. Butterfield... ...	Derby and Lancs. Gliding Club (Furness Gliding Club)... ...	1.12.38
5.	F. Bevilacqua	British Air Transport, Redhill (Surrey Gliding Club)	12.1.39
6.	H. Holdsworth	Yorkshire Gliding Club	12.1.39
7.	A. Walker	London Gliding Club ...	12.1.39
8.	C. G. Thorpe	Slingsby Sailplanes ...	16.2.39
9.	W. R. Scott	Scott Light Aircraft ...	16.2.39
11.	A. S. Boultbee	Derby and Lancs. Gliding Club	16.2.39
10.	A. Ainsworth	Derby and Lancs. Gliding Club	2.3.39

AIR REGISTRATION BOARD.

Instructions to Applicants for Certificates of Competence as Glider Engineers with Syllabus of Examination.

An applicant for a Certificate of Competence as a Glider Ground Engineer must have attained the age of twenty-one years, and will be required to have had such experience as, in the opinion of the Board, will enable him satisfactorily to perform the duties for which the certificate is needed. He will be required to have had practical experience of the maintenance and construction of aeroplanes or gliders.

In addition, to obtain the Certificate, the applicant must pass, or satisfy the Board that he can be exempted from, an examination based on the syllabus hereunder. Subject to a satisfactory interview by the Board, consideration will be given to exempting an applicant who holds an aeroplane ground engineer's "B" Category Licence.

Examination Syllabus.

The general principles of the systematic maintenance and inspection of gliders, including:—

(i) Knowledge of (*a*) the methods of inspecting and checking the assembly of the whole of the glider structure; (*b*) the rigging of an erected glider; (*c*) the adjustment and functioning of the flying controls; and (*d*) the correction of faults that may be experienced in flight.

(ii) Knowledge of the defects and deterioration in wing coverings, timber and metal members, metal fittings, stream-line wires, tie-rods, cables, shock-absorbing devices and other parts of the glider structure that may be expected to occur as the result of wear and tear, or may be produced by slight mishaps experienced during normal operation of the glider.

(iii) Knowledge of the methods of effecting structural repairs and replacements.

(iv) Knowledge of non-metallic materials; methods of identification, examination and testing; characteristic defects which render them unsuitable; and precautions to be observed in their application to glider construction.

(v) Knowledge of metallic materials; methods of identification, examination and testing; characteristic defects which render them unsuitable and precautions to be observed during processes of manufacture (heat-treatment, welding, brazing, soldering, plating, etc.).

(vi) Knowledge of the methods of construction, examination and testing of glider parts and components.

(vii) Knowledge of methods of installing and testing the instruments and other appliances to ensure correct functioning.

(viii) Knowledge of methods of testing, construction, examination and maintenance of launching appliances and quick release gear for aircraft towing.

News from the Clubs

Cambridge University Gliding Club

March.—Training has continued at Caxton most days this month. Many members have been plodding away steadily at spot landings in an effort to qualify for the Easter Camp at Huish, and enough have been successful to ensure a good attendance of prospective "C" pilots. The latest DAGLING has had a longer life than most of its predecessors; perhaps the many modifications, including differential ailerons and enlarged skid blocks, are at last bringing their reward to our harassed ground engineer.

Sunday, March 12th, saw us at Duxford for the first serious aero-towing of the year, and Morison, Musker, Barry, and MacBean all had their first tows. The air was very smooth and only the BLUE GULL and MacClement in the club KITE were able to delay their descents appreciably.

Cambridge to Colchester in the Clouds.

Thursday, March 23rd.—Several consecutive days of magnificent gliding weather at last proved too much for three members who were staying on after the end of term. The club KITE was taken to Marshall's and from the second tow J. Pringle managed to connect and rapidly disappeared into a cloud at 3,500 ft. The wind was about 30 m.p.h., and the up-currents were confined to huge storms about 10 miles apart, so he stayed with this cloud for half-an-hour, flying blind just inside the base and trying to find the central funnel of rising air. Then another storm started to the north and he flew towards it, finding lift as he approached and going on up to 5,000 ft. before the cold forced him to leave the cloud. Arriving over Colchester at 3,000 ft. he flew around and finally landed on a recreation ground in the middle of the town. The distance of 40 miles took 1 hr. 40 mins., of which over half was blind flying in poor lift; below the clouds there seemed to be very little activity.

Attendance in the workshop has been unusually good this term, and the GRANTA fuselage, tail, and rudder are nearly finished and all the wing ribs made. It is hoped to be able to publish an account of this remarkable little machine in a future issue. The trailers have been overhauled ready for the camp, and a huge blue notice board has been prepared for the roadside at Caxton. This last is part of a drive for new members to keep the DAGLINGS busy in the summer.

For the benefit of those who wish to make use of the club's aero-towing facilities it might be as well to restate the charges. Country membership for the summer costs £3 3s. (including aero-towing subscription), and entitles private owners to tows at 7s. 6d. (club machines 9s.). Those not wishing to join for the whole summer are charged 12s. 6d. a day membership and the same towing charges. Flying takes place at Duxford aerodrome most Saturdays and Sundays when the weather is good, and on week-days tows can be had from Marshall's Aerodrome in Cambridge between the hours of 1 and 2 p.m., provided previous notice is given to J. W. S. Pringle (Tel. 4411). The club is hoping to have a hangar at Marshall's by the beginning of May.

London Gliding Club

Sunday, March 5th.—A strong and rough W.S.W. wind in the morning. Judging from the tattered appearance of the clouds which were trying to form cumulus, the thermals were pretty well torn up. This was soon found to be the case by the pilots. Simpson, however, managed to get up to 1,200 ft. In the afternoon some high cloud came over and the wind turned smoother.

Tuesday, March 7th.—We hear that Hammond turned up to do his five hours towards the "Silver C." The air was exceedingly rough below, but after a bit he managed to climb to 1,500 ft. and found it quite smooth at that level. You or I would have been only too pleased, in the circumstances, to sit back and enjoy ourselves. But not so Hammond. He got so bored with the smoothness that he deliberately came down again to the rough stuff for a bit of excitement.

Saturday, March 18th.—A N.N.E. wind throughout the week-end, except for a curious short period late on Saturday afternoon, when it turned to a light drift from the west for an hour before dark. Withall stayed up in Desoutter GRUNAU until he was invisible in the darkness.

Sunday, March 26th.—Fed up with a persistent N.N.E. wind, a party took a GRUNAU to the Oxford Club's site and enjoyed themselves.

There has been a fair amount of week-day activity this March. It included two landings in the Zoo by Wright in his SCUD II, on the 15th and 24th. The second time he hit a bush in the bison enclosure and turned over, but luckily the bison were all at the other end and stayed there till the machine had been got back over the railings labelled: "These animals are Dangerous."

Below is the Daily Flying Certificate used for passing out machines. (See article on previous page.)

MACHINE OR TYPE

DAILY FLYING CERTIFICATE

The following items MUST be inspected daily before signing out machine.

ITEMS PASSED TO BE CLEARLY TICKED IN PENCIL.

Wings, Ailerons and Struts	Fuselage or Outrigger Units	Empennage Units	Flying Controls and Rigging Wires
1 Visual inspection of general condition ...	1 Visual inspection of general condition ...	1 Visual inspection of general condition ...	1 Check for correct direction of operation of all controls ... ...
2 Control horns	2 Damaged panels and bulkheads, etc. ...	2 Rudders and elevator hinges	2 Freedom of operation, wear and backlash, etc.
3 Struts and strut fittings	3 Wing root fittings ...	3 Ditto control horns ...	3 Check all turn-buckles for locking and safety position ... ...
4 Strut pins in position...	4 Skid units	4 Rigging	4 Wire connections. Condition of hand wires and cables, freedom from rust, etc. ...
5 Safety pins locked ...	5 Quick release lock ...		5 Flying wires should be free to swivel in all directions at points of anchorage ... ...
6 Aileron hinges ...			
7 Check alignment and rigging			

REMARKS:

Signature ..... *Date* .....

Oxford University and City Gliding Club

The club's new gliding ground at the foot of Beacon Hill, a spur of the Chiltern Ridge, is only thirty-nine miles from London on the main road to Oxford via High Wycombe, and just behind the Lambert Arms Hotel. Already several Londoners have enrolled as members. Those members who had carried on at Farmoor for some time after it became unusable owing to floods and who were developing webbed feet, hailed the sight of dry land with cheers when we moved to Beacon Hill.

The new site gives opportunity for hill soaring as well as for primary training and had been used for some time in a south-west wind by members making their soaring flights for the "C" certificate. On Sunday, March 19th, our Instructor-Manager, Robert Kronfeld, was winch-launched in a north to north-easterly wind and successfully tested the soaring possibilities of the slopes on the other side of the spur and of the main ridge.

In spite of the bad weather which has prevailed during January and February, especially during week-ends, there has been flying on most Thursdays, Saturdays, and Sundays, and four "A," four "B," and two "C" certificates have been gained this year. There will now be flying every day except Monday, and although a few members hope to go to the joint Oxford and Cambridge camp at Pewsey during the first fortnight in April, the usual club activities will continue at Beacon Hill, under the instruction of Robert Kronfeld. Temporary members may enrol at any time for short periods, and visitors with private sailplanes will be welcome. The ground happens to be also a private aerodrome and we have a few power pilot members who fly over and land on the ground for a day's gliding.

We were all delighted when a DAGLING pilot who, at the end of one of her first circuits, had to land in an adjoining field, was asked by the rustics who hurried out to see what was happening, if this was her first stop since Dunstable!

On Wednesday evenings during last term Robert Kronfeld gave a course of lectures on Meteorology, for members and others, and these will be resumed next term.

The present secretary of the club is: Mrs. M. FitzRandolph, 376, Banbury Road, Oxford.

Suggestion for a Constitution.—The O.U.C.G.C. has been drafting its constitution and the following are extracts from the version which gained most popular approval during the winter when members were struggling through mud and floods on the Farmoor site. Now that we have moved to Beacon Hill a new version will have to be compiled.

Post-Final (Sleeping) Draught of Constitution and Rules.

TITLE.—The name of the Club shall depend on the mood and the manners of the person naming it, but for the sake of brevity and politeness it is hereinafter referred to as The Club.

AIMS.—The aims of the Club shall be to encourage and promote the study of the nature and distribution of earth, air and water, hereinafter referred to as Mud and Weather; and if nevertheless and notwithstanding members still desire to trundle, to glide and to soar, to provide facilities for these and for associated activities, such as paddling, swimming, ski-ing, canal and road making, and the manufacture of mud pies.

CONSTITUTION.—It is hereby declared that the Constitution of the Club is sound, notwithstanding anything whatsoever, wheresoever, howsoever, whensoever or whysoever to the contrary.

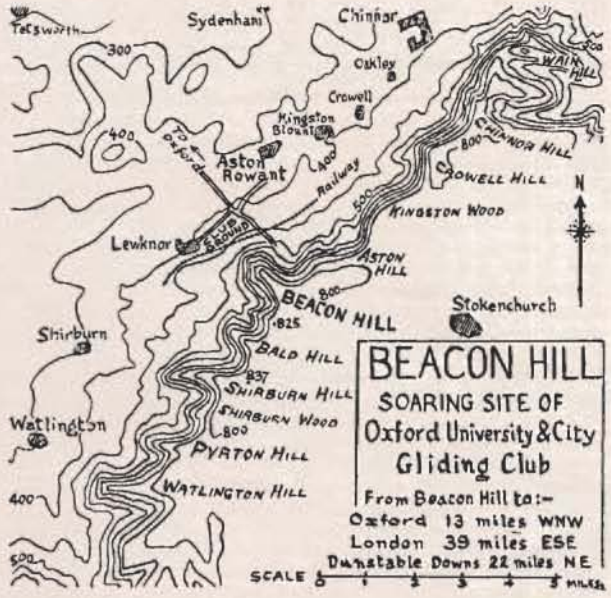
MEMBERSHIP.—There shall be seven classes of members:—

1. Clean Members.
2. Miry Members.
3. Dry Members.
4. Wet Members (who all explain themselves).
5. Terrestrial (earth-bound) Members, who feel that they will never rise more than six feet.
6. Atmospheric (Floating) Members, who soar to great heights. (All these members shall pay as great a subscription as can be extracted from them.)
7. Sane Members, who attend on the gliding ground only in fine weather and never attend a general meeting. (These members probably pay no subscription.)

QUALIFICATIONS.—Anyone wishing to become a member shall sign a declaration to the following effect:—

I agree to take the Constitution and the Rules, the gliding ground, the gliders inanimate and the gliders animate of the O.U.C.G.C. as I find them and use them at my own risk and agree that whatever happens it is my own fault.

The applicant shall then pass the following tests to the satisfaction of the committee:—



The Oxford Club has settled down permanently at its Beacon Hill site in the Chilterns, which was previously used only occasionally, when members were ready to collect a few "C" certificates. Soaring is possible round half the compass, in winds from S.W. through W. and N. to N.E. Launches are made by winch from the large field at the bottom, shown in the map.

(*a*) Swim fifty yards in full gliding kit, including three sweaters and gum boots.

(*b*) Sign his/her name on six wet flying tickets with a blunt pencil in the dark (no pencil-licking allowed).

(*c*) Fit six hangar-doors in position in a blizzard at night without uttering any language which a policeman would blush to hear.

(*d*) Draw a map of the gliding ground and on it mark the position of a herd of cows (i) as viewed by a pilot deciding where to land, and (ii) as they will be at the moment when he lands.

INVALIDITY OF MEMBERS.—Any Member who shall on the gliding ground become so covered with mud that his/her features are indistinguishable may, by the majority of those present and sober, be declared invalid and the committee may thereupon authorise his/her removal to the public wash-house. Such Member shall only be reinstated when he/she has appeared in person before the Committee and has been recognised and certified as immaculate.

DEMISE OF MEMBERS.—If any Member in charge of the winch shall be found to be dead and if it shall be deemed that his/her demise was due to exposure and privation, any unexpired portion of his/her subscription shall be spent upon a wreath.

EXECUTIVE COMMITTEE.—The Executive Committee shall consist of five Full Members (elected after lunch) and five Empty Members (elected after a day's gliding) and one Sane Member (if such can be found).

M.F.

Norfolk and Norwich Aero Club

Mr. P. Brown was again up at the club at the week-end, March 18th–19th, and made a number of adjustments to his MINIMOA sailplane prior to his contemplated long-distance flight. Conditions were rather unfavourable for such a project, but the north-east winds are still prevailing and it is hoped that shortly Mr. Brown will be able to make his attempt.

The gliding section has a new-comer in Mr. L. Strauss, who commenced his primary instruction last week under Mr. A. E. Firmin, the Gliding Instructor.

Bristol Gliding Club

The club, it is reported, has got its first four "A" certificates. They were taken by R. Coke, B. A. L. Grear, W. V. Warry, and Miss Sylvia Mapson.

Surrey Gliding Club

A Cross-country Flight.

Friday, March 3rd.—Briggs and Ann Edmonds soared KITE and GRUNAU most of the day; thermals very narrow, but quite strong. Previous Wednesday, hopping all day.

Saturday, March 4th.—Wind west, 20 m.p.h.; much low cloud. Payne soared the TUTOR partly blind for two hours, during which time he flew five miles beyond the end of the hill out over the town, and still got back with 200 ft. to spare. The GRUNAU got bent by someone doing steep turns near the ground. Briggs put in still more hours on his KITE. A. G. Douglas got his "C."

Sunday, March 5th.—Wind west, 20 m.p.h. Dent went for a cross-country flight to Detling Aerodrome, 38 miles away, under a cloud street, and White got his "A." This was followed by Turpin getting his "C" on the TUTOR.

[We hear that Mr. Dent used a cloud street and got up to 4,300 ft., with lift at 15 ft. per second. The flight took only 45 minutes, from 12.15 to 1 p.m.—ED.]

Monday, March 6th.—Hoppings. O. P. Jones (of Imperial Airways) made an excellent flight on the PRIMARY for his "A."

Friday, March 10th.—Hoppings. O. P. Jones got his "B," his first winch launch being the most interesting thing that has been seen for a long time.

Saturday, March 11th.—A day of such gloom and haze that the TUTOR was invisible at the top of the launch, and the milk-like circuits were lasting, bumpless, for three minutes from the point of release.

Sunday, March 12th.—Capt. Youell (of Imperial Airways) got his "A," and O. P. Jones won the spot-landing competition. Day spent in following the wind with the winch. Next day Bucknall circuited his KITE.

Wednesday, March 15th.—Very gusty, so packed up PRIMARY work after the nails had given up the ghost through lack of supporting air. Youell, however, was able to get his "B" on the KADET.

Friday, March 17th.—The Tank Corps contingent arrived, and we were just able to keep the number of launches equal to the number of hail showers.

Saturday, March 18th.—Wind gusty and from the north-east, but Capt. Horsey (I.A.) managed to get his "A."

Sunday, March 19th.—Wind worse. Day's flying consisted of two most peculiar circuits.

Monday, March 20th.—Hopping, followed by a nice "A" by M. Houdret, followed by a visit by Jimmy Youell in the "Tipsy" two-seater, which got in and out of the field, two up, with the greatest of ease.

Standard Telephones & Cables, Ltd.

A gliding club has been formed amongst the employees of The Standard Telephones and Cables, Ltd., under the auspices of the Athletic and Social Club. Membership now totals 37 flying members and the club can accept a limited number of non-employee members at an entrance fee of 10s. 6d. and an annual subscription of £1 1s.

Members have undertaken the construction of a sectional hangar, winch, and a Nacelled DICKSON trainer, the latter being practically completed.

The flying ground is at Romney Street Farm, near Shoreham, Kent, on the North Downs, and it is expected that training will commence on Easter Monday.

The club extends a hearty welcome to all members of other clubs who may wish to try the site. The Hon. Sec., A. Evison, S.T. & C., Ltd., North Woolwich, will be pleased to supply any further information on request.

A Club for Canterbury

A gliding club is being formed in Canterbury. The promoters have secured a large field consisting of over a hundred acres and propose to launch by winch. They are also trying to secure the use of Broad Downs, near Wye, for slope-soaring. These hills are stated to be an ideal site, being some two miles in length, facing south-west, and having a road running up to the top. They are on the look-out for a primary and a two-seater in good condition.

Enquiries should be addressed to Mr. K. Fripp, 19a, St. George's Street, Canterbury.

Newcastle Gliding Club

March.—This month has seen further progress in the development of the Hartside site, and some good soaring by various members. It has also, unfortunately, produced our first crash for nine months, when the nacelled DAGLING just failed to clear a fence and sustained several fractured ribs in consequence.

A lecture on meteorology given at the Newcastle Chemical Club was attended by several of the members, whose customary questions produced the customary barren results. Why is it that our meteorologists refuse to consider any phenomenon which does not extend over at least two continents, or have we been unlucky?

February 26th.—Training in rather unpleasant conditions was carried on at Cramlington while O'Grady, Savage and Morton helped to further flying time at Hartside.

March 5th.—Conditions unsuitable for training resulted in a big turn-out of members at Hartside, where O'Grady, Allen, Savage and P. Taylor put in 6½ hours' flying in KITE, GRUNAU and TUTOR. It was gratifying to notice how each machine without any difficulty attained cloud base (2,500 ft.) and stayed put, O'Grady and Savage making several out and return flights to various points north and south of the launching ground.

March 12th.—Training as usual at Cramlington, where Whittaker obtained his "A." Conditions being unsuitable for soaring, the opportunity was taken of transporting the winch to Hartside and erecting on the site which we have now got fixed up. A party afterwards went to inspect an east wind site which offers promise as a second string.

March 19th.—Whittaker followed up his previous week's effort by taking his "B" in the KADET. Nice work.

An expedition to Hartside found north-easterly winds prevailing and took the opportunity of trying out the site prospected the previous week. Massey proved its promise with an hour's flight in the G.B., during which he reached 2,500 ft.

March 26th.—No soaring possible at Hartside, but flying continued at Cramlington, where Savage succeeded in gaining 600 ft. in the G.B. after casting off a winch launch.

British Gliding Association

The Annual General Meeting will be held at 119, Piccadilly, London, W.1, on Friday, April 14th, at 6 p.m.

Published by H. O. DAVIES, 13, Victoria Street, London, S.W.1, and Printed by HICKS, WILKINSON & SEARS, 4, Dorset Buildings, Salisbury Square, E.C.4.