THE SAILPLANE & GLIDER

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OFFICIAL ORGAN *of* THE BRITISH GLIDING ASSOCIATION

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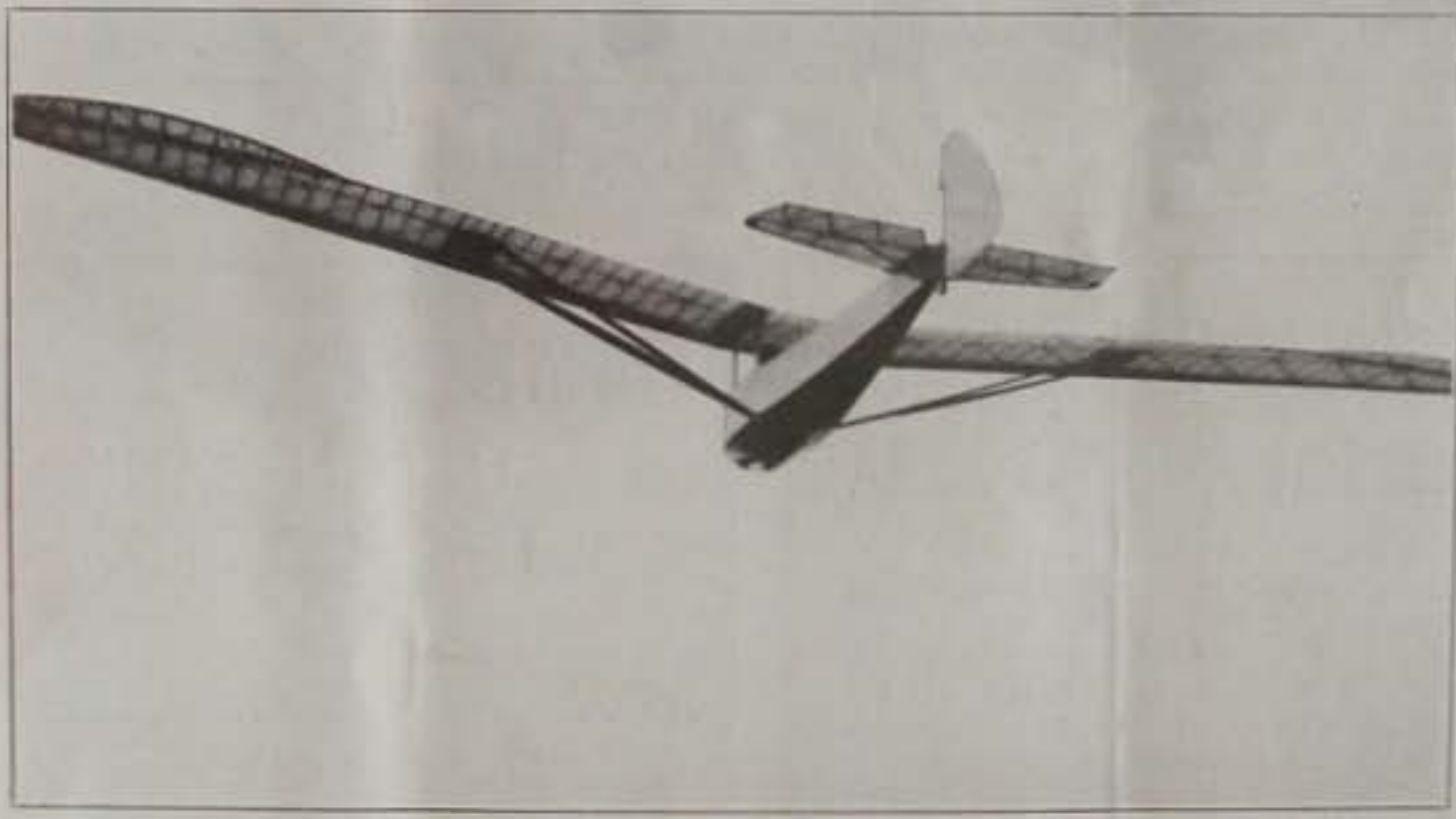

F. Slingsby flying his side-by-side two-seater sailplane at Sutton Bank with a passenger. *[Photo by J. C. Neilan*

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Editorial Offices: 13, VICTORIA STREET, LONDON, S.W.1 Telephone: Victoria 9153-4

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THE SAILPLANE AND GLIDER *welcomes news of gliding and soaring activities from all parts of the world. Articles are also published on all aspects of gliding and soaring, including related subjects; illustrations are also welcome. No payment is made for contributions. Orders for copies of the journal should be addressed to the Publisher, not the Editor; it is also obtainable through newsagents. Subscription rates: one year, 10s. post free; half-year, 5s. 6d. post free; single copies, 1s. post free. Enquiries for information regarding gliding clubs should be addressed to the Hon. Secretary of The British Gliding Association, 66, Victoria Street, London, S.W.1.*

Correspondents should note that our present address is 13, Victoria Street, S.W.1. The premises at Chancery Lane, which we left a year ago, are now in process of demolition.

Editorial Comments

Putting a Little Engine In

OVER thirty years ago the Brothers Wright, in America, added an engine to their glider. The result was the first successful aeroplane. Considering the number of aeroplanes to be seen nowadays in every civilised country of the world, one would have expected the idea to have become sufficiently familiar by this time. But not at all. To put an engine into a glider and turn it into an aeroplane is still, after all these years, regarded by the public as an act of inspired genius.

But the Wrights really were out to create a power-driven flying machine. With our own English pioneer, Percy Pilcher, it was different. When he died at the end of last century, it was known that he was about to "fit a little engine" into his glider; but what is not generally known is that his object in doing so was to reach heights from which he could practise the art of true soaring flight, which he guessed to be possible. Mr. Baynes and Sir John Carden, with their "auxiliary sailplane," are the first and only legitimate successors of Pilcher; they have done at last what he set out to do but did not live to see achieved.

The advent of the "auxiliary" is bound to raise questions of gliding ethics in many people's minds. There have been "motorless" purists who, as back numbers of THE SAILPLANE show, think it downright wicked even to be launched by car or winch, but nowadays most of us have so far fallen from grace as to be able to stomach the idea of aeroplane towing. So far as we can see, there is little to choose, ethically, between this widespread practice and going up in a Carden-Baynes auxiliary; in both it is done by attaching an engine to the sailplane, the difference being that in one case the attachment is rigid, and in the other non-rigid. What really matters is whether you thereupon proceed to soar, or merely go on using the engine.

The Subsidy

Captain C. H. Latimer-Needham has taken exception to our remarks on his letter published in the last issue, and states that he has not "swung completely round," as his present views are in agreement with the subsidy proposals to which he gave his approval last year. As we are not convinced that this is the case, the correspondence is still proceeding, but meanwhile it is only right that his contention should be put on record in this issue.

Coming Events

B.G.A. Competitions.—The Contest Committee of the British Gliding Association has decided on holding this year's National Competitions at Sutton Bank, Yorkshire, from August 24th to September 1st, inclusive.

* * *

German Annual Meeting.—This will be held on the Wasserkuppe in the Rhön Mountains from July 21st to August 4th. It is the biggest event of its kind in the world; about 100 sailplanes usually take part.

* * *

Swiss International Meeting.—To be held on the Jungfraujoch from September 4th to 14th.

* * *

American National Soaring Competitions.—From June 29th to July 14th at Elmira, New York.

* * *

Austrian National Competitions.—On the Gaisberg, near Salzburg, from July 20th to August 4th.

* * *

Model Gliders.—An open competition is being held on June 16th at Ivinghoe Beacon, Bucks.

* * *

Instruction Course at Dunstable.—From August 1st to 14th inclusive; fee for the course, £12 12s., inclusive of accommodation, full board, and gliding instruction. Apply to the Secretary, London Gliding Club, 13, Victoria Street, London, S.W.1. Vacancies are now nearly all filled.

From Here and There

Monster Model Meeting.—Five hundred models have een entered for the German model glider meeting to held in the Rhön Mountains at Whitsuntide.

* * *

Strap Yourself In.—An observer of the French Naval r Service from the Saint-Raphael base was thrown t of his cockpit during a violent storm between Lemuy d Les Ares. In falling he managed to grasp one of e bracing wires, and was still doing so when the pilot nded the machine. But you can't get away with it e that in a full cantilever sailplane.

* * *

New Looping Record.—During April a B.B.C. report ated that the Russian pilot, Simonov, looped a glider times consecutively at Koktebel, in the Crimea. e Russians do their loops while soaring in an up-rent, hence there is probably no loss of height. In erica, however, during an outbreak of looping ords a year ago, it was the custom for the sailplane be towed up to a great height and then cast off and p its way back to earth; the rate of fall usually rked out at nearly 150 feet per loop.

* * *

Autogiro Efficiency.—There have been occasional nours in the past of someone's intention to construct lider on the Autogiro principle. At a lecture to the yal Aeronautical Society on March 15th, Señor de la rva stated that the most efficient rotor so far duced had a maximum L/D of 13 to 14, which was increase of some 40% on the best of five years ago. at is, it would have a gliding angle of 1 in 13 or 14.) cording to Mr. Wheatley, of the American N.A.C.A., L/D figure is improved at higher speeds; but it uld be interesting to know the probable sinking rate an autogiro glider at *minimum* forward speed, since sumably the chief value of such a machine would be ability to remain almost stationary in very narrow rmal currents.

* * *

Foreign Gliding Courses.—The National Union of dents, 3, Endsleigh Street, London, W.C.1, is ganising two tours which are each to include a course a gliding school, one in Austria, the other in Poland. e Austrian tour is from August 3rd to 31st, costs 1 19s. 6d., and will include three days in Vienna and in Salzburg, while the gliding camp (tents) will bably be at Deutsch-Altenburg, a village on the nube 30 miles east of Vienna. One of the Union's oine guides will serve as leader and interpreter. Par-ipants are limited to 15 in number, and the last te for registration is July 15th. The Polish tour is m August 10th to September 9th and costs 7 7s. 6d.; accommodation is in hostels, and the last te for registration July 20th. For the three weeks' ding course the party splits into two, the beginners ing to Polichno, near Warsaw, and advanced pupils Bezmiechowa, near Lwow (Lemberg on old maps). reader, in sending us the above particulars, says that, m his experience of N.U.S. tours, they will be roughly well run, and the fee completely inclusive.

Swiss Cross-country Record.—Hermann Schreiber, the Swiss sailplane pilot, has put up new records for height and distance in his country by flying from Berne to Geneva, early in May. The flight lasted 3½ hours, and in the course of it an altitude of over 5,000 ft. was attained. The distance between the two towns "as the crow flies" is 80 miles, but as Schreiber flew it was about 125 miles.

* * *

Height Record with Passenger.—On May 18th, Heinrich Dittmar, of Darmstadt, flying a two-seater sailplane, achieved an altitude of 8,860 ft. This is 366 feet higher than the *official* world's record for single-seaters, and 536 feet higher than the British record. (Herr Dittmar's climb of 12,630 ft. in South America last year was for some reason not officially recognised by the *Fédération Aéronautique Internationale*.) The machine used was the research sailplane Ons, with passenger.

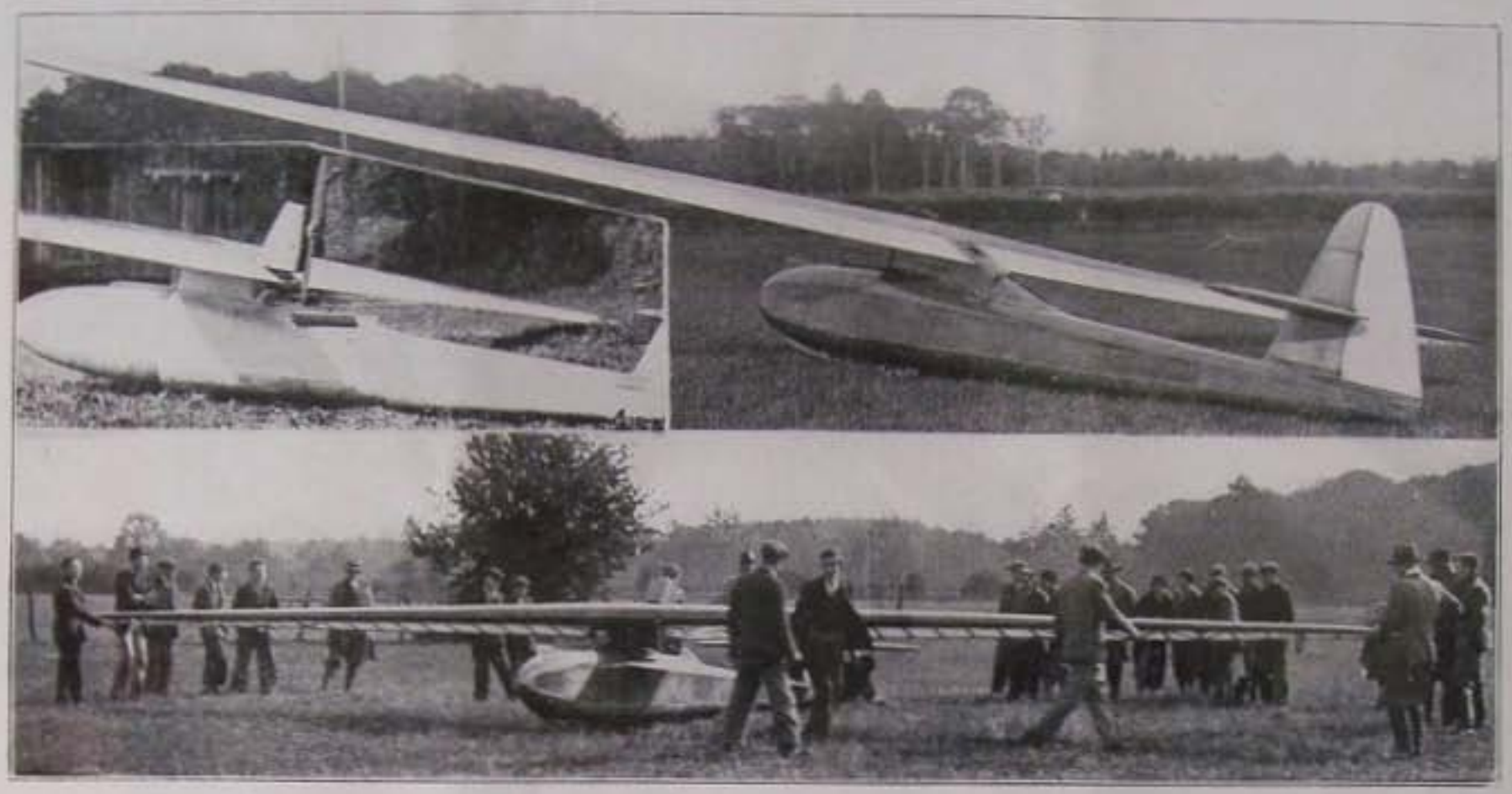
* * *

Nature's Weather Prophets.—There is an immense lore concerning the signs of coming bad weather discernible in the animal and vegetable kingdoms. While many of these can be attributed to a rise in atmospheric humidity, it is a question whether a fall in barometric pressure is sometimes responsible, especially in the case of birds, in whom the ability to detect such a fall would enable them to find up-currents. Writing in the *Radio Times* on "Weather Prophets at the Zoo," Craven Hill, F.Z.S., says: "Among the most accurate signs of the approach of rain are the howling of the wolves and the behaviour of the water-fowl, which show a certain restlessness at this time, caused by the thinness of the birds' skulls, which are peculiarly sensitive to atmospheric changes."

* * *

A Club Prospectus.—"There is really no particular reason why you should take up gliding. It is true that gliders are sometimes built to test aerodynamic theories, and also that power pilots with soaring experience have the same kind of finish in their work that liner officers get from training in a sailing ship, but fortunately no one has so far been able to produce conclusive proof that gliding has any serious commercial value. Gliding is, therefore, above all else, a *sport*." This is how the subject is introduced in a brochure just issued by the London Gliding Club, and obtainable from its secretary at 13, Victoria Street, S.W.1. The club's activities are fully described, and there are a number of photographs from THE SAILPLANE. Clubs which are thinking of issuing prospectuses of their own might do worse than take this one as a model; and we would again remind everyone that pictures from THE SAILPLANE, showing club activities, can be included in such publications for no extra cost, since we can lend the blocks free. Incidentally, it is about time the London Club ceased to tell inquirers (as they do in this brochure) to go by train from King's Cross to Dunstable Town. The way to get there by train is from St. Pancras to Luton, then on the Whipsnade bus (which connects) as far as the *top* of Dunstable Downs. This lands you on the spot. No other public transport comes within two miles of it.

The Carden-Baynes Auxiliary Sailplane, or Scud III



Above: the Carden-Baynes Auxiliary Sailplane is shown with the motor retracted within the fuselage, as in soaring flight. Inset: the motor raised into the "ready" position. Below: the machine is seen about to be launched on its first test hop.

THIS machine is made in two forms: it can be supplied either as a pure sailplane, or as a sailplane with auxiliary engine. In the latter form it made its first public appearance at the Royal Aeronautical Society's garden party on May 6th. Since then it has been given some catapult launches on flat ground, piloted by Mr. G. E. Collins, of the London Gliding Club, who was very pleased with the way it handled; but it may not be flown with the engine until the Air Ministry's permission has been obtained.

Mr. L. E. Baynes, who designed the SCUD I. and SCUD II., is responsible for the sailplane features of the design, as distinct from the engine installation. These differ in many respects from the SCUD II. The new machine has a full cantilever wing of 45 ft. 6 ins. span. Each half of the wing may be detached at the root without disturbing the controls, in a similar manner to the SCUD II. wing extensions, which detach from the centre section. The process of dismantling is, however, quicker than with the SCUD II., because there is no centre section to detach when the wings have been taken off.

The wings have both sweep-back and twist. Three basic wing-sections, evolved by the designer, are used. At the wing root the lower surface is flat, but a few feet out this has changed to a highly cambered section, which in turn changes progressively to a thinner and less cambered section with reflex trailing edge, together with wash-out of incidence towards the wing-tip.

The tail unit is novel, and has fixed surfaces cantilevered from half-way up the fin. Each half may be detached by disconnecting joints at their roots complete with elevator, the elevator controls automatically disengaging. The same dismantling tool is used as for the wings; in fact, the type of joint is very similar to the attachment of the wings to the neck of the fuselage. The tail has no external bracing, the rudder and elevator controls being entirely enclosed in the fin and fuselage. There are two reasons for the high position of the tail; one is that it brings the tail unit into the slip stream of the airscrew, and the other that, the tail being well clear of the ground, interference between rudder and tail is reduced. In addition, there is better rudder control at slow speeds or when stalled. The fuselage continues back to the trailing edge of the rudder, giving protection to the rudder and providing means for pushing the machine when on the ground. The fuselage itself is of oval section, with round top and bottom and flat sides. It is plywood-covered except for the nose, whose surface is built up of two layers of narrow spruce strips laid on diagonally.

All the controls have self-aligning ball bearings, and are thus very light to handle. The ailerons are differentially operated by chain and sprocket and push and pull rods.

The under-carriage consists of a single air wheel half projecting from the fuselage, and a main landing skid forward of the wheel. Thus the machine can take off on its wheel, making an easy get-away into the air, while the landing can be made on the skid by tipping the machine forward, so giving a quick pull up.

Without the engine unit the machine will be known as the SCUD III., and will be marketed at £175 as a high-performance sailplane. It is not, however, intended to replace the SCUD II., which will continue to be on sale at £125 as before. As an auxiliary sailplane the price of the new machine is expected to be about £250.

With regard to the engine, this is, of course, the most spectacular feature of all, in that it introduces the entirely novel principle of providing power not for maintaining level flight like an aeroplane, but merely for enabling the machine to reach a soaring area from ground level, and, if necessary, to reach another soaring area if the pilot runs out of lift and is unable to find any more within gliding distance. The machine is therefore a genuine sailplane, in that its purpose is to enable the pilot to indulge in soaring flight. In fact, any attempt to "cheat" by using it as an aeroplane would probably cause over-heating by putting up the engine revolutions, since the pitch of the propeller is designed to suit the machine's best climbing speed, which is 35 m.p.h., giving a climb of 230 feet per minute. The horse-power of the Villiers motor is 2½ nominal, and 9 actual (at 3,500 r.p.m.). Enough fuel is carried for a little more than half-an-hour's power flying, enough to take the machine to something between 3,000 and 5,000 feet.

When the motor is out of use it is retracted into the fuselage, along with the airscrew, by turning a handle in the cockpit; two flaps then automatically cover up what opening remains, and the clean aerodynamic form of a sailplane is all that is visible. The process is also reversible. This mechanism has been most ingeniously designed by Sir John Carden.

The following are the general data of the machine:—

Span, 45 ft. 6 ins.; length, 20 ft.; height (with wheel), 4 ft. Area, 120 sq. ft. Aspect ratio, 16 to 1. Weight, with pilot, parachute, motor and fuel, 500 lbs. The engine and fuel alone account for 50 lbs. Loading, 4·2 lbs. per sq. ft. Gliding angle with engine retracted, 1 in 24, and speed, 35 to 40 m.p.h. Sinking speed in motorless flight, 2·2 ft. per second.

New German Gliding Tests

IT was in 1920, in the Rhön Mountains in central Germany, that the first of a series of annual gliding meetings was held which led, two years later, to the mastery of the art of prolonged motorless flying, and has now given rise to a world-wide movement for developing the possibilities of soaring flight. Simultaneously there has arisen the practice of teaching pupils to fly on single-seater gliders as a substitute for the dual control aeroplane. So much has it come to be taken for granted that a gliding organisation should serve both these purposes, that it is hard to realise that the connection between the two is somewhat fortuitous, and is largely due to the special circumstances in which the German gliding movement arose.

In fact, when the first gliding certificates began to be issued, no soaring test had yet been introduced, the ability to soar being at that time confined to a few wizards, most of whom had already learned to fly on aeroplanes.

So at first there was only one test: a straight glide of 30 seconds' duration, for which a certificate was issued—no doubt highly prized by its owner. Mr. Aspegren, of the London Gliding Club, has one of these historic documents, having been one of a party of Swedish visitors who spent some weeks on the Wasserkuppe in 1923. But just after he passed his test a new series of gliding tests was introduced—the present "A," "B" and "C." The original half-minute test became the "A," a minute's flight with right and left turn was required for the "B," and a soaring flight of five minutes above starting level for the "C."

These conditions still held early in 1930, when the Germans helped to establish a gliding movement in this country; consequently they were adopted for the British gliding tests, with the additional provision, then current in Germany, that two glides of 45 seconds must be made before the "B" was attempted.

When the writer attended a German gliding school in May, 1930, however, it was found that the "B" had been altered, and five separate flights, each of at least a minute with S-shaped turn, had to be made. By that time, also, an "Official Soaring Pilot's Test" had been introduced in Germany; this is a kind of glorified "C," for which the candidate has to make five soaring flights totalling half an hour, after which he is subjected to an oral examination.

In 1926 the first cross-country flight in a thunder-storm front was made, and in 1928 the first cumulus cloud flight, while in 1930 and 1931 the art of using invisible thermal currents in cloudless weather began to be developed. Some pilots got so expert at exploiting these new possibilities that something had to be done, and the Germans introduced a special form of "C" badge distinguished by a surrounding silver wreath; hence the English name "Silver C," though in Germany it is now called a "Performance sail-flyers' badge," and the Americans call it the "D." The conditions are: A duration flight of five hours, a climb of 1,000 metres, and a cross-country flight of 50 kilometres. It was introduced in February, 1931, and in October of that year was adopted internationally.

The standards of motorless flying are continually rising; what is a piece of wizardry one year becomes a routine performance the next; the half-minute "A" flight, such an adventure in 1923, has become of so little account in Germany that the performer is merely *lent* a badge for his buttonhole, just as a little encouragement, but no other notice is taken until the obtaining of the "B" gives him the status of a qualified glider pilot (as distinct from soaring pilot).

And now, from the beginning of the present year, the German gliding certificates have been still further "hotted up." Herr Stamer, for ten years head of the Wasserkuppe gliding school, is chiefly responsible for the new regulations. They are as follows:—

"A" Test.—The pupil must first have made five glides of 20 seconds' duration; they need not be consecutive. The test is the usual straight glide of 30 seconds. But in all six flights the pupil must land on a defined strip of ground 20 metres wide (and presumably of infinite length), and the landing must be made at minimum landing speed, i.e. in a manner corresponding to a "three-point landing" in an aeroplane.

"B" Test.—There are two alternatives, according to whether the launch is made by catapult off a hill or by release from a cable drawn by stationary winch or moving car. In the former case five flights of at least 60 seconds are required, each including a right and left turn with at least 45 degrees change of course. In the latter, instead of S turns, full circles must be made—a left-hand circle in two of the five flights and a right-handed one in the other three. In all cases each turn must be made round a definite mark previously specified by the instructor; proper "bank" must be put on, and very wide turns are not allowed. The landing must be made within 25 metres of a flag or cloth previously placed in position, and at minimum speed. You are not allowed to stop yourself overshooting by rubbing the nose along the ground.

"C" Test.—A flight of *either* five minutes or more above the starting level *or* five minutes without loss of height. The landing may be made anywhere so long as the machine is not damaged. If the launch is by auto, winch or aeroplane tow, a barograph must be carried.

Gliding Certificates

We give below a list of all the British gliding certificates which have been granted since the last time we published such a list, in the September issue of last year.

"A" Certificates

No.	*Name.*	*Club.*	*Date.*
371	K. W. Dickins	London	29.6.34
372	O. J. O'Brien	London	12.5.34
373	E. A. Bret	London	15.7.34
374	A. M. Verity	Yorkshire	5.6.32
375	G. Toth	London	12.8.34
376	P. McC. Bond	London	1.9.34
377	Hon. J. R. Phillips	London	1.9.34
378	J. V. Gurteen	London	12.8.34
379	A. E. Shelton	Dorset	16.9.34
380	E. J. Furlong	London	23.9.34
381	R. A. Restall	London	23.9.34
382	A. E. Firmin	Wilts	26.8.34
383	F. J. R. Heath	London	23.9.34
384	H. P. Dean	Teeside	8.9.34
385	Kurt Thalhammer	(Austria)	24.12.33
386	F. C. Smith	Wilts	26.8.34
391	L. A. Lansdown	Dorset	18.11.34
392	F. Smith	Wilts	3.11.34
393	Duke of Grafton	London	21.11.34
394	E. W. Coombes	Southdown	18.11.34
395	E. E. H. Collins	London	23.9.34
396	R. S. W. Bailey	London	25.11.34
397	G. T. Rublick	Southdown	4.11.34
400	J. E. S. Fox	London	20.1.35
401	H. McClelland	London	20.1.35
402	J. S. Paget	London	18.11.34
403	R. C. G. Slazenger	London	25.11.34
404	L. H. Barker	London	10.2.35
405	W. Wheeler	Manchester	30.9.34
406	G. Hallam	Manchester	22.8.34
407	Miss M. S. Thring	London	23.2.35
408	W. Exner	London	18.11.34
409	C. O. Meeks	Midland	24.3.35
410	R. A. B. Williams	Midland	24.3.35
411	K. A. Edwards	Midland	24.3.35
412	A. I. G. S. Robertson	London	10.2.35
413	J. M. Williams	London	17.3.35
414	J. W. Horrell	Midland	24.3.35
415	R. N. Thwaite	Midland	24.3.35

"B" Certificates

No.	*Name.*	*Club.*	*Date.*
94	F. D. Bradbrooke	London	12.8.34
350	W. E. Godson	Manchester	14.10.34
354	B. V. Leak	Dorset	29.7.34
361	B. J. Stephens	Dorset	9.9.34
362	G. W. K. Frayling	Dorset	9.9.34
364	J. W. S. Pringle	London	16.2.34
368	J. D. Wood	London	24.3.35
370	Mrs. E. S. D. Baker	London	17.3.35
371	P. W. Dickins	London	15.7.34
374	A. M. Verity	Yorkshire	8.4.34
375	G. Toth	London	1.9.34
378	J. V. Gurteen	London	29.?.34
380	E. J. Furlong	London	31.3.35
384	H. P. Dean	Teeside	8.9.34
400	J. E. S. Fox	London	24.3.35
402	J. S. Paget	London	20.1.35
403	R. C. G. Slazenger	London	24.3.35
404	L. H. Barker	London	23.2.35
406	G. Hallam	Manchester	22.8.34
408	W. Exner	London	18.11.34

"C" Certificates

No.	*Name.*	*Club.*	*Date.*
94	F. D. Bradbrooke	London	12.8.34
184	W. R. Grant	London	24.3.35
282	R. C. Rainey	Imp. College	31.3.35
310	R. P. Cooper	London	29.7.34
348	H. T. Testar	London	11.8.34
354	B. V. Leak	Dorset	27.10.34
358	A. H. Curtis	London	17.2.35
363	P. R. Challier	London	13.10.34
368	J. D. Wood	London	31.3.35
370	Mrs. E. S. D. Baker	London	31.3.35
374	A. M. Verity	Yorkshire	22.4.34
375	G. Toth	London	7.4.35
381	R. A. Restall	London	31.3.35
385	K. Thalhammer	London	14.10.34
389	B. A. M. Goldman	London	20.10.34
400	J. E. S. Fox	London	31.3.35
402	J. S. Paget	London	17.2.35
403	R. C. G. Slazenger	London	24.3.35
412	A. I. G. S. Robertson	London	31.3.35

It may be noticed that many who have been reported in our Club News as having passed tests are not included in the above list. Application for a certificate must be made to the Royal Aero Club on the proper form, and within a specified period, or the Aero Club has a right to require the flight to be done again.

The R.Ae.S. Garden Party

At this event, which was held at the Fairey Company's aerodrome at Heath Row, soaring flight forced itself on the attention of the Royal Aeronautical Society. Not only did the Carden-Baynes auxiliary sailplane make its first public appearance, but G. E. Collins, in his Rhönadler sailplane, provided one of the most interesting items in the programme. The Rhönadler was to have been towed up by an aeroplane from Reading aerodrome, and released when still out of sight of Heath Row, high enough to be able to glide in. But the cable broke when only 2,000 feet had been reached; however, Mr. Collins was able to connect with some thermal lift and gain another 2,000 feet of height, so he found his way to the party and turned up, as per programme, only five minutes late. He then did one of his well-known aerobatic descents into the aerodrome, coming in at great speed, so that the machine was able to float on and on in apparent defiance of natural laws, before lightly touching down.

Sailplane Construction for the Amateur

5—Some Notes on Materials

(continued)

By W. BUTTERFIELD

THERE are three main methods of procuring lightness with a given strength:—

(1) Relates to choice of materials.

(2) Disposition of material throughout the structure.

(3) Reduction in the factor of safety. The first two are legitimate, the third should be avoided.

When choosing materials for sailplane construction our decisions are often governed by considerations other than weight, such as cheapness, supply facilities, durability, ease of working, etc., and the result is generally a compromise between lightness and one or more of the other conditions. Materials such as silver spruce, high tensile steel and duralumin stand out as being most suitable for our purpose, due to their having a high specific tenacity, which is regarded as being the ultimate strength per pound weight in a cubic inch of material.

To save weight the designer is often tempted to specify one of the many high tensile alloy steels, which requires special heat treatment in order to develop its full mechanical strength. Here lies a trap for the amateur, who may unwittingly commit an error in heating or working which would considerably reduce the strength of the material and consequently the factor of safety, whereas, had the fitting been proportioned to suit a material of lower strength such as mild steel, the amateur could not easily go wrong. Hence the popularity of mild steel for bent or welded fittings.

Steel. The different carbon and alloy steels of commerce vary considerably in their physical and mechanical properties. Steels which are weldable are generally called mild steels because they cannot be hardened in the ordinary way by heating and then quenching.

Low Carbon Steel contains less than 0·15 per cent. of carbon and is easily machined, pressed or welded, but cannot be hardened.

Medium Carbon Steel contains 0·15 to 0·4 per cent. of carbon and is weldable; it can be slightly hardened by heating and quenching.

Steel of higher carbon content is readily hardened but difficult to weld. Tool steel cannot be welded at all. The tensile, compressive and shearing strength of carbon steel increases with the percentage of carbon, but it is then not so plastic. Percentage elongation and reduction in area for a given load diminish with increase of carbon. The strength and hardness of steel is increased by the process of cold rolling or drawing through dies.

The weldable steels can be pressed, beaten or bent cold to fairly sharp angles without cracking. Fittings made by such methods should be normalised after working to remove internal stresses. The higher carbon and alloy steels require annealing during working operations and finally normalising, hardening or tempering according to specification.

Stainless steel can be obtained in various grades in the form of bars or sheets. Firth's "Staybrite" Steel is absolutely rustless, and is excellent material for the joint pins of sailplanes.

Heat Treatment

Heat treatment covers a number of processes which can be briefly described as follows:—

Normalising is the process of heating a steel, however previously treated, to a specified temperature and then allowing it to cool freely in still air.

Annealing is the process of heating to a temperature, not necessarily as high as for normalising, and then cooling very slowly, the slower the cooling the softer will be the material.

Hardening means heating a steel to its normalising temperature and then cooling more or less rapidly, in water, oil, or a blast of air.

Tempering means reheating a hardened steel to a temperature not exceeding its carbon change point, and then quenching.

Case Hardening. This process of heating a low carbon steel to a specified temperature whilst it is immersed in a substance which is rich in carbon, and then quenching in water, results in a glass-hard surface over a soft core. Mild steel parts which are subjected to much hard wear are often treated in this way.

Duralumin is an aluminium alloy about the same weight as aluminium yet possessing the strength of mild steel. It is the only substitute for steel where lightness combined with the strength of that material is required. It is an admirable metal for all kinds of forging and stamping work, but unlike mild steel it cannot be successfully welded.

Duralumin is supplied in many forms such as sheets, rods, bars, wire, tube, and in many extended sections suitable for aircraft construction, and is largely used in the construction of flying boats and rigid airships. It can be obtained in two grades, A and B, either in the normal or hard states, from the manufacturers, Messrs. James Booth & Co., Argyle Street, Birmingham 7.

When working duralumin it is often found necessary to anneal between operations. Such annealing should be done at temperatures of 350° to 360° C. and the heated material then quenched in water. The annealed material should be worked as soon as possible after quenching, since annealed duralumin begins to harden gradually during the first four days, after which no further hardening takes place.

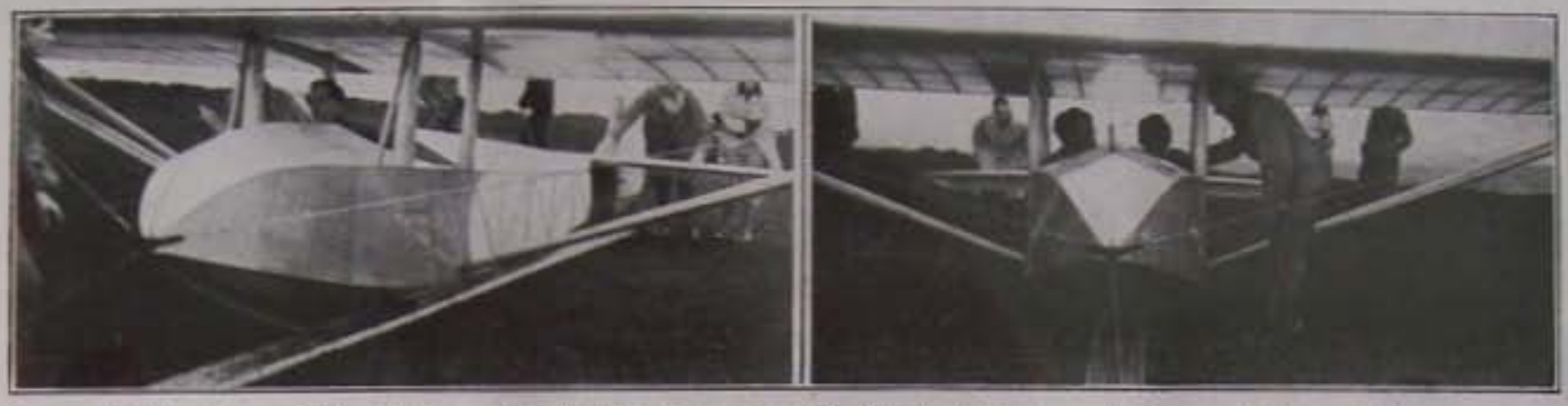
For forging and hot stamping work duralumin should be heated in a bath of molten potassium and sodium nitrates to a temperature of 400° to 420° C. This method prevents the metal from being burned during the annealing operation.

The third article of this series advised the amateur to have all metal parts manufactured by firms possessing the necessaary equipment and the experience of working aircraft materials; perhaps sufficient reasons have now been given to justify such advice.

And now just a final word on the subject of metal fittings.

The edges of all metal parts should be smoothly finished. Never use a steel marker to scribe the outline when marking off. When flanging or bending sheet metal, avoid sharp corners; the radius in the corner should never be less than the thickness of the material, otherwise fractures tend to develop.

News from the Clubs



The new "Falcon" type side-by-side two-seater, about to be flown by F. N. Slingsby, its designer. In the second picture he has a passenger. Note the starting plank. *[Photos by J. C. Neilan.*

Yorkshire Gliding Club

Easter was not quite the success we had anticipated. The weather was bleak and the east wind persisted.

On **Saturday, April 20th,** several of our visitors departed in search of an east wind site and, according to subsequent newspaper reports, they appear to have been successful. No flying, apart from ground training, was attempted at Sutton Bank.

Sunday, April 21st.—The wind had veered to S.E. and the winch was set at the top of White Horse Bank. After several members of the training squad had been launched successively in Dicksons, Briscoe decided to try the conditions over the gully on Scud II. He reached about 500 ft. before casting off and eventually, by quick turns, beating up and down White Horse Bank, he reached over 1,000 ft. It was obvious that the bumpy conditions made flying somewhat uncomfortable. Occasionally he touched something that looked like a thermal and went circling away under what appeared to be the most unlikely clouds. Finally he followed one out to Cold Kirby, but here the lift apparently withered and, with what altitude he had left, Briscoe just managed to scrape home, putting Scud II. down beautifully, having been aloft for 45 minutes.

At lunch time Coltman and party from Leicester arrived with the Albatross, which they proceeded to rig.

The new Falcon two-seater, built by Slingsby, Russell & Brown, Ltd., Kirby Moorside, was given its initial tests, piloted by Slingsby and carrying as passengers, first Mrs. Wills and then Fisher. This side-by-side two-seater showed remarkable qualities of "floatability" and manœuvrability, in spite of its sixty odd feet span, and should become very popular.

A new Slingsby single seater Falcon also was given its first tests. In it Slingsby was winch launched, after a few ground hops, over White Horse Bank, from where he settled down to a spot of soaring over a small wooded hill near Kilburn before landing near the water works.

At 2.30 p.m. a violent thunderstorm broke and the accompanying deluge drove away most of our spectators and put so much water on the moor that operations were discontinued for the day.

Southdown Gliding Club

Since the publication of our last activity report, which covered the first quarter of 1935, much good work and not a little progress have been recorded in both club development and actual flying.

New members are still coming in, and negotiations are almost concluded for the final acquisition of the three new soaring sites stretching across the Downs to the North of Brighton itself. Soaring has been going on steadily at the old site at Lancing as well as at the new sites, and certificates have been gained in all three categories.

Noteworthy was the flying done on **May 12th,** when soaring was in progress on all sites simultaneously, and seven "tickets" were picked up. Tinteren senior took his "A"; Rubick, Dunning, and Whiteman their "B's"; and Whiteman, Parsons, and Dunning their "C's." Meanwhile, at the No. 1 Dyke Area, McGlashan, Hatcher, and Jameson were auto-towing in the Prefect to 1,000 ft., and finding small thermals, thus proving that even near the coast is this type of soaring possible.

On the same day Little, in the Tern (*not* laid up at Airspeed, Ltd. as recently reported in The Sailplane, but Little's own property) was steadily gaining height on a five-mile beat at the No. 2 area (between the Dyke Hotel and Small Dole—which will be remembered as the old site of the former Sailplane Club), in the hope that he might be high enough to jump across the "Steyning Gap" and make off towards Portsmouth; but the wind veered towards the east and he could not get above 1,200 ft. in the slope-wind, there being a total lack of thermals at that time.

Duration of flight, 1 hour 10 minutes.

At the request of Air Commodore Chamier, the club is to be "at home" to the public, with special demonstrations on **May 26th,** in connection with Empire Air Day celebrations.

Furness Gliding Club

These days one hardly dares to report a week-end or two of ground-hopping, but just to remind our more fortunate friends that we still exist, it is worth recording that already this year we have more than doubled the number of launches made during the whole of last year.

Under the Ground Captaincy of C. Armer, the beginners have had a good time in the nursery field near Barrow. The damage to the primary B.A.C. II. has been very light considering that the average number of launches has been about 60 each week-end, when not raining.

Both the B.A.C. IV. and II. are now housed at the farm near our Ireleth soaring site, and much longer flights are the order of the day. On two occasions the advanced members were most unfortunate to find the main planes of the B.A.C. IV. damaged, just when soaring was possible, on one occasion by the farmer's dog, and again when someone put a foot through the leading edge. When we can secure that (anxiously awaited) hangar on site such disappointments should cease.

The membership of the club is about double that of last year, and drawn from a much larger radius. The old hands have lost none of their skill and the new ones show great promise.

Sunday, May 5th, at Ireleth.—Wind S.E. Armer and Hunter each made flights of 35 seconds on the east slopes, making good spot landings. After lunch the wind veered to S.W., Burnett making a splendid flight on the west side. A promising pupil was next launched on an "A" test flight, he confounded our hopes by stalling badly. The machine was patched up and ground hops were practised throughout the day. On this day our Workington member received his first air-borne launches and settled down in great style.

Saturday, May 8th.—Wind west, strength variable. Cumulus forming overhead and in a sea breeze too. Stevens (who has now joined the band of Benedicts) made three short soaring flights in the B.A.C. IV., adding about an hour to his total flying time, which by this time must have reached quite a respectable total. His landings on the hill top were well-judged efforts. Although the B.A.C. IV. looks well in the air with its modified tail assembly, Stevens is none too sure that the controllability of the craft is improved, but reserves his verdict until a more extended trial is possible.

London Gliding Club

Sunday, May 5th.—A slight westerly drift towards the hill. The FALCON, PFEILING, and two DAGLINGS spent the day gliding down off the top, all without emotion except in one case. The exception was one flight of the open DAGLING. Failing to get much height at the launch, it did a stalled right turn to avoid hitting the public, then an incipient left spin because the pilot forgot to straighten his rudder, another stalled right turn to avoid hitting the hill, and a stalled landing to avoid sitting down on the collection of cars at the bottom—all without damage either to itself, the public, the hill, the hedge, the winch, the cars or the pilot. Flying then proceeded as before.

Edmonds, Horrell, and Williams passed the "A" test; several did their 45 seconds towards the "B." Rattray passed the "B," and one member, Davis, carried off the "A" and "B" in one day, including the two 45's.

Instruction went on below, using the winch.

Monday, May 6th.—A faint wind from N.E. Brilliant sun; very hot. The day started with primary instruction, then, about mid-day, winch launches were begun.

Collins went up in GRUNAU BABY on the winch cable. The first launch wasn't much good, but the second took him up to 400 ft. He then found some thermal lift just south of the Bastion (i.e., the lee side), in which he circled up to 3,100 ft. After 20 minutes in the air, he returned to earth with an aerobatic descent. This is the first time anything of the sort has been done off the winch in the entire absence of any hill lift.

A "front" crossing Dunstable Downs on May 19th.

The RHÖNBUSSARD was launched repeatedly, but failed to find any thermals. The CRESTED WREN, with Humphries, had a "mammoth" launch to 500 ft. and ran into a thermal, but, having no instruments, lost it, and after four minutes in the air flew in to tea.

In the evening, in a dead calm, descents were made from the hill top until nightfall.

Saturday, May 11th.—Primary instruction, terminated by primary destruction (partial).

Sunday, May 12th.—Most of the day was spent winch-launching the two-seater. In the evening there was some flying off the top.

Saturday, May 18th.—With depressions travelling S.S.E. down the Irish Sea, passing to westwards and finishing up in France, wind changes during the week-end were rather peculiar. The first of the series, having reached the middle of France, changed direction and proceeded to North Germany, causing the Dunstable wind on Saturday afternoon to back from N.E. to N.W. In this wind Wills soared his SCUD, Barker his SCUD, Bergel the GRUNAU BABY, and Armstrong and E. H. Collins the FALCON, while McClelland kept up the nacelled DAGLING for six minutes, and Davis and Cox each flew it down.

Sunday, May 19th.—The wind having backed to S.W. for the next depression, some soaring was done in the morning. Nicholson and Cooper each took a turn at the RHÖNBUSSARD, and Thomas flew the GRUNAU BABY. As the only decent soaring was to be had over the Bowl, both machines had to do continuous figures-of-eight at much the same height; in fact, although the BUZZARD is supposed to have the better performance, the BABY sometimes got above it.

The FALCON and a DAGLING did some descents, until the rain came along with a south-east wind, and they descended for good; but not before S. Davis had got his "B."

The ground-hoppers must have started early, since 14 pupils made a total of 100 hops before the rain got really troublesome.

At tea time a dark "front" came over, consisting of low formless cloud into which ragged bits were ascending. The wind veered a little as expected, but dropped to almost nothing, and cloud settled on to the hill. The weather map afterwards showed it to have been an "occluded front" bringing warmer air. Club members occluded the fronts of the hangars and retired to the still warmer air in the bar.

Ulster Gliding Club

April 28th.—SCUD II. put the GRUNAU to shame when she soared for an hour with Metcalfe in a faintly perceptible breeze. Later it freshened and Mackie took her to Binevenagh and back; a nice bit of work in a north wind. Liddell later flew his BABY for half hour, got to somewhere near Hell's Hole, wished he hadn't as she sank beneath him, but just managed to get back to the beach. "That'll larn him!" Arguments, theorising, and prospective new members. Flying time, 2½ hours.

May 5th.—SCUD II. auto-towed at Magilligan in almost a flat calm. Mackie, Mrs. Mackie, and Metcalfe amused themselves repeatedly. On one flight the sinking speed from 600 ft. worked out at 1 ft./second, but no actual soaring took place. Circling over a hot patch of sand was possible at 100 ft. with just perceptable loss of height. Amorous couples disturbed on the cliff top by SCUD on its flight home; the pilot having to make known his presence when only fifty feet above them. The ethics of the whole question might well be discussed by the B.G.A. and a ruling given thereon.

May 12th.—On the invitation of the Irish Aero Club, SCUD II. and GRUNAU BABY II. were taken by road to Dublin to take part in Irish Aviation Day. Quite a lot of interest was aroused by the machines themselves, but the star turns of the day were, in the opinion of many, the two flights made by G. E. Collins, who had come over to visit us and fly the BABY.

He was towed up by a "Lynx Avro," of Cobham's Circus, to about 2,000 ft. At this moment the announcer was stating through loud speakers that he was about to attempt an endurance record for Ireland, whereupon Collins released and did a couple of loops and a spin. Following this the GRUNAU appeared to lose her head and go "clean daft," as we say over here. The crowd gasped as he sat on his tail and then slithered vertically backwards in, as Sir Alan Cobham himself described it: "One of the most sickening tail slides I have ever seen." It was the shortest endurance record we have ever seen. His second flight was more normal, in that, after having "aerobatted" for 500 ft. he climbed again under a cloud from 2,000 ft. up to 3,000 ft. We doubt whether the public there actually appreciated what was happening.

SCUD II. floated around serenely for ten minutes on a trial flight before the actual show had started, gaining 200 ft. after release from an auto-tow, over level ground. Perspiring marshals below may have been the cause of thermal activity. Personally, however, we believe it was due to the "lighter than air" condition of the pilot due to Dublin hospitality, which was, as always, generous in the extreme. We greatly enjoyed "basking in the reflected glory of the London Club," as someone put it, and we trust this organisation will not hold us entirely responsible for any subsequent dislocation of their training arrangements.

May 14th.—Liddell took Collins and Mrs. Collins to Magilligan for the day. Collins got 1,200 ft. on slope lift alone, and then proceeded upwards for another 800 ft. on something or other of quite a different character—goodness knows what! Aerobatic descents as usual—it is rumoured that the natives have not got their mouths to shut yet, but we believe this to be rather exaggerated. At any rate we hope he enjoyed himself and that he may visit us again soon.

Flying time, 1¼ hours.

May 18th.—KASSEL 20 and SCUD at Magilligan. K. 20's wings had suffered damage by rain leakage and she had to be jacked up again. Mackie tried to soar SCUD, but the wind had backed to an impossible angle along the cliffs and all he got was a scare. Even the gulls seemed nervous.

SCUD was dismantled and taken to Hell's Hole, where there was more than enough lift for Metcalfe who, after an hour at 1,000 ft., tried to get down, but couldn't. Followed a safe landing below in torrential rain.

Flying time, 1 hour.

Derbyshire Gliding Club

G. O. Smith flying the "Golden Wren" (left) and J. P. Dewsbery the "Rhönbussard" at Eyam Edge, Derbyshire, at Easter.

Sunday, April 28th.—The club's first day of training on the new site at Camphill Farm on Bradwell Edge. The weather could not have been kinder, a light east wind of about 5 m.p.h. blowing directly up a very gentle slope of 300 yards or so. About 20 members flew during the day, flights ranging from '005 second to 10 seconds duration. Nevertheless, the machine was put away intact, so credit is due to everyone concerned. Forty-five launches were made.

Saturday, May 4th.—GOLDEN WREN at Cocking Tor. Wind E.S.E., 20 m.p.h., dying to about 15. Hill lift only was to be found, and although the afternoon was profitable from the point of view of experience, nothing very exciting happened. Close to the landing area is a belt of trees, so placed that one has to fly through their lee eddy to approach. This eddy never seems to be in the same place twice, and all three pilots had an uncomfortable moment during their approach. Curiously enough, on another day with a wind direction only slightly different, the eddy was not noticed at all by any pilot.

Flying time for the day, 1¾ hours.

Sunday, May 5th.—Wind E., about 10 m.p.h. Primary training all day at Camphill. Good improvement was shown and almost all members have now got some sort of "feel" of the machine.

Our friends of the Manchester Club visited us for the week-end with their veteran PRÜFLING and some very nice hops were made in her, the slope being exactly right for the PRÜFLING's gliding angle.

Monday, May 6th.—Long Live the King! At last it has happened . . . a wind up the west slope.

But wait; it is early morning, the wind is east as usual and we continue soberly ground hopping with the R.F.D. and PRÜFLING as yesterday. Shortly after lunch somebody is seen to make a drift landing and the wind direction is checked. "Yes! It has changed a bit, we will launch in that direction this time." The same man is launched again, to restore his confidence, and again he makes a drift landing. What *is* the matter? Has he had too much lunch or is the wind *really* changing?

Again and yet again is the launching direction changed, until we are flying down into the dip from the opposite slope; and so it came about—as quickly and as unexpectedly as that. A *wind*: up the west slope.

Robertson was launched in the GOLDEN WREN and went straight up to 1,000 ft. by hill lift alone. We say hill lift alone because 1,000 ft. was obtainable anywhere along the three-mile beat at any time without any special skill or care. At a height varying from 1,000 to 1,250 ft. there must have been an inversion as all three WRENS pilots got quickly up to this ceiling, where it became strangely bumpy and the lift seemed to die out quite suddenly. There was not so much as a smell of anything thermal, so what will happen on this site when there *is*, we hope to be able to relate next month.

Meads, of the Manchester Club, at first sceptical, was eventually persuaded that if the WREN was up there the PRÜFLING would not go to the bottom; and his decision to fly was well rewarded. He was up about an hour, reaching a height estimated at 600 to 700 ft.; an exceptional height for a PRÜFLING. Meads did not say a great deal about the site, but we noticed with interest that some minor defect in the towing car prevented them taking the PRÜFLING back to Manchester. Flying time for the day, 3½ hours.

Saturday, May 11th.—Site, Mam Tor. Wind E.N.E., about 15 m.p.h. Mam Tor forms the head of a valley, the sides of which are steep, 400 to 500 ft. high, and about two miles apart. We find that when the wind is anywhere between N.E. and S.E. it gets deflected by the sides of the "U" (the east end, of course, being open) and by the time it gets to Mam Tor it is blowing more or less up the hill. The WREN has actually been flown here twice before, in very light winds, and each time has gone to the bottom after a struggle. To-day, however, there was no doubt about it, and although it was after 8 p.m. when the last man landed there were still occasional thermals about, Robertson and Smith both having good practice at circling in them. By the way, the WREN circles comfortably in 12 seconds if you ask her nicely.

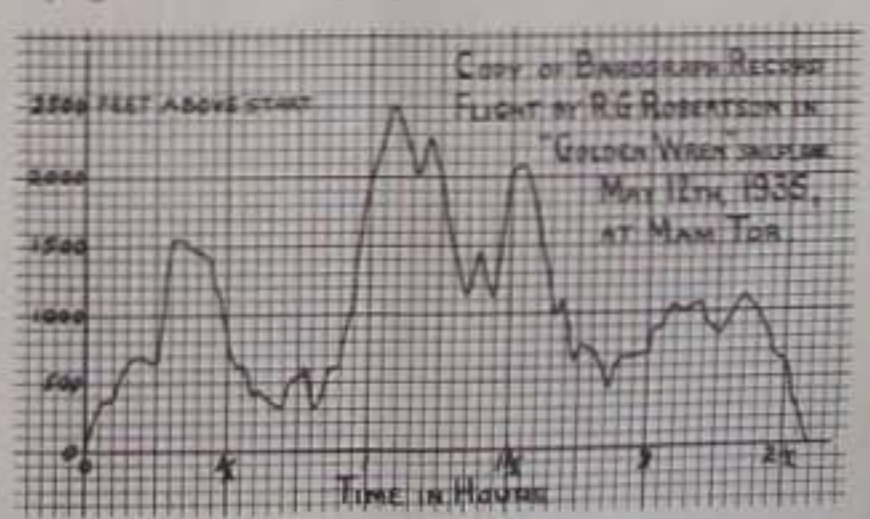
Maximum height reached, 1,300 ft. Flying time for the day, 1½ hours.

Sunday, May 12th.—Site, Mam Tor again. Wind N.E., 15 to 20 m.p.h. Slater flew for just over an hour, from approximately 1 p.m. to 2 p.m., and reported only slight thermal activity, not sufficient to circle in. This and the subsequent events make one wonder whether the best time for thermals is not rather later in the day than is generally supposed.

Robertson then took off and found considerable "instability," gaining at one time a height of 2,500 ft. and making a round tour of the neighbouring country. We attach herewith his barograph record (replotted from the original on a larger scale) which we think is of particular interest as it shows what can be done in Derbyshire on a day on which we venture to suggest no other English sailplane was in the air. [Except at the Southdown Club.—ED.].

Smith also had an interesting flight, taking off from Mam Tor and landing on the club ground at Camphill just in time for tea. The distance on the map is four miles, across wind; but it was not quite so easy as that, as there was a two-mile gap to get across and the down-draught of Bradwell Edge to be got over or round. The actual course taken was seven or eight miles, and this could not be achieved by hill soaring alone, as it was necessary to wait for a thermal to get across the gap. "Elementary, my dear Watson!" you may say, but interesting and valuable experience nevertheless.

Flying time for the day, 4½ hours.



Midland Gliding Club

The chairman writes that the club obtained eight more "A's" during the week-end, **April 27th, 28th.** Six were obtained on the nacelled DAGLING and two on the newly acquired PRÜFLING, which, under the name of "Watson's PRÜFLING," has already had an adventurous career elsewhere. The names of the eight are: Lawrence, Riley, Mott, Battie, Boyer, Jones, Olver, and Miss May Eversfield (the club's only lady member, who is considered to have done the best flight of all). Most of the times were 32 seconds, the best being 36, but a little more wind might have added another five or six seconds to each. Actually they all flew a course such as is required for the "B" certificate, having to take off from the wood at the back, turn right to the hangar, then left to the bottom of the training field, with a final right turn to land.

This brings the club's total of "A" certificates up to 15, of whom about three-quarters are ready to try for the "B," there are also a further five ready for the "A." The flying membership is 49. Since the first flying meeting was held last Boxing Day, these results have been achieved in only four months of week-end work, which is not bad, and for all we know is a record for a newly constituted club.

The Midland Club's "Prüfling" auto-launched at Castle Bromwich Aerodrome. Note the wind sock.

May 6th, Jubilee Day.—The club was allowed the use of Castle Bromwich Aerodrome, by kind permission of the Royal Air Force Command and the co-operation of the Midland Aero Club. The PRÜFLING and the privately owned FALCON were in use, and this was the club's first experience of auto-launching with a substantial length of cable, which consisted of 700 ft. of ¼in. hemp rope and three strands of bungy, each 15 yards long, tied together.

As neither machine has a quick release, it took a little time to get the knack of keeping the ring on the hook while going up, after which some good flights were made, and one member unexpectedly passed an "A" test and two got "45's" towards a "B."

But the FALCON did the most extraordinary things. Three times it got up to about 300 ft. facing the northerly wind, turned a half circle to the left, glided down-wind across the hangars and club house, and then, after some 70 seconds in the air, did a further right-angled turn to the left which took it all along the British Industries Fair buildings, which are a third of a mile long. Each time it traversed the buildings without loss of height, about 100 ft. above the top, in the thermal lift caused by the hot sun beating down on the roofs all day. The machine was too far back to be in any "slope lift" up the windward wall, and in any case the wind was only about 5 m.p.h. Davis, Hardwick, and Meeke (who did best) were the thermal-soarers. One pilot tried to do a second beat along the fair buildings, but left his turn till he had passed the end, where there was no lift; he lost so much height that he had to make a hurried landing in a roadway, and bruised FALCON's nose against the kerb.

On **May 21st,** happening to be in Birmingham, we found that the club is having regular meetings at Castle Bromwich on week-day evenings, the Handsworth ground being under hay at the moment. So we spent an anxious couple of hours watching the PRÜFLING going up at incredible angles (it always looks three times as steep as it really is when you are watching from behind), while the cable would invariably come off whenever the nose was pointing at a really hair-raising angle skywards. However, the members knew what they were doing and always had enough speed in hand to flatten out before stalling. Besides, you have only to put a PRÜFLING's nose down and it gathers speed like a rocket.

The club's PROFESSOR was also present, in the hangar; on Empire Day it is to be rigged, by special request of the organisers, and exhibited to the public as the first glider to cross the Channel (which it is—having been once the property of Mr. Beardmore).

It is a great joy to see such a flourishing club in one's native "Black Country." They are already discussing the formation of syndicates for private ownership of a sailplane or two, and the only thing that prevents one member from joining in is that he is building a light aeroplane to his own design, and will need all his spare cash for the A.I.D. inspection.

Leicestershire Air Sports Club

The club members have been busy during the last month re-conditioning our B.A.C. II. primary, which is now almost ready. We have left our training site at Beeby owing to the shooting rights of the landowner. We are scouting around for another site close to town now; we find it very difficult, but obstacles were made to overcome, so we keep on trying and hope for the best.

A. E. Coltman and two other members visited Sutton Bank at Easter, taking along the ALBATROSS. Coltman took his "A" licence test, but the weather held up any more flying.

May 5th, 6th.—Coltman again visited Sutton Bank and managed to gain his "B" and "C" licences, taking advantage of the only half hour's west wind that came along, and keeping up for 27 minutes. The ALBATROSS soars very easily and her undercarriage makes little or no difference to her performance.

The Yorkshire Club *do* make you welcome and give everyone a good time, for which we thank them most heartily.

A Useful Automatic Release

Mr. A. E. Coltman has sent a sketch and description of an automatic release which he has installed on his car for auto-launching. By its means, not only can the release be worked by hand, but it is effected automatically when subjected to a pre-arranged overload, which can be adjusted to any desired value.

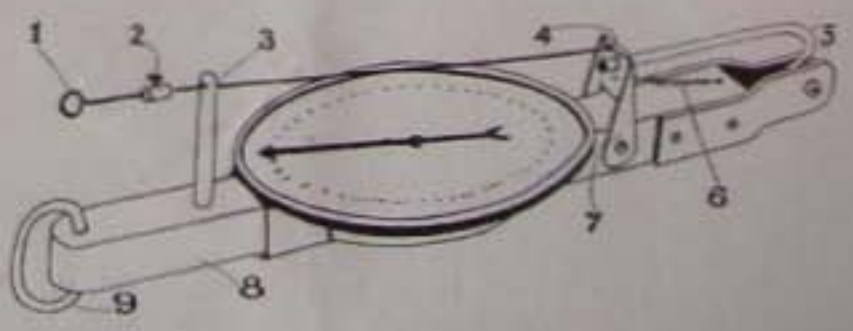
It can be put to several uses besides auto-launching; for instance, the car on which it is fixed can be stationary behind the glider and a rope connected from the apparatus to the tail of the machine; this saves having an extra man at the tail during a hand launch, and ensures the glider being released when the right amount of pull is being exerted by the team.

The apparatus is made from a 360 lb. spring balance, and the cost of making it is about £1 or £1 10s.

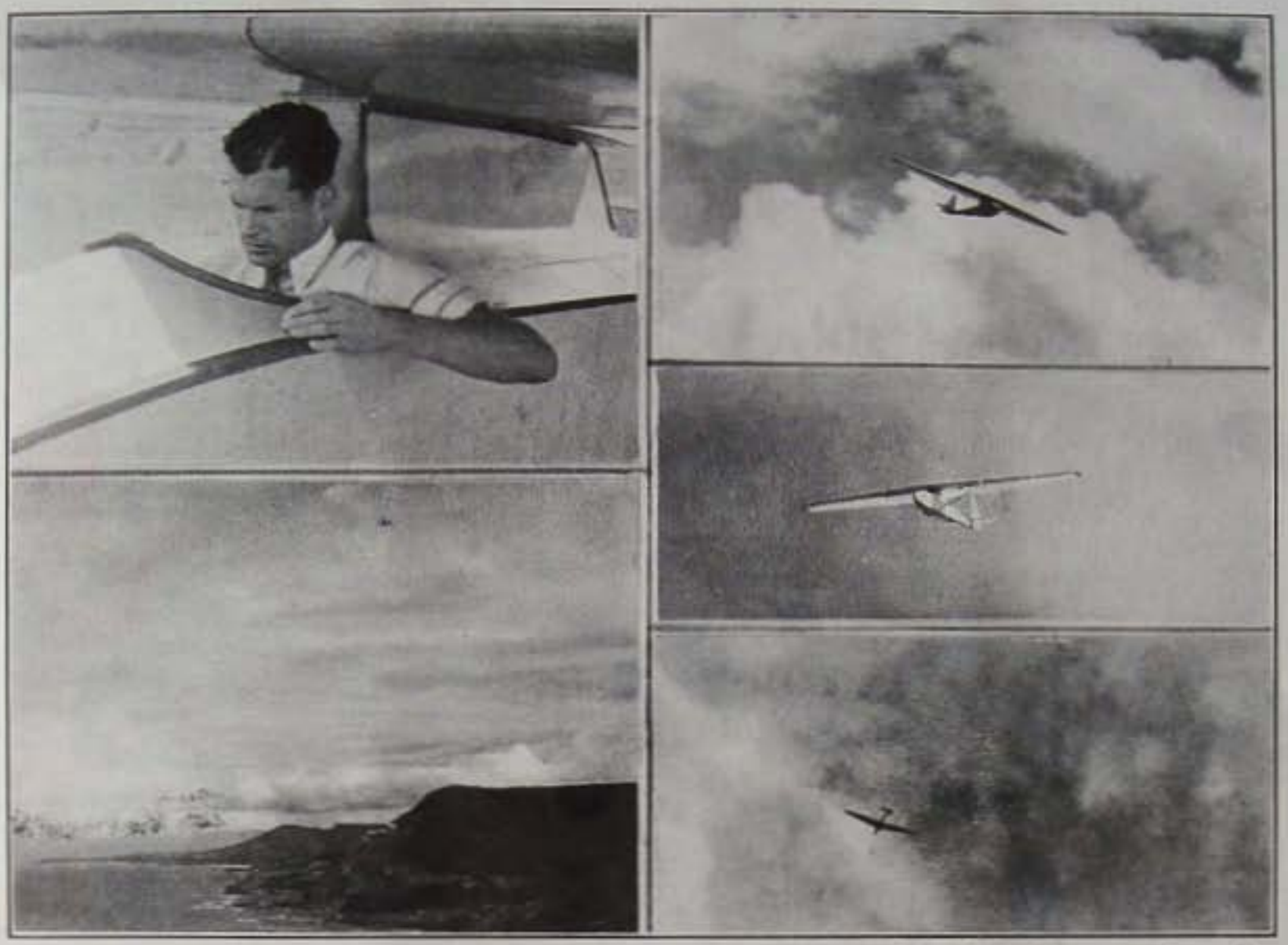
The following are the various parts as shown in the accompanying diagram:—

1. Hook to which cord is attached for safety release worked by observer in the car.
2. Collar and set screw for sliding along the wire (which must be a fairly stout one) to adjust the load. High to the left, low to the right.
3. Fixed steel post, with hole through which the wire passes, which pulls against the collar when under load.
4. Top of trigger, to which wire is fixed.
5. Hook, over which ring slips which is attached to glider cable. (A loop of elastic rope intervenes between ring and cable, to absorb shocks.)
6. Trigger spring.
7. Release trigger.
8. Extending part of scale.
9. This is fixed to the car grid.

As the scale extends with load, the steel post pulls against the collar on the wire and pulls the trigger to the release point. The hook then opens outwards, releasing the ring on the end of the cable. Mr. Coltman is of opinion that, for towing gliders by car, the best setting is about 200 lbs.



A "Wren" in Australia



Mr. F. M. Hamilton, formerly of the London Gliding Club and now in Australia, has built himself a "Willow Wren" out there, and, as the above pictures show, has now been flying it. Top left: about to start for a test flight. Top right: teaching himself to side-slip. Bottom left: a fine soaring site on the coast; the small spot near the top of the picture is the "Wren." In the far distance is a site where several enthusiasts gathered for an Easter meeting, 80 miles from Sydney.

Scottish Gliding Union

After a year's search for suitable ground the Scottish Gliding Union now find themselves in the position of being able to commence operations soon.

The ground problem in Scotland has been a very troublesome one, and months have been spent by members of the Formation Committee locating a site which they believed suited to the requirements of a well-equipped training school where instruction could be given for all grades of certificates. In addition they had to consider the locus of the site in view of the fact that a ground centrally situated would tend to attract a greater number of members, and enable the club to launch out on an extensive programme and engage paid officials to carry this through.

Ideal sites are difficult to find, and when located they are invariably refused for the purposes of the club. After a search over an area of three hundred square miles only four likely sites were located, and three of these were refused us on the grounds that gliding would attract large numbers of spectators and thus damage surrounding shootings.

Two suitable sites in mid-Scotland are still being sought after. One has been left in abeyance pending the completion of the new road bridge presently being erected across the River Forth. When the bridge is complete the site will be approximately 35 miles from Glasgow and a like distance from Edinburgh. On this account it is greatly favoured, but another year must lapse before it receives further consideration.

The second site is situated near Campsie and close to the locus of the Glasgow Gliding Club's display in June, 1930. It was from the hill behind this ground that the late Herr Krause gave his sailplane display that same year. There are good prospects of this site being procured, and should we be so fortunate there is little reason to doubt that its location will prove suitable to the majority of the members.

It is pleasing to report that the prospects of our making an early start are enhanced by the kind offer of Lord Glasgow in granting us permission to operate within his estate at Kelburn, near Fairlie. The site offered overlooks the River Clyde, and closely resembles that of the late Scarborough Gliding Club. There is ample flat ground for auto-work, good primary slopes, and the hill land at the back rises to some 500 feet. The ridge extends for miles down the coast-line, and has a western exposure.

The Formation Committee have agreed that the club shall commence its operations here, but realising that the majority of the members will require to travel a greater distance than was originally anticipated, they propose the formation of a camp where members might lodge during week-ends. It was their suggestion that, irrespective of the situation of the ground, a camp should be set up, so that their decision to found the club at Fairlie may not have so damaging an effect on the membership as some are inclined to believe. To the ardent supporters of the gliding movement distance matters little so long as once they have made the journey a good day's sport is assured them.

The policy of the club will be determined once the total membership is recorded, and the larger this number is the more elaborate will be the scheme submitted for their approval.

Mr. Reginald Brazier, who was in 1930 appointed ground engineer for the B.G.A. in Scotland, has agreed to accept office as ground engineer to the S.G.U.

The union's equipment has been overhauled and is now ready for service, but we contemplate adding to our equipment a new auto-tow dual-control sailplane, tenders for the supply of which are invited, and should be sent to the Hon. Secretary, Scottish Gliding Union, "Journal" Office, Alloa, as early as possible.

A general meeting of the club will be held on or about 15th June, and operations will be commenced the following week-end.

New Gliding Clubs

England.—The Barnsley Motor Cycle and Car Club is forming a gliding section, and is looking for a second-hand primary glider with which to commence operations. The organiser is Mr. Chas. W. Bray, 92, Spring Street, Barnsley.

An attempt is being made to form a gliding club at Blackburn, and Mr. John Crossley, of 116, Higher Audley Street, has written to the local press asking all those interested to communicate with him.

The re-formed Nottingham Gliding Club has enrolled over 40 members.

Scotland.—The Dunbar Gliding Club has started flying operations. On May 1st, Mr. Arnold Tegneri was flying his intermediate glider at Hoprig, Cockburnspath, at about 200 ft., when it banked to the left and landed on a hill top, after which it slid down the hill into a stone wall and was badly damaged.

The Elgin and District Gliding Club held a general meeting on May 11th. It was announced that Mr. P. Kynoch Shand, of Dunkindy, and Mr. H. Bibby, of The Haugh, Elgin, had guaranteed £25 to make up the £80 which is required before activities can begin.

The inaugural meeting of the Perth Gliding Club was held in the Salutation Hotel, on May 14th. Thirty or forty members expressed willingness to join. The club hopes to be allowed the use of the municipal aerodrome site at Newlands, and it is stated: "The ultimate intention is that once the aerodrome is a thoroughgoing concern and the club members reach the final stage of proficiency in the art of gliding the ambitious step of introducing power machines will be taken." An attempt is being made to obtain a glider from the Scottish Gliding Union which originally belonged to the now defunct Crieff Gliding Club. The meeting elected the following officers: President, Lord Provost Thomas Hunter; vice-president, J. Littlejohn; treasurer, J. Simpson; secretary, H. W. M'Kelvie, View Cottage, Union Road, Scone.

An Amalgamation.—The Manchester Gliding Club is to unite with the Derbyshire Gliding Club. The former club's secondary machine and two-seater are in future to be kept at Bradwell Edge.

Pwllheli and District Gliding Club

We have disposed of the incomplete DICKSON and have purchased another primary with detachable nacelle, with which we are very pleased. Our winch car is not yet ready.

On **Easter Monday** we had our first meeting, when the secretary just managed to leave the ground. The car used was underpowered, and not a breath of wind to help.

On **Thursday, April 25th,** we met again. There was a strong, gusty wind, and on the first tow the poor secretary was kited above the trees, but made a safe landing. Several members had ground slides, and later, after the wind had dropped, three were safely launched on their first hops. One lost his foothold and the stick, hanging over the side by the belt, but the machine brought him down safely. It served to bring home the lesson that the machine will fly itself!

Official Notice

Committees

At the 65th Council meeting of the British Gliding Association, Ltd., held at 66, Victoria Street, London, S.W.1, on April 25th, 1935, the following committees were appointed:—

Finance and General Purposes.—Messrs. D. G. Hiscox (treasurer), P. A. Wills, Major H. Petre, and Captain A. N. Stratton.

Subsidy Committee.—Messrs. J. P. Dewsbery (Convener), J. R. Ashwell-Cooke, D. G. Hiscox, C. E. Hardwick, N. H. Sharpe, and C. M. C. Turner

Contest Committee.—Messrs. W. Butterfield, G. E. Collins, J. P. Dewsbery, E. G. Sanguinetti, A. E. Slater, A. L. Slater, N. H. Sharpe, F. N. Slingsby, Captain A N. Stratton, and Mr. P. A. Wills.

Technical Committee.—Mr. W. O. Manning, Captain C. H. Latimer-Needham, and Captain F. T. Hill.

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