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THE SAILPLANE & GLIDER

Official Organ of the
British Gliding Association

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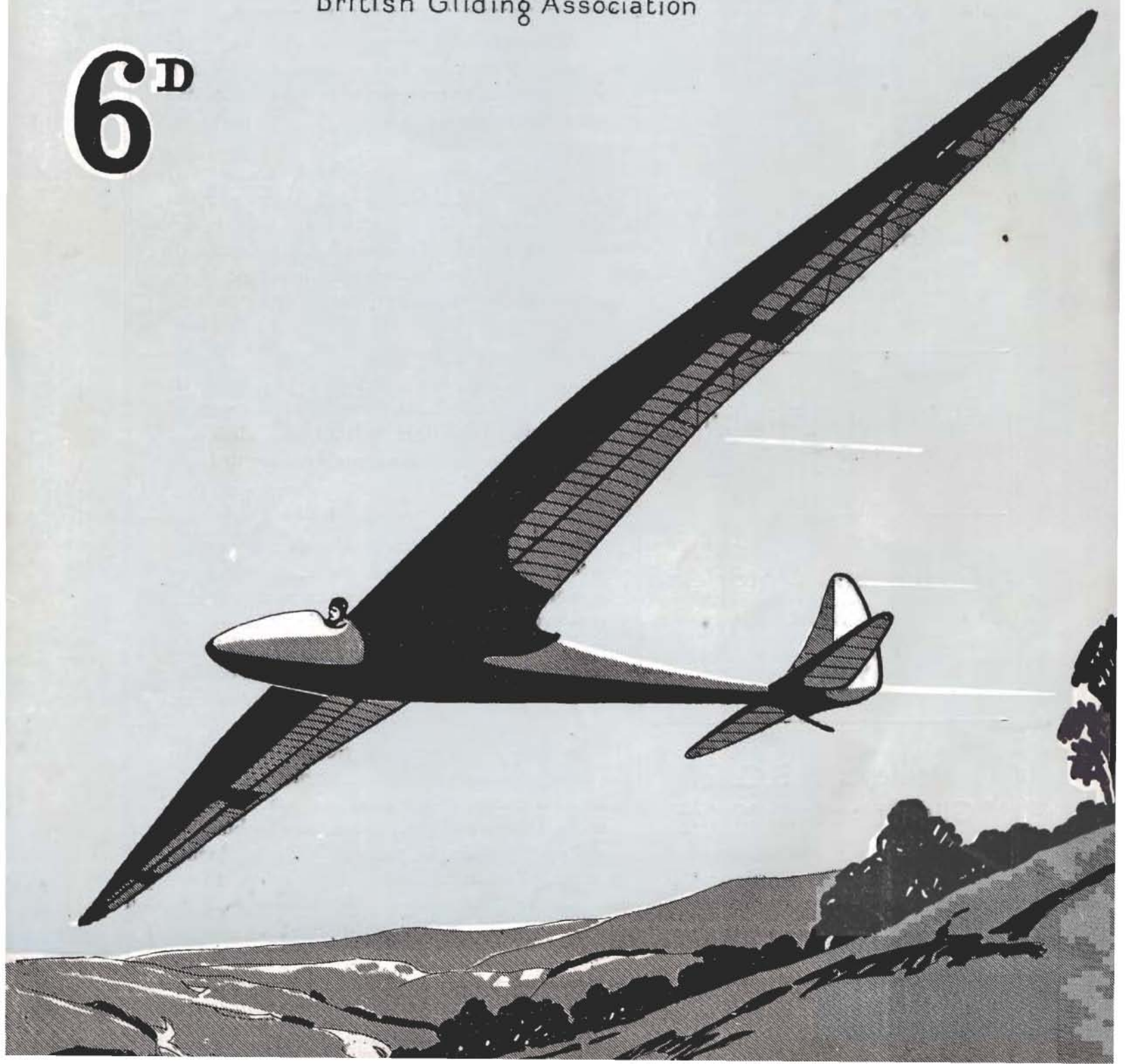

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THE SAILPLANE & GLIDER

(*Founded in September, 1930, by* THURSTAN JAMES).

The only Journal in the World devoted solely to Motorless Flight.

OFFICIAL ORGAN OF THE BRITISH GLIDING ASSOCIATION.

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CONTENTS.

A WARNING

IN recent months attention has been directed, on more than one occasion, to the financial position of the British Gliding Association. Ever since its inception, this organisation has had one long struggle for existence. That it has been able to continue its activities for three years has been due entirely to the interest of Lord Wakefield, who has, with characteristic generosity, made substantial donations on two occasions.

Experience has demonstrated abundantly that the Association, with its present organisation, cannot exist on what might be considered its legitimate income—capitation fees from affiliated clubs, fees for certificates of airworthiness, etc. If it is to continue, it must receive a definite income in the form of a subsidy or otherwise. THE SAILPLANE Fund, by which it was hoped to raise a substantial sum, has been a failure; all that can be said for it is that it has prolonged the life of the B.G.A. for, at the most, a few months.

In an earlier issue we were able to report that the Vice-Presidents of the Association had unanimously decided, after careful investigation, to approach the Air Ministry with a view to obtaining a subsidy. So far as our information goes, the Ministry has not yet given its decision on the matter. Unless a favourable reply is received within the next few weeks, or help arrives from an unexpected quarter, there will be no alternative to the Association suspending its activities. This does not mean, necessarily, that the Gliding Movement in this country will die out, though it must receive a definite set-back. The greater part of the real work connected with the Movement is already performed by honorary officers, and this, presumably, could be continued, although there is a limit to voluntary work of this kind.

A question which concerns us more intimately is the future of THE SAILPLANE. Like the Association of which this journal is the official organ, it has had a ceaseless struggle for existence. In spite of voluntary contributions —and we should here like to express our sincere thanks to those contributors who have made the continuation of the paper possible—and low printing costs, THE SAILPLANE is not paying its way. The income from any newspaper or periodical which pays for itself is derived almost entirely from its advertisement revenue. It is here that our own paper is severely handicapped. There is, as yet, no real industry behind the Gliding Movement which can

be depended upon for a steady flow of advertising. Similarly, the clubs being distributed over the country, there is no strong local interest to attract advertisers. Nevertheless, we believe that advertisers who patronise THE SAILPLANE, with its low rates, would find it distinctly profitable to do so.

The question which members of the gliding clubs have to ask themselves is whether THE SAILPLANE is essential to the Movement and, if so, whether publication should cease even if the British Gliding Association has to suspend its activities temporarily. It is, perhaps, impertinent on our part to attempt to answer these questons, but, according to our information, the general feeling throughout the Movement is that the publication should be continued at all costs. It does, after all, form a definite link, not only between those engaged in gliding in this country, but also with other countries. It circulates in four of the five continents (and we hope it will shortly circulate in the fifth), and receives contributions from many countries. According to the latest available figures, the circulation is steadily going up. If publication has to cease temporarily, it will take a long time to recover the ground that has been gained, with some expenditure of effort, during the last few months.

If the Air Ministry decides within the next week or two that it is in the national interest that the British Gliding Association should continue its activities, and that the cheapest form of control would be effected by an annual payment to the Association from public funds, these immediate questions will cease to worry us, although other, more serious, matters will then demand attention. In the meantime, we cannot afford to live on hope, but must face FACTS. One is that it is definitely within the bounds of possibility that the central organisation will have to put up the shutters in the very near future; and the second, no less open to doubt, is that the publication of THE SAILPLANE may have to be suspended.

Elsewhere in this issue we reproduce the first part of a discussion, by Professor Georgii, of the results achieved at the Twelfth Rhön Soaring Contest in the summer of 1931. One has only to read this inspiring article to realise how far we, in this country, have yet to travel. In Germany the Gliding Movement is heavily subsidised, and nobody acquainted with the true facts of the case will deny that the progress achieved in that country has been largely due to the supervision of the central technical and research institute—the Rhön-Rossiten Gesellshaft. What we have lacked, hitherto, in this country has been *technical* and *scientific* control, and we believe that no subsidy or other financial help will be really effective unless it provides for this form of assistance for the Gliding Movement. We have reached a certain point, but what is now required is a definite lead as to the form which the future of the Movement is to assume. In our last issue we invited correspondence on this subject. Nobody has, as yet, shown any haste to voice an opinion on this vital matter. We emphasised then, and we repeat, that this is, perhaps, the most pressing problem of the moment.

The present time is a critical one. It is not a question of simply waiting and seeing what is going to happen. Everyone who is really interested in Gliding must throw off inertia and face the present situation. On the decisions of the next few weeks will probably rest the making or marring, for some years to come, of the Gliding Movement in England.

GLIDERS FOR CLUBS

In considering the best means that a club may adopt for training, I am here considering the training of a soaring pilot; and the means are not supposed to be suitable for those without the ability to get a "C."

Two years ago, the equipment necessary for a club that hoped to turn out pilots who could fly high performance machines was clear. The ZOGLING or DAGLING was for primary training, the PRUFLING was used to get a "C," and the PROFESSOR was the ambition of the more hopeful pilots. Of these machines the PROFESSOR was too heavy to be convenient for the private owner or group, and the performance of the PRUFLING was not good enough.

Other methods of training are not discussed here because I have not enough knowledge of them to form an opinion. One hopes that their protagonists can put them into practice, so that we may see their value.

To-day the situation is very different. The ideal equipment for a club is, perhaps, a DAGLING on which to learn to fly, a HOLS DER TEUFEL on which to learn to soar, and a FALKE or PRUFLING on which to learn to fly better; but it is possible to do with less than this. For example, it is possible to soar a booted DAGLING, and a FALKE or KASSEL 20 are so efficient that they are reasonable machines for the private group and are at the same time more easy to fly than a PRUFLING. This is also probably true of the GRUNAU BABY.

Thus, when members had become really proficient in soaring a DAGLING, they would form private groups to buy or build one of these machines and would be able to fly them safely, the first flights being made under easy conditions and with advice from an experienced pilot. (An aeroplane pilot should be able to make the step from a DAGLING to the SCUD or CRESTED WREN.)

The group would then enjoy two years of flying, making duration fights at first and later, whenever conditions were favourable, doing some distance or cloud flying. Towards the end of this time, the more ambitious members would begin to sell out to progress to something of the high efficiency type, such as the SCUD or CRESTED WREN, or whatever had taken their fancy, and which they would by then be fully competent to fly.

"KENTIGERN."

B.G.A. DANCE.

Make a note of January 11th. From 9 p.m. to 2 a.m. a reception and dance will be held at the Portman Rooms, Baker Street, W.1. This dance is in aid of B.G.A. funds, and deserves the fullest possible support.

Mrs. J. A. Mollison (Miss Amy Johnson), who is one of the Vice-Presidents of the B.G.A., will be present with her husband and they will receive the guests.

Every effort is being made to ensure that the dance is a huge success. The arrangements are in the hands of Mr. Waplington, whose capabilities on the social side are well-known to everybody. With the help of an enthusiastic committee he has already sold a large number of tickets.

Make sure of *your* ticket now, and get as many of your friends as possible to come along.

THE TAILLESS SAILPLANE

During the past few years designers of sailplanes have made practically no advance in design from the point of view of aero-dynamic efficiency. The little betterment of gliding angle hand in hand with low sinking speed which has been achieved, has only been at the expense of gigantic wing span, and its consequent induction of great weight and lack of manœuvrability. The late AUSTRIA bears out this point to a marked degree.

Competing, on the other hand, is an ever-increasing school, whose doctrine is one of sacrifice of a certain amount of gliding angle and sinking speed to obtain good manœuvrability.

In short, extreme performance is at present out of range of adequate manœuvrability.

Salvation lies in some new departure: either a revolutionary aerofoil section, or some new mutual arrangement of sections; in any case, in some completely unorthodox adventure.

One such attempt we see in Mr. Nyborg's sailplane. Possibly the designer has found the solution, and all of us are looking forward eagerly to the trials. For the moment, however, let us consider a design which, after all, is not so unorthodox, namely, the tailless sailplane.

Why have a tail? It is dead weight—anti-lift. The wings have to be designed with greater area or loading to take the weight. The fuselage has to be lengthened to make the tail surfaces effective, and strengthened enormously to take tail loads. Up goes the weight again, and down goes the performance.

True, the wings of a tailless type must be designed to take considerable torsion loads, but the deep sections employed in sailplane design lend themselves to this. The increase in wing weight should be far more than offset by the saving in empennage weight. Again, the orthodox tail surfaces play havoc with the streamlines over the fuselage at the end which matters most.

Away, then, with this excrescence, and let us see roughly what problems arise without it.

First consider a rectangular wing with the pilot cradled beneath in a streamline nacelle, and with the C.G. and C.P. of normal flight coincident at about 0.3 of the chord from the leading edge. Move the orthodox ailerons differentially and they will give lateral control. Move them up simultaneously, and, as they and the forces on them (say, p_1 and p_2, acting at cp_1 and cp_2 respectively) are behind the C.G. by a distance x, they will increase the angle of attack of the wing. Depress the ailerons simultaneously and the reverse will hold good: the sailplane will dive.

What are the snags of such a simple design, and their remedy?

(1) Directional stability is inadequate because of the lack of keel surface behind the C.G.

The wings must be "swept back" to give this stability. About 30 degrees is our limit, as beyond this point the aerodynamic efficiency of the wing falls off rapidly.

(2) Owing to the very short length of the fore and aft

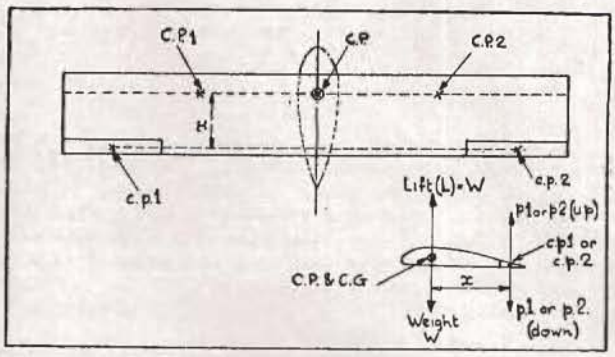

Fig. 1

distance x (Fig. 1), the moment of inertia of the sailplane in the looping plane is so small that the fore and aft control would be ultra-sensitive, and the damping very small. This would be largely remedied by the sweep back already advocated in (1), increasing the distance x.

(3) However stable may be the C.P. of the chosen section inherently over the normal flight range, between the two extreme positions of the C.P. in the high incidence and nose-dive conditions there is bound to be some considerable movement of C.P.

For adequate control the fore and aft moment x (p_1+p_2) must compare favourably with that of an orthodox design. The sweep back and choice of plan form will make x sufficiently large.

For adequate stability the wing form must be such that it has a very stationary C.P. over a wide flight range of angle of attack. This may be obtained by choice of a section with a reflexed trailing edge (*e.g.*, R.A.F. 33 and 34), or by "washing out" the incidence towards the tips. A suitable combination of twist and sweep-back has to be derived from formula.

As a certain amount of aerodynamic twist from root to tip does exist, wash-out of incidence, within limits, towards the tips, makes for lateral control efficiency. For stationary C.P. conditions the wash-out varies almost inversely as the angle of sweep back, and, happily, increase of aspect ratio allows further decrease of wash-out, eventually bringing it closer to the twist giving highest aerodynamic efficiency.

Statical stability is further enhanced by advancing the C.G. slightly. In a conventional sailplane the C.G. is usually behind the aerodynamic centre, and stability is obtained by the use of a tail plane. The advancement of the C.G. in a tailless machine as, in fact, in any type, bogey is practically laid by the tailless type.

If statical stability is increased by moving the C.G. forward, the twist or wash-out must also be increased to maintain balance. This twist performs the same control function as the tail plane does for a conventional type. It has no effect on statical stability but must be varied to obtain balance according to the characteristics of the design.

Continued on p.p. 259

TWELFTH RHÖN SOARING CONTEST 1931.

By Prof. Dr. W. GEORGII.

[*We make no apology, even at this late date, for reproducing Prof. Georgii's discussion of the results of the* 1931 *Rhön Soaring Contest. A careful study of these results will be particularly valuable at the present time, when the future of the British Gliding Movement is in the balance. The paper has been translated by Mr. J. Vanier, of the National Advisory Committee for Aeronautics.*—ED.]

The twelfth Rhön soaring competition formed the fitting conclusion of a period of gliding activities never seen before. Throughout the months from spring until midsummer the gliding enthusiasts were much in evidence in all parts of Germany, trying for the Hindenburg Glider Prize. Competition was benefited considerably by the general introduction of the towing glider in the spring of the year. Towed aloft by airplane, it made every landing field amenable for performance gliders which heretofore had been restricted to certain localities. Groenhoff's flight from Munich to Kaaden (Bohemia), an air-line distance of 275 km. (171 miles), in particular, had left a lasting impression of the great advantages of towing gliders. Groenhoff and Riedel's excursion by towed glider to Munich led others to undertake similar flights. It was soon followed by the thermic gliding experiments of Otto Fuchs in Berlin, which culminated in a flight from Berlin to Frankfort on the Oder, a distance of 80 km. (50 miles), by Kronfeld's flights in England, whose greatest achievement, apart from his spectacular Channel flight, consisted of a thermic gliding flight from London to Chatham, by Hentschel's 11½-hour flight at Dörnberg, near Kassel, and by Dinort's record of 11 hours and 39 minutes at Rossitten.

Part of the newer research problems embarked upon last year was the glider expedition into the high Alpine region of the Jungfrau in Switzerland. The crew of the FAFNIR—Groenhoff, Riedel and Harth—was given an excellent opportunity for collecting first-hand data as to the usefulness of gliders in the Alps. It is necessary to recount the remarkable glider achievements ahead of the Rhön Soaring Contest, in order to understand the tension and expectation with which the Rhön Contest was anticipated.

The large number of new gliders of groups making their first appearance on the Rhön, and the astonishing number of juvenile flyers with "C" certificates, prove that the numerous local contests in various parts of the country constitute an excellent preliminary training for sailplane contests. In spite of the extremely precarious economic conditions, 59 sailplanes were entered, of which 49 appeared at the field.

The former method of grading the entries into schooling practice and performance was retained in principle, even though the gliding contest was eliminated. For, according to the experiences from the 1930 contest, it was found that a certain classification into junior, advanced, and master groups was absolutely necessary—the first two categories being admitted to the "practice" contest only and comprising the pilots having but lately (a few months before) received their "C" licence and not having made any duration flights of more than five hours, or those who had not flown since 1928. The official certificate with five sailplane flights of altogether 30 minutes' duration was necessary to qualify the entrant for the "performance" contest. This method of grading has proved eminently satisfactory.

Another significant fact revealed by the contest was that in many cases the juvenile flyers had not enough experience to fly performance machines, and the result was that many a promising-looking craft was crashed during the first few days.

The rules governing the "practice" contest followed closely those of previous competitions; that is, primarily, duration and altitude. The duration was rated, as in former years, for total flight duration, and in two categories: juniors without experience, and juniors having more than one hour's experience.

The winners of the "practice" contest for total duration, according to this rating, were the "Württ. Luftfahrtverband" under the leadership of Kunzer and Hakenjos, and the glider of the "Arbeitsgemeinschaft Wurzburg" with Schmid and Endres as pilots, whereas the winners of the altitude total were W. Teichmann, Berlin, the "Akaflog Marcho-Silesia" (pilot Pfeiffer), and again the "Württ. Luftfahrtverband" (pilot Hakenjos). In 1930 the total of the "practice" contest for greatest total flight duration was 27 hours and 28 minutes; this year it totalled 9 hours less, which, however, is not to be interpreted as regressive. The best proof of the never-fading zeal and eagerness, particularly within the ranks of the juvenile group, is the large number of flights made, namely, 300 *actual flights*, as against 132 *starts* in 1930. The main reason for the smaller total duration and the considerably less maximum duration of the individual flights is traceable to the peculiar weather conditions. West-slope weather with amply strong, continual west winds, so typical of the 1930 contest, was altogether lacking, except for a very few days.

During the entire second half of the contest, in particular, the conditions were altogether abnormal under the influence of extremely bumpy, easterly winds. They especially proved a drawback for the duration flights. Besides, the upwind zones on the slopes facing south and east are very narrowly restricted, and several gliders in the air at the same time interfere with, if not actually endanger, one another. In spite of this, Schmid, of the "Arbeitsgruppe Würzburg," made an exceptionally beautiful flight. He attempted, on July 28, to break the Rhön endurance record with the WURZBURGER GENERAL-ANZEIGER. Although wholly unprepared, he decided to stay aloft as long as possible, but was finally forced to land after exactly 9 hours, because of rain and complete abatement of the wind. Hemmer's 1930 record of 9 hours and 36 minutes was not beaten.

Against this showing of the junior group, that of the advanced flyers during the "practice" contest fell surprisingly short. Of the eight entries, not one passed the minimum requirements of the prize rules.

Although there was not as much flying as usual because of the weather conditions, the days of the west winds were that much more eagerly taken advantage of, and many beautiful flights were made, notably the squadron flight of July 28. With Groenhoff in the lead, seven juvenile flyers received their initiation into the secrets of cloud sailing. It was a beautiful spectacle to watch the youngsters imitate every curve of their leader, and three planes, in fact—the OFFERMANN (pilot Teichmann) with 34.6 km. (21.5 miles), the PROFESSOR (pilot Hakenjos) with 29.8 km. (18.5 miles), and the STADT STUTTGART (pilot Kunzer) with 24.8 km. (15.4 miles)—were able to qualify for the consolation prize.

The chart (Fig. 1) shows four groups of preferred flight directions. The first and most extensively used is from the Wasserkuppe past the Hohe Rhön northward toward the Ochsen and Vacha. It is the favourite "Nehring" route of 1927 and 1928, so popular with the younger groups because of its favourable up-currents.

The second is eastward from the Wasserkuppe over the Hohe Ihön toward the Geba. The majority of gliders followed this route in the storm-front flights of July 25 and August 3. Altogether different from the normal front thunderstorms out of the west, this storm of August 3 rose out of the east. It most likely had the character of

*"Ergebnisse des 12. Rhön-Segelflug-Wettbewerbes 1931." From *Zeitschrift für Flugtechnik und Motorluftschiffahrt*, Feb. 29, 1932, pp. 97-102; and March 14, 1932, pp. 125-132.

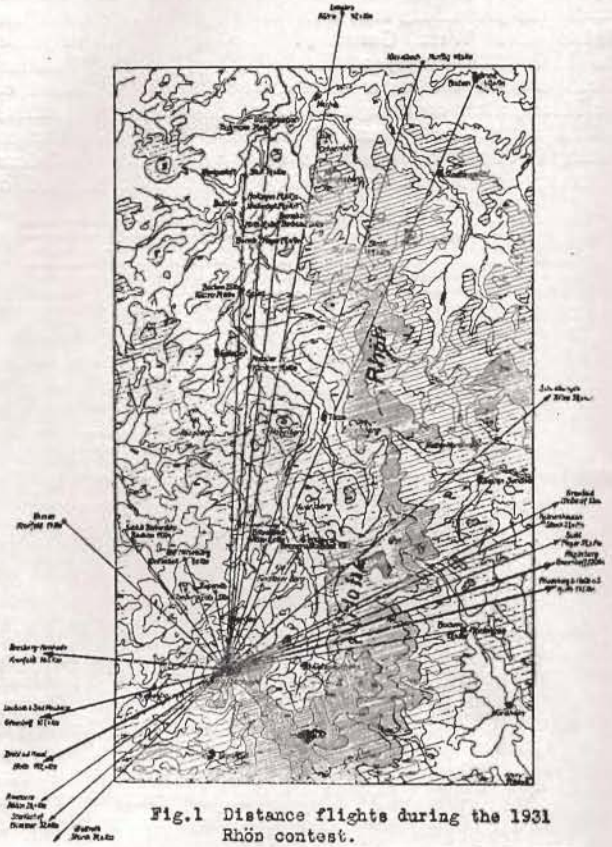

Fig.1 Distance flights during the 1931 Rhön contest.

a more local heat thunderstorm. No effective frontal up-current was ascertained. As a result, all the gliders had to land again in the neighbourhood of the Wasserkuppe. These landings form the third intermediate group in Fig. 1.

The fourth group is toward the east and the river Fülda. Botsch covered this route of 19 km. (11.8 miles) in 1923, the last time. The altogether abnormal east winds during the second half of this year's contest forced the flyers into this direction for the first time in eight years. These east winds, which at first threatened to become disastrous, subsequently proved to be of great value, inasmuch as they turned the contest into entirely new channels and enhanced the possibilities of thermic sailing.

The rules governing the prize for reaching a prescribed destination, run off every year during the performance race, were much more exacting this year than heretofore. Whereas last year's rules stipulated a flight of 15 km. (9.3 miles) to the Kreuzberg and return to the Wasserkuppe, this year's rules called for a flight with the Ochsenberg near Vacha, a distance of 34 km. (21 miles), as destination. The flight with fixed destination thus became more than 68 km. (42.3 miles) with start from and return to the Wasserkuppe. The flight to the Ochsen was a comparatively easy stretch, whereas the lap, Rhön—Wasserkuppe was very difficult. The last 10 km. especially, from the Hohe Rhön to the plateau of the Wasserkuppe, through the downwind zone of the Wasserkuppe, presumes high-flying altitude, which can only be attained by cloud-up-wind on the Hohe Rhön. It was foreseen that this last stretch near the goal would call for extraordinary skill, and for that reason the rules did not specify a return to the plateau of the Wasserkuppe, but merely a landing anywhere at the foot, providing the distance did not exceed 1,500 m. (4,920 ft.) from the top. The prize was not contested. Hirth and Groenhoff almost qualified for the entrance rules by landing 1,000 m. (3,281 ft.) and 1,500 m. (4,920 ft.), respectively, outside of the prescribed 1,500 m. radius. The flight put up by Hirth, Groenhoff and Kronfeld to complete this race victoriously was almost dramatic. Again and again Hirth and Groenhoff tried before they finally effected a landing within the radius cited above. The efforts of both flyers to push on from the Hohe Rhön to the Wasserkuppe, to overcome this last but most difficult lap, were an exciting fight for every metre of altitude. Groenhoff's attempt, in particular, to obtain a last ounce of up-wind by skimming the tree tops, and Kronfeld's three-time return to the Wasserkuppe for a new start was a spectacular and gripping sight. These flights of Kronfeld for the Ochsenberg prize, one of which lasted over seven hours, are new proof of the remarkable stamina and will-power of this pilot.

But the features which place this year's race at the head of all previous ones are: the unique front sailing flight by a squadron of 12, on July 25, in the face of an approaching storm; Groenhoff and Hirth's 220 km. (136.7 miles) and 175 km. (108.7 miles) flights to Magdeburg and Halle; further, the first thermic sailing flights of over 100 km. (62 miles) namely, Hirth's 192 km. (119.3 miles) to Bröhl on the Mosel, Kronfeld's 165 km. (102.5 miles) to Arnsberg on the Westfalen, and Groenhoff's 107 km. (66.5 miles) to Bad Nauheim. It is necessary, in order to appreciate and clearly understand these flights, to treat them in connection with an explanation of the scientific principles of thermic sailing flight.

The prevalence of ascending convection currents in the free atmosphere is contingent upon the local over-heating of detached air masses above a given thermically favoured territory, or upon the liberation of diffused atmospheric instability, which is produced by regional over-heating of the nethermost air strata or cooling off at some height. The escape of this instability, manifested by excessive vertical temperature gradient, is brought about by the rise of detached quantities of air, whether orographic by slope up-current, frontal by frontal up-wind, or turbulent by vertical displacement of air masses in turbulent layers. The ascending convection current becomes a cloud up-current when air masses are elevated beyond their height of condensation by any of these three methods of escape, and attain new buoyancy and acceleration by the heat of condensation set free through cloud formation. The cloud up-current has, in contrast to the thermically rising, dry air masses without forming clouds, the advantages, as far as sailing flight is concerned, of greater vertical extent, greater vertical velocity and, lastly, of being more readily recognised. For that reason it becomes readily apparent why thermic sailing flight in cloud up-winds preceded the utilisation of up-currents without clouds or "invisible" thermic up-winds.

* * *

Particularly favourable thermic up-current conditions prevailed in the second half of the contest, during the long spell of warm east wind weather. The gentle south-east wind on August 1 was unsuited for slope sailing, but eminently fitted for essaying thermic sailing flight with towed sailplane. The research institute of the R.R.G. had offered a special prize for towed flight on light breeze days, so as to give less experienced groups a chance of becoming familiar with towing start methods. On the afternoon of August 1, pilot P. Riedel towed nine sailplanes into the air. Released at 500 m. (1,640 ft.), Groenhoff in FAFNIR stayed aloft 1 hour and 42 minutes; Hirth in MUSTERLE, 1 hour and 37 minutes; and Kronfeld in WIEN, 1 hour and 10 minutes. Conditions were very favourable for the formation of convection currents. By a dry-unstable state up to 2,000 m. (6,560 ft.), air masses, risen orographically on the Wasserkuppe, were free to push on and upward. From 2,000 m. on, the air was damp-unstable, so that air masses risen to this height could continue to rise as cloud-upwind as soon as condensation began. The ascent continues up to 2,400 m. (7,874 ft.), where a strong temperature inversion forms an effective intercepting layer. And Groenhoff's, as well as Hirth's flight are in perfect accord with these theories. After unhooking from the aeroplane, Groenhoff soared along the east slope of the Wasserkuppe till the released slope current had changed into a free, ascending warm air current topped by a cumulus cloud, and in this convection current he gradually circled to greater height. It is a characteristic of the ascending convection currents formed from slope up-winds that their up-wind zone from

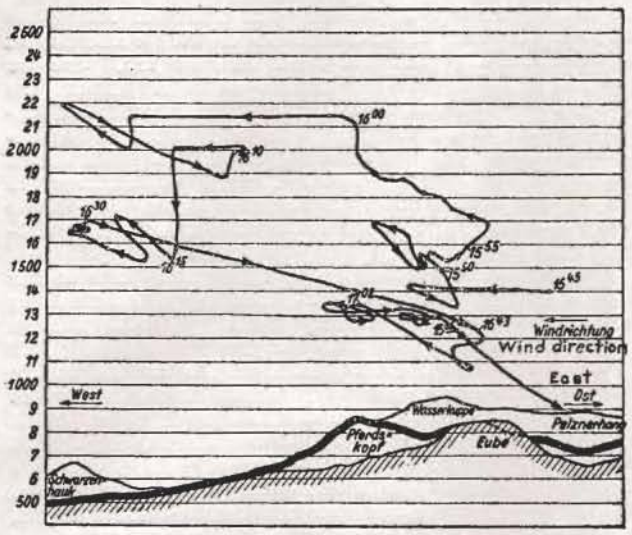

Fig. 2. Route of Hirth in "Musterle," Aug 1, 1931

the windward slope shifts more and more with the general wind toward the leeward side, whereby the free up-current very often does not attain its greatest strength until it reaches the leeward side, with the result that in the lee above downward-slope currents the ascending convection current is particularly powerful. This is well illustrated by Hirth's and Groenhoff's flights. (See Figs. 2 to 5.) In excellent agreement with the theory of vertical expanse of ascending convection currents, Groenhoff reached a maximum absolute ceiling of 2,300 m. (7,545 ft.), and Hirth's route was very much like it. (See Figs. 2 and 3.) Hirth's flight was also mainly made on the west slope of the Wasserkuppe despite the east winds, and this flight likewise revealed the previously mentioned phenomenon that the unstable energy set free on the windward slope of the mountain as a result of forced rise of the air, shifts the strongest ascending convection currents far to leeward.

On August 2 the thermic conditions on the Wasserkuppe were practically the same as the day before. The atmospheric instability was even higher. Up to 1,900 m. (6,234 ft.) the air was markedly dry-unstable, beyond it and up to 2,200 m. (7,218 ft.) damp-unstable, where, as on the previous day, a strong temperature inversion formed an effective barrier. The entirely successful flights of Pfeiffer, in his excellent SCHLESIEN IN NOT, were a revelation to the spectators. Taking advantage of the brisk east wind, he flew the little-explored east slope of the Eube and, to the astonishment of all, reached a height of 800 m. (2,625 ft.) in very little time.

His example was immediately followed by the other enthusiasts. The heights attained in the "practice" and "performance" contests were practically all made that

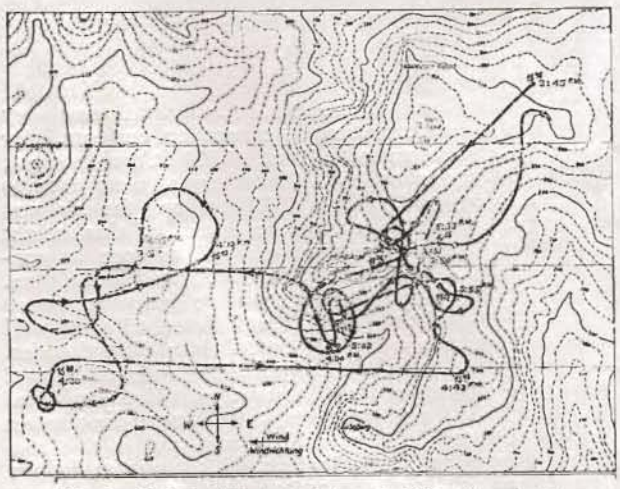

Fig. 3. Hirth in "Musterle," Aug. 1, 1931 Towed start, released at 4,800 ft.

day. Groenhoff and Hirth utilised the favourable thermic conditions prevailing that date for the first distance sailing flights into West Germany. Groenhoff landed after 107 km. (66.5 miles) at Laubach, near Bad Neuheim; Hirth crossed the river Rhine, and landed at Bröhl on the Mosel, after covering a distance of 193 km. (120 miles).

This rapid development of ascending convection current sailing is due in a large measure to the towing of gliders. It makes it possible to develop a systematic method of

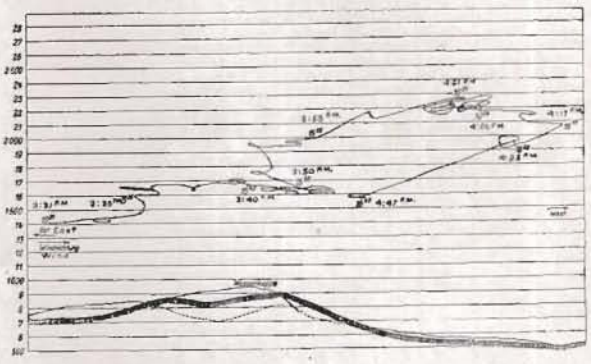

Fig. 4. Groenhoff in "Fafnir." Aug. 1, 1931

thermic sailing flight, which stipulates that the pilot must utilise as long as possible every indicated free up-wind zone (whether by feel or, better, indicated by sensitive variometer) by continuous circling in the zone. During this circling the pilot must attempt to attain the height which enables him to continue until he finds a new up-wind zone. When the ascending convection currents rise beyond the height of condensation, the cumuli serve as guide-posts to new up-currents. In the absence of clouds,

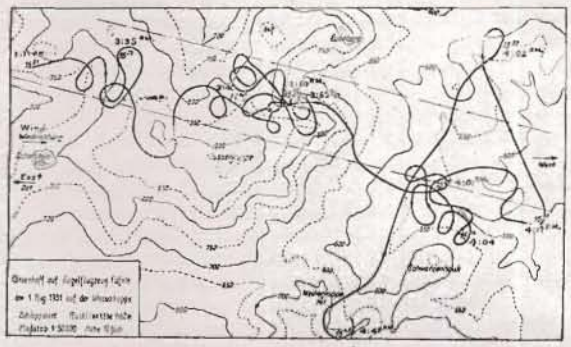

Fig. 5. Groenhoff in "Fafnir," Aug. 1, 1931. Towed Start; released at 4,800 ft.

the pilot must rely on his "feel" or his variometer, in order to orientate himself as to location, expanse and strength of the "invisible" ascending air masses. This method of thermic sailing flight was explored by the remarkable French glider enthusiast, P. Idrac, in several expeditions to North Africa in 1919-23.† Pursuing different methods, the research institute of the R.R.G. uses sounding balloons.

(To be concluded.)

†Idrac, P.: *Experimental Studies on Sailing Flight.* Librairie des sciences aéronautiques, Paris, 1931.

(*Continued from p. 255*)

It can be shown that twist has no effect on the damping of longitudinal oscillations. Unfortunately, whatever the sweep back and aspect ratio, the damping of a tailless type can never be so good as that of a conventional type of similar efficiency. The twist also ensures that the centre section of the wing stalls before the tips, thus giving timely warning to the pilot before he loses aileron (or elevator) control.

Directional control is generally effected by means of a rudder placed at either tip, the one or the other being turned out of streamline, thereby increasing the drag on that wing and so producing a turning movement in the direction of the swivelled rudder. These tip rudders also help to increase the efficiency of the wing by reducing end loss. By rigging both rudders and/or fins with trailing edges slightly outwards, the surprising slight directional stability resulting from sweep back may be increased.

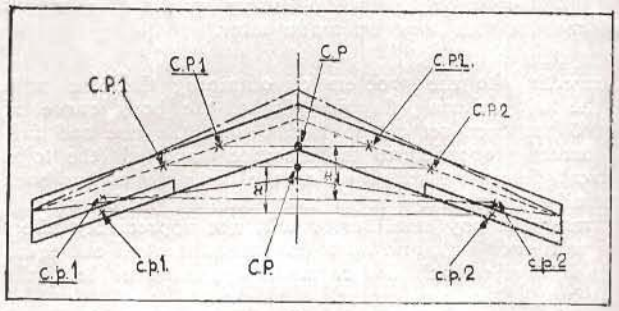

Fig. 2

It can be seen from Fig. 2 that for a given area, the C.P. of tapered swept-back wings comes further forward of cp_1 and cp_2 than does that of a system of rectangular wings swept back the same number of degrees. In short, distance x in the former case is increased, while, incidentally, the tapered wing means greater efficiency.

The pilot must sit either at, above or below, the coincident C.P. and C.G. in the case of a sailplane (where the pilot at one end of the fuselage or nacelle cannot be balanced by an engine at the other end), which means that he must be above, in or below, the wide centre section of a tapered wing. Both from the all-important aspect of field of vision, primarily for safety, and secondarily for observing clouds and terrain, and from that of the nacelle fuselage interfering with the concentration of wing area immediately around it, it would appear that the plan form adopted by Capt. Hill wins. Here the wings also taper from an "elbow" (at about 1/3 semi-span from root) to the pin-jointed roots, and are strutted at the elbows. After all, surely, Nature's feathered soarers must be right!

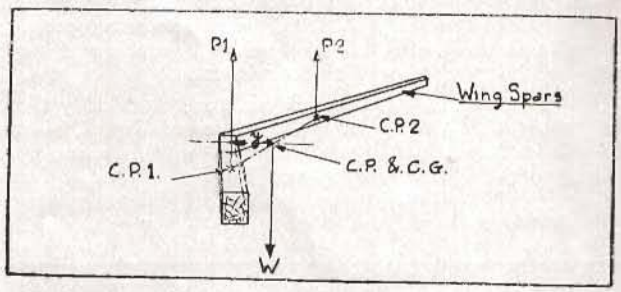

Fig. 3. Illustrating high torque produced by W. acting at C.G. behind spar roots.

It can be seen that, as a result of the sweepback, the C.P. and C.G. both must lie behind the wing spar roots (Fig. 3). This means that the weight of nacelle and pilot, etc., acting down through the C.G. at distance y behind the roots is producing a torsion moment (which is the product of the weight, w and y) at the spars.

A thick centre section will considerably reduce the torsion, but this only entails a poor aspect ratio and bad field of vision. Increased structural strength and consequent wing weight is thus essential. Notice that the advancement of the C.G. advocated previously is here an asset in reducing the torque.

The pilot may now be cradled beneath the wing. This will give him the best field of vision, and better the stability of the sailplane. The periodicity of this pendulum—as it were—must be well out of resonance with that of oscillation of the wings.

So much for a brief survey of the general characteristics of tailless machines. The mathematical calculation of stability derivatives, etc., is very complex, but results merely prove what commonsense suggests would be correct. Models can be constructed simply, accurately and inexpensively, and from their behaviour in flight one can gain a good deal of instruction in the habits of tailless sailplanes. It is fairly safe to predict that one day practically all types of heavier-than-air aircraft will be tailless. Herr Lippisch has already proved the superiority of the type, and one wonders whether British designers are fully awake to its possibilities—or are they chopping off tails secretly?

Something desperate will have to be done if we are to avoid a *cul de sac*.

L. P. MOORE.

IMPORTANT NOTICE.

THE SAILPLANE AND GLIDER is published on the 2nd and 4th Fridays in each month.

Club News and Copy intended for a particular issue must reach the Editor not later than the first post on Thursday morning of the week preceding publication.

Subscriptions and renewals should in future be sent to THE SAILPLANE AND GLIDER, 43, Chancery Lane. London, W.C.2.

Copy and instructions for advertisements are required at least ten days prior to date of publication of the issue for which they are intended.

A SAILPLANE COMPETITION.

Until further notice a year's subscription to THE SAILPLANE will be presented for the best photograph received during any one month, illustrating any feature of the Gliding Movement such as the activities of Clubs, etc.

Photographs, which must be original, should be addressed, "The Editor of THE SAILPLANE, 43, Chancery Lane, London, W.C.2." Envelopes should be marked "Competition" in the top left-hand corner. The competitors name and address and club (if any) should be written on the back of the photograph. Descriptive matter, which should be brief, should be written on the back of the photograph or on a separate sheet of paper.

The Editor reserves the right to publish any photograph submitted whether a winning photograph or otherwise. The Editor's decision on all matters will be final.

BIRD FLIGHT. III

By C. H. LATIMER-NEEDHAM, M.Sc., F.R.Ae.S.

Flapping Flight—True Path of Wing.

In the previous section, the path of the wing relative to the body has been dealt with, together with the path of the body during flight, and it is now possible to complete the analysis by superimposing the wing movement on that of the body.

No scales were given by Marey for the body path curve of Fig. 5. It is possible to obtain the horizontal scale with a fair degree of accuracy, since the speed of flight and time of wing-beat are known. The Buzzard makes three wing-beats per second, and therefore the time for one beat is, of course, one-third of a second, whilst the speed of flight is generally somewhere about fifty feet per second, but in this case the bird was laden with apparatus, was impeded by the drag of cable and tubes and had not time to get into its stride owing to the constricted space in which the experiment took place, so that a speed of only thirty feet per second may be more correct.

This will be the *average* speed during a complete wing-beat, for it is quite obvious that there must be some fluctuations in the speed during each stroke.

Velocity Variation of Bird during Wing-beat.

It might at first be imagined that there would be a gain in velocity during the down stroke, with a corresponding falling-off in the up stroke, and this would probably be the case if the wings had only an "up and down" movement relative to the body, without any horizontal component, whereas actually the motion is more involved. By taking a series of photographs, at one-fiftieth of a second intervals, of a seagull in flight, Marey* found that the speed varied between six and eight metres per second; the slower speed being when the wing reached the top of its stroke, and the higher value coinciding with the lowest position.

From investigations so far made by the writer, it appears that there is a gradual loss of speed during the first half of the down stroke (while maximum lift is being obtained), followed by a fairly rapid acceleration during the third quarter of the revolution. After this point there commences a second falling-off of speed, which lasts until the wing is roughly half-way up again, when acceleration recommences. There are, then, two periods of maximum velocity, namely, at the commencement of the down beat, and again when the wing has descended about three-quarters of the stroke.

The explanation of this velocity variation may be sought in the circular motion of the wings previously described. As the wing descends, accompanied with a forward movement, the centre of pressure is displaced forward so that a climb results and speed tends to fall off. The third quarter of the down stroke is devoted solely to forward acceleration (this will be shown more clearly later), after which the velocity decreases again until, the wing having moved back behind the bird's centre of gravity, a diving position is induced with a consequent regain of speed. The slowing-up process during the early part of the up stroke has been shown in the diagram of muscular movements to be due to the action of the air-stream in lifting the wing.

It is not intended that the above outline of the velocity variation should be regarded as conclusive, as it is hoped to make this the subject of further investigation. Furthermore, it appears probable that the tail is caused to move up and down during flapping flight to counteract to some extent the changing position of the centre of pressure of the wings, but this also may be more fully gone into at a later date.

Owing to the double fluctuation of speed during each wing-beat, it is fairly certain that the total speed variation is of a small order, and so, for want of more accurate information, the velocity will be taken as constant throughout the revolution in the following work. Corrections to alow for this may be made later.

Flight Path of Wing.

Reverting to the problem of obtaining the true path of the wing during flapping flight, the body curve of Fig. 5 has been set out in Fig. 7 with the rise and fall in correct proportion to the distance travelled (the total vertical distance through which the body moves has been carefully estimated. It is not intended to be strictly accurate, but any small error will not appreciably affect the main problem), and on it have been marked out equal time intervals, each dot representing, more or less, the wing-root attachment point.

The wing positions of Fig. 3 have next been transferred to Fig. 7, so that at each time interval the wing is shown in its proper position relative to the body, and thus the curve, for the portion of the wing being considered, is obtained superposed on the body curve, and this is the true flight path. (The correction for the axis of movement not being horizontal, as mentioned in Part I, has been made by twisting the axes through an angle of 10 degrees.)

It may be mentioned that before the wing position, relative to the body curve, as shown in Fig. 7, was adopted, many different positions were tried out; that is to say, by moving the wing curve from left to right, in order to make sure that the correct combination had been obtained. Curiously enough, the chosen arrangement was the first to be tried and it was finally selected for the following reasons:—

(a) It was the only combination to give the wing path a smooth continuous curve, free from excessive undulations.

(b) The incidence of the wing throughout the complete stroke kept within the most reasonable limits for this curve. In the other positions tried, excessive positive incidences often appeared where it was considered most unlikely that they should be found; and

(c) The positions of body and wing are identically those that would be expected from the curves of Fig. 5, giving the vertical body oscillation and the muscle movements. For example, it will be noticed in Fig. 7 that towards the end of the down stroke the wing incidence changes to negative in order that the resultant force should be

*"Le Vol des Oiseaux," E. J. Marey, Paris, 1890.

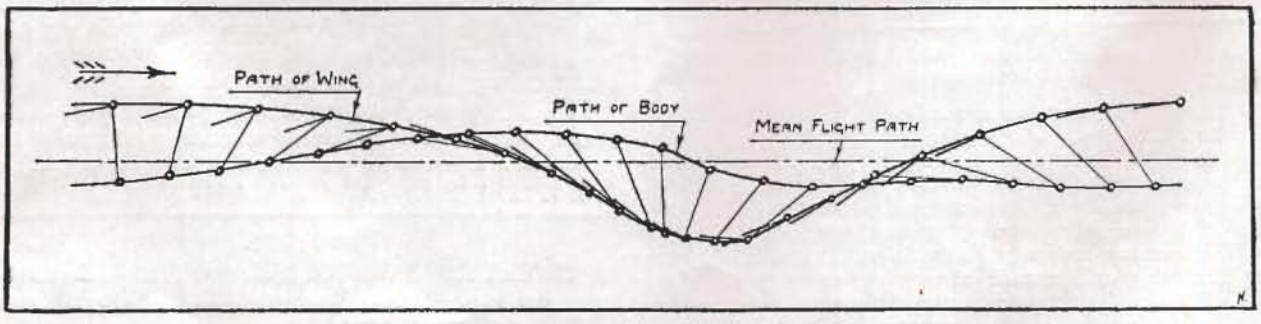

Fig. 7. Paths of Wing and Body during Flight, and Wing Incidence.

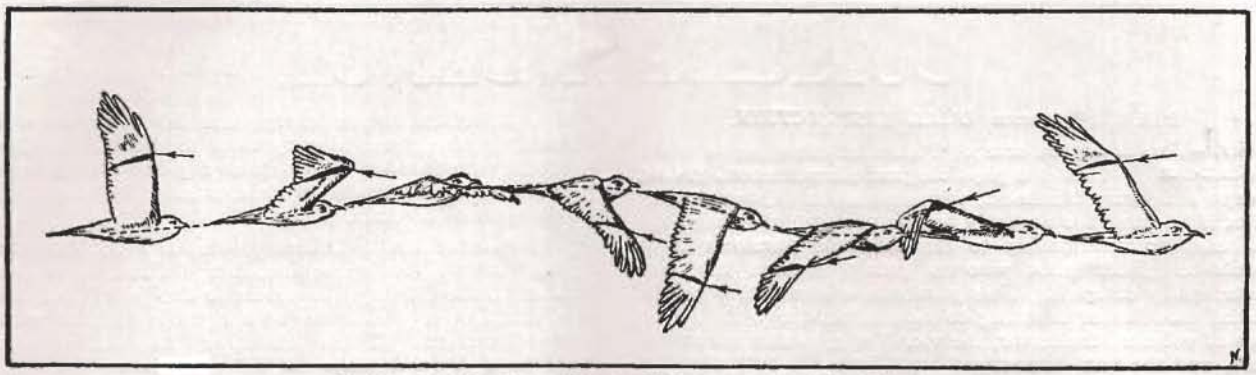

Fig. 8. Attitudes during Flapping Flight reconstructed from Fig. 7

directed forward for an increase of speed, while it will be noticed at the same time that the body tends to fall. And again, in the middle of the up stroke the incidence increases somewhat (where the elevator muscle comes into play), which accounts for the upward movement of the body gained in the up stroke of the wing.

It is not claimed that this represents a perfectly true picture of the wing and body movements and position during flight, but it is only reasonable to assume that it gives at least a very fair indication of the method employed for flapping flight.

The measurements made by Marey on the wing and body were not done simultaneously, and therefore it is quite probable that the two curves chosen for the combination are not in complete agreement, and, furthermore, Marey assumed for his measurements that the bird's body remained in a horizontal position throughout the stroke. It is very improbable that this is the case, since it would be expected that when the wing is in the forward position a turning movement would be set up, tending to raise the bird's head, and that the opposite effect would be present when the wing is in the back position. This tendency would be counteracted to some extent by means of the tail, but cinematograph photographs have shown that actually some inclination of the longitudinal axis does take place. It is only fair to add that in *Le Vol des Oiseaux* Marey states that the bird's axis inclines upwards during the down stroke and downwards on the return.

Some allowance for this could be introduced, but it is doubtful whether the present analysis would be benefited to any material extent. The result of such a correction would mean an increase in the wing angle of attack in the region where the body and wing paths first cross, Fig. 7, and a decrease in incidence in the neighbourhood of the second intersection, and in both cases this would appear, from an inspection of the diagram, to be an improvement.

Fig. 7 may therefore be taken to represent the general behaviour of the wing and body during flapping flight. Commencing at the left-hand end, the wing is seen to be descending at a fairly large angle of incidence, causing the body to rise at a steady rate. A change to a slightly negative incidence is then made for the purpose of increasing the forward speed, and this is accompanied by loss of height. The wing then begins its upward stroke, for a small portion of which it is again presented at a positive incidence and thus makes possible a regain in height.

The lines connecting the various wing positions with the relative body positions have been drawn in to show the movement of the wing in relation to the body, and these lines represent the approximate positions of the humerus bone during flight.

From this figure it has been possible to obtain Fig. 8 by drawing in the bird's wing and body, more or less to scale, in the positions already fixed, and thus a reconstruction of the flight as observed by Marey, forty years ago, has been achieved.

Similar series of photographs, depicting birds in the various positions shown in Fig. 8, were actually taken by Marey, but it is of interest to carry out the present reconstruction, and, moreover, it acts as a check to the previous work.

(To be continued.)

NEWS FROM OVERSEAS

FRANCE.

The monthly dinner of the French Aero Club on November 10th was devoted to motorless flying. About one hundred people were present.

M. Massenet, discussing the results already obtained, stated that there were about 200 gliding groups in France and 250 machines. The period of short flights was now ended, and they were about to put up big performances, thanks to the organisation of regional gliding grounds.

GLIDING IN THE CRIMEA.

A Soviet Gliding Meeting has been held recently in the Crimea. According to newspaper reports, the pilot, Golovin, remained in the air with passenger for 10 hrs. 56 mins. The flight was carried out at night. (The previous record with passenger was 9 hrs. 21 mins., which was established by Schutz, in Germany, in 1926.)

Another pilot, Stepanchenok, who was towed to the contest by aeroplane, nine hundred miles, from Moscow, made 29 loops in one uninterrupted flight.

The highest flight was achieved by Gabrisch, who reached 2,200 metres (7,250 feet). It is reported also (but not confirmed) that Golowin broke the world's duration record by remaining in the air for 40 hours 50 mins.

CORRESPONDENCE

PRIMARY versus DUAL INSTRUCTION.

Sir,—This is a good scrap. Please let me come in on it.

Black-Out. This is a physiological phenomenon, giving rise to temporary blindness, which assails a Schneider Cup pilot if he turns too abruptly on the morning after a party. It bears no relationship to the infantile paralysis of a would-be glider pilot who is going through his first launches by catapult. This paralysis is identical with the initial troubles of learning to ride a bicycle . . . the loss of volition, the terror, the vice-like grip on the handle-bars, and the final hypnotised crash into the only obstacle for miles around.

Fancy Landings. There is a type of motor-cycle rider, actor, footballer, roller-skater, motorless flier—what you like—whose overwhelming instinct is to play to the gallery. In soaring, since the spectators are concentrated at the launching or landing point, the gallery-pilot specialises on flashy take-offs and landings and never goes far afield.

The genuine sailor-boy looks upon efficiency in launches and landings as a necessity, but a dratted nuisance; the main thing is to FLY, to fly in all weathers, winds and temperatures at the greatest possible height, and always to return the ship intact. On the touch-line of a football match a thousand spectators may be cheering themselves sick; but the genuine Rugby forward sees everything, except the ball, as a blur, and hears nothing except his own smothered oaths. In soaring, if you really mean business, you are conscious of nothing except the job in hand. You are utterly alone with the machine, with the designer's ghost at your elbow.

Any chuckle-headed "C" pilot can dump a boxed-in primary on to a cabbage patch. But landing a reasonably efficient machine on the same cabbage patch is a grim business, grimmer than a high-wire act at a circus, and depending upon a form of trick-flying which has little connection with aerial sailing.

Auto-Towing. The competence of any form of dual instruction is directly proportional to the competence of the instructor. But don't drag into the argument a poor boob who, after receiving little or no desirable stimulus from his first thirty hand-launches in a primary, survived two unreleased SOLO auto-tows, barely got away with his first released SOLO tow, and got what was coming to him on a second released SOLO tow . . . the wind being bad enough to make a Moth fly through the telegraph wires, to smash an auto-giro, and to make a Redwing fluff a landing twice running, on the same aerodrome on the same afternoon.

To drag SOLO auto-towing into an argument concerning primary versus dual instruction is prima facie off the point. In any case it is rather embarrassing for the mythical (?) poor boob. All that happened subsequently was that the P.B. pulled through to a state of comparative bliss by joining an efficient club, after a full and voluntary confession, and by simply sticking it out. This instance proves nothing except the lack of scruples in the man who used it for his anti-primary argument; it is just possible that it also shows the capacity of a good instructor to succeed where a bad instructor fails.

But this argument is too good for it to be allowed to come down to mere bickering. Somebody once said, "Together we stand, divided we fall." There is something in that. There is also something in the saying that part of the attraction in motorless flying is the amiable comparing of notes with the genuine triers in the game—and in having your leg pulled by those same people.

THE POOR-BOOB-IN-QUESTION.

THE MOTOR-ASSISTED GLIDER.

Sir,—Mr. Lowe-Wylde, in his letter published in the last issue of THE SAILPLANE, raises a question which is, I suggest, the most important which has received publicity in your columns for some time.

With his characteristic energy and initiative, to which the Gliding Movement already owes so much, Mr. Lowe-Wylde has produced a motor-assisted glider which he has already flown sufficiently to demonstrate the possibilities of this type of aircraft.

Quite apart from the decision of the Air Ministry regarding Mr. Lowe-Wylde's machine, it is, I think, of vital importance to the Gliding Movement to decide without delay what shall be the attitude of the movement to motor-assisted machines. There are three main considerations which have direct bearing on this question:—

(1) The motor-assisted glider, by whatever name it be called, is quite definitely the offspring of the Gliding Movement. By reason of its construction, design, performance and pilotage, it is undoubtedly much more closely related to the motorless glider than to the so-called light aeroplane.

(2) If the Air Ministry regulations were altered so as to remove the great and altogether unnatural barrier which is at present fixed between the motorless and the motor-assisted glider, the latter would, I suggest, rapidly develop into a most valuable and important adjunct to the movement. Quite apart from the training possibilities of the motor-assisted glider, it would be of great advantage to the clubs to be able to offer facilities for power gliding, so that the support could be attracted and maintained of those aviation enthusiasts who lack the perseverance or ability to become good soaring pilots.

(3) However distasteful the idea of motor-assisted flight may be to the more idealistic of our soaring enthusiasts, it cannot be denied that the movement is badly in need of the wider support which its introduction would bring. In spite of the achievements of the London Gliding Club and the determined perseverance of a handful of Provincial Clubs, it is, unfortunately, obvious that all is not well with the Gliding Movement in this country, mainly because the movement is not large enough to support itself properly. The clubs need more members; the B.G.A. needs more financial support; and even THE SAILPLANE needs more readers.

The three considerations tabulated above lead me to affirm that the Gliding Movement should lose no time in taking the fullest possible advantage of the development of the motor-assisted glider.

The first step is, of course, to persuade the Air Ministry to remove the barrier which separates the Gliding Movement from its latest offspring. In the first place, motor-assisted gliders, which could be defined by a limitation of horse-power, should be handed over to the control of the B.G.A., in the same manner as motorless aircraft. In the second place, the B.G.A. should exercise this control with a minimum of bureaucratic expense, granting C.'s of A. and pilots' certificates on the same terms as for motorless gliders, and appointing competent local inspectors and instructors wherever possible.

It is not, I think, unreasonable to expect this. I would even suggest that any phase of flying which can be carried out on a motorless machine, including cross-country flying, can be carried out with an equal, or even greater, degree of safety in a power-assisted machine. Moreover, just as high a standard of airworthiness is necessary for a sailplane as for a powered glider, and there is no reason whatever why it should be more difficult or expensive to get C. of A. for the one than for the other.

This is, of course, a matter for the B.G.A. to take up with the Air Ministry, and, presumably, this is being done. The movement as a whole should, however, realise that here is a valuable opportunity—an opportunity not merely to simplify training or provide facilities for inexpensive power flying, but also a development which will enable the Gliding Movement to progress and expand, to the ultimate benefit of the science and sport of motorless soaring flight, which must always be regarded as the highest aim of the movement.

NORMAN H. SHARPE.
Chairman, Bradford and County Gliding Club

NEWS FROM THE CLUBS.

Buxton soaring the "Scud II" at Dunstable.

BRADFORD AND COUNTY GLIDING CLUB.

Sunday, November 20.

During the morning and afternoon several attempts were made on the nacelled DIXON to increase our times on the West slope, but with the wind at only 10 m.p.h. from S.S.W., this was well-nigh impossible. It was very pleasing to notice how the refinements to DIXON showed to advantage in her improved performance and directional manœuverability.

After a launch to about 50 feet, on turning south along the ridge into the wind, the DIXON would maintain her height for about 200 yds. until the turn was reached; here, the sharpest of turns was too wide for the machine to remain in the area of lift, narrow as this was, because of the acute angle of the wind to the face of the hill.

Stedman and Tillet are our aces up to the present, with Hastwell leading the high-speed section. Holdsworth's handling of the DIXON showed steadiness and careful judgment which should serve him well with his new home-constructed Sailplane which is nearly ready for its trials.

Ground training continued on the plateau throughout the day with the novices, of whom Jowett showed marked progress.

Sunday, November 27.

According to weather reports, we were between two gales, one covering Southern England and the other in Scotland. Wind was well set in the West, but rather too vigorous and gusty. After much debating as to the intensity of the gusts, four of us decided it was worth while testing from the crest of the West slope. As no A.S.I. was handy in a detached condition, we carried Holdsworth's new fuselage, complete with its instruments, from the hangar to the ridge. About six feet from the ground the wind strength was about 22 m.p.h., but the gusts were well over 30 m.p.h., so we decided that discretion was the policy of the day.

Later, during a fair spell, Holdsworth's sailplane was rigged and passed O.K. ready for her trials next week.

DORSET GLIDING CLUB.

November 20.—DAGLING primary was worked all day in a light S.W. wind. All flights except one (55 secs.) were of 1 min. and upwards in duration. Rolfe gained his "B," after several weeks of striving, during which he has made many excellent flights with the necessary turns, but a few seconds short of the required duration.

November 26.—Saturday afternoons are short nowadays, nevertheless a favourable wind invited us to turn up on this day, and those who responded will agree it was worth the effort. DAGLING primary was launched in a brisk westerly wind, and the first flight, carried out by Laver during a rain squall, produced a duration of 7 mins. 15 secs.—the best yet recorded on the Club's primary. Davis followed with 1 min. 30 secs., and Rolfe with 1 min. 4 secs.

November 27.—Wind W.N.W. fresh. Both machines were flown. DAGLING'S flights ranged from 48 secs. to 1 min. 30 secs.

Owing, however, to a northerly tendency in the wind, coupled with the limitations of the site, it was difficult to find a suitable launching spot for DORSLING (secondary), and the two launches tried both resulted in forced landings, the first on the hill-top and the second lower down, when damage to the port wing and a strut prevented further flights.

LONDON GLIDING CLUB.

On Sunday, November 20, the wind blew obliquely to the line of the hill into the Bowl. Later it backed until it was parallel to the hill. In the HOLS Hiscox soared for 20 minutes and landed on the top. In the WREN Dewsbery soared over and about the Bowl for 1 hour 5 minutes; Collins flew her down twice. Williams flew the Club PROFESSOR. Buxton soared the SCUD for about 10 minutes; Major Petre flew her down. Dent Junior, obtained a nice "A" in the Watson R.F.D.; McDougall flew down with great determination, causing the wings and nacelle to smoke. There were other miscellaneous descents, too many into the ploughed land, for which breach of Northern Etiquette the proposed penalty is the purchasing of six bottles of beer for general consumption.

On Saturday, November 26, the haulage gear being de-rigged, the WREN was wafted up the hill by hand; Major Petre and Dewsbery made a twenty-minute flight each.

On Sunday, November 27, the south-west wind in the morning was downright vicious, full of hair-raising gusts and surges exceeding 35 m.p.h. clear of the hill-top. A "very deep depression" was careering across the North of England, leaving a trail of lifeboats and inverted perambulators. Liverpool recorded a gust of 70 m.p.h.

In the PROFESSOR the air-speed indicator jerked about from 28 to 45 m.p.h., regardless of the controls. Poor Collins, 750 feet above the hill on his first soaring flight in this machine, was jerked off his seat until both belts came undone, whereupon he called it a day. The KASSEL two-seater dropped a wing so decidedly that the pilot as a last resort spun her round downwind in a circle and then continued to soar. His hair was snowy-white when he landed after 40 minutes; his passenger was last seen wandering quietly over the wintry fields, looking in vain for the wherewithal to make a daisy-chain. One of the club elders, Elisha by name, boldly embarked in the PROFESSOR, but found the chariot firily resemblant to that of Elijah; he therefore landed within three minutes.

The WREN hovered about for 40 minutes, hunting for a calm spot, but could only find volcanoes, waterfalls, rapids and whirlpools. The Whipsnade Bump was in such good form that the pilot emerged singing "Don't go down the Mine, Daddy; there's PLENTY of coal in the cellar," accompanied by occasional twangings from the

drag-wires caused by the impingement of the greater gusts.

After lunch, Mole turned up, full of a thirst for first-hand knowledge. (There's nothing like it, cost what it may). But the wildness having gone out of the wind, he had to content himself with heavy rain and some practice in approaches for hill-top landings. He then handed the two-seater to the morning-pilot, who sailed round comfortably in the dusk and delivered the machine to the hangars by air, as required, thus edifying his passenger, Young Sproule. The glass was now rising fast (so were the bar-takings), the trough having passed by with maximum aerial emotions at about 1 p.m.

Power-pilots of repute say that you have to go soaring before you know what a bump really is. It is nice to know that they do not have all the fun. Why crash blindly through the billows in a destroyer, when the use of a dinghy will enable you to give each facet of each billow your deliberate, meticulous and sympathetic attention?

Another thing. The text-books (bless 'em) are right again. On a genteel soaring day the factory-chimney smokes trail away in long smooth ribbons. But on Sunday morning the smokes were demented. One look at them was quite enough for any pilot in mid-air; it kind of undermined your last-trace-but-one of normal optimism.

Owing to the absence of Mr. Ashwell Cooke in foreign parts, we have been forced to find another Chairman who can keep up the pace set throughout the past three years. This is hardly the place to express the unanimous gratitude of the Club toward Major Petre for taking on the thankless and extremely difficult job. We now have renewed hope of continuing to make bricks with an everlasting shortage of straw. If we make a mess of it under his leadership, it will be our fault.

During the week-ends from September 18th to November 27th the CRESTED WREN has knocked up a flying time of 15 hrs. 11 mins.

TWO QUESTIONS FOR CLUBS.

1.—Do you send your Club News regularly to THE SAILPLANE?

2.—Is every member of your Club a subscriber to THE SAILPLANE?

OFFICIAL NOTICES

EXTRACTS FROM PROCEEDINGS OF THE 42nd MEETING OF THE COUNCIL OF THE BRITISH GLIDING ASSOCIATION.

Held in the Library of the Royal Aeronautical Society on Monday, 21st November, at 6.30 p.m.

Present: E. C. Gordon England (Chairman), C. H. Latimer Needham, F. Entwistle, G. R. Paling, C. H. Lowe Wylde, Miss Joan Mack, S. Humphries, A. N. Stratton, C. H. Jackson, F. Pilling, Sir Gilbert Walker, S. Whidborne (Hon. Treasurer) and the Secretary.

The 1932 Competitions. The accounts in respect of the Furness Meeting were presented by Mr. F. Pilling (Chairman of the Contest Committee), and formally adopted.

The B.G.A. Dance. The General Purposes Committee was empowered to carry out the arrangements for a dance to be held on January 11th at the Portman Rooms.

Motor-Assisted Gliders. The Council considered a resolution, proposed by Mr. Lowe Wilde, to the effect that the policy of sponsoring the motor-assisted glider should be considered as a means of consolidating the British Gliding Movement, but decided to defer consideration of the matter until it had been considered in all its aspects by the Technical Committee.

Official Observers. Messrs. Hastwell, Stedman and Tillett were appointed as official observers to the Bradford and County Gliding Club.

Date of Next Meeting. It was decided to hold the next meeting on December 19th, at the same time and place.

B.G.A. DANCE.

A Reception and Dance in aid of B.G.A. funds will be held at the Portman Rooms, Baker Street, W.1, on Wednesday, January 11th, 1933, 9 p.m. to 2 a.m.

Miss Amy Johnson (Mrs. J. A. Mollison), who is one of the Vice-Presidents of the B.G.A., will be the guest of honour.

Mr. and Mrs. Mollison will receive the guests.

Tickets (10s. double) may be obtained from the British Gliding Association, 19, Berkeley Street, London, W.1.

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IMPORTANT NOTICE TO ADVERTISERS.

Many advertisers have supported the "Sailplane & Glider" as a gesture of friendliness to a publication unique in the worlds of pioneering effort and sport, without calculating with too great a nicety the immediate and tangible benefits that might accrue from their investment.

The following letter from the President of the Central Scotland Air Yachting Club indicates that readers appreciate this fact, and that they are acting in that spirit which places business dealings on the right plane—a level free from depressions and adverse conditions, economic and otherwise.

Glasgow,

September 12, 1932.

The Editor, "The Sailplane."

Dear Sir,

It has been on my mind for a couple of months to let you know that I was able to put some business of a friend of mine in Glasgow in the way of your Advertisers, Messrs. Austin, Reed & Co., purely because they support the "Sailplane."

I naturally propose to follow suit myself as soon as occasion arises.

Messrs. Reed might like to know that their advertisements have been worth at least £11 to them which otherwise would have gone elsewhere.

Yours faithfully,

(Signed) E. T. H. GODFREY.

The "Sailplane & Glider" circulates in every country in Europe (except Russia and Scandinavia), Canada, Australia, New Zealand, South Africa, British East Africa, Egypt, Palestine, the United States of America and South America.

The nature of its circulation is such that each issue has at least 5000 readers, all of whom are equipped with Purchasing Power and the desire to apply it in any direction that will help the Gliding Movement.

Copy and instructions for advertisements should be sent to the Advertisement Manager, *The Sailplane & Glider*, 43 Chancery Lane. London, W.C.2., at least ten days prior to the date of publication of the issue in which the advertisements are to appear. Rates on application.

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