

# FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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## Flight.

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## EDITORIAL COMMENT.

### The Royal Aero Club and its Regulations.

Apart altogether from any merits of the case, it seems to us to be a great pity that the dispute between the Royal Aero Club and the Grahame-White Aviation Co. should have been allowed to assume the proportions it has taken to itself, and to become a matter of public discussion in the columns of the general Press. After reading the correspondence on both sides, and in the light of our knowledge of the circumstances of the case, we cannot help the thought that a little more of sweet reasonableness on both sides might have averted a most regrettable state of affairs. However, now that the matter is being discussed in public, we feel that we can do no less than present the case as seen from both sides.

The genesis of the trouble lay in the disqualification of M. Brindejone des Moulinais by the Club, for having flown over London in contravention of the Aerial Navigation Act and the rules of the Royal Aero Club. It may, possibly, be as well if we give at once the facts of the case, so far as they are to be seen from the standpoint of Mr. Grahame-White and Mr. Richard T. Gates, and as set forth in the following letter addressed to us by those gentlemen:—

"Sir,—On the 11th May last, the famous French aviator, M. Brindejone des Moulinais in his flight from Bremen, Germany, to Hendon passed over London at a great altitude, thereby innocently

contravening the Aerial Navigation Acts, 1911 and 1913, and incidentally breaking one of the rules of the Royal Aero Club.

"In flying from Germany to London it was M. Brindejone des Moulinais' intention to compete in the flying races at the Hendon Aerodrome on Monday, May 12th, upon which date, however, the promoters of the meeting and the clerk of the course received letters notifying them that the R.A.C. had withdrawn M. des Moulinais' competitor's certificate. The stewards of the meeting—who were members of, and officially approved by the Royal Aero Club—although fully aware of these communications, allowed him to start in the cross-country race which he won and of which he was declared the winner and duly awarded the prize.

"In direct contradiction to the attitude adopted by the R.A.C. it may be mentioned that, in the meantime M. Brindejone des Moulinais, on instructions issued by the Home Office, was summoned for breaking the law of the land and appeared before Mr. Dickinson at Bow Street, where, upon his explaining that he inadvertently flew over London, he was bound over and discharged.

"In spite of this the Competitions Committee of the Royal Aero Club are inexorable in the stand they have taken, and we fear that a continuance of such autocratic and high handed procedure may prove of great detriment to the future of the sporting side of aviation in this country, and we have, by way of protest, resigned our membership of the Royal Aero Club, and copies of our letters of resignation are enclosed herewith.

"We shall be glad if you can find space in your columns to publish these letters, as we hope their publication will assist in bringing home to the officials of the Royal Aero Club the fact that they have arrogated to themselves the right to try, and condemn, a distinguished foreigner without as much as giving him the opportunity to appear before them to defend himself, a procedure which is entirely foreign to the law and custom of the British constitution, and which we have every reason to believe does not represent the views and wishes of a large majority of the Club's members.

"Yours faithfully,

"C. GRAHAME-WHITE.  
"RICHARD T. GATES.

"The London Aerodrome, Oct. 6th."

It may now be useful to point out that on the statements contained in this letter, the Club did, prior to the opening of the meeting, actually notify the officials of the Hendon Aerodrome that it (the Club) had officially decided to withdraw M. Brindejone des Moulinais' licence to compete in the Whit-Monday events. We are not at the moment expressing any opinion as to whether or not the disqualification was justified by the facts of the case, or whether it was arbitrary and high-handed, as the writers of the letter contend. All we are concerned with pointing out was that the Club's action was, under its regulations—under which the Hendon meeting was conducted—perfectly in order.

Now let us see what has been said on the other side. The Secretary of the Club informs us that the following letter has been sent by the Club to the Grahame-White Aviation Co. :—

"Dear Sirs,—The committee of the Royal Aero Club have considered the question of your failure to pay to Mr. Brock the prize which he won in the above competition, and they feel that it is essential that they should support him in his rights.

"When you appeared before the Competitions Committee to explain why you had failed to carry out the award of the stewards of that meeting, it appeared that either you were not properly acquainted with, or else had misinterpreted the rules under which you advertised that the competition was to be held, viz., those of the Royal Aero Club.

"The rules which you, as promoters, infringed are Nos. 29 and 33. Under these rules, M. Brindejone des Moulinais' entry was null and void, and his name should have been erased from the programme.

"The decision of the stewards of the meeting, awarding the prize to Mr. Brock, was in order. It was duly communicated to you, and you should either have acted upon it or lodged an appeal to the stewards of the club. They, as you are aware, are independent of the club committee, and form the court of appeal in aeronautical sport in this country.

"The committee must, therefore, call upon you to intimate your willingness to carry out the award and hand the prize to the rightful winner.

"As it appears from your letter of October 3rd, 1913, that you desire to appeal to the stewards of the Club, the committee will be prepared to facilitate your doing so if a definite intimation to that effect reaches me within three days of your receipt of this letter.

"Yours faithfully,

"HAROLD E. PERRIN, Secretary."

So far as we are able to gather by reading in between the lines of the dispute, the Grahame-White Aviation Co. appears to have thought that the disqualification of M. Brindejone des Moulinais was arbitrarily carried out on his own responsibility, by the secretary of the Club. Had that been so, we frankly acknowledge that we should have looked askance at the exercise of any such arbitrary function, without the necessary reference to the Club Committee. A body exercising the functions of the Royal Aero Club, which must often have to take action that is distasteful to those under its control, and which may on occasion even look like injustice, cannot be too zealously careful in its administrative methods. But there does not seem to be any suggestion that the disqualification was in fact carried out on the responsibility of any one individual. We have before us the letters sent by Mr. Grahame-White and Mr. Gates to the Club, in which they tender their resignations, each practically repeating, as their reason, the terms of their letter set out above, the concluding paragraph of Mr. Grahame-White's reading thus: "It was not until yesterday's (October 2nd) Committee meeting that it was fully brought home to me that such a course had been pursued with the complete approval of the said committee, otherwise my resignation would have been tendered ere this." That, together with a similar statement by Mr. Gates, appears to dispose of any suggestion that might have been made

to the effect that the withdrawal of M. Brindejone des Moulinais' certificate was anything but the official act of the Club, approved and authorised by the Committee.

It will be seen from the letter sent by the Club to the Grahame-White Co. that there is still a way open to the Company in regard to the original decision of the Club, subject to the other competitors agreeing to abide by any ruling. That is by appeal to the stewards of the Club. Without that consent, however, we are at loss to see how this will help much in the end. The point as we see it is this. The Club, under its regulations, disqualifies the competitor who, starting *hors concours*, finished first in the race. He knew, and the promoters of the meeting knew, before he started, that he could take no part in the race proper. What is even more germane to the issue is that the other competitors, equally bound by the Club's regulations, knew that he was disqualified from taking part, and thus it seems to us that they have a legal right to dispute any finding which might reinstate a competitor who, by a breach of the Club's regulations, had been already disqualified. Otherwise the Club's regulations are reduced to a dead letter.

We say nothing at all as to the justice of the original disqualification. That is entirely beside the point so far as this issue is concerned. What we have to keep in mind is that, the thing having been done it is difficult to see how it can be altered or modified. As a matter of sentiment it was certainly felt at the time that the Club might have shown a little more leniency to M. Brindejone des Moulinais, and have imposed a less drastic penalty than it did. On the other hand, it must not be lost to sight that at that time—in May last—there was considerable public outcry about flying over populous districts, and sternly restrictive legislation was being demanded. It was doubtless this fact that the Club had in mind when it took the action which is now the subject of so much acrimonious discussion, and from that point of view it is possible to acquit the Club of any considered severity of an undue character. The police court proceedings and decision were, it must be remembered, subsequent to the Whit-Monday racing, and would not therefore be in evidence in time to morally justify the Club Committee in re-issuing M. des Moulinais' competitor's certificate. But, however the matter may be argued, or whatever the opinions of the individual may be as to its merits, everyone who has the welfare of the movement at heart will deplore the consequences which such a dispute may easily bring about, and we shall hope to see a more tolerant spirit enter into the dispute.

## F. B. FOWLER. PILOT-CONSTRUCTOR.

THE subject of our full page portrait this week is a self-taught pilot. He purchased a Blériot monoplane with a 25 h.p. Anzani engine in the summer of 1911, and practised with it at the old Beaulieu aerodrome, persevering until he had thoroughly mastered the art of flying. He then purchased three Blériots from Messrs. MacArdle and Drexel, who were giving up the Beaulieu aerodrome, and transferred them to Eastbourne, where he opened a school on Dec. 1st, 1911. That Mr. Fowler was engaged as an engineer before taking up flying, having served his time with Messrs. Vickers, Sons and Maxim, Ltd., to a large extent, no doubt, accounts for the excellent service which has been obtained from those original machines which have been flown continuously since the opening of the school, and have been the means of a good many pilots qualifying for their certificates. On

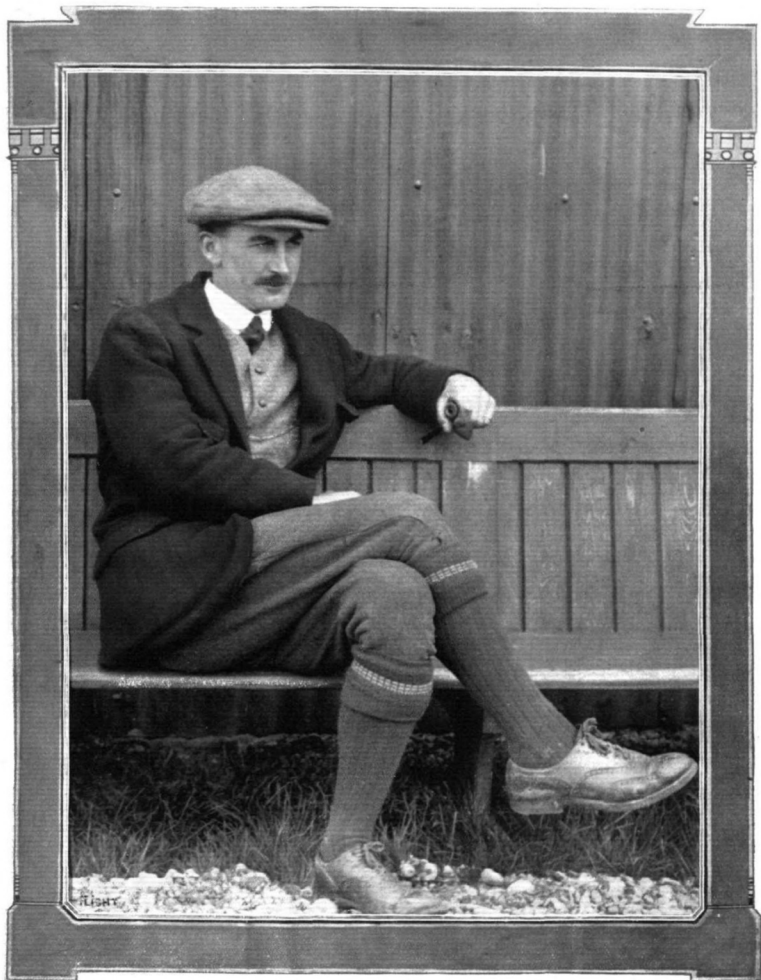
Jan. 8th, 1912, Mr. Fowler attempted to fly from Beaulieu to Eastbourne on Mr. Drexel's 50 h.p. Gnome-Blériot, but he got lost in the fog over the Solent. He came down, and his machine, striking the water when going all out, turned over on top of him, the pilot narrowly escaping a watery grave. He was fortunately seen by the Coastguards, who sent a boat to his aid, and landed him at Calshot, little the worse for his adventure. A week later he qualified for his pilot's certificate at Eastbourne on a 50 h.p. Gnome-Blériot. In addition to flying Blériot monoplanes of various types, Mr. Fowler has piloted Sommer, Bristol and Farman biplanes. At present he is the managing director of the Eastbourne Aviation Co., Ltd., and this year he has done a good deal of waterplane work, his records showing that since July 1st he has taken up over 200 passengers.

"THE HAWK."

OCTOBER 11, 1913.

**FLIGHT**

**MEN OF MOMENT IN THE WORLD OF FLIGHT.  
Pilot-Constructor.**

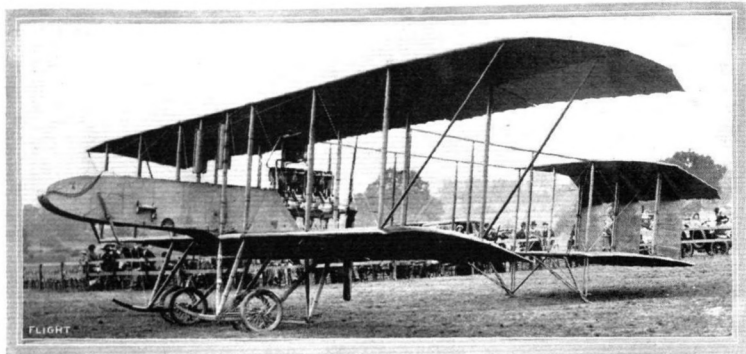


MR. F. B. FOWLER.  
IIII

# **THE GRAHAME-WHITE "AERO-CHAR-A-BANCS."**

So popular have the passenger flights at Hendon proved, that, although the Grahame-White Aviation Co.'s "stables" include about half a dozen passenger-carrying machines, these have been found inadequate to cope with the ever-increasing demand, especially at week-ends, for trips round the aerodrome. In order to meet this contingency,

The scale drawings and photographs show the machine to be of the engine behind or "pusher" type, with the pilot's and passengers' seats placed well out in front in a nacelle built up in the usual way of four longerons of ash, connected by struts and cross members of the same wood, the whole structure being rendered rigid by means of

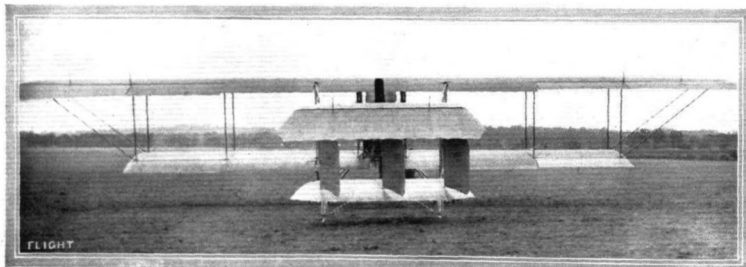


THE GRAHAME-WHITE CHAR-A-BANCS.—A three-quarter view from the front.

a new machine, capable of carrying four passengers—it has already made records with 7 and 10—in addition to the pilot, has been constructed, and it has already become very popular amongst the spectators, who have nicknamed it "the char-à-bancs."

Superficially the new five-seater bears a certain resemblance

to the H. Farman biplanes, but a close inspection reveals the fact that this resemblance is confined to the general disposition of the various members. Aerodynamically it is quite different, and its designer—Mr. J. D. North—has managed to incorporate in it a good many cleverly conceived and skilfully executed constructional details, some of which are shown in the accompanying sketches.

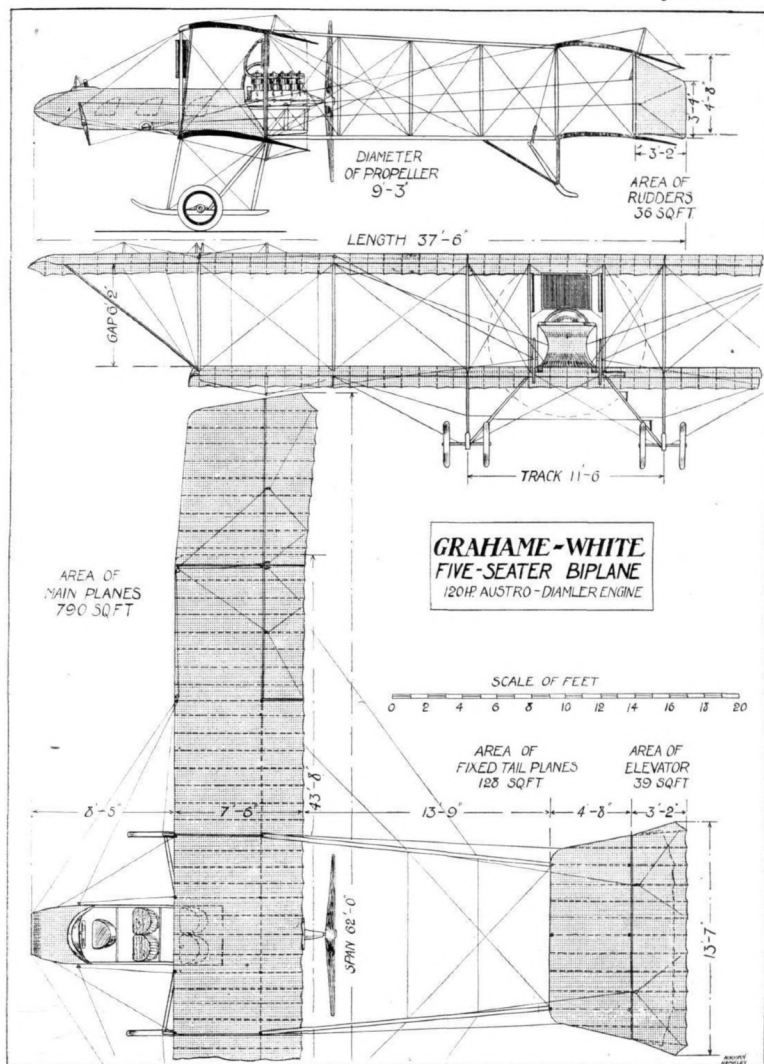


THE GRAHAME-WHITE CHAR-A-BANCS.—View from behind.

which carries on its extremities, and outside the nacelle, two crank levers, from which cables run to the corresponding levers on the elevator. The cables, through which the ailerons are operated, are lead through the central column and transverse shaft and thence round a pulley to the ailerons. These are operated by the pilot by means of a rotatable hand wheel mounted on the upper extremity

of the engine behind or "pusher" type, with the pilot's and passengers' seats placed well out in front in a nacelle built up in the usual way of four longerons of ash, connected by struts and cross members of the same wood, the whole structure being rendered rigid by means of

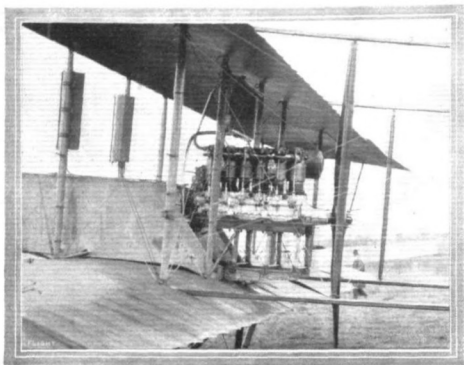




GRAHAME-WHITE 5-SEATER BIPLANE.—Plan, side and front elevations to scale. "Flight" Copyright.

of the central column. The axle carrying the drum around which passes the warping cable, is provided with semi-thrust ball bearings in order to reduce frictional

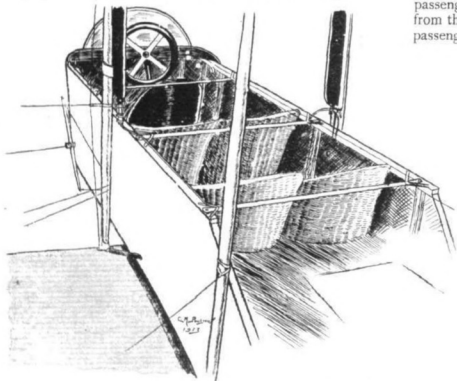
indicator, altimetre, compass, air speed indicator, *etcetera*. The *etcetera* includes a motor horn, which creates quite a lot of amusement when sounded while the machine is



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THE GRAHAME-WHITE CHAR-A-BANCs.—A view showing the mounting of the Austro-Daimler engine.

resistance, and the control wheel itself is secured on the axle by a large nut forcing it up the tapering axle in a similar manner to that employed in securing a propeller to its shaft. The cable drum is integral with



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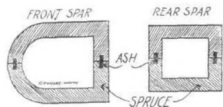
Sketch of the nacelle, showing seating accommodation for pilot and four passengers.

the axle, the whole being machined out of one solid piece of steel.

To the right and left of the pilot are mounted the various instruments, such as pressure gauge, revolution

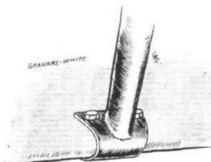
in flight, as it can be distinctly heard above the very effectively silenced roar of the engine.

Behind the pilot are the four passengers' seats, arranged in pairs. Plenty of room is afforded so that the passengers may enjoy their flight in comfort as distinct from the more or less cramped positions occupied by the passenger in older types of machines. The *longerons* of



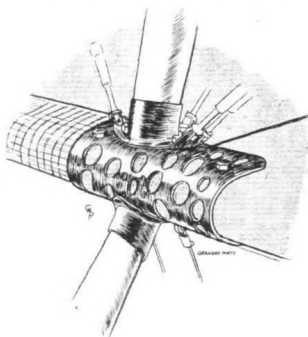
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Sections of wing spars.



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How crank-lever is attached to leading edge of aileron.



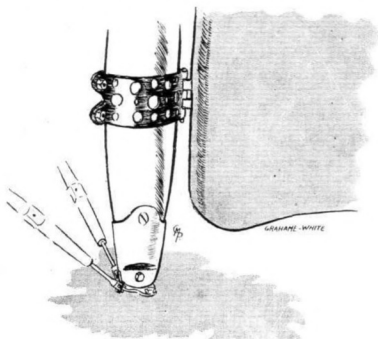
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A skid strut joint.

the *nacelle* are extended to carry the engine, a 120 h.p. Austro-Daimler, which is so rigidly mounted that hardly any vibration is felt when sitting in one of the seats. Four stout steel tubes running from the engine bed to

the front and rear spars respectively, transmit the thrust to the wings, the unit formed by the *nacelle* and engine bearers being further secured by means of steel wires taken to various points on the machine.

Slung on the cross wires of the central *cellule* is the



A neat rudder hinge.

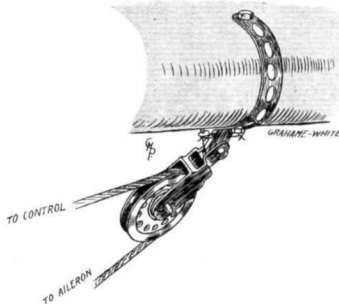
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radiator, which, situated as it is right above the engine and between the main planes, receives the maximum amount of draught, thus rendering it very effective. In the bottom of the *nacelle*, and under the passengers' seats, is a large petrol tank with a capacity of 28 gallons.

From this tank petrol is forced by pressure to a service

to any one who has ever experienced the sensation of carelessly resting a hand on a hot exhaust pipe.

The wings are constructed in the usual way of ribs, built over two main spars. The ribs are built up of webs of three-ply wood with flanges of spruce, while the main spars are built up of spruce hollowed out for lightness.

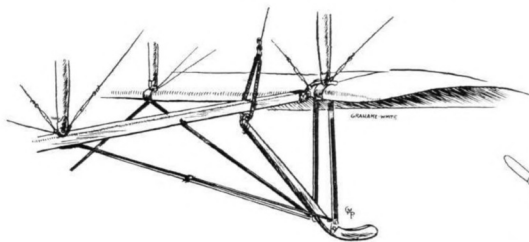


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Another neat fitting—the universally-jointed pulley for aileron cable.

In section the wings are provided with a very pronounced camber, thus rendering the machine somewhat slow; her flying speed is about 45 m.p.h.

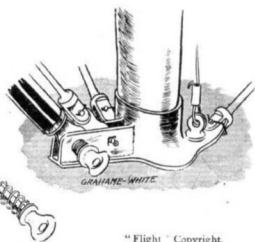
Four tail booms of spruce, hollowed out in a similar manner to the main spars, carry at the rear the biplane tail planes. To the trailing edge of the upper tail plane is



One of the tail skids.

"Flight" Copyright.

tank mounted on one of the inner plane struts, from whence it runs by gravity to the two carburettors. Oil is carried in a similar tank mounted on the corresponding plane strut on the other side of the *nacelle*. As we have already said, the engine is very effectively silenced by means of a silencer designed by Mr. North, and consisting of two concentric cylinders, the inner one of which is divided into 6 compartments, and perforated with small holes. After an extended run of the engine, the inner cylinder will be found to be red hot, while the outer one is barely warm. The advantage of this will be apparent



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Sketch of quickly detachable fitting of tubular extension struts to main plane struts.

hinged the elevator, while hinged to the outer tail struts are the three rudders by means of which the machine is steered. One of the accompanying sketches shows one of the two tail skids by means of which the tail is protected against contact with the ground. Hollow spruce struts are employed in the tail, outrigger and between the main planes in the outer portion, whilst the 8 inner plane struts are made of ash. A very strong landing chassis of the type usually employed in biplanes, and belonging to the wheel and skid type, supports the machine on the ground.

## FLYING AT HENDON.

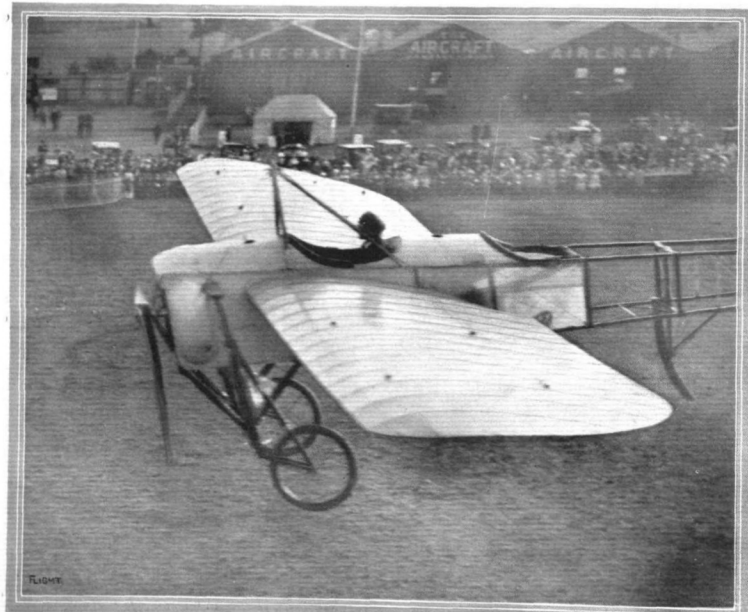
THE October meeting at Hendon last Saturday opened in mist and rain with two flights by W. L. Brock and Marcus D. Manton, the former flying a 50 h.p. Blériot monoplane, and the latter a 50 h.p. Grahame-White biplane. Manton climbed to a height of about 3,000 ft., and then made a fine spiral *vol plane*. Many other exhibitions were given during the afternoon, including several fine demonstrations by B. C. Hucks on his "Tornado" Blériot, and a flight by Claude Grahame-White on the aerial char-a-banc with four passengers. Distinguished visitors were present to witness the flying, including Prince Christopher of Greece. Two events were down on the programme, a speed handicap and an altitude contest, but owing to the weather the latter had to be abandoned. The first heat of the speed handicap over six laps of the aerodrome was well filled, there being five starters as follows:—R. H. Carr on the 50 h.p. G.-W. 'bus (4 mins. 19 secs.), Marcus D. Manton on the new G.-W. biplane (3 mins. 52 secs.), Louis Noel on the 70 h.p. Maurice Farman (2 mins. 22 secs.), W. L. Brock on the 50 h.p. Blériot (48 secs.), and Philippe Marty on the 50 h.p. Morane-Saulnier (scratch). The first to cross the line was Brock, who had slowly gained on Manton, passing him just before the finish, and winning by 2 secs. Marty came in third, 11 secs. after Manton, Noel following some 14 secs. after. In the second heat of 6 laps, W. Birchenough, on the 50 h.p. G.-W. 'bus (4 mins. 29 secs.) was the limit man, the other starters being E. Baumann, on the 60 h.p. Caudron (2 mins. 44 secs.), Pierre Verrier, on the 70 h.p. Maurice Farman (1 min. 30 secs.), and B. C. Hucks, on his 80 h.p. Blériot (scratch). Both Birchenough and Verrier had to retire after completing several laps, leaving the race to be decided by Baumann and Hucks. The latter gradually gained on Baumann, but just failed to obtain first place by 1 sec. The final heat of eight laps was flown in the midst of a heavy shower of rain, and resulted in an easy win for Baumann on

the Caudron (3 mins. 36 secs.), who started second, and overtook the limit man, Manton, on the G.-W. biplane (4 mins. 19 secs.), during the fourth lap. Hucks, on the Blériot, started from scratch, and only overhauled Manton towards the end of the last lap, coming in second 24 secs. after Baumann, and 2 secs. in front of Manton. Brock, on the Blériot, who received 5 secs. start from Hucks, had to retire after completing six laps. The rain then practically put a stop to anything further taking place, but G. L. Temple made a fine high flight on his 50 h.p. Blériot, reaching an altitude of about 4,000 ft., and descending in a series of wide circles. The aerial char-a-banc was doing good work during the afternoon, one of its several passengers being Prince Christopher of Greece. Sunday was also rather dull and showery, but there was nevertheless plenty of flying. Lady Victoria Pery went up as a passenger with Claude Grahame-White in the Maurice Farman biplane. All the Grahame-White pilots were out, W. L. Brock on the Blériot, W. Birchenough, R. H. Carr, and Marcus D. Manton on the G.-W. 'buses, Louis Noel on the Maurice Farman, Marty on the Morane-Saulnier, B. C. Hucks on his Blériot, and Verrier on the Maurice Farman, put up some very good stunts, whilst J. L. Hall brought out his 35 h.p. Caudron, and E. Baumann was also out on the 60 h.p. Caudron.



### Fast Flying by Mr. Hamel.

TIMED over the flying kilom. while piloting his 80 h.p. Morane-Saulnier monoplane at Hendon last week, Mr. Gustav Hamel's speed was 87.38 miles an hour. Subsequently over eight laps of the 1½-mile aerodrome course, Mr. Hamel did an average speed of 75½ miles an hour, his fastest lap being at 76½ miles an hour.



ANOTHER CLOSE-RANGE PHOTOGRAPH OF A MACHINE IN FLIGHT.—Mr. Brock, on the 80 h.p. Blériot, passing No. 1 pylon at the Hendon Aerodrome.

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FLIGHT.

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A LABOUR OF LOVE.—Manton flying at sunset, with his mother as a passenger, at Hendon Aerodrome.

## NATURAL FLIGHT.

### AN EXHIBITION OF UNIQUE INTEREST TO AVIATORS.

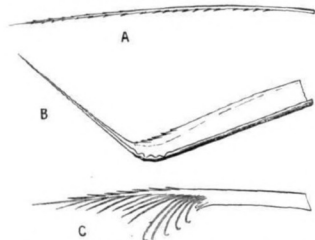
(Concluded from page 1093.)

Next to the muscular action controlling the wings, the most interesting point for study is the detailed structure of the wings of birds and insects, particularly in respect to the provision that is made for folding them. The specimens showing the structure of a feather are quite wonderful, and call for an additional word of appreciation of Dr. Ridewood's work. Everyone is familiar with the beautifully smooth and curiously membranous-like texture of the feather of a bird that is strong in flight. Compared with the ragged downiness of the feather of an ostrich, which does not fly, it seems almost to be a different substance.

No one would suppose, at any rate, that the barbs of those soft, ragged ostrich feathers were larger than the apparently rigid barb of a feather that is used for flight. Such indeed is, or at any rate may be, the case, however, and the only difference between the structure of the two types of feather is that the barbs of the flightless feather are unprovided with "hooks."

In the structure of a feather there is the main quill, which projects obliquely from the arm of the wing. Projecting obliquely from the quill are the barbs, and projecting obliquely from the barbs are the minutely small barbules.

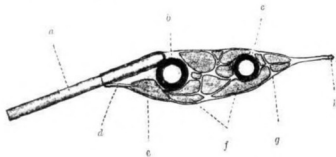
The barbules on one side of one barb overlap, diagonally, the barbules on one side of the adjacent barb, and in a feather that is used for flight these two layers are interlocked. The barbules of the upper layer grow into hooked extremities, and the barbules of the lower layer grow a rolled edge, into which these hooks engage. There is thus a most complete, yet minutely small, interlocking system all over the wing surface, which accounts for its tenacious character and for the fact that when the barbs



A, barbule of a feather of an American ostrich, enlarged 42 diameters. Small spiny, or hairy, processes occur along the under edge and along a part of the upper edge. B, one of the proximal barbules of a wing feather of a bearded vulture, i.e., a barbule taken from the side of a barb that is towards the base of the feather; enlarged 136 diameters. The basal part of the barbule (towards the right in the figure) has an overturned scroll-like upper edge; the other part is sharply bent upon the basal part, and tapers off to a point. C, one of the distal barbules of a wing feather of a bearded vulture, i.e., a barbule taken from the side of a barb that is towards the tip of the feather; enlarged 136 diameters. The basal portion of the barbule (towards the right in the figure) is strap-shaped; the other part is broken up or shredded into bristle-like processes, a few of which (five in the specimen figured) end in hooks. These hooks of the distal barbules fasten over the scrolls of the proximal barbules, and thus impart a certain firmness to the vane of the feather. The barbule, C, is represented as flattened out; in the actual specimen the basal half is twisted upon the other half through nearly a right angle.

have been forcibly separated they do not go back into place. All this is shown in an amazingly clear way by the models at the museum.

The feather is attached to the arm of the wing in a way that looks at first sight extremely insecure, for the root of the quill merely lies on the top of the bone of the arm. It does not even reach quite to the top. It is strapped in position by a ligament and, presumably, if this ligament were cut, the flight of the wing would cause all the feathers to be blown off.



Transverse section through the middle part of the wing of a wood-pigeon (*Columba palumbus*). a, quill of feather; b, ulna; c, radius; d, tendon; e, *flexor carpi ulnaris*; f, other muscles; g, skin; h, elastic ligament.

The general structure and arrangement of the bones in a bird's wing is similar to that of a man's arm and hand. Thus there is the humerus, projecting from the shoulder to the elbow, the ulna and the radius, which are two bones forming the forearm, and the hand with its four fingers and a thumb. The primary feathers of a wing, that is to say, the large strong feathers that form the outer third of the wing span, grow on the hand, and there is also a feathered growth on the thumb, which the bird is able to move independently, and which it can so move for the purpose of altering the camber at the wing tip. This movement can be performed independently of any movement of the hand itself, or of the wing as a whole. The hand can be moved to alter the incidence of the wing tip by rocking it on its axis, as a man can twist his own arm through a limited number of degrees.

These details of muscular control are of especial interest in the light of Dr. Hankin's observations on bird flight in India, where it will be remembered that he recorded a rotation of the wing tip for the purposes of steering control. The subject is also, as we have pointed out before,



Right wing of a bird, showing the disposition of the feathers. 1, primary remiges; 2, secondary remiges; 3, major coverts of primaries; 4, major coverts of secondaries; 5, medium coverts; 6, minor coverts; 7, marginal coverts; 8, remiges of bastard wing; 9, scapulars.

directly related to the theory of negative wing tips and stability, and particularly to the use of the differential negative warp for steering and control.

In very fast gliding flight Dr. Hankin observed the

birds partially fold their wings. There is a splendid specimen of a wing in this condition in one of the cases, and it shows how admirably Nature's design maintains a suitable aeroplane surface in spite of the difficulty that is presented by this problem. If a bat were partially to fold its wings the membrane would sag out of shape.

The folding of a bird's wing is an automatic mechanical action resulting from the drawing in of the humerus towards the body. Ligaments or muscular cords attached to the humerus on either side run round the back and front of the elbow as if this latter were a pulley. They similarly pass over the wrist joint.

When the elbow is moved back towards the body it pulls upon one of the ligaments, which in turn draws in the hand, and so the different sections of the wing are folded and extended in unison. The ulna and the radius bones also play a part in this movement; they behave,

aware that the earwig can actually fly. It is not often seen in flight, and it must be admitted that if any human being had to fold his wearing apparel in the same manner that the earwig folds its wings he would be very well satisfied to use it as little as possible. The earwig's wing first folds rather like a paper fan. When partially folded it halves its length by bending the folded portion back upon itself. Having done that it still contrives to make another fold or two before it finally tucks its wings under its body. Everyone is familiar with the size of an earwig; we leave it to the imagination to conceive the minuteness of its folded wing.

In the exhibition the folding is illustrated by a paper model that is many hundreds of times larger than the original. The folding of the wings of beetles is similarly complicated, and is equally well illustrated.

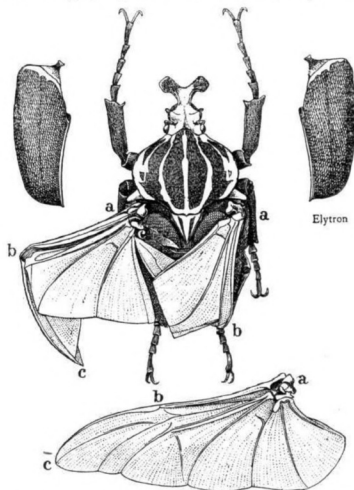
Taken both as a whole and in detail, the exhibition is, as we have said, one of singular interest, and our only criticism is that numerical data relating to the weights and wing areas of birds and other exhibits might with advantage be given among the enumerated facts. It is true that they are available elsewhere, and are perhaps of small interest to the student of natural history, but we venture to think that they would bring home to the aviator how great is the difference between the loading of wing surfaces on birds and on aeroplanes. It is, in fact, probably because the low standard of wing loading utilised by Nature in her most successful flight cannot be maintained with any structural convenience on a very large scale that the bigger and heavier birds, like the ostrich, are unable to fly at all. Yet how small is the ostrich compared to man's aeroplane.

More attention to the relative motion of the flapping wing in the air might also with advantage be given in the course of time, when Dr. Ridewood has the leisure from his other numerous duties to attend to this phase of the subject. We notice, for instance, a model illustrating an old theory that the wing feathers operate on the principle of a venetian blind in order to let the air through during the up-stroke. It is pointed out in the catalogue and on the appended notice that this model is exhibited with reserve, but we must admit that we should more approve its absence. There is, so far as we can see, no primary reason why the wing should need to operate on this principle, for we do not accept as true the theory that supposes a wing to be necessarily subjected to down pressure during its up-stroke.

On the contrary, we believe that a bird's wing in flight continues to lift all the time, although possibly with a varying force. It seems to us that those who believe otherwise cannot have given sufficient importance to the effect of the superimposed horizontal motion of the wing due to the flight speed of the bird as a whole. If the wing were to merely flap up and down in still air, with the bird stationary, it would, of course, be subjected to top pressure during the up-stroke.

In flight the bird as a whole is moving horizontally through the air. If at the same time the wing beats downwards, the direction of its motion in the air is a downward slope. During the up-stroke the direction of its motion is an upward slope. The effect of this slope is merely to alter the virtual angle of incidence of the wing to the relative wind. It causes the angle to be greater during the down-stroke and finer during the up-stroke for a constant attitude of body and absence of rocking of the wing at its shoulder.

Under these conditions, there would be a superior force during the down-stroke due to the increased angle, but



Goliath beetle (*Goliathus giganteus*) dissected to show the mode of folding of the wings when at rest.

in fact, somewhat in the manner of the parallel motion mechanism that is familiar to the engineer.

The method by which a bird spreads its tail is probably unknown to many of our readers. The muscular control is applied directly to the outer feathers only, but the feathers are attached to each other by an elastic ligament that acts like a spring. By pulling on the outer feathers the ligament is stretched, and the other feathers open out fan-like automatically and equally. When the controlling muscle is relaxed the ligament contracts and the tail is folded.

Anything more simple could scarcely be imagined, but it is one of the fascinating features of Nature's solution of her problems that, although a past-master in the art of attaining simplicity, she is equally facile in evolving complicated motions when they are proved necessary.

A positive masterpiece in complicated wing folding, for example, is that on the earwig. Many people may be un-

if the wing is drawn backwards during the down-stroke, and is moved forwards during the up-stroke (as the best observations of bird flight tend to show), then the increased angle is discounted by a reduced relative speed and the finer angle is compensated by an accelerated motion, so that the up-stroke and the down-stroke might well have an appreciably equal supporting effect.

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# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## Special Committee Meeting.

A SPECIAL Meeting of the Committee was held on Tuesday, the 7th inst., when there were present: Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Mr. Ernest C. Bucknall, Col. J. E. Capper, C.B., R.E., Prof. A. K. Huntington, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. Mervyn O'Gorman, C.B., Mr. C. F. Pollock, Com. C. R. Samson, R.N., and the Secretary.

**Geisler Challenge Trophy.**—The report of the Competitions Committee was received, and the following letter was ordered to be addressed to the Grahame-White Aviation Co., Ltd.

"Royal Aero Club of the U.K.  
"October 7th, 1913.

"Dear Sirs,

"The Geisler Challenge Trophy.

"The Committee of the Royal Aero Club have considered the question of your failure to pay to Mr. Brock the prize which he won in the above competition, and they feel that it is essential that they should support him in his rights.

"When you appeared before the Competitions Committee to explain why you had failed to carry out the award of the Stewards of that meeting, it appeared that either you were not properly acquainted with, or else had misinterpreted, the rules under which you advertised that the competition was to be held, viz., those of the Royal Aero Club.

"The Rules, which you, as Promoters, infringed, are Nos. 29 and 33. Under these Rules, M. Brindejone des Moulinais' entry was null and void and his name should have been erased from the programme.

"The decision of the Stewards of the meeting, awarding the Prize to Mr. Brock, was in order. It was duly communicated to you, and you should either have acted upon it or lodged an appeal to the Stewards of the Club. They, as you are aware, are independent of the Club Committee, and form the Court of Appeal in aeronautical sport in this country.

"The Committee must, therefore, call upon you to intimate your willingness to carry out the award, and hand the Prize to the rightful winner.

"As it appears from your letter of October 3rd, 1913, that you desire to appeal to the Stewards of the Club, the Committee will be prepared to facilitate your doing so, if a definite intimation

to that effect reaches me within three days of your receipt of this letter.

"Yours faithfully,  
"HAROLD E. PERRIN, Secretary.

"The Grahame-White Aviation Co., Ltd.,  
"London Aerodrome, Hendon, N.W."

## Duration Record at Hendon.

On Thursday last, the 2nd inst., the Grahame-White biplane, fitted with a 120 h.p. Austrian-Daimler engine, piloted by Mr. Louis Noel, and carrying nine passengers, made a flight of 19 mins. 47 secs., at the London Aerodrome, Hendon. The total weight of the pilot and nine passengers exceeded 98 stone. The flight was officially observed by Mr. A. G. Reynolds and the Secretary of the Royal Aero Club, whose report will be considered by the Committee at its next meeting.

## Gordon-Bennett Balloon Race.

The Gordon-Bennett Balloon Race will take place from the Tuileries Gardens, Paris, on Sunday next, the 12th inst. The following is a list of entries and the order of departure:—

No.	Name of Pilot.		Balloon.
1	M. Bienaimé	(France) ...	Picardie
2	John Dunville	(Great Britain) ...	Banshee
3	Agostoni	(Italy) ...	B. A.
4	J. Watts	(United States) ...	—
5	L. Gerard	(Belgium) ...	Patrie
6	E. Sigmundt	(Austria) ...	Astarte
7	Hugo Kaulen	(Germany) ...	Daisburg
8	V. de Beauclair	(Switzerland) ...	Zarich
9	A. Leblanc	(France) ...	Ile de France
10	J. de Francia	(Great Britain) ...	Honey Moon
11	Pastine	(Italy) ...	Roma
12	Honeywell	(United States) ...	—
13	E. Demuyter	(Belgium) ...	Belgia II
14	Lehnert	(Austria) ...	Frankfurt
15	von Pohl	(Germany) ...	Hamburg II
16	Armbruster	(Switzerland) ...	Helvetia
17	R. Rumpelmayer	(France) ...	Stella
18	Ralph Upson	(United States) ...	Good Year
19	Dr. Hans	(Austria) ...	Zeppelin
20	H. Berliner	(Germany) ...	Metzeler
21	Palmarini	(Switzerland) ...	Azura
166	Piccadilly, W.		HAROLD E. PERRIN, Secretary.

## ROYAL FLYING CORPS (MILITARY WING).

OFFICIAL summary of work for fortnight ending October 4th:—

**No. 1 Squadron.**—The airships "Delta" and "Eta" returned from the manoeuvre area at the end of last week, after carrying out numerous reconnaissances both by day and night throughout the Army Exercise. The "Wireless" worked excellently, and constant communication was kept up. Although the weather was rough—there was a 30 m.p.h. wind blowing on September 24th—the airships were undamaged, and stood their mooring in the open well.

**No. 2 Squadron.**—All the machines of this squadron are now back at Montrose on the termination of the Irish Manoeuvres. A considerable amount of reconnaissance work was carried out in Ireland, the aeroplanes being out in all sorts of weather over very difficult country.

**No. 3 Squadron.**—This squadron took part in Inter-Divisional Training, and then joined the "Brown" Force for the Army Exercise. The 12 machines were out daily reconnoitering. The total mileage flown works out at 6,245 miles.

**No. 4 Squadron.**—This squadron joined the "White" Force

on manoeuvres. 4,600 miles were flown in all. The squadron aeroplanes (with two exceptions) returned to Netheravon by air on completion of manoeuvres.

**No. 5 Squadron.**—This squadron joined up with No. 4 for the Army Exercise. No machine was damaged and all were flown back to Farnborough. The mileage done works out at 4,400 miles.

**Flying Depot.**—During the Army Exercise, the Flying Depot formed a workshop base on the "White" side. Besides carrying out repair work and issue of stores, etc., several of the Flying Depot pilots and machines took part in the reconnaissance work.

**General News.**—Much valuable experience was gained by all ranks on manoeuvres. It is satisfactory to record that only one accident occurred: that in which Lieuts. Chinnery and Playfair were hurt. It is expected that both these officers will be well again in four or five weeks.

Although the weather during the Army Exercise was far from good from a flying point of view, airships and aeroplanes were out the greater part of every day, with the result that a constant supply of information was brought to headquarters.



## FROM THE BRITISH FLYING GROUNDS.

### Royal Aero Club Eastchurch Flying Grounds.

GORDON BELL, very successfully put a new 160 h.p. Gnome-Short seaplane through its tests last week at Leysdown. The test was in every way satisfactory, the machine lifting quickly and smoothly, and, after completing a wide circuit, made off in the direction of the Grain Hydroplane Station. It has two large central floats, and also floats at wing tips and tail, and the air and water rudders work simultaneously. The upper plane extensions are constructed so as to fold back, to facilitate hauling on to parent ship in transport, and the machine is similar to the one previously supplied to the Admiralty.

Mr. F. K. McClean has been out three times last week, and took up several passengers, flying with his usual good style and judgment.

Commander Samson has been flying well on Short No. 3, and on one flight he quickly ascended to several thousand feet, and then commenced a beautiful spiral descent, which he continued until he got quite near to earth, when he suddenly darted off on a horizontal course, and made several circuits of the aerodrome, "banking" well and generally giving a fine exhibition of his skill. During his spiral at times he appeared to be almost vertical.

The excellent flying conditions were taken full advantage of, and the following made numerous flights on Avro, Sopwith, Shorts, Blériots, Deperdussins, &c.: Capt. Courtney and Barnby, R.M.L.I.; Eng.-Lieut. Briggs, R.N.; Lieut. Davis, R.N.; Lieuts. Rainey and Miley, R.N.; Sub-Lieuts. Marix, Littleton, and Young, &c., besides a deal of instructional work.

### Brooklands Aerodrome.

On Monday morning last week, Mr. Raynham carrying a mechanic as a passenger started for Leeds on his new 80 h.p. Avro biplane, calling at Rugby en route to lunch with some friends. Later in the week he competed in an Inter-County Match between Lancashire and Yorkshire for the former county against Mr. Blackburn. An excellent race resulted, Mr. Blackburn proving the winner. Mr. Raynham having failed to locate the Barnsley control.

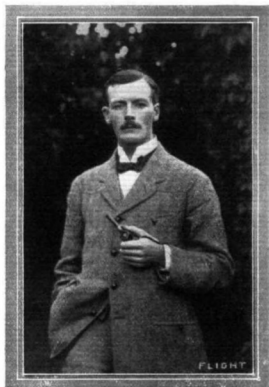
On Saturday, Lieut. Briggs paid a visit on a Blériot monoplane. For the October Aeroplane Cross Country Handicap the record number of 16 machines were entered, but in the end, owing to rain

Paterson, 50-h.p. Blériot monoplane, also finished. Mr. Alcock made some excellent test flights on the Maurice Farman with 100 Sunbeam engine.

On Sunday the weather was dull but ideal for flying, and a number of excellent flights were made by Messrs. Hawker on the 80 Gnome and 100 Green Sopwith biplanes; Barnwell, Blériot monoplane and Vickers biplane; Dukinfield Jones, 60 h.p. Flanders biplane; Orr Paterson, Vickers biplane; Knight and Newton-Clare, Vickers monoplanes. Mr. Merriam was very busy with his pupils on Bristol biplanes. The winner of the ballot for the free flight



Lieut. Geof. R. Bromet, R.N., a pupil at the Bristol School, Lark Hill, who has recently taken his Royal Aero Club certificate.



Capt. Francis A. Ferguson, R.E., who has just secured his brevet at the Bristol School, Salisbury Plain.

and several minor mishaps, only 6 faced the starter, a closely contested race resulting in a finish in the following order:—

Handicap Time.

- |   |        |
|---|--------|
| 1. F. W. Merriam (50 h.p. Bristol biplane) ...        | 14 50  |
| 2. H. G. Hawker (80 h.p. Sopwith biplane) ...         | 14 58½ |
| 3. R. H. Barnwell (120 h.p. Martinsyde monoplane) ... | 15 3½  |
| 4. A. Knight (60 h.p. Vickers monoplane) ...          | 15 24½ |
- Mr. Merriam, however, was disqualified for inadvertently missing a pylon. Messrs. Waterfall, 70 h.p. Parsons biplane, and Orr

was Mr. K. Rice, of The Crescent, Weybridge, who enjoyed a long trip with Mr. Barnwell on the Vickers biplane.

Howard-Flanders School.—Thursday last week, Dukinfield Jones out on biplane for ¼ hour in early morning and for 20 mins. in evening. Isaacson engine running much better.

Dukinfield Jones made three flights Friday, lasting 20 mins., ¼ hour and 25 mins., practising vol planes from 1,000 and 2,000 ft.

Saturday, Dukinfield Jones out for 20 mins. in morning, had not entered for race, so did not fly during afternoon. On Sunday he was up for 10 mins. in morning, after having re-insulated ignition wires from coil. Up again twice in afternoon for 20 mins. each time.

Vickers School.—Tuesday last week, in evening, Knight testing biplane 20, then with Capt. Franklin (new pupil).

Barnwell testing biplane 20 for ¼ hour in bumpy wind, Wednesday. Thursday morning, Barnwell and Knight with Messrs. Pierson, Kinsman, and Batty-Smith (new pupils) on biplane 20. Paterson with Mr. Sherlock; this pupil then solo straight. Capt. Wood on biplane 21. Barnwell on No. 7 mono. test. In afternoon, Knight on biplane 20 with Capt. Franklin. Barnwell with Mr. Sherlock.

Barnwell on biplane 20 with Major Kinsman and Mr. Pierson Friday morning; Knight with Major Kinsman. Barnwell test No. 7 mono. In evening Knight with Mr. Pierson, Major Kinsman, and Lieut. Batty-Smith on biplane 20. Barnwell circuits on No. 7 mono., Mr. Howell and Mr. Sherlock solos on biplane 20.

In morning, Saturday, Barnwell test on No. 7 mono., Knight on biplane 20 with Major Kinsman. Lieut. Styles on No. 7 mono., made heavy landing, turning machine over, and doing considerable damage.

### Eastbourne Aerodrome.

Unfavourable weather prevented any school work last week until Thursday, when the wind slackened, and Gassler brought the E.A.C. biplane out. After a test flight he took up a couple of passengers. Then Mr. Thornley took the control, and with Gassler up behind, he did two or three circuits.



Mr. F. B. Alford, who took his certificate very skilfully at the Bristol school at Brooklands, under the tutorage of Mr. F. W. Merriam.

On Friday, after giving Mr. Thornley some further practice, Gassler tested the E.A.C. 'bus' capabilities by climbing rapidly to about 2,000 ft., and then taking a stunt round the country for about 20 miles, passing over Stone Cross, Polegate, and Wittingdon, then over Hampden Park and straight out to the sea front, returning to the aerodrome and descending with a spectacular spiral drive. Fowler was also out on the front with the Farman hydrobiplane carrying passengers. Saturday, Gassler had the Bristol out, but

after a couple of circuits decided that there was too much wind for pupils. These conditions prevailed until Monday afternoon, when both Fowler and Gassler went out, Fowler on the 70 h.p. Farman, and Gassler on the E.A.C. biplane, giving exhibitions, which lasted until dark.

#### London Aerodrome, Collindale Avenue, Hendon.

**Grahame-White School.**—Mr. W. Strange circuits on Monday last week. Messrs. L. C. Kidd, J. P. Clark straights with Instructor Manton in passenger seat. Mr. Carpenter solo straights.

Tuesday, Mr. W. Strange solo circuits. Mr. Hart-Davis straights with Mr. Manton.

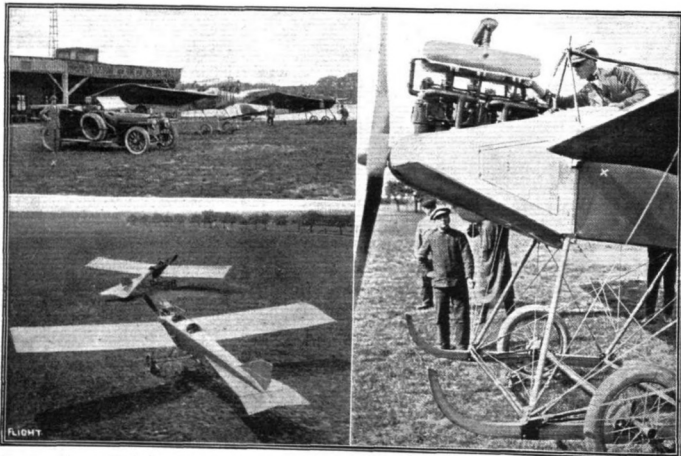
Friday, Mr. Cripps, Mr. Edridge-Green, Mr. Francis, and Mr. Hart-Davis straights with Mr. Birchenough. Mr. Draper and Mr. Hart-Davis straights with Mr. Manton, afterwards solo straights. Mr. Strange circuits. Mr. Draper and Mr. Hart-Davis circuits with Mr. L. Noel. Mr. Segen-Baden, Mr. L. C. Kidd, and Mr. Clark straights with Mr. Manton. Sir Bryan Leighton *brevet* tests, making especially fine landings, and gaining his pilot's certificate.

**W. H. Ewen School.**—On Monday, last week, at 5.30 p.m., M. Baumann was on the *brevet* Caudron, but found it too windy for pupils. Tuesday, Wednesday, and Thursday, were also too windy for pupils' practice. On Thursday afternoon, M. Baumann made several flights on the 60 h.p. Caudron.

On Friday, the school out at 8.30 a.m. M. Baumann made a test flight on *brevet* machine. Mr. C. George was doing half-circuits and circuits, Capt. Jennings, and Lieut. Holbrow doing straights. Mr. Warren made a flight on same machine. Mr. F. Gooden was instructing Mr. Scott, who was rolling and doing straights on 35 h.p. Caudron No. 1, Lieut. Fraser and Mr. Badgery rolling, and Mr. McGregor doing straights. School again out at 3.30 p.m.

Test flight by M. Baumann on *brevet* machine. M. Baumann instructing Mr. C. George, who was doing circuits, Capt. Jennings, who was doing circuits and figures of eight in good style, landing well, and Lieut. Holbrow, who was doing half circuits. Mr. F. Gooden was teaching Mr. McGregor, who was doing straights, Mr. Scott short straights, Messrs. Badgery, Colling, and Carruthers rolling, and Lieut. Fraser doing short straights.

**Hall School.**—Monday, Tuesday and Wednesday too much wind. Thursday J. L. Hall circuits on Caudron after adjusting machine. Next day Scotland good circuits preparatory to figure eights, and on Saturday Hall exhibitions on Caudron at good height, but forced to come down owing to rain. Scotland now ready for *brevet*.



The monoplane which have been designed and constructed by Prince Friedrich Sigismund, son of Prince Friedrich Leopold of Prussia. In the top left-hand picture Prince Friedrich Sigismund is standing by his Adler car, which he also drives himself. On the right is a closer view of the chassis and engine mounting, Prince Friedrich being in the pilot's seat attending to the running of the motor.

# ARMCHAIR REFLECTIONS.

By THE DREAMER.

## The Effect of Thought.

It is Sunday, to-day, and wet. Yes, I know I ought not to be writing this on Sunday, but as it is raining I cannot go to Hendon. I have watched the rain from my window till I am tired of it, and I have read all the Sunday papers till I am equally tired of them, so I am writing just to prevent worse happenings. It's a long way to Tipperary, also I've heard toll it's a rocky road to Dublin, but in both cases it seems to me it is a question of the point of departure. Again it may be a long way from babies to aeroplanes, but again it is a question of the point of departure. The point of departure is a thing that has worried journalists more than enough when they have got to write about something. They don't know what to write about, or where to begin. The education of the masses is a thing that has my approbation every time, and I am not inclined to be hypocritical when our weekly newspapers try to teach the young idea how to shoot. The following, culled from the *People* of to-day should go a long way with the young mother who is perplexed as to what to do under trying circumstances: "A deep drawer lifted out from the dressing chest, and made comfortable with pillows and soft flannels, makes an excellent substitute for a cot; it is a good sleeping place, and easily contrived. But do not under any conditions place in the drawer so that it may be accidentally closed, or poor baby might be smothered." It is the following of advice such as this, that has placed England where she is to-day.

I have read all about the Eugenic Baby, and here comes the connection between babies and aeroplanes.

Eugénie Bolce—that is the name, and it is the name of a baby and not a skin-ointment. It appears that if parents will but concentrate their entire thoughts on the matter on hand to the exclusion of all else, the little life that is coming may be gently steered in any desired direction. In the case under notice, it was evidently desired that in after years this little specimen of humanity should be a star turn, and have the place of honour at the top or bottom of the bill at the West End halls, and so, the mother that was to be was entertained

by George Robey, Harry Lauder, and all the others they could think of, and I believe the result has surpassed expectations. It is a fine baby, and although it has, I believe, not up to now taken to wear a bowler hat without any brim, or told us the reason why it wears a kilt, it keeps smiling, and is even supposed to be thinking out some new jokes to take the place of those that will be used till it comes of age, and will then spring them on us unawares. I hope that by now you will have seen the connection between babies and aeroplanes, and will be prepared to take back all you have said. If you happen to be in the position delicately hinted at above, and you wish your little man to eventually hold all records in aviation, you must start at the very earliest moment to train him in the desired direction. If you have to get up in the night to warm the milk over the gas-jet in the bedroom, always put on a Warren helmet; be sure he is watching, and it will help his little mind into the right channel, even if the helmet tops a suit of pyjamas. Whilst taking his nourishment it might help matters if you stand him on his head in the corner; this will get him used to controlling himself upside-down. Everything about the house should help to bring thoughts of aviation, and when he cries, don't say "Oh! didums little tummyummy," &c.—he will probably look at you with surprise if you do, and wonder how late you were at the club; say "Oh! was the mixture too rich then? Well, his mechanic shall see to it, so he shall; there, close his little throttle, then." Never think for one moment of having a cradle, or even putting him in the bottom drawer (the bottom drawer is for use before marriage, not afterwards). Have a nice little *nacelle* for him, fitted up with all the controls, and when he wakes in the morning, early, you can lie in bed and watch how he is getting on with his studies of the warp.

When he is older, he will probably be studious, and want to sit in a swing and read a book. Don't give him an ordinary swing; have a model Blériot hanging in the garden, and for a book, give him "Aviation," by—but no, this is not an advertisement page.

# AIRSHIP AND BALLOON NEWS.

## The "Astra Torres" at Work.

On Friday of last week, the new Naval airship "Astra Torres" was taken out for a voyage, which lasted nearly an hour, during which some speed tests were made, the highest speed being about 51 miles an hour. Lieut. Osborne was in charge of the airship, while the passengers included Capt. Murray Seuter and Lieut. L'Estrange Malone, of the Air Department of the Admiralty.

## "Z-V" in Danger.

AFTER a voyage of three and a half hours from Leipzig to Potsdam on the 2nd inst., considerable difficulty was experienced in mooring the dirigible "Z-V." On account of the cross winds it was impossible to get the airship into her shed, and she had to be held down by a human anchor composed of a great crowd of soldiers. Several times the vessel was dragged from their hands, and several soldiers were injured. Eventually, after a very anxious three hours' work, the airship was safely housed. Extraordinary precautions have been taken by the military authorities to keep visitors away from this new airship; even the Zeppelin Co. have been unable to get permission to show the vessel to people who are interested. Sentinels are posted inside and outside the hangar, and no one is even allowed to approach the shed.

## New Parsevals for German Army and Navy.

ON Sunday, a new Parseval airship built for the German Army was out for the first time at Bitterfeld, while on Monday a similar vessel for the Navy was being tested. Both airships are 96 metres long, and have two motors of 180 h.p. each.

## A New Airship Garage at Hanover.

THE municipal authorities of Hanover have decided to build a new shed for dirigibles. They have secured a piece of land with an area of 40 hectares, and they propose to erect on it a hangar 200 metres long, and 60 metres high.

## Two Airships over Paris.

ON the 30th ult. the Astra airship "Conte" was taken for an hour's cruise from Issy, and for some time was steered over Paris side by side with the "Fleurus," which was cruising over the French capital for about two hours. The "Fleurus" left St. Cyr on Monday for Maubeuge, and she will be replaced at the former place by the "Adjudant Vincinet."

## The Gordon-Bennett Race.

THE list of entrants for the Gordon-Bennett Balloon Race, which takes place from Paris to-morrow (Sunday), will be found on p. 1120. The British representatives are Mr. J. Danville (Banshee) and Mr. J. de Francia (Honey Moon).

## Extraordinary Balloon Accident in Spain.

AN accident under most exceptional circumstances occurred at Barcelona on Sunday. As a balloon was rising, a man in the crowd was caught by the guide rope, and carried up into the air. The aeronaut in endeavouring to drag the man into the basket over-balanced, and fell to the ground, being killed instantaneously. Relieved of the aeronaut's weight, the balloon rose to a good height, and eventually came down some distance from the city, with the man still clinging uninjured to the guide-rope.

# AIRCRAFT IN WAR.

THERE has been a good deal written lately on the subject of the use of aircraft in war, particularly from the point of view elucidated by the lessons of recent military manoeuvres, both in this country and on the Continent. Much of this has necessarily been of a speculative character, and is thus of merely theoretical value. Not but what all discussion is useful, since we have nothing much to go upon in the way of practical experience in the "real thing," but the main point is that very little we have seen recently bears the stamp of real authority. Therefore, we are the more pleased to have read, in the *Daily Telegraph* of the 8th inst., a closely reasoned and excellent appreciation of the lessons of the late manoeuvres, from the pen of that journal's aeronautical correspondent. So interesting is this contribution to the subject, that we feel we need make no apology to our readers for reprinting it *in extenso*. The following is the text of the article in question:—

"The recent Army Exercises will be memorable chiefly for the excellent work accomplished by the air scouts, and for the eminently valuable experience gained in this new branch of warfare. From the very first the conditions militated against success, but every obstacle was overcome, and generally the achievement of the pilots was brilliant.

"In the first place, the weather was continuously bad throughout, low-lying clouds rendered observation impossible from a height exceeding 2,500 ft., while high and gusty winds prevailed. Next, the country was most unsuitable for aerial work, owing to the absence of good landing ground in the manoeuvre area. And, lastly, the scouts attached to the Brown Army were severely handicapped by the fact that the White Army was a mere skeleton, so that they were deprived of the advantage, possessed by the White scouts, of being able to observe large bodies of troops. Where a whole company is represented by one private, not only are the difficulties of the air scouts enormously increased, but guesswork must necessarily play an important part in their reports.

"The Brown forces were allotted No. 3 Aeroplane Squadron, consisting of twelve biplanes; to the White army were attached sections of Squadrons 4 and 5, together with a detachment comprising six machines from the Naval Air Service—a total of twenty-four aeroplanes and two airships, the 'Delta' and the 'Eta.'

"As already stated, the work of the aeroplane squadrons was eminently satisfactory, especially when the unfavorable conditions are considered; and the high wind proved in a measure a blessing in disguise, since it not only served to bring out the fine qualities of our military pilots, thus showing the immense strides that have been made within the past six months, but furthermore taught one conclusive lesson. A considerable proportion of the White aeroplanes were biplanes of a relatively slow type, with a maximum speed of fifty-five miles an hour. Throughout the exercises the wind blew strongly, and on several days attained a velocity of some fifty miles an hour. On these days the slow White biplanes were simply unable to accomplish any effective work. True, they ascended; but, their speed being insufficient to allow them to make headway against the wind, they were unable to attain the enemy's lines, though but a few miles distant.

## Importance of Speed.

"The more speedy machines, on the other hand, were never inactive, and flew day after day, heedless of wind and weather. In real warfare these would have disposed of their opponents without difficulty, and could at an early stage have firmly established themselves masters of the air. The lesson is obvious: the slow machines, ideal for the purposes of instruction, are worthless for active service.

"Another lesson, equally conclusive, is the unsatisfactory nature of the aeroplane of the BE type for purposes of accurate observation. In this respect the RE (which stands for Reconnoitring Experimental) is equally deficient. If the observer is to accomplish his work, it is absolutely essential that his field of vision should be as wide as possible; in no event should it be interrupted by a propeller revolving in front. Undoubtedly this consideration will exercise a decisive influence on the trend of design, which is already apparent in the latest military aeroplanes produced by the Aircraft Factory. These are of the Henry Farman type, in which both pilot and observer are seated in front of the main planes, the latter, whose place is right forward, controlling a light machine gun mounted on a revolving platform, with an uninterrupted field of fire ahead.

"In the points of transport, facilities for repairs, and shelter

accommodation, great progress has also been recently accomplished, especially during the past few months, though great effort is still needed to bring the squadrons up to even their meagre establishment strength, owing to past neglect.

"Two further lessons were taught, each of which will no doubt exert an important influence upon future developments. In the first place, it was proved throughout the whole course of the manoeuvres that in order to fulfil his work conscientiously, an air scout must make his observations from a height not exceeding 2,500 ft., at which he is undoubtedly vulnerable to rifle and gun fire from below. In the second place (a curious point this), military tents in the future will have to be made of some coloured material, for the white tents now universally in use constitute the most glaring landmarks to the aviator, which it would be impossible to miss on even the dulllest day. On the other hand, if dun-coloured, they would be practically invisible.

"But if the work of the aeroplane squadrons was satisfactory in every respect, that of the two airships was the reverse. The fault lay not with their crews, for they were handled in the most praiseworthy manner, but was inherent in their nature. Both airships were small, incapable of ascending to any height, and (cardinal defect), being slower than the slowest aeroplane, would, with their enormous bulk, have proved the easiest of targets to every hostile aeroplane and to attack from below. They, too, were rendered entirely useless on the days when a high wind prevailed, and, even when the wind had dropped, the Brown aeroplanes made a practice of circling around and above the airships, which they could have destroyed with ease.

## Rôle of the Airship.

"Once again the lesson is clear, and the conclusion is one already formed by every Continental Navy, and by Germany in particular. The slow, non-rigid dirigible is certain to be destroyed should it attempt to take part in daylight warfare. Speed, and speed alone, can save it; but speed can only be obtained through a vast increase in power and in size. The process is clearly seen in the evolution of the Zeppelin. That built in 1906 measured 423,000 cubic feet in volume; that of 1911 already scaled 627,000 cubic feet; the first naval craft, lately wrecked off Heligoland, measured 776,000 cubic feet; while the second naval Zeppelin, 'L-2,' has a volume of no less than 950,000 cubic feet, and still larger craft are on the stocks. Speed has increased correspondingly: from the thirty-six miles an hour attained in 1906, the Zeppelin reached fifty-two miles an hour last year, and the present naval dirigible is stated to be capable of close upon sixty miles an hour, a speed but little inferior to that of the average aeroplane.

"It is clear, therefore, that a small airship, with its slow speed and restricted radius of action, must inevitably give way to the vessel of capital size.

"But in considering the military value of the airship two facts have ever to be borne in mind. First, an airship is capable of carrying out its work by night, when the aeroplane is perforce unable to ascend, or at all events, ceases to be effective. For the purpose of reconnoitring on land, this feature may not be of very great value, it is true. But at sea, and particularly if the dirigible is regarded as the view is firmly held in Germany—as a weapon of destruction, capable of dropping large quantities of explosives, its capacity for flying at night, when it may hover over a selected spot, silently, invisible, immune from attack, becomes of enormous value.

"The second point is this: an airship of large size, and especially of the rigid type, is wholly unsuitable for use in such a country as England under ordinary campaigning conditions, and as part of the equipment of the Army, for an enforced landing would inevitably spell disaster. On the other hand, its vast radius of action enables it to work from a base far removed from the scene of operations, and renders it ideal for work over the sea.

## The Outlook in Aviation.

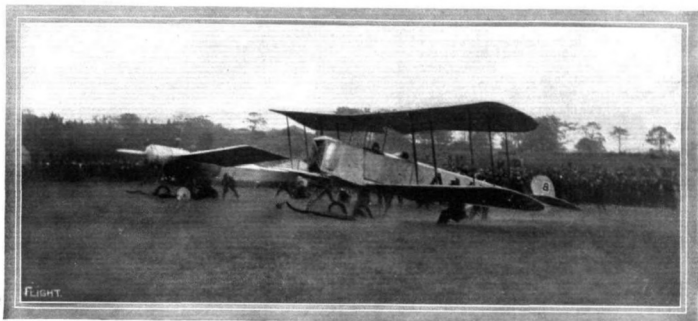
"While the whole of experience, therefore, goes to show that the day of the small non-rigid airship is irrevocably past, it is equally certain that the large war dirigible is only now entering upon its career, the full extent of which we cannot yet foresee. However efficient our aeroplane service may be—and it is only in the very first stage of its development—it remains powerless to deal with the danger of a fleet of great airships working over enormous distances. If it is the task of the Army to develop the aeroplane, it remains just as certainly the duty of the Navy to provide the large airships—essential for national defense as a whole, and for lack of which it will be placed at a serious and possibly decisive disadvantage as compared to its more enterprising rivals.

"Unfortunately, for the reasons already given, the manoeuvres afforded no means for judging the respective capabilities of aeroplane and airship when matched against one another, or of their powers of offence."

## THE WAR OF THE ROSES.

A "WAR of the Roses" was fought out again last week in the form of a race between F. R. Raynham on an Avro biplane, which, of course, was built in Lancashire, and Harold Blackburn on a Blackburn monoplane, a Yorkshire product. The race, which was for a challenge cup offered by the *Yorkshire Evening News*, started and finished at Leeds, and was held over a circuit of which the chief points were York, Doncaster, Sheffield and Barnsley, a total distance

he had the same trouble at the next control, Barnsley. In fact he flew right past it, and when he did descend it was at Dewsbury, some miles away. As it was then hopeless to try and put matters right, he flew direct to Leeds, and arrived some time before Blackburn. Soon after Blackburn's arrival the cup was presented to Dr. Christie, and handed by him to Blackburn. We understand that a return match will be held in Lancashire towards the end of



THE YORKSHIRE AIR RACE.—The Avro biplane and the Blackburn monoplane in line just at the moment of getting away.

of nearly 100 miles. To see the start about 60,000 people gathered on Moortown on Thursday of last week and both pilots got away from Leeds promptly at 2.14 p.m., Mr. Blackburn with Dr. Christie as passenger and Raynham accompanied by Mr. H. V. Roe. The weather was very bad, the mist making it very difficult to pick up the landmarks and keep on the course, in which respect Blackburn scored over his opponent, as he was more familiar with the country. It will be seen from our table that Raynham had an advantage by the time York was reached, and he was the first away again. At Doncaster, however, he was three seconds behind. Both men got away promptly from the Town Moor, Doncaster, and Blackburn still further improved his position, Raynham being handicapped by being unable to locate the control at Sheffield. He had to make two descents before reaching his destination, and

the month, and it is anticipated that the event will become an annual one.

		Blackburn.	Raynham.
		h. m. s.	h. m. s.
Start ... ..	...	2 14 0	2 14 0
York ... ..	arr.	2 39 48½	2 38 59½
" ... ..	dep.	3 1 28½	3 0 40
Doncaster ... ..	arr.	3 33 0	3 33 3
" ... ..	dep.	3 51 0	3 51 3
Sheffield ... ..	arr.	4 19 50	4 23 50
" ... ..	dep.	4 42 0	4 43 0
Barnsley ... ..	arr.	4 55 23½	—
" ... ..	dep.	5 19 0	—
Leeds ... ..	finish	5 48 0	Disqualified

## BRITISH NOTES

## THE ROYAL FLYING CORPS.

The following appointments were announced by the Admiralty on the 2nd inst. :—

Lieut. N. Osborne, to the "Hermes," as Squadron Commander, for command of Naval Airship No. 3; W. C. Hicks, to the "Hermes," additional, as Flying Officer for Naval Airship No. 3.

The following announcements appeared in the *London Gazette* of the 3rd inst. :—

**R.F.C.—Military Wing.**—*Special Reserve of Officers.*—The undermentioned Second-Lieuts. resign their commissions. Dated October 4th, 1913: Henry R. Basted and Herbert D. Cutler.

The following appointment was announced in the *London Gazette* of the 7th inst. :—

**R.F.C.—Military Wing.**—*Special Reserve of Officers.*—Louis Arbon Strange to be Second-Lieut. (on probation). Dated October 8th, 1913.

## The Cody Memorial Fund.

It is announced by the Joint Committees of the Aerial Leagues appointed for the purpose of raising the Cody Memorial Fund, that they have handed over to Mrs. Cody the sum of £1,250.

The **Salisbury Plain Aviators and their Friends** and the **Cody Memorial.**

MR. H. M. JULLEROT, school manager of the British and Colonial Aeroplane Co., at Larkhill, Salisbury, advises us that he has sent a cheque for £71 16s. 6d. to Col. Massy of the Aerial League,

## OF THE WEEK.

being the amount of subscriptions collected on behalf of the Cody Memorial Fund from the Salisbury Plain aviators and their friends. The following are the subscribers to this fund :—

Mr. Da Costa Tod, £20; Mr. Robt. Smith Barry, £10; Sahmarine Officers at Gosport, £3 12s. 6d.; H. H. Prince Cantacuzene, £3 3s.; Mr. E. C. Bass, £3 3s.; Mrs. Tattersall, £2 2s.; Mr. E. L. Smith Masters, £1 10s.; Hon. Mrs. Herbert Beaumont, Hon. Herbert Beaumont, Miss Violet Marsh, Mr. Piggott, Capt. Ferguson, Capt. B. H. L. Hay, Capt. Grace, Mr. C. H. Pixton, Mr. H. M. Jullerot, Mr. Farnall Thurstan, Mr. A. E. Stone, Mr. S. V. Sippe, Mr. H. R. Basted, Mr. Lionel Sutton, £1 1s. each; Lady Bower, Lieut. G. Bower, R.N., Mr. H. S. Garnett, £1 each; Mr. Whistler, Lieut. Cooper, R.N., Lieut. G. R. Bromet, R.N., Mr. R. M. Davy, Lieut. Watham, Lieut.-Col. Ford, Capt. Pollak, Capt. Tompkinson, Lieut. Williams, Lieut. Godman, Lieut. de Tuyl, Lieut. Edwards, Lieut. Gallagher, 10s. each; Capt. Fielden, Lieut. Hornby, Capt. Leslie, Lieut. Anstruther, Lieut. Fitzgerald, Lieut. Leigh, Lieut. Bruce, Lord Ebrington, Lieut. Beech, Lieut. Horn, Lieut. Haslam, Capt. Argyle, Lieut. Bannatyne, Lieut. Juler, Lieut. Bagnell, Lieut. Bigge, 5s. each; James and Parker, 2s. Total, £71 16s. 6d.

## The Women's Patriotic Aerial League Fund.

In aid of the above fund a successful amateur dramatic entertainment, organised by Miss Gwendolen Atherton, took place last Saturday, October 4th, at Iichen House, Alesford, Hants. As a result of the performance, Miss Atherton has forwarded a cheque for £13 to the hon. sec. of the Women's Patriotic Aerial League.

## Mr. Churchill and Col. Seely Fly Again.

DURING his visit of inspection of the Naval base at Cromarty, Mr. Churchill, First Lord of the Admiralty, went for a long flight with Lieut. Longmore on a Farman biplane. He was succeeded in the passenger's seat by Col. Seely. Subsequently Col. Seely went up with Lieut. Oliver on a monoplane, on which Mr. Churchill also made a trip lasting nearly 40 minutes, and traversing the whole of the firth.

## The Montrose Air Station.

SINCE the 3rd squadron of the Royal Flying Corps has been stationed at Montrose it has been found that the aerodrome is not very conveniently situated, as it is some 4 miles from Panmure Barracks. The military authorities are now in negotiation with the Town Council with a view to leasing about 300 acres of what is known as the Town Land, which is quite close to the barracks. This site is excellent for the purpose of an aerodrome, and it has the extra advantage of a frontage to the sea.

## The "Aero 'Bus" Record.

LOUIS NOEL added to his laurels on Thursday of last week

when he took up nine passengers beside himself on the Grahame-White char-à-bancs. The aggregate weight of the passengers was 1,371½ lbs., and in addition the petrol weight was 146 lbs. and the lubricating oil 25 lbs. With this load the machine flew for 19½ minutes, which is, of course, easily a record for this number. The machine is fitted with a 120 h.p. Austro-Daimler engine.

## Flying at Shoreham.

QUITE a deal of interesting flying has been accomplished at Shoreham during the past week. Mr. Cecil Pashley on his H. Farman, has been doing his usual stunts, and it is pleasing to note that he has the good sense to keep well up. *En passant*, Mr. Eric Pashley has improved a little, but it will be some time before his complete recovery. Mr. B. H. England, and Mr. Elliott are doing very well with their newly formed school, another pupil having joined during the past week. It will probably not be long before Shoreham accounts for another *brevet*. Mr. Elliott, who has progressed in a marked degree, is the promising pupil. Last week he did seven circuits consecutively, and at a fairly good altitude, too. He should make good as a pilot; from all appearances.

# FOREIGN AVIATION NEWS.

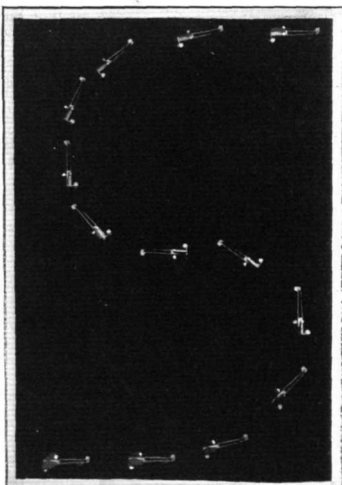
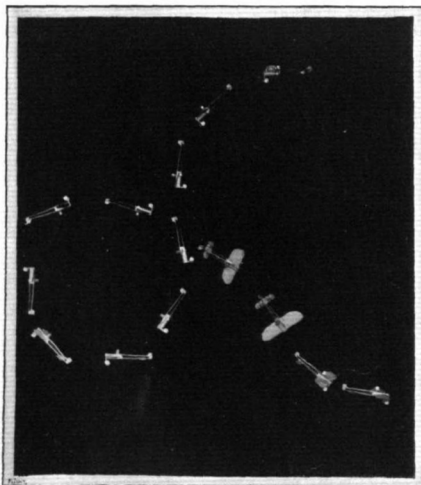
## More German Passenger Records.

FOLLOWING on his five high flights with two or three passengers at the Johannisthal meeting, Sablatnik, on the 1st inst., took up four passengers to a height of 2,080 metres. Two days later he went up to 1,015 metres with five passengers.

## Latest Pegoud Developments.

FRESH from his success at Brooklands, Pegoud reappeared at Buc, on Wednesday of last week, and demonstrated some developments of his upside-down flying. Taking his Blériot to a height of about 800 metres he turned it over and, with the motor still running, flew in that attitude for 59 secs., the machine steering as easily, apparently, as if it had been the right way up. When the machine had glided to within about 500 metres of the earth he turned over again and dived steeply. He then climbed again to a height of 1,200 metres, from which he looped the loop

five times in succession, this manoeuvre bringing him to within about 100 metres of the ground, causing some little anxiety to the spectators. Making the machine climb 400 metres, Pegoud did another three loops, keeping his motor running all the time, and remounting once more to a good height, he finished the display by bringing the machine down in a series of very short spirals, the monoplane appearing to be standing vertically on one wing tip at times, while the pilot took his hands off the controls. On Sunday, Pegoud tried to carry out some tests with a two-seater Blériot, with the passenger seat filled with a sack of ballast. When he dived to loop the loop, however, the machine did not turn over until it had dropped about 400 metres, and then the movement was slow and clumsy. Still Pegoud succeeded in getting it over and back to its normal flying position, when he was able to return by a spiral *vol plane* to the ground. Later he was up on his ordinary machine, and looped the loop six times in succession.



PEGUOD'S RECENT FLIGHTS.—The above plates have been prepared by FLIGHT for the purpose of more graphically showing the evolutions which are performed by M. Pegoud when looping the loop and doing his "S" shaped upside down flight, and how he actually recovers his normal position. The diagrams are prepared by photography from a small model of the Blériot.



Prince Axel of Denmark, who is a certified pilot, explaining the controls of the Maurice Farman biplane to King Christian X of Denmark.

#### More Nieuport Superior Pilots.

ON the 30th ult. Armand Malard succeeded in making all the qualifying flights for a superior certificate in one day. Setting out from Villacoublay on his Nieuport at 7.30 a.m. he finished the triangular event *via* Orleans, and Chartres at 11.25 a.m. In the afternoon he made the straight line flight, going from Villacoublay to Chalons in 1 hr. 50 mins. Louis Chapier, a Comite Nationale pupil, also went from Villacoublay to Chalons, taking an hour and three quarters for the trip. Louis Brullard also made one of the triangular tests over the Villacoublay-Orleans-Chartres course.

#### M. Bienaime Learning to Fly.

ONE of the best-known balloonists in France, and the winner of the last Gordon-Bennett balloon race, M. Bienaime, has taken up aviation, and after a course of instruction at the Caudron School at Crotoy, has just secured his *pilote-aviateur's* certificate.

#### A Farman Superior Pilot.

CONCLUDING his cross-country flights for a superior *brevet*, Bagnol, a C.N. pupil, on Saturday flew through the pouring rain from Mailly Camp to Etampes, a distance of more than 150 kilometers.

#### Another French Balloonist Tries Aviation.

FOLLOWING the example of M. Maurice Bienaime, M. Pierron, another prominent French balloonist, has taken up aviation. After only eight days of training he qualified for his *brevet* on the 2nd inst. at the Blériot school at Buc.

#### Buc to Poitiers and Back.

ACCOMPANIED by a passenger, Lieut. Faurite, on Sunday week, made a non-stop flight to Poitiers on a Borel. The following Friday he returned to Buc, and on this trip his speed worked out to 150 k.p.h.

#### Rheims to Paris in Company.

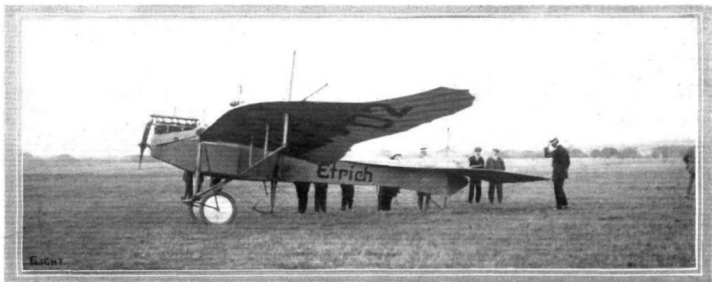
AFTER the Rheims meeting it was decided to take the Morane machine back to Villacoublay by the aerial way. There were four machines and the trip was made on Friday of last week, the pilots being Leon Morane, accompanied by M. Frantz Reichel, Garros and Legagneux, each with a lady passenger, while the fourth machine was in charge of the Argentine aviator, Mr. George Newbery. They started at 11.30 a.m. and, keeping together, arrived at Villacoublay at 12.20.

#### Farman Waterplane at Biarritz.

AT the conclusion of the hydro-aeroplane meeting at San Sebastian, Renaux flew over to Biarritz and decided to accept an invitation to stay for a fortnight and give exhibition and passenger flights.

#### A Quick-firer on an Aeroplane.

EXPERIMENTS have recently been carried out at Rheims with a quick-firing gun mounted on an aeroplane. The target consisted of the wings and fuselage of an old aeroplane, which was, at the conclusion of the test, riddled with bullets. The trials are to be continued, probably, with a moving target.



The Etrich monoplane.

"Flight" Copyright.

## Gougenheim Tries for the Michelin Cup.

On Sunday Pierre Gougenheim, chief-pilot of the Farman School at Etampes, commenced an attack upon Fourny's record of 15,989/6 kilsoms. in the International Michelin Cup contest. He made six rounds of the Villeneuve-Gidy course, so that his total metres for the day was 607 kilsoms. only. During six of the rounds he was accompanied by a passenger.

## A Black Week-End.

JUST as a non-commissioned officer—Sergt. Hurtard—was starting from Sezanne to fly to Rheims with two passengers on Saturday, the motor suddenly stopped and the machine dived to the ground just outside the aerodrome. The pilot was killed on the spot and both passengers were seriously injured.

Also on Saturday, Sappat Laverloche, who had been giving exhibition flights at Chaumont, fell with his monoplane in the neighbourhood of Perthes. He sustained a fracture of the skull and died almost immediately.

At the conclusion of an exhibition flight at Marmande on Sunday the monoplane of Geo. Sivel capsized and threw out the pilot, who was so severely injured that he died on the way to the hospital. The Johannisthal Meeting.

CONTINUING his successful attack on the height records with passengers, Sablaton on his Albatross biplane on the fourth day of the Johannisthal meeting, the 1st inst., took up four passengers to 2,800 metres, while two days later he took five passengers up to 1,007 metres. On the 1st inst. there was also an as-sembling and dismantling contest which was won by Laitsch, who took 9 mins. 18 secs. to erect his monoplane, and dismantled it in 2 mins. 58 secs. A speed race competition, organised by the Minister of War, was won by Stoeffler whose Albatross biplane did 92.3 k.p.h. as its fastest speed and 87 k.p.h. as its slowest.

## CORRESPONDENCE.

### "Where those Wings Bending?"

[1797] *Re* that photo, "The Man Who Took It," in my very interesting letter recently, mentions three factors to be considered, but does not mention a fourth, viz., the human element himself. Assuming all is as he states, a slight variation in the speed with which he swung the camera would also account for the distortion; such a variation could be caused by the movement made in releasing the shutter. The sharpness of definition in the details proves nothing! I will explain why. Let us assume that the plate is 5 ins. deep, and that means a travel of the same extent for the slot in the shutter; assume, also, that this slot is  $\frac{1}{4}$  in. deep, and traverses the

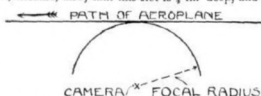


plate in  $\frac{1}{10}$  of a second, it will be pretty obvious that each quarter of an inch in the plate only receives an exposure of  $\frac{1}{40}$  of a second, whilst if the image extends across the whole surface it will have made progression equivalent to the  $\frac{1}{10}$  of a second in an aeroplane moving 60 m.p.h.; this would amount to nearly 11 ins. Now it is obvious that an object taken under such conditions must be entirely false perspective, as it is moving in a straight line whilst the camera is swung in an arc.

Now a curved line can result from these perspectives alone; it can also result from the progression through the 11 inches whilst the shutter was falling due to the human element. I have also known a film to become distorted whilst drying, although in the present case this is unlikely, still I think considering the views I have suggested that a verdict of "not proven" can be looked for, though personally I share Lieut. Port's view that the interior bracing would have carried away before such bending was possible. I would like some enthusiast to enlighten us a little *re* that false perspective and work it out a little further.

ANTHONY WESTLAKE.

P.S.—The camera was very close, so perspective would be acute, also speed was more like 90 m.p.h.

[1798] I sent you a letter a few weeks back on the above subject and apparently you considered the argument contained therein wrong, as it was not published. But on reading the article by the man who took it, I feel more than ever convinced that there is something in it.

He speaks of the lack of distortion usually met with (of a pole travelling along with the object) owing to the camera moving with it, but has overlooked the fact that the wings are not upright and that the near wing tip is travelling relatively faster than the far one, whereas the fuselage is following the body of the machine.

The longest flight of the day was Gruner's 95 mins. On the following day Reiter on an Erich and Kanitz on a Union-Arrow machine shared the duration trial with 92 mins. A speed race was won by Stoeffler on an Albatross monoplane, while in the altitude test Fiedler on an Auer monoplane was best with 3,900 metres. In the get-off competition, Thelen was the only one to qualify, with 70.08 metres, the others all taking over 100 metres. During the day the "Z IV," of Luneville fame, cruised over the aerodrome for some time. The next day there was a photographic competition, several officers being detailed to go up in the various machines, and take certain objects in the districts, but the result was not announced. There was also two 20 kilm. races, and the one for monoplanes was won by Ingold in 11 mins. 21.3 secs., while the biplane class was secured by Janisch in 11 mins. 14.7/10 secs. A landing competition was won by Rupp, who stopped his machine in 50.959 metres.

## Chevillat in Sweden.

CONTINUING his tour of Sweden, Chevillat, still accompanied by Capt. Sunset, on the 30th ult. went on from Upsala to Nordkoping, a distance of about 300 kilsoms. On his arrival at the latter point he was met by Prince Charles of Sweden, who congratulated him on the success which had attended his Swedish visit. On the following day a further 200 kilsoms. were flown to Carlstad, while on the 2nd he flew 100 kilsoms. from Carlstad to Orebra, through heavy rain, in two minutes under the hour. His mount is, of course, a H. Farman.

## A Bristol in Italy.

ON Saturday, Lieut. de Riso flew from Mirafiori to Malpensa, a distance of 120 kilsoms., in an hour and forty minutes, his machine being a Bristol-Gnome.

Let me repeat my argument, and take an exaggerated case again where the total length of exposure is of considerable length.

Let the exposure start when machine is in position A (I have added a pole for argument's sake).

When shutter slit is half across the plate the machine is in position B (the camera lens following pole so that remains in centre of plate always).

End of exposure is as position C.

Shape of image on plate would be something like D.

This is obviously what would happen with a lengthy exposure; surely the same thing would happen on a smaller scale with a shorter exposure and so produce the effect of bending backwards.

If the "man who took it" will think this over, I am sure he will see that there is ample room for shutter distortion of the wings although an upright pole would show none.

I do not know if my term "relative speed" is correct, but what I mean is, supposing one were watching two aeroplanes both travelling at the same pace and level, but the one nearer than the other, as they were approaching the farthest one would be the foremost in the field of view, and in line only when directly opposite; when past, the near one would take the foremost position in the field of view. Thus, although travelling at the same speed, the near one would be travelling relatively the faster.

I am not quite sure of the actual shape Fig. D should take; possibly owing to progressive ratio it would really take the form of a curve, though either way the effect in the photograph would be the same owing to the small scale.

Oxford.

ARTHUR B. COOPER.

## Looping the Loop.

[1799] In the current issue of your paper I note you mention that M. Pegoud cannot roll over from right way up to upside down; this feat *can* be accomplished by warping the reverse way after the machine passes the dead centre.

22, Praed Street, Paddington.

S. J. FROST.



## ITALIAN WATERPLANE CONTEST.

ONE of the most important competitions for hydro-aeroplanes organised up to the present time was that held on Monday and Tuesday of this week by the Italian Aviation Society under the patronage of Ministers of War and Marine. The accompanying map shows the course which had to be completed in two stages, Monday's stage of 230 kilometers, being from Como to Pavia, while the remainder of the circuit, 140 kilometers, was completed on Tuesday.

For each stage the main prizes were four in number, and were of £400, £200, £120 and £80, while should the winning machine of the first or second prizes be entirely built in Italy, there was a bonus of £200 or £120. There were also for each stage four prizes of £100, £60, £40 and £20, while for the qualifying events there were prizes of £40 and £20 in the climbing, altitude and getting-off test and £40 in the speed trial. In addition, there was a special prize of £180 for machines capable of use

both on land and water. The competitors had to start from water and on being given the order to go had to cross the line within ten minutes or their starting time was taken as from the expiration of the ten minutes. They also had to cross the line in the direction specified. On the second day there was a control at Pallanza and each competitor had to stop for half an hour, which was deducted from the flying time. For the restart there was an allowance of 15 minutes, at the expiry of which the competitor, if he had not crossed the line, was deemed to have started. Each machine had to carry two barographs and during the last part of the second day's stage, from Varese to Como, a height of 600 metres had to be attained.

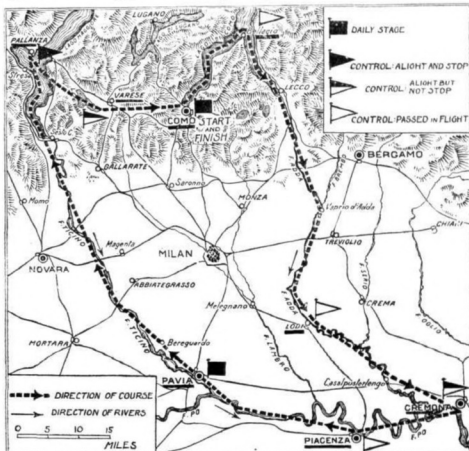
From our map it will be seen that there were a number of controls, some of which had to be passed in flight, the machine just circling above the mark post; at others the machine had to come down to the surface of the water, but not stop, while at Pallanza, as already explained, the competitors had to stop half an hour. In the case of a machine coming down on the land, and being unable to rise or get away again, it was permissible to tow it down to the water, but the point at which the course was left had to be flown over. At the finish of the event the machines had to taxi across the line, but at Pavia and Pallanza the line had to be crossed in flight.

The maximum time allowed for the first day's run was 12 hours, and for the second day 10 hours. The winner was the competitor who fulfilled the conditions and completed the course in the least aggregate time.

The qualifying events were four in number. In the first, the competitors had to climb 500 metres in not more than 20 mins., the time being taken from the signal to start. The landing had to be made within a certain place marked off for the purpose. The prizes were awarded according to the marks secured, the number of marks being obtained by dividing the height attained in metres by the time taken, and then multiplying by the constant 3 if the pilot went up alone, and by four if he carried a passenger at least 18 years old and weighing at least 65 kilograms. In the event of there being a tie, the prize went to the machine which went highest. In the height trial an altitude of at least 1,000 metres had to be reached and the prize was awarded to the one with the most marks, one mark being given for each metre and multiplied by three if the pilot was alone and by 4 if he took a passenger. In the event of a tie the prize to be divided. In the getting-off test the competitor had to leave the water in at least 300 metres from a standing start, and within five minutes. Marks were allotted at the rate of one mark per metre. In the speed test the marks were allotted according to the mean speed expressed in metres, the minimum speed being 80 kiloms. an hour. The course was 16 kiloms. being twice round an out and home course round a buoy fixed four kiloms. from the starting point, which had to be passed each time in flight. The machines classed first and second in the race were to be purchased, subject to their satisfying certain conditions regarding range of vision of pilot and passenger, starting apparatus for motors, facilities for erecting and dismantling, &c., by the Military and Naval authorities at a price of £1,600 plus £200 for each 20 h.p. that the motor develops over 80 h.p.

On the day previous to the start of the preliminary competition there was a gale blowing, accompanied by heavy showers of rain, and this continued on the following day, Sunday last, until the evening, when, however, the speed test was carried out. In this the

first place was secured by Garros (Morane), his time for the 16 kiloms. being 7 mins. 30½ secs., the others in order being Divietain (Borel), 9 mins. 14½ secs.; Morane (Morane), 9 mins. 20½ secs.; Landini (S.I.A.), 11 mins. 37 secs.; Chemet (Borel), 11 mins. 47 secs.; Fischer (Farman); Hirth (Albatross). These were the starters on the following morning from Como, Chemet leading the way at a quarter to eight; the others followed at intervals of ten minutes, and all got away in good style, except the only Italian, Llandini, who had to return, and in coming down damaged his machine so badly that he could not go on. Garros had to land at Malgrate with trouble with his petrol pipe, and decided to abandon, and Divietain had to give up at Borgoforte. All the others got through, and Leon Morane secured first place for the stage, his time being 1 h. 59 m. 54½ s.; Hirth was second in



Map of the Italian International Waterplane Contest, October 5th to 8th.

2 hrs. 10 mins.; Chemet third, in 2 h. 23 m. 33 s.; and Fischer fourth, in 2 hrs. 45 mins.

In spite of the wind and the rain the four competitors remaining in the competition got away from Pavia in good time on Tuesday on the second stage back to Como, Chemet leading the way a few seconds before 8 a.m. He was followed by Garros, who, being out of the race himself, had, with the consent of the organizers, taken the place of Leon Morane on the machine which had secured the leading place during the first day's run. On arrival at Pallanza, where a stop of half an hour had to be made, the Frenchman had lost the lead, and the only German in the race, Hirth on the Albatross monoplane, was in front. He was followed with only a few minutes separating them by the three others. After the lapse of the stipulated time, the last section of the journey to Como was begun, Hirth being started first at 11 h. 45 m. 27½ s. Three and a half minutes later Garros was away, followed by Chemet after an interval of 16 mins., while Fischer brought up the rear at 11 h. 37 m. 27½ s. Chemet mistook the route, and came down by Capolago, near Lake Lugano. On going to restart he had trouble with the petrol tank, and eventually had to give up. Hirth arrived at the finish, Como, at 11 h. 45 m. 27½ s. by the clock. Garros was second at 11 h. 54 m. 56½ s., while Fischer finished at 12 h. 18 m. 50 s. The times taken for the distance of the second stage, 130 kiloms., deducting the time of the control at Pallanza, were: Hirth, 1 h. 28 m. 6½ s.; Garros, 1 h. 41 m. 57½ s.; Fischer, 1 h. 49 m. 42½ s., while the official times for the complete journey were: Hirth, 2 h. 31 m. 50½ s.; Garros-Morane, 3 h. 41 m. 52½ s.; Fischer, 4 h. 14 m. 54½ s. It should be pointed out that Fischer was the only pilot to carry a passenger throughout the race.



Edited by V. E. JOHNSON, M.A.

**How and Why I Built a Glider.** By JOHN C. MORRISON.  
I BEGAN to study flight when I was about thirteen. I had no books on the subject, and conceived the idea of the kite to make a flying machine, and was quite disappointed to find in the Encyclopedia that the principle had been already made use of. I also invented a helicopter, and was rather keen on the idea at first, but gave it after a time. When aeroplanes came into public notice, I read all I could about them, but was much troubled by the large amount of power required to make them fly. I often watched the seagulls on windy days, and saw how they could rise against the wind without being driven back by it, from which I argued that a machine built with wings similar to theirs ought to fly when driven through the air at the speed necessary for flight. I read of aeroplanes having curved wings, and thought that the curve was an arc of a circle, which did not appear to me correct. I shot a seagull, and measured the curve of a cross-section of its wing, and found out afterwards that this was similar to Philip's curve. It never struck me that the upper curve had anything to do with the lift, and in the construction of my glider I considered only the lower one. I read that automatic stability would be of great advantage, and immediately thought of a pendulum suspended in such a manner that when the machine swayed to one side the pendulum remaining vertical would be made to work something in the nature of balancing ailerons. Then I decided to build a glider to test this idea, and also to see if it would rise against the wind, owing to the air lift of its arched surface. The main plane was 6 ft. by 15 ft., and the cross spars of light pailing wire, the camber being about 2½ ins. Of the number and shape of the tails I tried I would rather not speak, but at the present time the machine has a triangular tail, which has been broken and mended a good number of times. When I had nearly finished the pendulum balancing apparatus, it struck me that however excellent in theory it would be useless in practice, so I removed it straightaway. At first I made skids of pailing wire, but as they were unsatisfactory I made three light wheels, and used the skids as shock absorbers. The weight was 9 lbs., or 1 lb. to every square foot of surface, and it balanced perfectly about its centre of symmetry. I could not get it to glide very well, and found it rather risky to try it against the wind, although it did exhibit some of the symptoms of a seagull. After a time I got tired of being asked if the glider "went," so I determined to make a last grand attempt, and either succeed or smash it up. I took it to the top of a brae (hill) on the road, and pulled it down after me on my bicycle. When I reached a speed of about 15 m.p.h. its wheels ceased their noise, and I knew it had risen. I couldn't very well look behind me, so I got several witnesses to view the experiment and establish the fact that the glider "went." My ambition now is to get an engine and make it fly "on its own."

[The foregoing very naive account is not, we think, without interest, especially as a "reflection from the past," which it behoves us now and then to look at in order that we may the better appreciate where we stand to-day.]

**Dope for Full-sized Glider.**

Mr. H. F. McManus (Birmingham Aero Club), writing *re* "Canard's" recent query, says: "Your correspondent states it is his first machine." Well, in the light of our experience it is not worth while to use an expensive fabric or dope, as owing to lack of experience in handling such a machine it is likely to soon get smashed. We have found boiled linseed oil very satisfactory. Our last glider was proofed with it, and it has been left out in the open, exposed to all sorts of weather for several months, and the fabric is still in good condition. This last machine has had the longest life of any glider we have made, which proves that we are getting to know more about them. We have had to repair it several times, however, owing to bad landings. Last week we had a particularly bad smash, the machine side-slipping from a height of about 20 ft. Fortunately, the member who was piloting it was unhurt. We have at the present time one club glider, and two in the possession of private members. One of the last-named was covered with Dunlop fabric, which came out rather expensive, costing about fourteen pounds."

**Some Interesting Experiments with a Large Power-Driven Model.**

"You may be interested," writes Mr. F. Mayer, "to know that

I have been away to fly a large and heavy model for a friend. The model weighs between 40 and 50 lbs. The first engine used being one of my make, which has seen over three years' service, this was not successful, and on the following day I installed an engine similar to the 'Bonn-Mayer' one exhibited at Olympia; with this engine and 3 ft. propeller of approximately 2 ft. pitch, the model flew at the first attempt and made five short flights in all. In initial trials of this kind I always use a stout kite cord attached to the rear of the model. When the model is released I run after it paying out the line as I run. Then if the model gets up to the right or left and bring it back just hang on to the cord and tug to the right or left and bring it back to earth, usually before it has had a chance to get sufficiently out of hand to smash. I have had some considerable experience at this game; it is just like 'breaking in' wild horses at a Wild West show."

[Verily there are more things in . . . &c., &c. Mem. for 1914, "Aerial Model Chariot Races" in single and double harness. N.B.—No stunts permitted.]

**Some Experiments with Floats.** By PHEROGE E. J. MINVALLA.

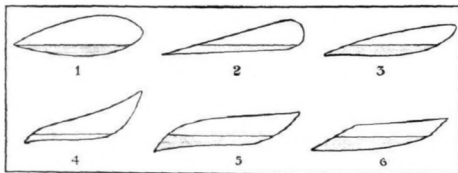
I am sending you herewith the results of some experiments carried on by myself in floats, with comments thereon.

You will see on plan A silhouettes of various float shapes towed under water. Not having the apparatus necessary for the use of coloured glycerine threads, I was compelled to use this substitute.

However, I am led to believe that the actual merit of each type is shown equally as well in water as in air or glycerine.

No. 1.—The form of this float is ichthyoid, except that the bottom surface is more curved than is the case usually. There was little disturbance but that due to viscosity, but the liquid after leaving the trailing edge acquired an upward motion, thus causing the rear edge of the float to sink deeper into the water. This, I believe, was due to the fact that the bottom surface was more curved than usual; consequently, the strata immediately touching the surface were deflected downwards, and when it did find space to rise clear of the float, came upwards with greater force, and so on account of the opposite force acting from the top surface, the trailing edge dropped; the length of the partial vacuum formed by the lower strata of water rising from the middle of the float.

No. 2.—This float has a conical body with a semi-spherical head. There were great disturbances in the water as this one was drawn through it. I attribute them to this: the semi-spherical head caused little resistance, consequently the water flowed over it in the usual waves; the body of the float allows of no such natural flow since it is perfectly straight. Therefore as the concave part of the wave strikes the float the flow is broken and forms numerous eddies above and below. Thus it requires considerably greater force than No. 1 to draw it through the fluid.



Mr. Minvalla's float sections.

"Flight" Copyright.

No. 3.—The bottom surface of this float is of ichthyoid form, while the top is a gentle curve. There was little disturbance on the top and none on the bottom surface. The disturbance on the top surface I ascribe to the same cause as in No. 2. The trailing edge lifted very quickly, the reason, I suppose, being that the eddies on the top multiplied the downward sweep of the top strata of water, while the lower strata were allowed to have full scope and upward tendency, due to their being undisturbed by the form of the surface.

No. 4.—Though the drawing of this model is somewhat crude, yet the salient features have been represented. It is a float combining

the canoe head and catamaran rear. It was not at all successful as a quick riser, but as a weight carrier it was very good. There appeared to be too much dead-head resistance to enable it to be applied to models.

No. 5.—This float is, I believe, used on full-size hydro-aero-planes. However, I have made it somewhat different, in that the front section is triangular, with the apex forming the keel. There was very little disturbance; it lifted quickly, and carried a very considerable weight. (I have refrained from giving any actual data, for the reason that I have appended it in table form).

No. 6.—The difference between this float and the previous one is that its section is rectangular, and the entry and trailing edges are not curved. It was by no means as good as No. 5. The rear dipped considerably, and there was a greater number of eddies formed under the trailing edge than in the previous one.

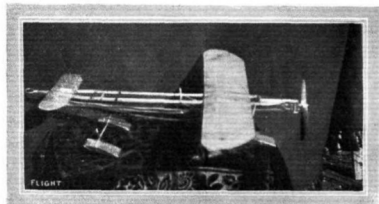
No.	Length.		Width.	Chord.	Weight of Float.		Weight Carried.	Materials.
	ins.	ins.			ins.	ozs.		
1	4	2	4	3	14			Spruce spars, $\frac{1}{8}$ in. square; spruce sheet ribs, $\frac{1}{8}$ in. thick; covering, goldbeater's skin
2	5	1	5	5	6			Iditto ditto
3	4	2	3	5	9			Iditto ditto
4	4	1	5	4	21			Spruce spars, $\frac{1}{8}$ in. square; spruce sheet ribs, $\frac{1}{8}$ in. thick; varnished wood-work; same covering
5	5	2	5	25	4	19		Spruce spars, $\frac{1}{8}$ in. square; spruce sheet, triangular ribs, $\frac{1}{8}$ in. thick; covering, goldbeater's skin
6	5	2	5	4	12			Iditto ditto; rectangular ribs with perforations; same covering

#### The Single Propeller Hydro. Competition.

We give herewith particulars and illustrations of two of the winning machines, and also of one of Mr. Weston's models, the one not entered for the competition.

##### Mr. L. H. Slatter's Model.

Length of machine, 3 ft. 3 ins.; span, 33 ins.; chord, 6'25 ins.; total area, 216 sq. ins.; total weight, 7 ozs.; 10 ins. diam. pro-



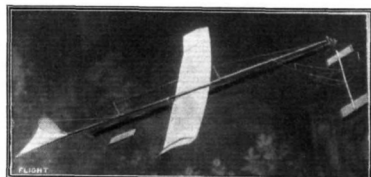
Mr. L. H. Slatter's model.

pellor; twin-gear rubber motor, each skein consisting of 8 strands of  $\frac{1}{16}$  in. strip rubber; floats, usual Slatter type, i.e., bamboo frame-

work covered with silk; track of two leading floats, 10'50 ins.; c.g. about 3 ins. in front of leading edge of main plane, viz., about half way between front and back floats; the planes being the same as Mr. Slatter used on his record r.o.g. machine. Best duration in competition, 35 secs.

##### Mr. C. C. Dutton's Tractor Model.

Single-screw tractor hydro. Chief dimensions: Total length, 3 ft. 7 ins.; total weight, 5'5 ozs.; weight of rubber, 1 oz.; diameter of tractor, 9 ins.; total area of horizontal surfaces, 156'25 sq. ins.

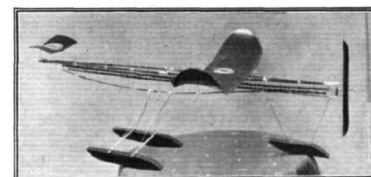


Mr. C. C. Dutton's model.

Floats: Weight of three floats with cross-bar, 1 oz.; breadth of floatational base, 18 ins. Main plane, set at a positive angle, span, 30 ins., the tail being set at a slight negative angle. Gears: Twin, built of steel wire and brass tubing, weight  $\frac{1}{2}$  oz. Centre of gravity slightly in front of leading edge of main plane. Chassis, steel wire braced to main frame. Best duration in competition, 30 secs.

##### Mr. Weston's Model.

Overall length, 34 ins.; span of main plane, 28 ins.; chord of main plane, 5 ins.; elevator of wire, 8 ins., by 2'8 ins.; 15 s.w.g. steel wire. Main floats of cane at the leading and trailing edge,



Mr. H. Weston's model.

the tips of patent black wire 20 s.w.g. Fuselage, Blériot Canard pattern, with the rubber motors running inside the frame, twin gears being used: propeller, Wright pattern, 11 ins. diameter, 20 ins. pitch; total weight of gear  $\frac{1}{2}$  oz. only, complete with propeller. The floats are of spruce, sides and tops machined out of one piece, blocked out at intervals, bottom silk covered, 8 ins. in length and 1 in. sq. vertical section; length of back float, 6 ins. The two main floats being 7'5 ins. apart inside measurements. Complete weight of machine, 6 ozs.



day, at 3 p.m. The Royal Aero Club have renewed the appointment of this Association for the year 1914. Also the Club has again offered a prize of £5 for a competition to be held during 1914 among members and affiliated club members.

Research Work.—Will any member or reader who is willing to undertake research work write the hon. sec. at once? The work will be carried out under the direction of Dr. A. P. Thurston. The winter work has already been mapped out.

Competitions.—The tractor competition takes place to-day (Saturday), on Wimbledon Common, on the Plain, Wimbledon side of Windmill, at 3 p.m.

Novices' Duration and Stability Competition.—This contest took place on Saturday, Oct. 4th, on Wimbledon Common, and attracted a good entry. The results were: 1st, R. Bird, Paddington Club, 95 marks; 2nd, D. C. Chown, Wimbledon, 92; 3rd, F. W. Powell, Wimbledon, 89; 4th, W. E. Evans, Paddington, 80; 5th, L. G. Tucker, Wimbledon, 77; 6th, F. H. Hawthorne, Leytonstone, 71. Mr. R. Bird won the £1 worth aero requisites, presented by T. W. K. Clarke and Co., Mr. Chown and Mr. Powell winning respectively the Silver and Bronze Medal of the Association. The judges were Messrs. Akehurst and Slatter. Mrs. W. H. Akehurst presented the prizes to the winners.

Model Competition.—Wish Harp, Hendon, Oct. 18th, at 3 o'clock. Entries closed Saturday, Oct. 18th. Duration and stability competition for hydro-aeroplanes. Prizes: 1st, Rose Bowl; 2nd, Silver Medal of the Association; 3rd, Bronze Medal of the Association. Tests: A. Duration of flight; B. Stability. Maximum marks, 100.—50 for test A, 40 for test B. Rules: 1. Competitors

## KITE AND MODEL AEROPLANE ASSOCIATION.

### Official Notices.

#### British Model Records.

Twin screw, hand-launched	Distance	R. Lucas	...	590 yards.
Single screw, do. ...	Duration	A. F. Houlberg	...	159 secs.
Single screw, do. ...	Duration	H. Bedford	...	49 secs.
Twin screw, rise off ground	Distance	L. H. Slatter	...	365 yards.
Single-tractor screw, hand-launched	Distance	J. E. Louch	...	2 mins. 49 secs.
Single-tractor screw, hand-launched	Distance	C. C. Dutton	...	266 yards.
Do., off-ground	Duration	J. E. Louch	...	68 secs.
Single screw hydro., off-water	Duration	C. C. Dutton	...	190 yards.
Single-tractor, do., do.	Duration	J. E. Louch	...	45 secs.
Single screw hydro., off-water	Duration	L. H. Slatter	...	35 secs.
Single-tractor, do., do.	Duration	C. C. Dutton	...	29 secs.
Twin screw, do., do.	Duration	L. H. Slatter	...	45 secs.

"Model Engineer" Exhibition.—The aero section of this exhibition has only attracted an entry of about 50 models. The judging for design and construction will take place on Wednesday, 13th, at 6 p.m. The results of the aero motor tests of the scale models will be announced during the evening.

Flying Tests.—The flying tests will take place at the London Aerodrome, on Saturday, Oct. 25th, at 10 a.m. The hydro. tests at Welsh Harp, on same

