

BULLETINS

OF THE

Aerial Experiment Association

Bulletin No. XXXVIII Issued MONDAY, MAR. 29, 1909

MR. McCURDY'S COPY.

BEINN BHREAGH, NEAR BADDECK, NOVA SCOTIA

BULLETIN STAFF.

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Bulletins of the Aerial Experiment Association.

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BULLETIN NO. XXXVIII ISSUED HOLIDAY EAR. 29. 1909.

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Belton H. Burchard, Rear Rudder, Nova Scotia.

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EDITORIAL NOTES AND COMMENTS.The Gauldric's Engine transferred to Ice-boat.

March 20, 1909:- The Buffalo Marine Motor has been taken out of the Gauldric which is laid up for the winter and is now being transferred to the ice-boat in order to make a series of experiments upon the thrust of an advancing propeller. A.G.B.

Postponement of Further Flights with Silver-Dart and Cygnet II.

March 21, 1909:- There is now open water on the Bras d'Or Lake excepting in sheltered Bays and an attempt is to be made to-morrow to cut out the Steamer Blue Hill from Baddeck Harbor so as to open navigation again.

As we fear that the good ice in Baddeck Bay may not last much longer we have decided to discontinue experiments with the Silver-Dart and Cygnet II for the present in order to secure some data concerning the thrust of an advancing propeller by experimenting with the power driven ice-boat. Upon the conclusion of these experiments the Silver-Dart and Cygnet II will be tried again if the ice still holds good on Baddeck Bay. A.G.B.

Departure of the Editor for Ottawa.

March 22, 1909:- Men are hard at work upon the ice in Baddeck Harbor to clear a passage to open water for the Steamer Blue Hill. I propose to leave this afternoon for the Grand Narrows unless there seems to be a prospect of the steamer making a trip in the morning. I propose to leave

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Grand Harrows to-morrow morning (March 25) for Montreal and Ottawa, returning here by the end of the month. I make an address before the Canadian Club of Ottawa on March 27. As I shall not be here when this Bulletin comes out, and the Asst. Editor is in Washington, I shall ask Mr. McCurdy, as Secretary of the A.E.A. to take charge of the Bulletin with the assistance of Mr. Cox. A.O.B.

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PROPELLER EXPERIMENTS WITH ICE-BOAT.

March 26, 1909:- Our days for flying over the ice at Baddeck are practically numbered for weather conditions indicate that with the approach of early Spring the ice is fast breaking up and will soon disappear.

We must now turn our attention to the consideration of the plans, details of propellers, change of gearing etc., which we are to adopt in performing our experiments with the ice-boat having the Buffalo engine mounted thereon.

It was, I think, mentioned in a former Bulletin that the Smithsonian Institution had been asked to furnish us with the propeller tests conducted by the late Prof. Langley. I may say that it was a great surprise that we learned through Mr. Charles M. Manley that these results were not published owing to inaccuracy in the reading instruments employed.

The correspondence relating to our request for Prof. Langley's work will be found in the miscellaneous communications in this Bulletin.

I feel that the designing of a propeller which would be most efficient for a certain machine is one of the things we know least about, and the propeller is certainly the most important adjunct to a successful machine. If the compilation of results referred to by Mr. Manley could be at our command before our experiments begin we might be saved much labor, such as going over work already performed by others. J.A.D. McC.

TELEGRAMS FROM MEMBERS AND OTHERS.

- March 18. Dexter (Halifax Herald) to Bell:- New York World wants your complete story on air flight. Review in detail of aerial achievement of past twenty years, and your forecast of what will likely be achieved long same lines in next twenty years. Can you write 5000 words and mail to me and when? Answer to-day. (Signed) F.P. Dexter.
- March 18. Bell to Dexter (Halifax Herald):- Telegram received. Too busy can't afford time. (Signed) Graham Bell.
- March 18. McCurdy (Halifax Herald) to Bell:- Thanking you for past favors we would be very much obliged if you were to continue despatches on aerodrome tests. (Signed) W.R. McCurdy.
- March 18. Bell to McCurdy (Halifax Herald):- Mr. F.W. Baldwin, Chief Engineer of the Aerial Experiment Association made this evening, at dusk, a flight in drome No. 6, McCurdy's Silver-Dart. This is the first time the drome has been tried by anyone except Mr. McCurdy. I can't undertake to do anything more than send my Associated Press Despatches which I presumed you received from New York. (Signed) Graham Bell.
- March 18. McCurdy (Halifax Herald) to Bell:- We don't receive your associated press despatch from New York. If, in sending your Associated Press message you would also address it to Halifax Herald as joint message it would answer the purpose, or instruct the operator at Baddeck to send A.P. Despatch also to Halifax Herald, this would involve no extra labor on you, Canadian papers would then get your news for A.P. does not send news originating in Canada back to Canada. By doing this you will greatly oblige. (Signed) W.R. McCurdy.
- March 20. Bell to Curtiss:- Have your business arranged so as to be here 31st sure; very important and you will regret it all your life if not. (Signed) Graham Bell.
- March 20. McCurdy to Curtiss:- Express four Dart wheels with tires. Don't forget oil. (Signed) McCurdy.
- March 21. Curtiss to Bell:- Very satisfactory consolidation Saturday. Named Herring-Curtiss Co., Hammondsport. Interest and management retained. Gardiner here, home to-night. (Signed) G.H. Curtiss.

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March 21. Bell to Thompson (Associated Press):- There is now open water on the Bras d'Or Lake excepting in sheltered Bays and it is expected that navigation will be resumed to-morrow. The Aerial Experiment Association, fearing that the good ice in Baddeck Bay may not last much longer, has decided to discontinue flights with the aerodromes Silver-Dart and Cygnet II for the present in order to secure some scientific data concerning the thrust of an advancing propeller, for experiments here indicate that the thrust of a rotating propeller when an aerodrome is flying in the air, is materially different from what it is when the machine is at rest.

The Association has fitted up an engine and aerial propeller upon an ice-boat which makes a speed of about forty miles an hour under its own power. The power-driven ice-boat carries scientific apparatus for measuring the thrust of a propeller while advancing over the ice at various speeds. Upon the conclusion of the tests dromes 4 & 5 McCurdy's Silver-Dart, and Bell's Cygnet II will be tried again if the ice conditions on Baddeck Bay still continue good. (Signed) Graham Bell.

NB. The above telegram was also sent to Fred Cook, London Times Correspondent at Ottawa; to W.R. McCurdy, Halifax Herald; to Halifax Chronicle To Milton Brown, Sydney Post, and to the Sydney Record.

March 22. Cox to Thompson (Associated Press):- J.A.D. McCurdy, Secretary of the Aerial Experiment Association in drome No. 4, McCurdy's Silver-Dart, made two successful flights on the ice in Baddeck Bay this morning. McCurdy's last flight brought much praise to the young aviator, as he circled the Bay three times in succession, covering a distance of about six miles in eight minutes. Mr. McCurdy in this flight dromed through the air at different elevations from six to thirty feet high, demonstrating his perfect control of the machine at all times.

Mr. F.W. Baldwin, Chief Engineer of the Association also made a flight in McCurdy's Silver-Dart to-day, but as the wind was puffy at the time Mr. Baldwin shut off power and glided to the ice, the machine skidding to a great extent. A clock has been placed on the wheel of the Silver-Dart in order that the aviator might keep his own time. (Signed) Charles R. Cox.

Cox to Chas. S. Thompson (Associated Press).

March 23, Mr. J.A.D. McCurdy in Drome No. 4, McCurdy's Silver-Dart made three flights from the ice in Baddeck Bay to-day. McCurdy in the last flight circled the Bay three times. A track had to be cleared on the ice to allow the machine to start as about 4 inches of snow had fallen during the night.

Mr. F.W. Baldwin, Chief Engineer of the Aerial Experiment Association also made a beautiful flight in the Silver-Dart to-day. (Signed) Charles R. Cox.

(The above was also sent to Fred Cooke (London Times Correspondent, Ottawa; Halifax Herald, Halifax Chronicle, and Sydney Record).

Fielding to Bell.

March 23, Will you give us the pleasure of your company at dinner on Saturday evening twenty-seventh? (Signed) W.F. Fielding.

McCurdy to Bell.

March 23, Casey and I made several flights with Silver-Dart this morning during which the circular course was lapped. (Signed) Douglas McCurdy.

Gerald Brown to Bell.

March 23, Please advise me if possible time you expect to arrive Ottawa and name any who accompany you. (Signed) Gerald Brown.

Bell to McCurdy.

March 23, Congratulations. Received telegram Fielding and Brown. Stay Windsor Hotel Montreal. (Signed) Graham Bell.

McCurdy to Bell.

March 25, Silver-Dart tried out to-day. Substituted short ice runners for the hind wheels, but the wheels proved to be far superior. The ice was covered with about three inches of water which however did not interfere with the operation of the machine. Good luck to you in your address. (Signed) Douglas McCurdy.

EXPERIMENTS REPORTED BY THE EDITOR.

March 18, 1909:- Mr. Baldwin had the opportunity of trying the Silver-Dart this afternoon just about dusk. He did not make much of a flight but succeeded in getting into the air. I was not present but give below the accounts of Baldwin and McCurdy. A.G.B.

Baldwin's Account:- Took Dart out and ran her around in a snow storm. Didn't steer straight and nearly took the steering wheel off on a skid. Machine would not lift on elevating the front control.

Later in the afternoon after Conference John and I took the Dart out by ourselves and tried a short jump. The engine worked well and she went into the air with no difficulty. The starboard wheel lifted first. When in the air the machine turned to starboard for some reason, and fearing that skidding action was getting worse and not wanting to break the wheels I shut off power. F.W.B.

McCurdy's Account:- This afternoon we took the Dart out on ice with the intention of having Casey make a flight. He took his seat and the engine started. He sped away, but as his plan was to get just the feel of the machine and controls, he did not allow her to rise, but described a long circle to starboard coming back almost to his starting point.

Later on in the day about 5.40 P.M., after the Laboratory was closed we again took her out and started the engine. It worked well and Casey started off. She rose nicely but a turn to starboard evidently decided him to shut off which he did,

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landing after traveling a distance of about 35 yards. The distance was easily paced off on the ice as a slight fall of snow showed exactly where the wheels left the ice and where they landed. It was very pretty to me as it was the first time I had seen the machine under way. J.A.D. McC.

March 20, 1909:- This morning Baldwin had another try at the Silver-Dart. The following are the accounts given by McCurdy and Baldwin. A.G.B.

McCurdy's Account:- This morning Casey took out the Dart and tried for a flight. The ice was covered with about 4 inches of snow saturated more or less with moisture.

The engine worked well but sufficient speed to cause the machine to take the air could not be attained.

Just to see whether thirty pounds in weight would make the necessary difference in speed (Casey is thirty pounds heavier) I tried a run but with the same results.

We then had a track ploughed on the ice about half a mile long and Casey tried again. This time he succeeded in getting into the air, and a short flight resulted.

A minor repair was here necessary and so experiments were postponed till afternoon. J.A.D. McC.

Baldwin's Account:- John and I tried the Dart this morning with about six inches of snow covering the ice. I could not get the machine into the air. We then had a track cleared and I tried a short flight. It did not seem to me at first that she would carry me so after trying to raise the control slowly and failing to get up I gave her a quick shoot. This put her into the air all right; but after a short distance she

came down again to one side of the track so I did not get up again.

The beam which holds the front wheel was weakened, although landing was quite easy, so we decided to have a small iron reinforcement put over it before trying later. F.W.B.

March 22, 1909:- As it will take some days to make repairs on the Gauldrie's engine, the proposed experiments with the ice-boat must be postponed. Mr. McCurdy and Mr. Baldwin took advantage of this delay by making some practice flights in the Silver-Dart. In one of these flights McCurdy circled Baddeck Bay three times without coming down droming for at least six miles in the air. I give below accounts of these experiments by Baldwin and McCurdy. A.G.B.

Baldwin's Account:- John made two flights this morning round the Bay in the Silver-Dart. On the second flight he made three rounds of the Bay starting at Laboratory and circling around from the old church to about the warehouse and back to Laboratory. In this flight he was in the air for about eight minutes. Shifted yoke back and I took a small jump in the Silver-Dart a little over 100 yards. A side gust caught the machine and she slewed around breaking back wheels and a chord in landing. F.W.B.

McCurdy's Account:- Silver-Dart made this morning several flights. First tried to circle in the Bay starting at the Laboratory over to the Crescent Grove Shore and round to the warehouse etc. etc.

The first trial was unsatisfactory as the machine touched the ice several times. We stopped the engine and put more

oil in the crank case and tried again. This time we succeeded in making three complete turns. Time in the air being eight minutes. The wind was blowing in puffs from the SE. and SW.

Casey had the tip lever shifted back about two inches and made a flight. A puff of wind however, struck him from off the port bow and tipped him up so that the starboard wing struck the ice and consequently the machine turned rapidly to starboard and the wheels gently removed from under the Dart. Repairs, however, can be made in about an hour or more. J.A.D. McC.

March 23, 1909:- Experiments were continued with the Silver-Dart on the ice in Baddeck Bay to-day. I give below the accounts of Mr. Baldwin and Mr. McCurdy:- C.R.C.

McCurdy's Account:- The morning being exceptionally fine for flying the Dart was taken out on the ice about 9.30 A.M.

Mr. Manchester had ploughed a track through the 4 inches of heavy snow which extended in the direction of Baddeck for about $1/3$ of a mile.

It is worthy of note that the engine has for the last two or three days worked beautifully, no tuning being necessary at all. It was agreed that I should try her first with the idea in view of circling the Bay as many times as possible. At the conclusion of experiments yesterday afternoon a watch had been attached to the center of the steering wheel so that the aviator could observe the time of flight for himself.

The Silver-part started off well and responded at once to the action of the front control. The yoke had been previously

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shifted back 2 inches to accommodate Baldwin's weight and I soon found that the center of gravity, with my weight, was too far back. I therefore landed after making one complete circle and had the yoke shifted forward to its old position. This time the machine seemed to be better balanced but the power of the engine didn't hold out owing to over heating and so again after completing a circle during which I touched the ice twice, the power was shut off and investigation showed that the water in the jackets was very hot.

To prepare for the third experiment we put a quart of light oil directly into the crank case and waited about twenty minutes till the water was cool. The circulating system, pump, etc. were carefully looked over and tested to be sure that good circulation was ensured.

During the 3rd flight, the Dart covered the circle touching the ice but once. Investigation again showed the water was hot. The reason for this was not apparent.

The weather still continued good and so Baldwin was elected to make a try. Everything in connection with the engine and machine proper was carefully looked over, and at the signal Baldwin started. He only made a little jump of about 100-200 feet finally landing at the end of the ploughed track. Here the machine was turned round and off she started again going about due East. The machine rose well to a height of about 6 feet and flew for about 6-700 feet when suddenly she rose to an altitude of about 12 feet and there dove striking the ice with the front wheel. Casey immediately stopped the engine and we all hurried to the scene. It proved

to be one of these accidents which seem to be a lot worse

than they really are. The machine proper was not injured at all. The bow control and trussing gave way and a wheel was slightly bent. Repairs will be easily effected in a day or so. J.A.D. Rec.

Mr. Baldwin's Account: - The ice was in very poor condition

this morning for experiments but the morning was so still

that we took Dart out for an airing.

The engine worked well and John made a very pretty circle

of the Bay at an average height of about 10 ft. from the

ice. After landing the yoke which controls the forward lat-

-eral ladders was shifted forward a few inches because he-

Curdy found the balance not as good as usual. When this

change had been effected John made two more flights. The

first of these was not very satisfactory owing to the overheat-

ing of the engine. We could not see why the engine should

overheat and examined the water circulation but found every-

thing O.K. There was plenty of oil in the crank case and the

oil feed was working, and we are still in the dark as to

reasons why the engine should have overheated. On other oc-

casions the cylinders have remained perfectly cool under

similar conditions. It does not seem likely that the thing

mechanism had slipped so that the engine was running on a

retarded spark which would cause overheating, or that the

oil weather could account for it.

I then took the Dart for a run down the track and made

a short flight, and then started back from other end of

track coming up towards the Laboratory.

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The machine got into the air very nicely and on turning slightly to the left to clear the land, the starboard wing tilted slowly up. This was the first opportunity I have had to consciously use the lateral rudders. Their action was perfectly smooth and the machine came back on an even keel very satisfactorily.

I was just beginning to think that I had a nice clear field ahead of me to the end of the Bay when I made a sudden and quite unintentional landing by shifting the bow control too far up and then too far down. The truck and back wheels were quite extensively smashed but luckily enough the front wheel itself was not even bent. When the header at the front of the truck gave way the bow control scraped along the ice and was badly broken. F.W.B.

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EXPERIMENTS WITH THE SILVER-DART, MARCH 26.

McCurdy's Account:- Repair work on the Silver-Dart was rushed right along as fast as possible and so by this afternoon at 5 o'clock she was again taken out on the ice for a trial. As we had run short of wheels it seemed as although a good opportunity had offered itself to test the efficiency of ice runners or skids as compared to wheels such as we have been using. Two runners were made about 3 1/2 feet long and by suitable tubing braces were attached to the truck in the same manner as when the wheels are used.

The steering gear was left unchanged, and a wheel as usual was in its place at the front end of the truck making the third point of suspension. As our new control was not finished we substituted the red cloth control of the Cygnet II so that no time would be lost in making a trial.

The ice was covered over with about 3 inches of water which, with the addition of a little snow, made fast travel impossible. We, however, ran the Dart round the ice without making any attempt to fly her. The runners seemed to be sluggish, not allowing the machine to "get away" fast as in the case when wheels are used all through.

While repairs were going on with the Dart the eight cylinder engine was thoroughly overhauled inside and out and all of the nuts and bolts carefully looked over. We have ordered a new supply of wheels from the Curtiss factory and when they arrive we do hope that the long flight which we all so much desire may be pulled off.

J.A.D. McC.

Baldwin's Account:- The Silver-Dart was in commission again to-day with runners in place of the back wheels. The runners were about 3 ft. 6 inches. They were made of wood with half round iron for a shoe and were so arranged that they fitted in taking the place of the back wheels without necessitating any change in the running gear.

The front wheel was left as before and the front control of the Cygnet II used as the new one was not ready.

The ice was covered with three or four inches of slush and water which made the going very bad.

After turning the engine over inside the harbor the machine was pushed over the neck of land and headed out on to the Bay. It was evident from the difficulty we had in pulling the aerodrome along that it would be hard for her to pick up good speed when under power. However it looked like a good opportunity to see how runners worked over very bad ice.

When the engine was started the ice was so sticky that the Silver-Dart instead of having to be held back had to be given a little push to get started. She picked up headway very slowly but after going about 200 yards seemed to be making pretty good time. The front wheel and runners threw a great deal of spray all over the machine and John got thoroughly soaked before he had gone very far. Two short runs were made and the machine was taken back into the shed.

The experiment indicated that under the circumstances wheels would have offered much less resistance. A mud guard on the front wheel might make it much pleasanter for the

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aviator. Although no turns were attempted Mr. McCurdy when interviewed after the experiment expressed himself as being of the opinion - dirigibility offered no insuperable difficulties. F.V.R.

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HAS THE OMISSION OF THE TAIL IMPROVED MACHINES: ByF. V. Baldwin.

The object of our experiments is, presumably, to develop an aerodrome of practical utility. If so, we should consider the pros and cons of a question which is of vital importance in the operation of our machines.

The laurels in the commercial field will be won by the machine which is most easily handled. High speed and efficiency are of secondary importance to air-worthiness in the present state of the art. There does not seem to be any doubt that a machine with a tail is more easily controlled, and the great argument against a tail is that it is unnecessary and incidentally impairs the efficiency of the aerodrome.

The "drag of the tail" has become a sort of a by-word suggesting inefficiency and obsolete design, but it is always well to consider results quantitatively. The tail on the "June Bug", for instance, undoubtedly offered more resistance than the vertical rudder and its truss does on the Silver-Dart, but we should compute exactly how much the resistance of the machine has been reduced by the omission of the tail before finally discarding it.

One argument which is usually advanced against a tail is the increased resistance due to the draft of the propeller. This is of course true but we are apt to get an exaggerated idea of this increased resistance by observing the draft of a propeller when the machine is stationary. In flight the draft is increased only by the velocity of slip.

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The big question involved is longitudinal stability. It is a matter of choice whether we want a machine which is easily upset and easily righted or hard to upset and hard to right.

Mr. McCurdy seems to have no difficulty in maintaining smooth flight in the Silver-Dart unless the wind is puffy. With a puffy wind the machine pitches and scends in a quick uneasy fashion which suggests that the flights would be much steadier with a tail.

The difficulty with a very sensitive control is that the operator moves it too far. It may be that in a wind a quick, sensitive control is necessary. We have not had enough experience in really windy weather to appreciate just what the conditions are, but in comparatively still weather it would seem that the advantage lay with the machine in which the fore and aft motion was somewhat damped.

If the objection to the tail is the resistance it offers, the same effect can easily be obtained by putting the fixed tail in front, so to speak, and using the bow control truss to support it.

This idea, if carried to an extreme, would produce a machine of the Langley type and might be a step in the wrong direction. Still it is worth thinking about.

Mr. Lanchester in comparing the Wright and Voisin machines aptly remarks of the Voisin type that "In the hands of a beginner the machine would, very likely, be able to take care of the aeronaut to some extent until the aeronaut has learned to take care of the machine."

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The truth of this remark is born out by experiment. Although many men have made flights in the Voisin machines (always, as far as we know, in public) the landings have been consistently good, and some very remarkable flights have lately been made by inexperienced aviators.

The Wrights' machine, on the other hand, has been completely wrecked by a sudden dive when they were experimenting at Kill Devil Hill tuning up their machine for the Government trials at Fort Meyer.

If it had not been for the example of the Wright Brothers, I doubt very much if we would have discarded the tail, but however that may be we should see to it that we see clearly the advantage and have good and sufficient reason for adopting such an important modification in our machines. F.W.B.

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CURVED SURFACES FOR FRONT CONTROLS: By J.A.D. McCurdy.

It seems to me that perhaps in the design of our front controls, we are confining ourselves too much to the elementary function of that control.

We assume that as the function of this part of the aerodrome is to control the elevation of the machine by say, first, presenting a positive angle to elevate and then a negative angle to depress we must necessarily arrange things so that the turning moment produced positively is equal to the turning moment produced negatively.

Under such an arrangement the bow control when producing no turning moment does not add to the support of the machine as a whole. It is even possible that it does not ~~even~~ support its own weight and that of its supporting truss.

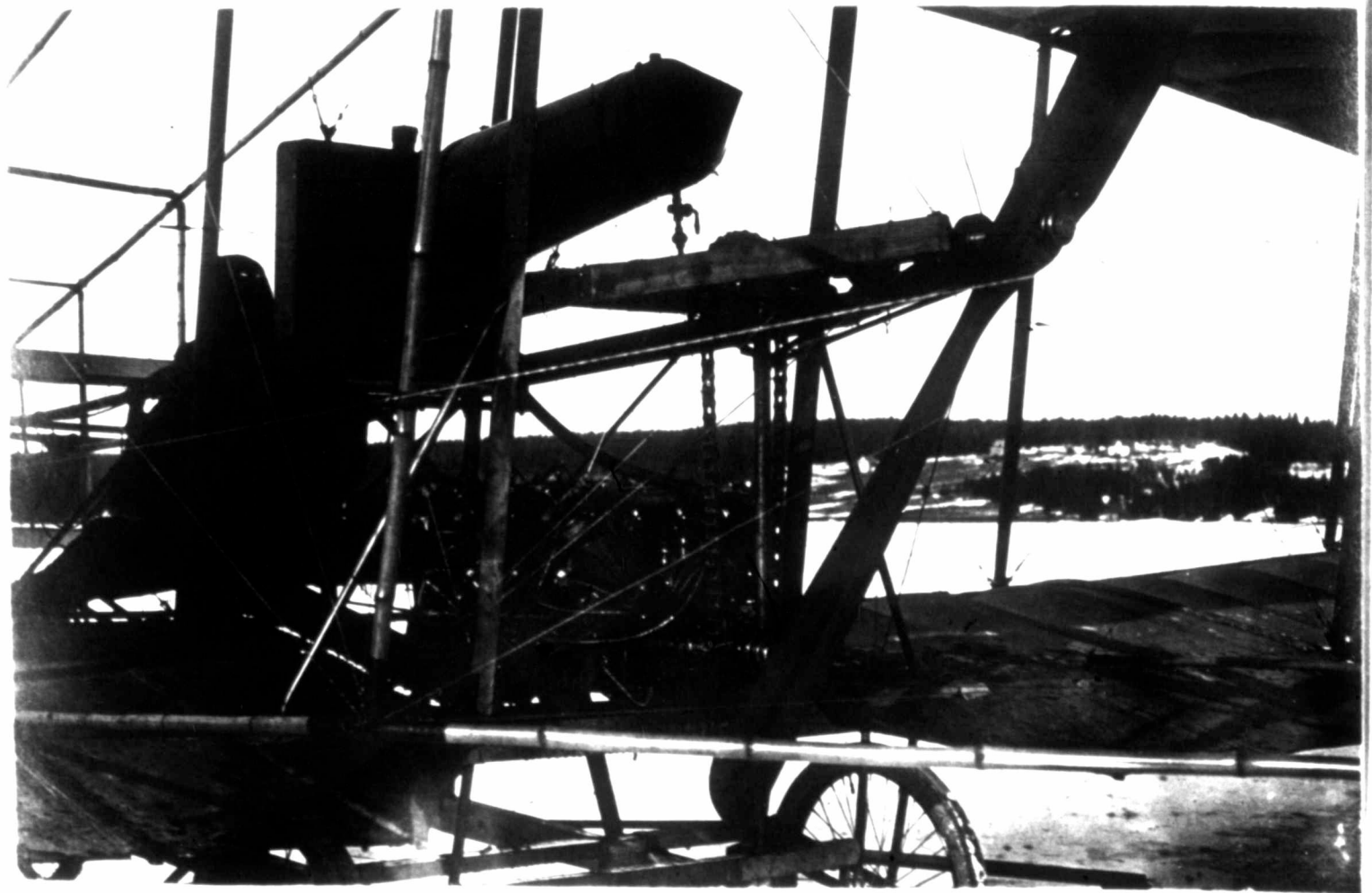
Would it not be better that the front control be given a positive angle of incidence, the same as that given to the main planes, and that the surfaces composing this control be given the curved form similar to that designed as most efficient for the main surfaces.

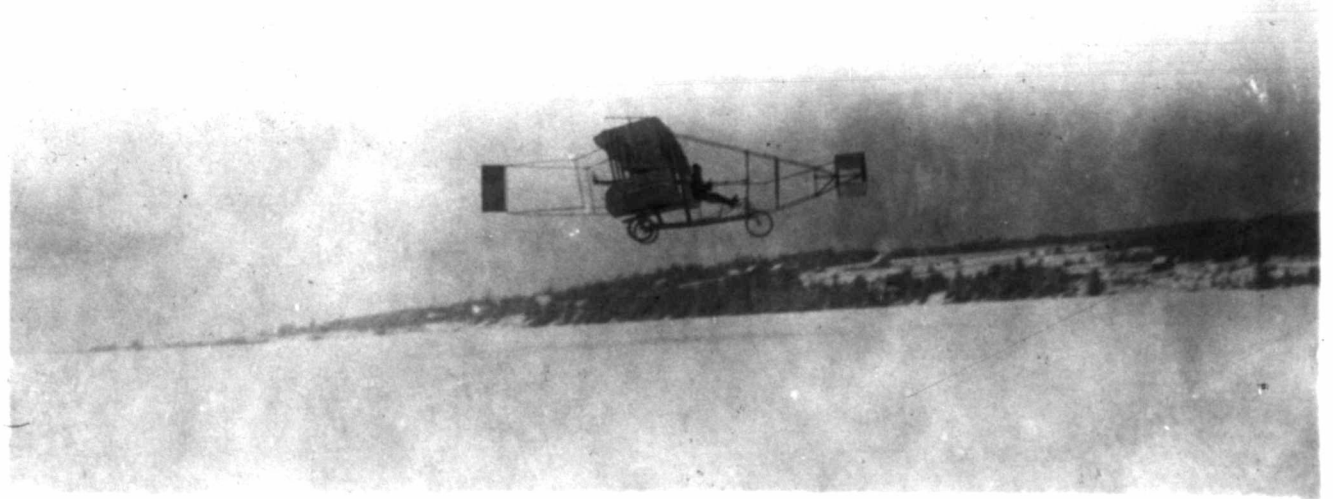
Now what would happen when we wish the machine to descend, would be that simply the lift of the bow control would be diminished as we decreased its angle of incidence. The drift element resulting from such an action would probably be much less than if the surfaces were substantially flat. In causing the machine to rise a greater positive angle would increase the lift without materially increasing

the drift element.

Mr. Baldwin has suggested in an article written by him which appeared in Bulletin XXXIV pp 37-39 that the head resistance of controls would be greatly reduced by making them approximately square in plan instead of having comparatively great lateral extension. This is undoubtedly true from the standpoint of head resistance due to its struts, chords, and guy wires, but from an efficiency standpoint I think that the form we have already adopted, that is quite narrow from fore to aft, and having great lateral extension, would if its surfaces were curved and having its neutral position at say, 4 degrees, positive angle of incidence prove to be of better advantage to the machine. J.A.D. McC.

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LECTURE ON AVIATION AT BADDECK: By Charles R. Cox

On Tuesday evening March 23, nearly everyone crossed the ice from Beinn Bhreagh, in the midst of a blinding snow storm to listen to the Lecture on Aviation given by Mr. Douglas McCurdy, and Mr. Frederick W. Baldwin in aid of the Parent's Association of Baddeck.

Although the night was perhaps one of the worst we have had this winter, it did not materially interfere with the attendance, as the Court House was well filled, and was a great success from a financial standpoint.

Mr. H. Percy Blanchard, acting as Chairman, opened the meeting by stating "There is something in the Air", which remark brought laughter and applause. He further went on to state, that the Association was sorry that they did not have the honor of listening to Dr. Bell, who had gone to Ottawa to make an address before the Canadian Club of that city, but that he would take great pleasure in introducing the first speaker of the evening, well-known to all present, Mr. F.W. Baldwin, who sometime will be Sir Frederick Baldwin, otherwise known as K.C.B. It was some little time before the joke was actually taken up, but which finally brought forth much laughter and applause.

Mr. Baldwin in his address, which towards the end was illustrated with Lantern Slides took up the subject of Aviation from the time of Leonardo de Vinci (1492) up to the organization of the Aerial Experiment Association at Halifax, Nova Scotia, October 1, 1907. Mr. Baldwin with few

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changes repeated his lecture which he delivered before the Faculty and Students at Toronto University, and the Canadian Club of Toronto. This lecture appeared in full in Bulletin XXXIII pp 8-29.

Mr. J.A.D. McCurdy then took the subject from the organization of the Aerial Experiment Association, Oct. 1, 1907 up to the present experiments, which have been witnessed daily by the people of Baddeck on the ice in Baddeck, Bay illustrating his lecture with lantern slides. Mr. McCurdy spoke as follows:-

Mr. Chairman, Ladies and Gentlemen:- During the Spring of 1907, Dr. Bell had gathered around him four young men who were more or less interested in the subject of Aviation. These men to whom I refer are personally known, I think, to you all, and are respectively, Messrs. F.W. Baldwin, G.H. Curtiss, the Late Thomas E. Selfridge, and myself. All through that memorable summer we had the opportunity, and I may say privilege, of being closely connected with Dr. Bell in his work.

One afternoon in September, after we had come home from the Laboratory and were sitting round the big fire in the Hall of Dr. Bell's home, Mrs. Bell presiding over the small tea table, announced that she had conceived an idea which had been appealing to her more and more as time went on, and now she intended to submit it to Mr. Bell before all of us who were present.

She briefly reviewed the work which led to the establishment of the Volta Association, which had been started

and financed by Mr. Bell many years ago, and which consisted of himself and three other gentlemen, the object of which had been to produce a talking instrument; and so the graphophone was evolved which to-day is of great scientific value and the source of great amusement to old and young.

She then went on to say, that here was a similar condition of affairs, Mr. Bell surrounded by these young men who were all interested, both in Mr. Bell personally, and the work for which he labored. Now the proposition was, that Mr. Bell should form an Association of some kind, the object of which would be "to get into the air". Mrs. Bell herself generously proposed to finance such an Association.

It is perhaps hardly necessary for us to state, that the idea met with the enthusiastic approval of us all and so after considerable planning on the part of Dr. Bell the papers of the organization of the proposed Association were drawn up and signed by the above named five gentlemen in Halifax.

October 1st, 1907, thus marks the date which will long be remembered by us personally, and perhaps also by those who have followed the development of the Art, the organization of the Aerial Experiment Association.

Work had been going on during the summer on the construction of a large man-carrying tetrahedral kite. This machine was designed and in fact most of the details worked out by Dr. Bell. The younger members of the Association with Mr. Bedwin had of course many suggestions on points of construction to offer. When completed the kite was indeed a

beautiful structure composed as it was of over 3000 small tetrahedral cells covered with brilliant red silk. The egg had but just hatched, and a beautiful young swan had been born. Such was the comparison made by Mr. Bell when Mrs. Bell by pouring over its bow a mug of Beinn Bhreagh water christened it the Cygnet.

It was early in December when finally all preparations were made for the first trial of the Cygnet. The Victoria Steamship Company kindly supplied us with the services of their boat, the Blue Hill, with which to tow the floating raft "Ugly Duckling", on which the Cygnet rested.

It had been decided that Lieut. Selfridge should have the honor to be the first to make an ascension in a tetrahedral structure, so on December 6, he took his place in the man-hole of the machine dressed in as light clothing as was compatible with the weather conditions.

When off Beinn Bhreagh Head the steamboat was headed into a NW wind and the signal given to the men on the deck of the Ugly Duckling to "let go". Away soared the kite to an altitude of 168 feet. The wind, however, was of insufficient velocity to support the machine, and so during a period between two puffs the Cygnet gently came down till finally she rested on the surface of the water. So slowly and gently did she descend that Selfridge was not aware that he was coming down till suddenly he was rushed forward through the water at the speed of the Blue Hill. The smoke from the funnels had so obscured our view from the upper deck of the boat that the signal was not given to cut the flying line,

and so the beautiful structure was totally wrecked. Some data had, however, been secured by Selfridge from the scientific instruments which were secured to the Cygnet in places convenient for his observation, and the angle of flight and wind velocity were carefully noted by him in his book.

The season was by this time so far advanced that the Association decided to go to Hammondsport, the home of G.H. Curtiss. This town held special advantages as our work would be near the motor cycle shops of Mr. Curtiss. A large lake was close beside us where experiments over the ice could be conducted, and a meadow of considerable size just outside the limits of the Town, where experiments could take place in the summer after the ice had gone.

We were all very anxious to build a glider, the technical meaning of the word has been so ably explained by Mr. Baldwin. This machine served its purpose, but as a stimulant^{us} to get into the air in a power machine, rather than in giving us any actually data from which we could design machines. We made about 50 glides in all, varying in length from 10 feet to 100 yards. Well do I remember the hard bumps which resulted from losing control of the glider when man and machine were thrown violently to the ground.

We soon had collected together all the information we could obtain on the construction of machines which were actually flying, and by sorting out what we considered their good points incorporated them into ideas of our own, and so finally the first power machine of the Association was lying in the aerodrome shed at Hammondsport ready to be tried. At the suggestions of Mr. Bell and Mrs. Curtiss it

was officially named Selfridge's Red Wing. This machine was given its first trial over the ice on Lake Keuka on March 12, 1908. Mr. F.W. Baldwin, who was the aviator therefore has the honor of being the first man to make a public flight in a heavier-than-air machine in America. The distance covered by the aerodrome was carefully measured by means of a steel tape, and the actual distance recorded was 318 feet 11 inches. We were all of course very much pleased and Mr. Bell jokingly remarked that it was fine, but only to think, that it was made by a Canadian and not by an American.

The Red Wing was tried once more on March 17, St. Patrick's Day, but the good Saint forgot to come to our aid, for a sudden puff of wind turned the machine up on end, so that the port wing struck the ice, and the Red Wing was telescoped into a shapeless mass on the ice. Baldwin however escaped without any injury whatever. The accident to this our first machine did not however dampen our spirit, and so at once designs were gotten out for our second machine, Baldwin's White Wing.

By this time the ice had all disappeared, so the runners were replaced by wheels. Mr. H. Chaplin, a gentleman of Hammondsport kindly offered us the use of his large meadow at one end of which was a half mile race track. A stretch of this track we proposed using as a place for starting our machines. The machine proper differed from the Red Wing, in that moveable wing tips were provided being substantially a continuation of the main surfaces whereby the operator

could preserve the lateral balance of the machine. The White Wing made in all five flights, the distance of which ranged from 20 to 300 yards. In the final flight, in which I was the aviator the machine got away from me, and plunging to the earth was completely demolished. I however came through the fall without mishap.

We felt by this time that our successes were such as to warrant out building a third machine, and especially with the idea in view of applying for the award of the Scientific American Trophy, it was decided that Mr. Curtiss should alone ride the machine, which was finally named the June Bug. By adopting such a plan much experience could be gained by repeated flights, whereas if all took turns as aviators, disaster to the machine was sure to come.

Many successful flights were made of varying lengths and at last we thought that our chances of lifting the Scientific American Trophy were fairly good, and so arrangements were made with the Aero Club of America to come to Hammondsport on July 4, and officially observe our flight over the prescribed distance of one kilometer. This distance was easily negotiated, and so not only did we win the coveted trophy, but added to our records the honor that one of the Association aerodromes was the first to make an official flight in America.

For the remainder of the summer months the June Bug was flown day after day by Curtiss, Solfridge and myself, and much experience gained in control and balance. Her record flight was in covering the figure eight, a distance of about 2 1/2 miles.

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Still a fourth machine was built at Harmondspport which, I think, is perhaps known to you all, as the Silver-Dart. A specially designed water-cooled motor was installed in the machine, and we anticipated longer flights. A mile and a half with part of a turn negotiated was the greatest distance covered with the Silver-Dart at Harmondspport, and so with the first of January plans were completed for transporting the machine to Baddeck, where experiments could be conducted over the ice on Bras d'Or Lake in conjunction with the tests to be performed with Drone No. 5, Bell's Cygnet the Second.

This large tetrahedral structure as you are presumably aware resembles the Cygnet I in general appearance. It is composed of nearly 4000 small tetrahedral cells, and the completed structure is mounted on ice runners to facilitate getting up speed over the ice.

It was Dr. Bell's original intention to try this machine in a similar manner to that employed in flying Cygnet I, but navigation being closed on the Lake due to the formation of ice, compelled us to perform tests along the same lines as in the case of our other aerodromes. Several trials have been made, but so far the Cygnet has not left the ice. It is possible that this is due to improper application of the power at our command, or it may be that headresistance of the structure is too great when as in the case of Cygnet II pure tetrahedral construction is employed all through. I think that I may assume that you are all with us in hoping that we may in time succeed in getting

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a tetrahedral structure into the air under its own motive power.

Numerous flights have been made with the Silver-Dart on Baddeck Bay, the first of which marks an epoch in the history of Canada, for on Feb. 23, 1909, at Baddeck the first flight in Canada of a heavier-than-air machine took place. As time goes on and Canada gains more and more prominence in the eyes of the aeronautical world, the citizens of Baddeck can look back and be proud that their home town was instrumental in introducing aviation into the Dominion.

On the 31st of this month the Aerial Experiment Association will be dissolved, but in name only, for we sincerely hope that circumstances will permit the members to work together in the future along lines which through the Aerial Experiment Association have proved to be so agreeable, interesting and instructive to us all. J.A.D. McC.

At the conclusion of the lecture a vote of thanks proposed by Mr. Sutherland and seconded by Mr. McIntosh was unanimously adopted, expressing the appreciation of the citizens of Baddeck for the opportunity of listening to the very instructive address concerning a work in which Baddeck along with the rest of the world was deeply interested. C.R.C.

Bell to Walcott.

Badeock, N.B., Feb. 16, 1909:-- In Langley's "Experiments on Aerodynamics" p. 88, reference is made to a complete series of propeller experiments, the details of which "are reserved for future publication".

The members of the Aerial Experiment Association would like to have access to this material, and will be much obliged if you could help us in the matter.

(Signed) Alexander Graham Bell.

Walcott to Bell.

Washington, D.C., Feb. 23, 1909:-- Referring to your letter of Feb. 16, I beg to say, that the material you refer to giving the account of Mr. Langley's propeller experiments is now in the hands of Mr. Hanley, who has in preparation the volume giving an account of Mr. Langley's work subsequent to his memoir "Experiments in Aerodynamics".

I have to-day written to Mr. Hanley asking how soon the manuscript will be ready for the printer, and also whether the portion about which you enquire is available for reference.

(Signed) Charles D. Walcott.

Walcott to Bell.

Washington, D.C., March 17, 1909:-- I beg to enclose herewith a copy of a letter just received from Mr. Hanley in regard to the series of propeller experiments about which you wrote me under date of Feb. 16, 1909.

(Signed) Charles D. Walcott.

Manley to Walcott.

New York, March 16, 1909:- Continued absence from the City has delayed me in replying to your of Feb. 23. Regarding the Memoir I regret that it is not yet ready for the printer, but it is making steady progress and I am putting all the time I can possibly spare on it.

Regarding the data on propeller experiments referred to on p. 86 "Experiments in Aerodynamics" most the data of the experiments which had been made at the time this note was published was later found to be incorrect owing to inaccuracy of the measuring instruments of the whirling table.

In the summer of 1898 I made a rather complete series of tests and this data is being embodied in the Memoir. Some of it, however, has not yet been calculated out, but I hope to finish the calculations on it some time within the next few weeks.

To compile the "raw" data into a form intelligible to anyone else would take nearly as long as to complete the calculations ready for the Memoir. So I think it hardly practicable to give the data to Dr. Bell until I have had a chance to complete preparation of it.

I can then easily supply Dr. Bell with a copy in advance of its publication.

(Signed) Charles M. Manley.

LETTERS FROM MEMBERS AND OTHERS.Cook (London Times Correspondent) to Bell.

Ottawa, March 16, 1909:- I have to renew my thanks for sending me the results of your experiments in aerial navigation. The Times has been endeavoring to arouse the British War Office from its lethargy on this important question, and as our new Chief, Lord Northcliffe, was at Pau watching Wilbur Wright's experiments your messages fitted in admirably with the telegrams which Lord Northcliffe was dictating from Pau. Thanks very much for the description of the Silver-Dart and Cygnet II. They were just what I wanted, and I shall have pleasure in using them in the Times. If you have no objections I should like to send the photographs to Lord Northcliffe.

I am only sorry that the fact of Parliament being in session prevents me from running down to Baddeck to witness your experiments. I am glad to know that the attention of the Home Authorities has been drawn to the work of your Association. Probably the result may be that the War Office will ask for an official report upon the subject.

(Signed) Fred Cook.

Government House Ottawa to Bell.

Ottawa, March 20, 1909:- His Excellency desires me to write and ask you if you would stay with him at Government House on Saturday next as he hears that you will be in Ottawa on that date.

(Signed) A.V. Fife,
Capt. A.D.C.

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Post to Bell.

March 19, 1909:- It is with great regret that my opportunity to visit Baddeck and your Laboratory seems to have passed for the present, and I also regret that the rules would not allow the contestant making the best record to have his name inscribed on the Scientific American Cup at the time of making the test. It would seem to me that this stimulus would be necessary to give aviators something to strive for, while as it is, it would seem to produce the result of having all the machines held down to their very lowest distance until midnight, Dec. 31st, when all would have a race by moonlight to see which could fly the furthest before the new year. I wish to extend my most sincere and deepest congratulations to Mr. John McCurdy and Mr. Casey Baldwin, and wish I were flying with them.

My best wishes for your success with the Cygnet II.

(Signed) Augustus Post.

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Bishop to Bell.

New York, March 23, 1909:- It was with a great deal of regret that I received your telegram some days ago. I beg to assure you and I hope you will appreciate that the Aero Club of America has no desire to prevent the Aerial Experiment Association from having its name engraved on the Scientific American Trophy as many times as possible. It appears that you were under the impression that the rules promulgated last September still hold good, but those rules were announced for a definite date and as the trophy was not competed for on that date the conditions no longer held. Enclosed you will find copy of the circular for that competition, also proof copy of the rules for 1909, which were in course of preparation when you entered first into communication with us. We have given a great deal of time and thought to the elaboration of these rules, and we do not think it possible to have machines appear at a designated time and place for public competition.

We have decided to adopt methods of competition which have proven successful in Europe, notably in the case of the Michelin Trophy which Wilbur Wright won last year. It was far from our intention and desire to shut off the Aerial Experiment Association from anything, but we felt that the rapid development of Aviation made it necessary to increase the interest and give the Trophy to the machine which had done the best work during the calendar year. In that way interest will keep up to the end of the year and competition

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will be kept up to the last available date. This is just what happened between Harman and Wright last year in France.

We beg to assure you that we regret there should have been any misunderstanding on your part or on ours, and it is a great disappointment to us that we cannot have the honor to engrave the name of the Aerial Experiment Association on the Trophy which it won for the first time last July.

We also regret extremely that you were not able to be with us at our banquet last Saturday evening. I assure you the affair was very successful, and you were greatly missed.

(Signed) Cortlandt T. Bishop,
Pres. Aero Club of America.

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THE SCIENTIFIC AMERICAN TROPHY.

The Scientific American Trophy for heavier-than-air flying machines was offered by the Scientific American for annual competition under the rules and regulations formulated and promulgated by the Aero Club of America in 1907.

The first trial for this cup was held at Hammondsport N.Y., on July 4, 1908, by the Aerial Experiment Association of Hammondsport, New York. On the second trial the "June Bug", in charge of Glenn H. Curtiss as pilot, rose from the ground and flew from a designated point a distance of 5,090 feet, and was awarded the trophy, having fulfilled the requirements of the Contest Committee and performed in this aeroplane a flight of more than a kilometer, which was the minimum distance required under the rules adopted for 1908 by the Aero Club of America.

In accordance with the Deed of Gift, which provides that the conditions for each contest for this trophy shall be made progressive in their severity of test, in accordance with the progress of aerial navigation, the conditions to be fulfilled by the next person entitled to have his name placed on the Trophy shall be a flight of not less than twenty-five kilometers, including a return to the point of starting, and a descent or alighting at a point not more than 100 meters from the point at which the machine rose from the ground.

RULES GOVERNING COMPETITIONS FOR THE SCIENTIFIC AMERICAN
TROPHY FOR 1909.

(1) It is distinctly understood that the Trophy is to be the property of the Club and not of the members thereof, except in the event that any one person shall win the trophy three times, in which case it is to become his personal property.

Should the Trophy be won by the representative of some foreign club affiliated with the Aero Club of America through membership in the International Aeronautic Federation, it shall be held in custody of such Club, but it shall be subject to competition under the same terms and conditions as if it were still held by the Aero Club of America.

Should a contest or trial under the Rules not be held within a year from the date on which a foreign competing machine shall have won the trophy, the foreign Aero Club having possession of the cup shall give up its custody of the same and shall return the cup to the Aero Club of America, in order that the competition or trial for that year may be held in the United States of America.

The conditions under which the competitive tests and trials shall be made, shall be determined by the Contest Committee of the Aero Club of America, and such conditions shall be made progressive in their severity of test, as far as possible, in order to foster and develop the progress of the art of aerial navigation.

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(2) All heavier-than-air machines of any type whatever (aeroplanes, helicopters, ornithopters etc.) shall be entitled to compete for the trophy, but all machines carrying a balloon or gas-containing envelope for purposes of support are excluded from the competition.

(3) To compete for this prize each contestant must notify the Club of his intention to compete, by telegraph or by registered letter, addressed to the Club at its headquarters in New York, and must specify the days on which trials are to be held. He must also deposit the amount of the fare from New York to the place of trial and return. Sufficient time must be allowed for the representative of the Club to reach the place where the contest is to be held, with an additional two days in which to make arrangements for the journey. If trials are to be made within twenty-five miles of New York City the Club will send a representative without expense to the contestant.

(4) The person or Committee having charge of the test or trial shall make careful measurements of the distance covered by the flight, and shall prepare a written report of the test or trial, which shall be delivered to the Contest Committee of the Aero Club of America, and in such report shall state fully whether in his opinion the machine can be handled with safety and, as far as possible, he shall determine the speed attained during the flight. He shall also take into consideration the question of stability and ease of control, and he shall state in his report weather and wind conditions.

(5) The flights will be made in as calm weather as possible, but the Contest Committee or its representative will at its discretion order the contest to begin at any time it sees fit, provided the velocity of the wind does not exceed twenty miles an hour. The machine may start by running on the ground or upon a track under its own power, for a distance not exceeding one hundred meters, but no special launching device will be permitted. There is no requirement as to the height above the ground at which the machine must fly, but it must demonstrate its ability to rise or descend and circle to the right and left at the will of the operator.

(6) Complete specifications of the competing machine, giving weight, supporting surface and power of engines, together with a description of the best trial of the machine, shall be forwarded to the Contest Committee at or before the time of making entry for the contest.

(7) The minimum distance which must be covered by the competing machines during 1909 shall be twenty-five kilometers, including the return to the point of starting and a descent or alighting at a point not more than 100 meters from the point at which the machine rose from the ground. Under the rules promulgated for the year 1909, bona-fide owners of machines may make application for a test or trial, as above provided for. No entrance fee shall be required from persons desiring to compete for the Scientific American Trophy.

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(8) No trial or test for the year 1910 will be allowed until the rules governing the competition for that year have been promulgated.

(9) All tests and trials shall be under the official supervision and direction of the Aero Club of America, and all questions that may arise in regard to such contest or trial shall be decided by the Contest Committee of said Club, and its decision in all questions of dispute shall be final, and without right of appeal to a court of law or equity.

(10) The winner of the Scientific American Trophy for 1909 shall be the entrant of the flying machine which, in accordance with the above rules, shall make during the year mentioned the longest and best flight in excess of the minimum performance specified in Paragraph 7. His name and record will be appropriately inscribed on the Trophy.

(11) In case the Contest Committee is unable to determine which machine has made the best performance during the year 1909, it shall arrange that a competition between such machines be held, and the machine making the best performance in such test shall be awarded the Trophy for the year.

GENERAL RULES APPLYING TO ALL AVIATION CONTESTS AND RE-
CORDS ESTABLISHED UNDER THE CONTROL OF THE AERO CLUB OF
AMERICA.

Each contestant by the fact of his entry for cups or prizes of the Aero Club of America, agrees to accept a decision of the Club without appeal, and further pledges himself in advance not to carry the matter to the courts.

The Aero Club of America declines all responsibility for accidents which may happen to contestants or to their apparatus, and contestants agree to assume all claims for damages to third persons or their property.

These conditions are accepted by every entrant for a record race, or a prize and by the very fact of his entry the contestant agrees to these conditions without reserve.

All contests for prizes and records must take place between ten A.M. and sunset.

All contests for prizes under the control of the Aero Club of America must be supervised by a person or persons delegated with the power authority by the President of the Aero Club of America or, in default, thereof, by its Contest Committee.

Persons desiring to enter for prizes or to establish records must notify the Aero Club of America in writing in sufficient time to allow for the journey of its representative to the place designated for the trials. Twenty-four hours must be given in addition to the time required for the journey.

If the trials are to be made within twenty-five miles of the New York City Hall the Club will furnish a representative free of charge. If the distance is greater than twenty-five miles the representative of the Club will be entitled to his fare for the round trip, and in addition to expenses at the rate of four dollars per day for the time the person is absent from New York.

If the trials are to be held within twenty-five miles from the headquarters of a Club affiliated with the Aero Club of America arrangements will be made with the latter to delegate a representative with all powers of the Aero Club of America for the purpose of certifying to the trials or contests.

For the purpose of giving official sanction to records one or more persons may be delegated by the Aero Club of America to represent it, as depends on circumstances as decided by the Club, but the expenses of one representative must be paid by the contestant.

The rules for each particular prize will state the amount of the entrance fee to be paid by the contestants for that prize. The delegate of the Aero Club of America has full power to direct the trials or contests on the ground chosen for the contests.

The terms delegate, representative, committee etc., as used in these and other rules and regulations governing aviation contests and records established under the control of the Aero Club of America shall be held to indicate the person or persons delegated with the authority of the Club for this purpose. He shall represent the Contest Committee either

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in special or general cases and shall be appointed by the President of the Aero Club of America, and in default thereof by its Contest Committee.

Entrants for the various prizes may name, if they so desire, several different days for their trials; in such cases the full entrance fee must be paid for each day.

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THE OUTLOOK ON AVIATION: By F.W. Baldwin.

The English newspapers are making a great howl about England's backwardness in Aeronautics. A very opportune panic seems to be forcing the Government's hand to take steps to get up to date in aeronautical equipment.

The rumour that the War Department is negotiating with the Wrights has neither been confirmed nor denied, but it would seem altogether likely that they would avail themselves of the opportunity to acquire one of the Wright's machines. Very little has leaked out in regard to the experiments the British Aeronautical Corps are supposed to be carrying on secretly, but the Cody Machine, at Aldershot, does not seem to have inspired much confidence by its performances.

The Aeronautical Society of Great Britain announces that a splendid practicing ground is now available for aviators to make experiments upon.

Mr. Moore-Brabazon will probably be one of the first to use it. He has bought a Veisin machine which is practically a duplicate of Farman's with the exception of the motor. This is a large eight-cylinder water-cooled motor which develops 55 H.P. and weighs about 280 kg (610 lbs) according to figures given in the last number of "La Revue de L'Aviation."

Mr. Moore-Brabazon has already given his aerodrome a trial which proved very satisfactory. On the first trial

the balance was not perfect but this was corrected by shifting the fuel tank and the next day Mr. Moore-Brabazon made three rounds of the parade ground at Issy in splendid style in spite of a wind of about 10 or 12 miles per hour.

The very encouraging performance of this machine which carries a powerful motor, in which weight seems to have been a secondary consideration, is of signal importance to the art of Aviation.

The March Number of "La Revue de l'Aviation" also describes a monoplane which is being built for M. Victor Tatin. The propeller is in front and has a large blade area, M. Tatin being a strong believer in large surface and comparatively slow rotation. The diameter is two meters forty centimeters, and the pitch two meters fifty centimeters. He proposes to drive this propeller between 500 and 600 rpm., with a 2-1 gear from a 50 H.P. seven cylinder water-cooled engine.

Taking the rpm. at 500 and the pitch 2 m 50 cms. (8 ft.) the pitch speed is about forty-seven miles per hour. This seems rather low for a machine which has only 23 sq. m supporting surface (less than 250 sq. ft.).

The French School seems to be devoting a great deal of attention to machines with very small surfaces. M. Louis Blériot has succeeded in making a flight with his monoplane No. 11 so arranged that the surface is only 16 sq. meters. (172 sq. ft). The machine, weighs 250 kilos. (550 lbs) which gives a flying weight of about 3.2 lbs. per sq. ft. It is remarkable that this machine should fly at less than 40 miles

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an hour and it would seem to indicate that there may be something in the claim of those who prefer the monoplane in the matter of efficiency. Bleriot himself, however, does not seem to have any preference as the machine he is now building is a double surface machine very much like the Wrights with the exception of his propeller plant which is a single four-bladed propeller driven by a 100 H.P. Antoinette motor.

The influence of the Wright's machine upon French designers is also quite apparent in the biplane built by M. Guée which is illustrated in the *La Revue*. The skid arrangement on which M. Guée proposes to land looks very crude and, unless he has exceptionally good control of the machine, some trifling repairs may be expected to interfere with his experiments.

The aeroplane Antoinette has apparently made some good flights but the particulars of them do not seem to be noted.

It is reported that the Wright Brothers are charging admission to the grounds over which they make their flights.

Miss Wright accompanied her brother for the first time on the 15th. She was up for seven minutes. Wilbur Wright has made two efforts to break the speed record for a kilometer. His best time was 55 seconds with the wind, 63 seconds against.

Orville Wright is superintending the building of a new machine which is being designed for speed.

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Wilbur Wright now describes his present apparatus as "a slow old thing, suitable only for teaching". During the month he definitely denied two rumours. First, that he was not thinking of discarding the starting rail, next he had no intention of entering for the Monaco Contest. On the 24th Orville got into the air for the first time since his accident. With his sister he went up in the balloon Icarus with the Marquis de Kergarion.

On Feb. 20 the monoplane R.E.P. piloted by M. Guffey came to grief. At the close of a flight of 400 meters M. Guffey drove into a bank on descending. The machine turned over and a blade of the propeller was knocked off. M. Guffey was not hurt, however, and thoroughly enjoyed his flight. The speed was 80 kilometers per hour.

In a German publication Mr. Carl Dienstbach has an article on the Silver-Dart and, judging from the illustrations, he appears to have a thorough grasp of the good points of the machine.

Count von Zeppelin has made a new record with his big airship. He ascended 3000 feet, the greatest height ever obtained by a dirigible balloon. After manoeuvring at this altitude he brought his machine down very gently over the land and found his boat arrangement quite as satisfactory for alighting on the land as on the water.

We read with great regret that Prince Henry of Prussia after being given a splendid ride in Zeppelin's machine was unkind enough to say that the dirigible balloon was still very imperfect and practically useless as an instrument

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of war.

Herr Zipfel is making good progress at Berlin with a Voisin machine. On the 8th of this month he made a flight of 600 meters in what was considered quite a violent wind, but on the 16th, when venturing out again in a stormy breeze his machine was blown over and its left wing was damaged. Preparations are under way for a great International Exhibition at Frankfort to remain open through the summer.

It is said on good authority that no fewer than forty airships are to be built for the Italian War Department during the next twelve months. A sufficient sum has already been appropriated and six of the dirigibles will shortly be delivered. As many of them as possible are to take part in the military manoeuvres this summer.

The Aero Club of St. Petersburg already numbers no fewer than 800 members. The Government is reported to have ordered ten Wright machines.

An Austrian syndicate has purchased Henri Farman's old Voisin. They bought it because they were so anxious to have one at once that they could not wait for one to be built, moreover they wanted to have no doubt that their machine would fly. M. Legagneux, the head of the syndicate, spent most of the month at Chalons taking lessons. He made a brilliant start flying over two kilometers at his first attempt and then going on and doing five kilometers.

The final papers of the Herring-Curtiss Syndicate have been signed and it is understood that new concern will take

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charge of the Curtiss' works immediately.

The machine which Mr. Curtiss will deliver and exhibit before the Aeronautic Society in May is described in "Aeronautics" as having a spread of twenty feet with a depth of four feet. The supporting surfaces will be parallel and spaced five feet apart. The vertical rudder will be placed in the rear and there will be a horizontal rudder both in front and rear. A new and partly automatic device for maintaining equilibrium will be employed consisting of moveable surfaces between the supporting frame. The surfaces will be made of the same rubber silk which is used on the Silver-Dart.

An automobile steering wheel will be used on which is located a spark advance and throttle. By pushing back and forth the wheel raises or lowers the horizontal control.

The engine will be a 25 H.P. four-cylinder motor driving direct at 6 ft. laminated wood propeller of new design, pitch equal diameter, at 1200 revolutions per minute. The engine has double valves in the head with a single push valve.

Another machine, which has already been built, is described in this month's aeronautics. Mr. Wilbur R. Kimball has turned out a remarkable looking aerodrome. The chief feature, apart from its struts and cross-struts is a weird propeller plant. Mr. Kimball proposes to drive his machine with eight four-bladed propellers the design of which is the result of many years of experiment and scientific research. They are 3 ft. 10 inches in diameter with a pitch equal to 4 ft.

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These propellers are placed in a row between the main surfaces extending the entire length of the machine. Transmission is effected by means of a small steel endless cable specially designed for the purpose. The motor is a 4 cylinder two-cycle 4 inch bore and 4 inch stroke, water-cooled and is supposed to develop 41 H.P. with a total weight, including magneto of 130 lbs.

The main supporting surfaces are parallel and measure 37 ft. in width by 6 ft. 6 inches depth and 4 ft 2 inches apart. The curvature of the surfaces are very shallow being about 1 in 26.

The front horizontal rudder is an open cell of two planes measuring 12 ft. by 2 ft. 6 inches, set 3 ft. apart placed 9 ft. 9 inches in front of the main planes.

One of the new and original features to which attention is especially directed is the unique lateral stability device. This is a very commendable copy of the lateral balancing rudders employed upon the June Bug and Silver-Dart.

The machine department of the Weston Cordage Co. of Easton, Pa. is building an aeroplane of the biplane type under the direction and supervision of Mr. C. Norvin Rinek which although it closely resembles in general appearance the Veisin type of machine differs very materially from it in detail and method of construction.

The machine is composed of one principal cell 10 meters in width and 2 in length. At the back is a smaller cell 3 meters in width and 2 in length, which is connected

to the main structure by means of steel tubing. The body or car of the machine is placed in the middle of the front plane and is joined to same by means of substantial aluminum casting, which in turn rests upon the chassis or running gear. With the exception of the car, the machine is built entirely of steel tubing and weighs complete, without the motor about 700 lbs.

The wings of the aeroplane are covered with rubber silk cloth. In addition to the main planes small immovable planes or tips are attached to the ends of the main planes and so connected with the vertical rudder that they can be operated either separately or in connection with it.

The power plant, situated in the rear of the car, consists of a four cycle water-cooled engine capable of delivering 60 B.H.P. at normal speed of 1200 rpm.

The propeller is a combination of steel and aluminum sheeting and probably is very similar to that used by Farman.

The March number of Aeronautics contains an article entitled "The Orville Wright Disaster" which gives Mr. Cline's version of the accident, and Dr. Ball's discussion of the lessons which may be drawn from what may have happened to the machine". F.W.B.