

Letter from Alexander Graham Bell to Mabel Hubbard Bell, March 6, 1909

Beinn Bhreagh, near Baddeck, Nova Scotia. March 6, 1909. Mrs. A. Graham Bell, 1331 Conn. Ave., Washington, D. C. Dear Mabel:

In turning over the pages of "The World's Work" for March, the other day I was surprised and interested to note my own article "When does Profit become Usury". It is so long since I have seen it that I was really quite pleased to read it through once more. Somehow or other it looks differently in print and I am very much pleased to know that it has at last found its way to the public. Please thank David and Marion for what they have done in the matter. I think it reads better in print than it does in typewritten form.

Dr Bell to Mrs Bell

Casey arrived Thursday evening (March 4) and has given us full accounts of his three lectures or rather of his three repetition repetitions of the same lecture. First he rehearsed before the Canadian Club of St. Catherines. Then he read his lecture, or rather half read it and half spoke it, at the Toronto University. Then he spoke it without referring to his notes at all before the Canadian Club of Toronto and declares that upon that occasion he felt more en rapport with his audience and derived an inspiration from their evident interest. Douglas' flight in the Silver Dart helped his lectures enormously.

The new propeller for Cygnet II is finished and the laboratory is now at work completing the new shaft. We are also having a few changes made as I found, upon looking over the structure, that Douglas had made absolutely no provision for his own safety in case of accident. Indeed he had introduced dangerous features. I had left to him the arrangement of the front control expecting him to copy substantially the front control in the Silver Dart. I find, however, that he has reversed the operation of the front control. The motion that

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would cause the Silver Dart to rise would cause the Cygnet II to dive and vice versa so that his experience with the Silver Dart would be of no use in handling the Cygnet II but would actually lead him to make the wrong move. Then again the kind of motion required to operate the front control is disadvantageous from another point of view. It is advisable that in lifting the front control to rise into the air the operator should lean backwards so as to throw his center of gravity a little further back. But he has so arranged matters that he would lean forward in rising for he has to push the steering wheel forward under such circumstances; so that whatever displacement of his center of gravity would occur would tend to neutralize the steering action of the front control.

The vertical rudder, which in the Silver Dart is placed at the rear and by means of which he can steer the machine to right or left, is in the Cygnet II placed in front over the front control. I have no objection to this but the placing it above the front control has rendered it difficult to manipulate the front control as in the Silver Dart thus leading to the reversal of the action. Mr. Bedwin has suggested that we place the vertical rudder below the front control instead of above and then it would not interfere with the operation of the front control as arranged in the Silver Dart. I have accepted this suggestion as it also remedies another point 3 Douglas has arranged the bamboo framework, which supports the front control, so that it is cocked up in the air. This has been done chiefly on account of looks but it introduces a dangerous feature. It is of great importance to the safety of the aviator that there should be a considerable extension in front of him and to either side that should break the shock of landing by crushing in in the event of a bad landing. Now if the machine should take a header the front control and its framework should act as a buffer. First, in receiving the first shock of landing and secondly as a lever to turn the machine on the ice and cause it to glide over the ice. In the present arrangement the framework is so cocked up as to afford no protection and the aviator would receive the full force of striking the ice upon the very part of the machine upon which he sits. The placing of the rudder below the front control will obviate this by affording something far out in front that would have to be

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broken before the shock of a bad landing could reach the aviator. The rudder itself and the framework which supports it would catch the blow.

The sledge runner in the center of the machine is formed of a metal tube which is bent up in front and right on the top of this tube is placed a thin board on which the aviator sits and the whole arrangement is such that the first blow of landing, in the event of a header, would come upon this sledge runner. I would therefore anticipate that the force of such a blow might drive the end of the pipe through the hole in the board right into the aviator himself, a most dangerous arrangement. We are obviating this by placing the aviator's seat at a considerable elevation above the keel of the structure and securing the end of the pipe so that such an accident could not happen,

The sledge runners are so long as to afford an obstacle in rising, and the tilting up of the winged surfaces in front introduces so much head resistance as to prevent the machine from gaining a sufficient speed on the ice before rising. We are remedying this first, by making the keel stick horizontal — that is parallel to the ice. The head resistance will then not be so great and the machine can gain greater velocity on the ice. The sledge runners will only be in contact with the ice as far as the middle of the machine and from that point to the rear will be cocked up at an angle of six degrees. As the center of gravity of the whole machine is a little in front of the center the machine will rest upon the front part of the runners while progressing over the ice then, when the front control is raised to get into the air, the machine will rock backwards on the after part of the runners. If it has sufficient velocity to rise into the air the runners will simply leave the ice. If it has not the backward motion of the machine will be limited to six degrees and the machine will simply skate along the ice on the after part of the runners.

The engine has been placed in the Silver Dart while these changes on the Cygnet II are being made so as to take every opportunity that may arise for a flight.

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The repairs on the Silver Dart were completed a few days ago but the ice conditions have been bad. A heavy fall of snow destroyed the smooth slippery condition we had in the last experiments. Two days ago however, a rain storm and thaw set in and the ice on Baddeck Bay became covered with water. Yesterday, although there had been no frost, the machine was 5 got ready for a trial. In the forenoon a fog prevailed which showed signs of clearing at noon. So in the afternoon the machine was taken out on the ice but a strong wind had by this time come up and experiments were postponed. There was frost last night and the Bay is now in good condition so far as the ice is concerned. A strong wind has been blowing all day and we have therefore made experiments with kites instead of with the Silver Dart.

We have notified the Aero Club of our desire to try again for the Scinetific American Trophy and it is likely that we shall try a flight of sixteen miles as required within a few days.

Hope you have not forgotten to arrange with Charlie for funds for the Association. I transferred One Thousand Dollars today to our Baddeck account. I hope Charlie will write me fully concerning the commercial propositions made in Bulletin thirty-four.

We are all turned out of the dining room as Mr. Byrnes' men are in full possession. A.G.B.