

Letter from Alexander Graham Bell to Mabel Hubbard Bell, May 30, 1893, with transcript

ALEXANDER GRAHAM BELL TO MABEL (Hubbard) BELL Beinn Bhreagh, C. B.
Tuesday, May 30, 1893. My darling Mabel:

The enclosed sketches will show you where my thoughts have been wandering.

I have read the article "Aeronautics" in the Encyc. Brit. once or twice already — and have always supposed that that was the only article upon the subject in the Encyc. Brit. but on Sunday I turned up accidentally — a long article upon flying machines and etc., under the head of FLIGHT.

I have been reading this with greatest interest. I am much surprised to find no account there — or in fact anywhere in print accessible to me — of the common French flying toy (made of tin). It has always seemed to me to be of importance from the fact that it is made of metal.

My steam and rocket experiments having failed to give me much valuable information concerning rotatory apparatus. I thought I would start now on a new line of enquiry.

Make that French flying toy — that is — make a machine entirely of metal that will fly — and then make variations upon construction. If the changed machine does not fly — why not? and etc.

Commence with an actual flying model — and vary its construction on various lines.

Yesterday Mr. Ellis and I put our heads together to see whether we could remember the construction of the 2 French toy. We both remembered the general features of the apparatus. Today we were able to try the following tin fan-wheel arrangement.

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This was placed in a suitable handle and rotated by means of a string — wound round handle — and pulled.

Result: Tin wing-piece left the rotator and handle and rose in the air to the height of about 50 feet — and remained floating in the air until rotation ceased when it came down.

Today tried following variations. 1. Omitted one pair of wings — so as to leave two alone. Result: Good rotation as before — but the moment the wing-piece rose high enough to get clear of the handle — it turned a somersault in the air — and came to the ground head down — exactly as our winged rocket apparatus used to do ! Two wings alone will not support the rotating wing-piece in the air when free. Upon a shaft two blades are sufficient to cause apparatus to mount from A to B — and this has misled me into the idea that two wings would be sufficient in a free machine.

Experiments today seem to indicate that this is not so — and this may perhaps be the cause of our numerous failures with steam rotatory apparatus and rocket rotators.

With two wings — the thing tips over like a two legged stool. Think now we cannot do with less than three. Will try this tomorrow as three would be preferable to 3 four on account of lightness and etc.

Having failed to get ascension with two wings — Mr. Ellis repaired the apparatus so as to restore the four wings. 2. Then tried apparatus without the vertical steel rod. Result: Rotated beautifully and went up at least 50 feet in the air. Seemed to do as well — if not better without the steel rod. Apparatus did not tip over. Remained horizontal and came down with the plane of the machine horizontal. 3. Next changed the angle of the blades or wings.

Cannot draw it.

(a) Angle 45°

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(b) Angle less than 5°

(c) Angle about 15°

In all three cases thing mounted well. (a) with angle 45° — apparatus rose about 25 or 30 feet and came down very soon — wobbling somewhat as it descended.

(b) With very small angle — (almost horizontal) — apparatus rose to a height less than 15 feet I think — but seemed to float like a feather in the air. Rotation continued for a long time — apparatus drifting with the wind nearly 100 yards before it came down.

(c) Rose to a greater height than 50 feet. This seems to be the best angle (of the three) for lifting purposes — and the rotation lasted for a much longer time than with Angle 45° — and for a less time than with smaller angle.

We shall repeat our rocket experiments — with three 4 or four wings instead of two. If experiments show that three wings will do then we will try three rockets. If not — then we will try four.

Our failure before I now see was due to having only two wings. The force developed by the rockets was so great as to smash the whole apparatus. It rose a little way and then tipped over — made a somersault — and dived head-long to the ground smashing everything. Four rockets will go up . Think three may also.

I am getting anxious about water supply at Point.

Have come to conclusion that cheapest way of getting water there is to lead it to Reservoir by means of V-shaped wooden trough.

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Also take it from the gulch where it exists in quantity and carry it to Point. Intermediate springs can be led in where desired. An open trench dig in the ground would cost a great deal and difficulties would exist at every gulch crossed.

The wooden V-shaped trough can cross the gullies on supports and be out of harm's way when freshets come. The material for the wooden trough from the gulch will cost less than (\$100.00) one hundred dollars — whereas the annual repairs to an open trench would probably exceed that amount — the labor and etc., required to put the trough up. Mr. McInnis estimates at only fifty dollars.

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An open trench alone would cost several hundreds of dollars. A pipe would involve the expense of a trench as well as the pipe. The only question about the V-shaped wooden trough is — will it stand the winter! I think it will. Running water will not be stopped by frost. Ice will form all round — so that the water will go on flowing through a tube of ice. However, the expense of the experiment is so slight — compared to other suggested schemes — that I feel warranted in trying it.

Have, therefore, given orders for the purchase of ten thousand feet of spruce boards at (\$8.00) eight dollars a thousand — ten dollars (\$10.00) delivered here.

If Mr. McInnis is smart we will have the trough completed before the Reservoir is ready.

The Reservoir will be 50 feet in diameter and 6 feet deep. This store of water should give us ample protection against fire — and also enable us to have water power sufficient to be utilized for electric lighting and other purposes.

The water from our spring has been running through a V-shaped board for two if not three years — WINTER as well as summer. Frost never interfered with the functions of

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the trough as a conductor for water. The trough is still as good as ever. We will try the experiment.

ITEMS

Two fox cubs have been caught on Beinn Bhreagh. The mother had made her den under one of the sluices or bridges for 6 passage of water on the Bras d'Or Road on our property.

One of the workmen at the Point saw the two cubs playing on the road like little kittens — and noticed that they retired beneath the sluice. He then quietly stopped up both ends of the sluice and went for assistance.

In the evening a crowd of men went there — and opened up the sluice. The cubs were caught alive — and the den was explored. In addition to the bones of rabbits and birds — were found the remains of my missing lamb! A four-nippled lamb — and the only female on the place having both parents and all four grandparents four-nippled!

Princess has given birth to a fine colt.

The Lake is encroaching upon the land on the Baddeck side of the Bay — to such an extent that portions of the road are now in danger. The banks have slid down into the water — and a whole grove of trees has toppled over to such an extent that they have had to be cut down. There are now no trees standing on the shore between Baddeck and the old Gaelic church.

The Presbyterians of Baddeck have been indulging in a “PINK TEA” — whatever that means! Money has been raised — or is being raised for a NANSE for Rev. Mr. McAougal, near the new church.

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Mr. Hall is no longer Principal of Academy — been succeeded by a young man, Mr. McKay.

Mr. Hall is still in Baddeck but I have not seen 7 him yet.

Mr. Hoppin is hoppin mad! Sorry to hear from Mr. Blanchard today that Mr. Hoppin is not at all well just now. Mr. Blanchard says he thinks there really is some germ of truth in the idea that gave us the word “lunatic” and that he has noticed poor Mr. Hoppin's moods change with the phases of the moon!

Mrs. Hoppin is in Baddeck too. Mr. Blanchard recommends that I defer my proposed call for a few days — so that Mr. Hoppin may have time to improve.

I went into Baddeck this evening, and called on quite a number of people. Mr. and Miss McCurdy and Miss Archibald and etc., George and Lucien showed me the toy horse made by George. A grand affair into which he goes — papered with pictures — and having a table and chair inside — and all sorts of conveniences.

Called on Mr. and Mrs. Blanchard and was introduced to Mr. Harry Hubbard Blanchard — a fine looking little fellow — apparently not more than a few weeks old.

Called on Dr. McKeen — Mrs. McKeen has just returned home bringing with her, her daughter, Mrs. Carry (?) and two little children. Saw Ethel for a moment. She was just going out to join Maud and Frank at some party at the Bras d'Or House.

Called on Miss Wyhoska and Miss Cain. Found them much pleased with the Middle River class which opened today with 17 girls!

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They report continued interest among all the girls. The whole country (juvenile) seemed to be excited last year over your sewing-school party — and the prizes received by the firlle.

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Lots of girls were in tears over the fact that they did not belong to the Sewing class, but they have done so now — and are working hard in the hope — that you will give another party this year — and that they may receive some of the prizes.

Good bye my darling — with love for Elsie and Daisy and my little Douglas.

Your loving husband, Alec. Mrs. A. G. Bell, 1331 Connecticut Avenue, Washington, D. C.