*(December 16th, 1935)*

# Bridging the Atlantic

By Hugh Duncan Grant.

President A. L. Bishop said:—As there is a little time before we go on the air I should like to take the opportunity to pay recognition to one of our esteemed members, which will take the form of a letter which I will read to him on your behalf.

Leslie L. Grabill, Esq.,
Canadian National Railways,
Toronto.

Dear Mr. Grabill,—

For the past sixteen years you have served diligently and efficiently as the Honorary Treasurer of the Canadian Club of Toronto.

It might also be said that a meeting of this Club, without your presence and your generous self-sacrificing services, would hardly be considered constitutional. From first to last this has been wholly a labor of love on your part.

But it is the feeling of the Club that we should no longer impose on your good nature and that the time has come to recognize your services. We would, therefore, show in a slight measure our appreciation of your long and faithful term of office by electing you to Honorary Life Membership in the Club.

This is the highest award in the giving of the Club, and carries with it the hearty approval of the Club membership.

It is with the greatest pleasure that this Gold certificate is presented to you for your distinguished services.

Yours Sincerely,
(Signed) A. L. BISHOP,
President.

And in receiving this honorary membership he joins this distinguished company: Sir Sandford Evans, Sir Oliver Mowat, Sir Gilbert Parker, W. A. Ogilvie, Sir Frederick Banting, Sir Robert Falconer, and Dr. Charles Best. Now his own name is on the list. Leslie L. Grabill.

The growth of the Canadian Club this year has been altogether satisfactory, and up to the hopes of your executive. Memberships come straggling in from day to day, but it is your Club and it is up to the members to see that their friends are enrolled. The objects of the Club are to maintain the unity of the individual parts of Canada, and the closely interwoven friendly relations of the Mother Country and the other Dominions of the Empire in one community and fellowship.

Today we have pleasure in having with us one who is distinguished in a field with which, fortunately or unfortunately, not many of us are well acquainted. I refer to meteorology. Hugh Duncan Grant served as chief Meteorologist to the Admiralty during the war, and his responsibility you can well imagine when I tell you that his was the job of keeping the Grand Fleet safe from the weather, warning them in advance of storms that might bring them into danger. He comes to talk of bridging the Atlantic, and this month has become peculiarly significant for several things. We have seen the Pacific spanned by the China Clippers and regular services are soon to be started on that route. We have seen a conference at Ottawa between Imperial Airways and the Dominion Government, with a view to extending a trans-Atlantic service across Canada and soon in New York there is to be another between Britain and America, with a view to establishing a regular service by the short route by means of sea-dromes.

In the lives of us all we can remember the days when the horse and buggy were the prime movers, and within thirty years we have seen the world contract and the factors of time and space completely changed. It gives me great pleasure, on your behalf, to welcome Mr. Grant, who will tell us more of these things.

MR. GRANT:—Mr. Chairman, members and guests of the Canadian Club. Allow me to say what a privilege it is



to be here today. This is my first visit to Toronto, and to have, on such an occasion, the opportunity so courteously tendered to me of speaking on the subject of trans-oceanic weather is a matter of great pleasure to me.

My subject is , "Bridging the Atlantic"—not a bridge for the puny footsteps of man, but one adjusted to the ever growing strides of the aeroplane. It is a story of the development of flight over land to a linking up of continents over an ocean of wind, waves and tide that in recent years has been steadily shrinking. And in proportion with that shrinkage the bonds of Empire are tightened, and there is found a happier expression in expansion of trade, and in self-defence, of that understanding, which is not only the birthright of the English-speaking peoples, but on which depends the peace of the world.

The greatest contribution, that aviation can render, is service in the cause of peace and not as a weapon of destruction. If an armament race comes—as come it will—there is no question that the focal point will be military aircraft. But today the world is engaged in something happier—in a race to expand trade by world air-routes. Aviation, properly handled in the hands of the English-speaking peoples of the world, working as they must in happy concert, will be one of the greatest factors for good that we of the present decade and century can pass on to humanity.

Before Sir Charles Kingsford Smith had flown the Atlantic, before Mount Everest was scaled, and before explorers had crossed the poles by air, we were accustomed to talk of distances in terms of miles and not time, but nowadays, I notice, we talk of so many days' travel by air, and the world's circumference does not seem so large as it did a few years ago. In fact the whole globe seems to be shrinking into something much smaller than we should expect a planetary body to be.

The efforts of aviators, meteorologists, aeronautical and maritime engineers are making the Atlantic and Pacific look very small. In recent weeks there have been discussions at Ottawa, and aviation history has been made at those discussions relating to air-port facilities for a trans-Atlantic air service. There have been difficulties in the

matter of route, and changes of route for seasonal reasons, and those difficulties can be boiled down to weather, which comes as part of man's inestimable heritage and condition. There have been great advances in weather science, and the service is not what it was a few years ago. It has made as great an advance as the aeroplane.

Let me tell a story that goes away back to the days when aeroplanes were called crates; when there was no radio, and the meteorological service was in a state of embryo; away back before the war. In the early days of flying a Scotsman and his wife decided they would like to fly. They went to an aerodrome and, as usual, there arose the question of cost. At last they spoke to a pilot, who said he would take them for a long flight for £5. That was out of the question, and they argued and argued, till at last he agreed to take them for a short flight for £1. He made it a condition, however, that neither of them should speak a word while they were in the air, and to this they agreed. They climbed into the crate and away they went. The pilot performed all the stunts in his repertory. He looped, side-slipped and rolled, but his passengers abided by their agreement and never said a word. At last they went down, and were just about to land when the Scot yelled out: "May I speak noo?" "You can," said the pilot, and the Scotsman said, "Weel, I want to tell ye that roond aboot that last turn Maggie fell oot!" Imagine anything like that today.

There is just another story I would like to tell you. Its about an Irishman whose performances brought him before the courts on a charge not of ordinary drunkenness, but rather, I would say, of super-intoxication. He pleaded not guilty, but the court asked him where he had bought his liquor. "I didn't buy it," he answered. "A Scotchman gave it to me." "A Scotchman gave it to you," exclaimed the Judge. "Thirty days for perjury."

But to get back to my subject. Within the past thirty years aviation has made tremendous strides, and meteorology has endeavored to keep abreast of the progress. With the development of the science the demands upon it have grown. Some of these are serious, some are not serious, and some are definitely romantic. In the last category must



be placed this one. In the early hours of a dull January morning the telephone bell rang in the weather bureau, and a sweet voice, speaking long distance from Denver, asked what sort of weather it would be on the 21st of June. It was quite a large order, but in the eagerness of the voice the forecaster scented romance. He recovered his equilibrium and replied politely, "Dear lady, the weather will be beautiful." Naturally he didn't really know, but he realized that even if it were a bad day the lady would have had six months of joyous anticipation, and he felt, moreover, that when the 21st of June did come, she would not mind what the weather was like.

It was possibly the same sort of feeling that led Ruskin to say that there was no such thing as bad weather. "Sunshine," he wrote, "Is delicious, rain is refreshing, wind is bracing, snow is exhilarating. There is no kind of bad weather, just four kinds of good weather." Mark Twain was not quite so enthusiastic. He said that everybody seemed to be complaining about the weather and nobody doing anything about it. But if Mark Twain were alive today and could see a few of the measures that are being taken for the aviator, I am convinced he would not let that statement stand. Storm protection has come to be a science, and the storm protector is the meteorologist. In seeking to make the airways over land and over the Atlantic and Pacific safe for aviators, the twin sciences of aviation and meteorology have got together in a manner that is without parallel in the history of kindred sciences.

After each performance in the air people are asking the question, "what part had the weather in, say, a flight over the Atlantic; and if it could have taken place with equal facility in the opposite direction? What is the weather handicap imposed today on modern aeronautics? Is it being restricted by the concentrated efforts of aviation and meteorological research?"

It is true today that in all parts of the world there are two main sources of danger. The first is inherent in the aeroplane itself, and the second is in its behaviour under differing weather conditions. As time goes on, the first source of danger will diminish to zero, for each year shows

improvement in the performance of aircraft, but there is no hope of controlling the weather. The forces of nature are too great to be fettered, and the only hope is in the increase in the scope of meteorological data. The standards of meteorological data will be improved, when some sort of Esperanto is devised for world-wide reporting of weather phenomena. When this comes about the accuracy of weather forecasts will increase considerably.

The question is often asked, "What about the Ocean? How can trans-Atlantic flying be made reasonably safe and commercially possible?" Great developments have taken place in the Pacific, in the air line to China. Clippers flying at intervals of 1200 or 1300 miles, have crossed the Pacific and returned safely—a great triumph indeed for aeronautics. This question of ocean routes and weather is of unusual importance, for of the inhabited surface of the earth, fifteen per cent. is land and the balance water, and the speeding up of traffic over this eighty-five per cent. of water must have a great influence on trade. One of the foremost economic necessities of the day is a trans-Atlantic air mail service, and it can readily be seen that such a service, uniting two hundred millions in the West with three hundred millions in the East, in Europe, must ultimately double, if not treble, certain aspects of international trade.

Up till a little while ago the aeroplane seemed to be encountering difficulties, and the opinion was expressed that the solution lay in super-sized aeroplanes, flying at great speed and altitude. That is quite feasible for, in the stratosphere, planes would not be subject to the weather hazard as they are, flying at lower levels, across the north Atlantic. Hops across the Pacific are between natural islands and so do not present the same obstacles. The difficulties of the Atlantic will at once be obvious. There are three possible routes. The southern, via the Azores and Bermuda is the longest by far, but at certain seasons of the year it is the most suitable. The shorter, between Newfoundland and the south of Ireland, sometimes becomes the longest on account of the weather. It is only 1900 miles from Cape Race to the south of Ireland, and though the southern route has the advantage of weather, it is the longest water hop



by at least 200 miles. There, however, one is out of the low temperature area and well out of iceberg range, but it is 4,000 miles to London, twice the distance of the Newfoundland-Ireland route. If the Clippers can fly a route 6330 miles long in the Pacific, it should be practical to fly the Azores route. There is no doubt that it will be practical, but on the other hand Pacific weather and weather on this particular route are not strictly comparable. There are huge areas of doldrums in the Pacific which are not exactly duplicated in the Atlantic, but on the other hand, certain average conditions existing have been to some extent duplicated in the Pacific, and there is every reason to believe that the performances of the China Clippers can be duplicated in the Atlantic.

On the other hand the shortest route, linking up Great Britain across Canada with the Orient, is that across the north Atlantic, and this is practical, except for a very few winter months. One finds fog, of course, and there is at times a tendency to the formation of ice on the wings of a plane. But devices have been introduced to minimize this form of weather hazard. The Goodyear Company has brought out a rubber device, which breathes and cracks the ice and throws it off. There is another invention which allows the exhaust gases to flow over the wings and prevent ice from forming, and there is still another method on the market in the form of a gelatin. You can see, therefore, that the ice problem is being gradually reduced, and soon an aeroplane without an ice preventive will be like a ship without boilers.

Fog, of course, is a tremendous hazard, because it imposes a terrific strain on the pilot. One pilot who flew from Orchard, Mass., to Ireland said he had fog by day and clouds by night so that he never saw any sky, stars or sun, and the result was blind flying. But blind flying is not practical, and the fog hazard has been greatly reduced by the introduction of the Radio beam. All the pilot has to do to be safe is to fly along the beam.

Then there is the gyro-pilot which is almost infallible and which nowadays is coming into standard use. So that you can well see that, in the matter of fog and ice hazards,

north Atlantic flying over the direct route has made great progress, rendering the route more practical, so that it is only a matter of time before this route will be available and open for traffic all the year round for flight between Europe and America. When this time comes, in fact even now, Canada offers a tremendous field for linking up the world and the Empire. There is a third route via Greenland, but it has the disadvantage of a very distinct weather hazard, It is the shortest route, but it offers little prospect because it is one of the world's storm centres.

We are developing a new era in which the application of world weather science comes in in a new way, and mountains and deserts will no longer offer obstacles to transportation. Man is restless and inquisitive, and in the old days what more gallant adventure could be found than to pit himself against the terror and mystery of the sea. That element has now been conquered, and now, in the air, man seeks to disarm the tempest, and convert the headwinds to a propelling force. Ovid said, "let them close up the passages of earth and Sea. The heavens are open." It is there that we shall pass, and man is very close to that conquest of the air, which has been the dream of the human race for centuries.

Thanking the speaker, Colonel Bishop said: Mr. Grant, we are deeply indebted to you for the most charmingly given and thought-provoking address which you have delivered today. The possibilities which you open up are really quite terrifying to some of us who don't get so close to air travel, as those of the older world. But with the *élan* and vivacity with which the people of the new world do things, once they start, we can safely say that, when these events you forecast come into being, the people of North America will not disappoint you. It gives me great pleasure to convey to you a hearty vote of thanks.