

## The Economic Club of New York

1. Brigadier- General The Right Honorable Lord Thomson  
Former Secretary of State for Air of Great Britain.
2. Major General Mason M. Patrick  
Chief of the Air Service of the  
United States Army at Washington
3. Commander Kenneth Whiting, United States Navy
4. The Honorable Will H. Hays  
President of the Motion Picture Producers  
and Distributors of America
5. Charles L. Lawrance  
Vice-President, Wright Aeronautical Corporation  
President of the Aeronautical Chamber of Commerce
6. Captain George W. Steele, Jr., United States Navy

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Table of Contents

The Right Honorable Lord Thomson.....2

Major General Mason M. Patrick .....11

The Honorable Commander Kenneth Whiting, U.S.N. ....17

The Honorable Will H. Hays .....20

Charles L. Lawrance .....31

Captain George W. Steele, Jr. U.S.N. ....35

Aerial Navigation - Its Commercial Development and Possibilities

Mr. Elliott: Members of the Economic Club, tonight your Executive Committee is very fortunate in being able to present to you the most experienced men in the country to discuss aerial navigation, its commercial development and possibilities.

One hundred years ago railways, with steam or electric power, were non-existent. The steam engine was hardly born. Transportation through the air is far more advanced today than was transportation on either land or sea by steam 100 years ago.

On June 5<sup>th</sup>, 1783, the Montgolfier Brothers in France had a paper balloon filled with smoke and heated air that amazed the spectators by rising 1,000 feet. Compare that with the zeppelins of today. In 1891, Samuel Pierpont Langley proved that it was possible to sustain a heavier-than-air machine, and in October, 1898 he attempted to fly his machine over the Potomac River, but failed. He was laughed at, but the same machine did fly in 1913 and 1914.

Meanwhile, Wilbur and Orville Wright were experimenting, and in December 1903, they had a plane with a light motor, which flew from 12 to 59 seconds, and in September, 1905 a flight of 11 miles was made. To Langley and the Wright Brothers belong the honors of being pioneers in aviation in this country.

In 30 years wonderful progress has been made. What will be the development in the next 10, 30, 100 years, and what will be the influence on the civilized world? Our first speaker is Brigadier-General The Rt. Hon. Lord Thomson, Former Secretary of State for Air, of Great Britain. He has had an active career as a soldier in the Boer War, the Balkan War, and in the Great War, and was in active service up to the occupation of Jerusalem. He was the British Military Representative at the Supreme War Council at Versailles, and remained there until peace negotiations were ended. Since then he has been in political life and was recently Secretary of State for Air in the Ramsay McDonald Cabinet. I take great pleasure in introducing Lord Thomson. (Applause)

The Right Honorable Lord Thomson

Mr. President, and Gentlemen, I thank you very much for your kind reception. It is an old saying that a prophet is not without honor save in his own country. Well, I don't know how true that is, but I must confess that I find it easier to prophesy the future of aerial navigation in any country but my own. (Laughter). And indeed, if I had to choose a country where I could let my imagination run riot in regard to aerial navigation, I think I should choose the United States. It is the country of opportunity, and the country with a great opportunity. You have vast spaces; you have great industrial activities; you have keen enterprising, skillful and courageous men. What the future holds for the United States in regard to aerial navigation only the most imaginative mind can predict. I leave that task to others.

Tonight I wish to talk to you about what has been done in my own country. I will begin by

telling you how we organized aviation at home across the water. Everything aerial is under one man. We tried other methods in the war, and in the stern test of war we were forced, before it ended to concentrate all military, naval, and air force activities under one directing head. And now, and indeed, almost immediately after the war, we found it necessary to even put, to a certain extent, commercial aviation under the Secretary for Air. The reason for that was fairly obvious. My country, as most of you know, is somewhat limited in extent. We also have got a very excellent railways system, the directors of which do not sit pretty, as I understand you to say over here. (Laughter). It is so easy to make the 600-mile journey overnight in England that very few people travel by air between our great cities. That is all very well for the traveler, but it is very disappointing for the Air Ministry. We had to go outside our shores for the development of...we had, in other words, to cross some sea or another to really develop commercial aviation in Great Britain. We tried a good deal with Ireland, but Ireland is one of the worst countries for landing ground that has ever been made, (Laughter), and we had to subsidize. We subsidized almost from the end of the war. There were various arguments in favor of that. It was not only kindness of heart to the manufacturers, but the manufacturers who make our military and naval planes have got to be kept going, and I will come back to this later on in my remarks as to the other advantages of having an aircraft industry.

Now, these four companies that we subsidized, beginning, I think, with 1920, after one year of seeing the breakdown of commercial aviation in England without a subsidy, we amalgamated these four companies with the approval of the government rather more than a year ago, and we

are paying as a government one million Sterling to this company for a period of ten years, and the company is to repay that money out of the profits, if it ever makes any.

Now, I would like to draw your attention to some very encouraging facts and figures in connection with these small efforts at civil aviation. I have got figures here beginning in May, 1919, and ending in September, 1924, and every period that I give you in this connection will be a 12-month period, except the last one, which is only 6 months. In the first 12 months of commercial aviation in England, the number of passengers carried on flights to Paris, Cologne, Berlin, Amsterdam and Brussels, was 1,155, and the tons of cargo carried were only 46. In the next year that figure was multiplied five-fold for passengers, and threefold for cargo. In the next year, there was a slight setback, but in the third year again a very big rise. In the six months which have just ended, namely, the six months which ended in September of last year, the only months for which we have got records, we carried more in six months, both in the way of passengers and cargo, than we carried in the biggest 12-months heretofore. In other words, we were carrying something like three tons of cargo a day by airmail into England, and we found that cargo was becoming an increasingly profitable proposition, because the dressmakers in Paris, and the glass makers in Europe, used to send fragile goods by aeroplane for two reasons: One was that they got quicker to England, and the other one was that there was less pilferage en route (Laughter), and a thing that will surprise you was that the insurance rates were lower by air than they were by other routes. During the four years that these subsidized companies have been in existence, 3,350,000 miles have been flown by civil machines, that excludes joyrides

altogether, and during that period there have been 6 people killed, and 5 injured in fatal accidents.

I am aware that there are railway magnates here tonight. I would like them to bear in mind those figures – 3,350,000 miles flown, 6 people killed and 5 injured in 3 accidents. In justice I must point out that that last fatal accident which occurred while I was on the high seas is not included in the figures which, as I already stated, terminated on September 30<sup>th</sup>, 1924. But these are flattering and encouraging facts and figures. Of course, we have got a great deal more to do, especially we British, and at this present moment, there are under construction in England, two giant airships. They will be rather more than twice the size of any airship yet constructed. Our reasons for making them so big are to enable us to use the very strongest material in the girders. It is also stated by those in a position to know, that the bigger the ship the smaller the overhead charge.

I was warned when I took up this airship business that the big shipping companies would oppose me, and I approached them artfully, as an old diplomat. I got around them at dinner parties and various other places before I actually made a proposition. What our shipping magnates say is this: “We don’t care a bit what sort of ship it is. Our business is transportation, and if the Air Ministry will produce the specification for an air-worthy machine, and air-worthy airship in which it will be safe to travel, then we are just as pleased to build airships as we have been to build steamships in the past.” That is the proposition from the shippers’ point of view, and it

seems to me an eminently reasonable one.

We propose to use one of these large airships for a variety of experiments. We have also got three other airships being reconditioned with the same idea. The other giant airship will be for purely commercial purposes. It will carry 100 passengers in at least equal comfort to that enjoyed in a train crossing the continent. It will carry large quantities of luggage. It will have a lift of 155 tons. It will have a cruising speed of from 60 to 70 miles an hour under normal conditions, and it will go first to India by way of Egypt, and later on to the Antipodes and Australia.

We regard the airship in England as not the rival or competitor of the aeroplane, but as its complement, and I hope to see in the course of the next two or three years air links with the Antipodes, with Australia and New Zealand, which will be partly airship and partly aeroplane, throughout that immense distance of 12,000 miles. Already we have very big links in that system, one in Australia of 1,200 miles in length, shortly to be increased to 2,100 miles; another between Singapore and Batavia. We are subsidizing all these routes as far as we can, but the man, who corresponds to the Secretary of the Treasury out here, has got a heart of flint, as a rule, in England (Laughter), and there are some difficulties.

I am not going to weary you with many more details, but, of course, aviation has got to be improved in many ways. There are two ways in which it will have to be improved. We will have to provide for night flying to make aviation a paying proposition, and in my country, for flying



through fog also will be a very necessary provision. After that we have got to get people accustomed to flying. The pilot must no longer be a hero of romance, nor must the traveler by air think he or she is undertaking a great adventure. Commercial aviation will never go until people get into an aeroplane like they get into the subway now (Laughter), and you have no idea how safe it is.

I am described by my airmen at home as a good passenger. The other day when we were flying over Arabia, I was in the leading machine up at the Turkish frontier, and the flying wire in the machine snapped, and the lad who was piloting the way, we were then together in the upper air, fired off his pistol, turned around, and the other machines followed us back. I asked him what had happened, passed up a note, and he passed a note to me to state what the accident had been and I replied, "Supposing I were a bomb, would you return?" And he said, "No, I don't think I would." Well, I guess a bomb weighs more than I do, so I said to him, "You know, really, as a good military airman you ought to have more respect for a well-made bomb than you do for a talking politician." But he took me back and treated me with more respect than, perhaps, he should have.

Speaking as an old soldier, and in the presence of a very distinguished American soldier, there is just one point I want to bring out about commercial aviation. I feel quite certain that you will never have an efficient air force in any country unless behind it there is a large commercial aviation service. We British have always had big fleets. Some people say far too big fleets, but

where would our fleets have been if it had not been for the fact that behind them was the merchant marine, the Royal Navy Volunteer Reserve, the men and the ships which came to our rescue for every sort of purpose in time of war? Our strength as a maritime power has been built up on what might be called the habit of the sea in our population. Now, as I understand it, any country which wishes to keep its pace in the van of progress will have to get the habit of the air, and I should be very sorry to be Air Minister in ten years time if there was a war in Europe if, behind the air force that was being directed by the Air Staff in London, there was not a commercial aviation services whereby one could, in various concentrated centers, find pilots, factories for machines, reserves of mechanics, and all those human and material factors which go to make up a reserve. No central Air Force, however costly, however well organized, could possibly cope with the situation which will arise in Europe if there is a European War, because the air will be the first line of defense, and the first line of attack in all countries. You might survive the first three weeks, but it will be on those reserves inside of your country, on the factories, on the civilian population, that will depend whether you will survive the first six months, and victory in the air is largely dependent on the existence of a commercial air service behind a military air service.

The other point about commercial aviation to which I wish to draw your attention is that it does correspond to that growing desire for speed in communications which is characteristic of our age. I prophecy, and I know how foolish it is to prophecy, but prophecy that within ten years people in a hurry in your country and mine will cross the Atlantic in airships regularly. We have

already got a regular clientele who fly and go no other way, as a rule, to France, Cologne, Berlin, Amsterdam and Brussels. I foresee that people in a hurry, once they realize how safe these ships can be made, and how comfortable they will be, I believe they will go by no other route. There is the picture that I have got, and I believe that in your country, gentlemen, you will find that you are about as out of date as if you were in a hansom cab, if you travel by one of Mr. Elliott's trains to San Francisco. (Laughter and applause)

Now in conclusion, I am reminded, and I wanted to meet them ever since I got over, of the great performance by some American airmen last year. I remember at the time people were saying in London, "What is the good of these world flights?" They may have been talking like that because, after all, our fellow has failed in his attempt. He made a gallant try, and every airman knows how difficult it is, but my answer always was that people attempt things like the round-the-world flight just as artists make pictures, or writers make books. It is because they have got to do it, it is because of something in their blood which does not depend on gain or profit. It is that sort of enterprise which is really the foundation of your present prosperity, and, in a way, of my own countries. But these deeds, such as those young fellows performed, flying around the world, are of practical and material benefit probably very little, but deeds of that description are like lamps which light the way for others. I personally was more delighted to meet these young fellows than I was at almost any public banquet I attended during my term of office. I remember their arriving, rather reluctantly, at the Savoy Hotel in London. They wanted to stay with their machines. How well we understood. However, we got half of them up, and word was passed

around during dinner that the Prince of Wales was in the Savoy Hotel, and these lads wanted to be introduced to him. I believe they have been extremely discreet about it, as they would be, being good sportsmen, because, as I say, the dinner was in the Savoy Hotel and the Prince of Wales was not at the Savoy on official duty that night. (Laughter) However, they had their little talk and it really was very interesting to be with these young fellows. Personally, as one who has to make public speeches very often, I envied the fate of an airman who is more than three-quarters the way around the world when he gets up to make a public speech. He only had to stand up and he got an ovation which lasted five minutes. Then he said, "Mr. Chairman," frantic cheers lasting another three minutes. Then he said, "Ladies and Gentlemen" – a delirium of applause – public speaking made quite easy. (Laughter)

Well, I was there to talk and I told that audience what I believed every sportsman and sportswoman in the room believed, that they had watched these great performances of theirs not with envy, but with profound respect; that there was not a trace of envy about it, only pride, pride in the performance of people with such names, and their success in what should and must be our common effort as English-speaking peoples; their success in so far achieving the conquest of the air, because I feel deeply how much America and Great Britain can cooperate. I believe this, gentlemen, that on us depends the future of this sort of transportation. I believe we, on our side, can link up the old country with Australia and New Zealand. That is half way around. And I believe we can leave with absolute confidence the rest to you.

There is no spirit of envy, only one of emulation, in my country with regard to aviation. What we say to you is this: Let us cooperate in this great cause. Let us work together. If we do that, between us we will put a girdle around the earth.

I thank you very much for your kind attention. (Applause)

Mr. Elliott: Our next speaker, Major General Mason M. Patrick, has spent his life in the service of his country, a distinguished engineer, filling positions of importance prior to the great war, and in that great war Chief of the Air Service of the A.E.F., with headquarters in Paris, and now Chief of the Air Service of the United States Army at Washington. At the youthful age of 60 he qualified as an air pilot, and Secretary of War Weeks, in speaking of that, said, "We used to hear that a man more than thirty years of age should not attempt flying, but General Patrick has won his wings at twice that age. This fact, his genius as an engineer and his experience as Chief of the Air Service of the A.E.F. have made his service during the past three years popular amongst the men and a great aid to the cause of aviation."

It is an honor to present to you Major General Mason M. Patrick. (Applause)

Major General Mason M. Patrick

Mr. President and Gentlemen: It is a fascinating subject this, the possibilities of commercial air transportation. When we try to gain an idea of just what it means, just what this method, this new

method of travel, of carrying passengers, carrying mail and express matter in flight, what it all means, we might contrast it with the somewhat parallel development of automobile traffic.

Apparently, more than any other one man, Daimler invented the automobile. In March, 1887, he operated the first gasoline-propelled motor vehicle. That was just about 38 years ago. In December, 1903, the Wrights made their first successful flight in an aeroplane. That was just 21 years ago. In 1892 Henry Ford brought out his first motor car. But in 1906, 20 years after Daimler's automobile, appeared the single cylinder, one lung Cadillac, which was quite a remarkable car. Twenty years after the Wrights made their first flight, we had built an aeroplane powered with motors delivering 2400 horsepower, capable of lifting, in addition to its own weight, some 15,000 pounds, and of carrying it through the air at a rate of about 80 miles an hour and in lighter machines men had gone more than 260 miles an hour. The automobile had just 17 years start on the aeroplane.

As Lord Thomson has said, it would be a rash prophet who could predict what the next 17 years will bring forth. But, certainly, if we compare the progress made by each of these methods of transportation during their first 20 years, we can expect and hope that aircraft will be used more and more, and there will be many improvements on the machines that we use today.

Now, as Lord Thomson has said, it is a matter of common knowledge, that in Europe you can go almost anywhere by aeroplane. There are regular air transportation companies; they have their timetables and tariffs as do our railroads. In the last five years all of the air transportation

companies in Europe have flown about 28,000,000 miles. They have carried a great many over 100,000 passengers, and they have carried millions of tons of freight and mail. Yet, in this country today, there is not a single air transportation company in operation. And this, in spite of the fact that the majority of the passengers on the European airlines are Americans, and of the further fact that here our greater distances make air transportation more feasible and much more advantageous. We wonder then just why the contrast, and the reasons are not very far to seek.

Of course, conditions are different in Europe than those which we find here. Take, for example, the journey from London to Paris when made by ordinary methods of transportation. First, there is the railroad to the Channel port; off the train, on the boat, the Channel crossing, and not always an unalloyed pleasure; then another train to the French capitol. Contrast that with the comparable journey in this country, say from New York to Washington, or from Boston to Washington. We make it so easily by train, with no changes, so quickly, that it is scarcely probable to my mind that excepting in an emergency there will be very many who will want to make that trip by air. This is especially true because the landing fields are so located that it takes you an hour or an hour and a half to get from the center of the city to the starting flying field, and it takes about half an hour from the terminal landing field in Washington to the center of that city.

I don't think there will ever be any great demand for air mail between Boston, New York and Washington, but when it comes to longer distances, then the gain is so great that it is easy to

understand the advantages of air travel. It is faster, and the probabilities are that under proper regulation it will be brought into being. You know that the air mail has already brought New York and San Francisco within about 32 hours of each other, saving at last two whole days in the delivery of mail between these termini, and every day saved really counts. For example, the exchange of interest-bearing paper between New York and Chicago averages daily \$9,000,000. Take the cities of Chicago, Detroit, Cleveland, New York, Philadelphia, Baltimore and Washington, and this exchange amounts daily to an average of about \$35,000,000. The interest on that sum for every day saved in transit, we can very readily calculate.

Then again there is the fear of accidents. Lord Thomson has touched on that. We find from the records that the regular air transportation companies in Europe, properly regulated, properly supervised, have had one passenger fatality for about every 2,663,000 passenger miles. Prior to 1913 in this country there was a passenger casualty on our railroads for about every two million passenger miles. So that, as a matter of fact, air travel, when properly supervised and regulated, is about 25 percent safer today than railroad travel was in this country about 10 to 13 years ago.

Lord Thomson has also given, however, probably the most potent reason why we have no air transportation company in being here. As he said, in Europe, they are subsidizing. The governments there, having a keener realization, possibly, than we, of the military and economic advantages of developing air transportation, simply guarantee their companies against loss. Here we do and have nothing of the kind. We have not aided them in any ways. We have not



attempted to regulate or supervise them in any way, and yet, as I pointed out many times, there is not a method of transportation that we know that has not been subsidized, directly or indirectly.

There were immense land grants to railroads; the government dredges harbors and rivers, which is nothing, if not profitable, to water borne traffic, and the states of the nation are spending hundreds of millions of dollars in order to make truck and automobile transportation better.

These are indirect subsidies of these different methods of transportation.

Personally, I believe thoroughly that we should give government aid to our own air transportation companies. I advocate a direct subsidy, as do the English and French. If we cannot do that, then aid them indirectly, by marking out landing ways, air ways, and the fitting out of the landing fields and the facilities.

Then there must be a measure of insurance, and at reasonable rates, and above all things, there must be government regulation and government supervision. Now, again, I hark to one of Lord Thomson's points. We of the military force are intensely interested in this development of commercial air transportation, and precisely for the reason that he gives. We will never have large standing army. We will never have a large air force and we must look to commercial air transportation as a reservoir for trained pilots and machines if we are ever so unfortunate as to be engaged in another war. All of those who have actually studied the matter have come to the conclusion that it is not too much to say that not alone our national safety, but possibly our economic independence, our ability to compete on equal terms with others in the markets of the

world depends upon the development and use of aircraft. To bring this about we must have wise and carefully thought out legislation; that can be secured only by an intelligent public demand for it. Our people must be made to realize its actual importance, and then it seems to me the duty of every good citizen, of every man who has the welfare of this country at heart, to do everything possible to hasten the coming of this era of air transportation. I thank you. (Applause)

Mr. Elliott: Gentlemen, when we planned this dinner, Rear Admiral William A. Moffett, Chief of the Naval Bureau of Aeronautics, was expected to be with us. He was prevented at the last moment, and while we are very sorry to miss him, we are lucky in having a substitute, Commander Kenneth Whiting. He is one of the few men in the world who voluntarily had himself shot out of a submerged torpedo. Finding that experience successful he turned to the air, and had a training under the Wright Brothers, and here again he was the first aviator to be shot from a catapult on the ship "North Carolina." So he is a very brave and hardy man. He has served with effectiveness and distinction in the Great War. He organized the bombing squadron that patrolled the North Sea. After the Armistice he was in charge of the aviation part of the building of the Langley, the aeroplane carrier, and was its executive officer until September, 1924. Today he is in charge of the aviation construction of the new aircraft now being built by the United States. I am very glad indeed to present Commander Kenneth Whiting, one of the foremost aviators of the country. (Applause)

The Honorable Commander Kenneth Whiting, U.S.N.

Mr. Chairman and Members of the Economic Club: I would like to express Admiral Moffett's regrets at being unable to address you tonight. He was taken with a sudden cold and yesterday at noon detailed me to take his place. Speaking is not in my line, but I am in the military service, so I came along. (Laughter). The subject is commercial aviation, and I will try to tell you the Navy's part in commercial aviation.

We have two ways in which we assist commercial aviation. First in the development of the personnel which may be used commercially after serving for a short time in the Navy. During the war we trained 3,000 pilots, and I will say we had the cream of the country in Naval Aviation. We trained 15,000 mechanics. Practically all of those have returned to civil life. In peace times our turnover in four years was about 80 percent, or about 20 percent each year. So that each year we feed back into the country 600 well trained aviator mechanics. In addition to that, we train reserve pilots for Naval Aviation. These, I regret to say, are in very much smaller numbers because of the amount of the appropriation which Congress gives us for that purpose. The number trained is approximately 50 per year. So much for the personnel.

As far as the material goes, we are attempting to develop planes that may be operated from ships, wherever they may be, and we run into many difficulties in doing that. Some of the devices that we have developed for the purpose of launching planes from ships and permitting them to fly back to ships will have in the future a great value to commercial aviation. As General Patrick

pointed out, it is desirable to have your commercial air fields close to the heart of the city; that is difficult today because the cities grew up without the idea of having aviation.

It can be done by applying the retarding gear and the catapult. The catapult is a development that has been taken up by the Navy. There is nothing original about it. Xerxes used it for throwing rock at his enemy. Langley used it in his first attempt to fly. The Wright Brothers used it before wheels came in, and we have used it before ships since 1912. It was first developed for using compressed air, and it is merely a gear upon which a plane rests and is given flying speed at the end of a run of about 60 feet. In 60 feet we can give it a speed of 60 miles an hour. That subjects the plane to excessive strain, perhaps, but the run, as far as commercial aviation is concerned, can be increased to 100 feet, and you can be assured that planes to the weight of 10,000 pounds and more can be given flying speed in a run of about 100 feet to 150 feet, without subjecting them, or their personnel to any additional strains.

The retarding gear is a device we use on board ships when planes return and have to be brought to rest in a very short space. A 2,000 pound plane traveling at 60 miles an hour represents 250,000 foot pounds of energy, and we have successfully brought that to rest in a distance of 100 feet. A 10,000 pound plane represents a million and a half foot pounds of energy. We have not quite gotten that high, but we are up to 8,000 pounds now, and we have stopped that in 100 feet. That development is partly American, partly French, partly British. The British did it before we did it, although the first plane to alight upon wires was in this country in 1912, alighting on a

wire platform. It came to rest very suddenly at the end of the run.

This describes the retarding gear in a general way, so that you may understand. After this I am going to read a paper that was written three years ago by one of the leading aviators in the United States Navy who, unfortunately was killed in an accident shortly after he wrote this paper.

Lieutenant-Commander Godfrey Chevallier, one of the pioneers of Naval Aviation.

The retarding gear is a device which has wires running along the deck and which are held above the deck by what we call a fiddle bridge, for want of a better name, a fiddle bridge having the same function as the fiddle bridge on a violin, holding the wires off the deck. In addition to the longitudinal wires there are devices for applying friction to the plane after she has engaged the wires. I won't go into a detailed description of that, because that development is secret. It will become public just as soon as there is a demand for its use in public. At present the British have a similar device. They not only treat that device as secret, but the ships upon which they are installed are treated as secret ships, and even their designers who designed the planes are not permitted to board the British ships. We permit people to board our ships, but we very carefully cover up the retarding gear with canvas.

The longitudinal wires engage the hooks on the axles which, once the wheel touches the deck, assure the plane traveling along parallel to the deck, locking her to the deck, and making her part of the ship. The additional means of applying friction simply bring her to rest in a short distance.

That has a direct application to commercial aviation, as you will see, in listening to this paper. As I say, this paper was written three years ago, and some of the devices that are mentioned in here have already been perfected, some by the Army Air Service, and some by ourselves.

(Commander Whiting then read paper by Lieutenant-Commander Godfrey de C. Chevallier).

Mr. Elliott: I want to introduce to you now a gentleman from Indiana (Laughter and Applause). He hardly needs an introduction to a New York audience. Some of my Democratic friends probably know that he conducted a campaign a few years ago and rolled up a wonderful majority for the lamented and beloved Harding. He was Postmaster-General under Mr. Harding and vitally interested in the transportation of mail by air. He gave up that position and is now President of the Motion Picture Producers and Distributors of America. Whatever he does, he does well, and efficiently, and one of his sayings is, "Let's Go." I take pleasure in introducing the Honorable Will H. Hays. (Applause)

The Honorable Will H. Hays

Mr. Toastmaster and Friends: I offer my felicitations to the aristocracy of intellect and substance that makes the Economic Club of New York, and my compliments to Lord Thomson and to General Patrick, whom I see here, and to the other guests. The interest in the subject matter is a very hopeful indicator.

There has been very much done and very much undone in aviation in America since the Wright Brothers made their contribution to civilization on the sand dunes at Kitty Hawk, North Carolina, 21 years ago last month.

What has been done –

The first frail craft flew a few yards, a few feet high, at 40 miles an hour. Now, improved principally by American engineers, great planes mount five miles, speed 260 miles an hour, lift ten tons and have remained in the air nearly thirty-six hours.

From the bicycle shop in which the Wright Brothers first worked there was developed under the incentive of war a vast industry, the like of which in short time of creation, perplexity of task and actual accomplishment has never been equalled. (Applause) Starting with practically nothing, during the eighteen months we were at war we produced nearly 14,000 airplanes and nearly 42,000 engines. It was one of the greatest industrial achievements of all time. At the time of the Armistice a capital investment of \$100,000,000 was represented. Including the spruce forces 250,000 operatives were employed.

Training had been given to some 17,000 pilots and many magnificent flying fields created, in addition to the enormous stocks of airplanes and engines produced and on hand. The industry on the basis of an 8-hour day was producing planes at the rate of 12,000 a year and engines at the rate of 24,000 a year.

Engineers of the American aircraft industry deliberately set about capturing or establishing world records through refinement of design and introduction of new ideas, so that there were brought to the United States some 42 of the 50 or so world records including speed, altitude and endurance. An American plane, powered with American engines, was the first to fly the Atlantic. American built planes and engines penetrated into the Alaskan wilderness at a time when such an overland flight was a marvel of ground organization and daring in the air. An American built plane and engine spanned the continent from dawn to dusk, flying at a speed averaging 160 miles an hour.

American engineers and American mechanics designed and constructed the Shenandoah, demonstrating that the rigid aircraft monopoly which had been held by Germany was broken.

Americans with equipment completely American were the first to circumnavigate the globe. Nothing has been finer than this achievement, aided by the splendid sportsmanship of the English in cooperating to make the flight a success. (Applause)

First among all nations the United States established air mail. It is the most convincing demonstration of the value of the airplane as a useful instrument in peaceful commerce. It is a complete refutation of the belief, and this belief is one of the worst enemies of aviation, that the airplane is solely or even primarily an instrument of destruction.



From New York to San Francisco mail planes operate day and night in an average of 32 hours. In the last six months of its operation upon a tariff basis it has returned nearly \$320,000 to the Treasury. The United States Air Mail Service is the longest regularly operated aerial activity in the world. The transcontinental line is the longest airway in the world. The night-lighted sections now functioning between Rock Springs, Wyoming, and Cleveland, Ohio, and which will shortly function between Cleveland and New York, constitute the only night-lighted airway in the world, with its 500,000,000 candle power beacons every two hundred and fifty miles casting their beams 150 miles into the night, with 5,000,000 candle power flashing lights every 3 miles. The success of the air mail from an operating standpoint from July 1, 1924, when the regular day and night service was established, may be summed up in the statement that traveling at three times as great a speed as the average first-class train, the mail planes are approximately as efficient in their regularity of operation.

During the last calendar year the air mail planes flew more than 2,000,000 miles and carried more than 34,000,000 letters with a record of safety so impressive that insurance companies have granted patrons of air mail rates upon a parity with older transportation. Bankers are the heaviest patrons, saying that it saves them millions of dollars. We use it ourselves, picture companies save money by paying as high as \$338 for one package.

If legislation now pending in Congress is passed authorizing civil aviation and granting the Postmaster General authority to establish air mail routes, I am advised he will immediately

designate New York and San Francisco, will extend the eastern terminus from New York to Boston, will establish a loop service between Chicago and Omaha by way of Kansas City, St. Louis, and St. Joseph, and will divide the western end at Salt Lake City and Elko, Nevada, where one branch will run southeast from Salt Lake City to Los Angeles and the other branch will run northwest from Elko to Portland, Tacoma and Seattle. In this way at least 10,000,000 more people will be added to the millions now directly served. All this is a most distinguished accomplishment. Too much credit cannot be given to Postmaster General New and Colonel Paul Henderson.

What has been undone -

Today the aircraft industry as such in America has almost disappeared. Of the \$100,000,000 invested in aircraft plants at the time of the Armistice certainly not one-tenth remains. This industry, through which we had achieved world leadership in aeronautical engineering as visualized in world records and such performances as the Round-the-World-Flight, is near collapse.

A year ago there were in existence not more than twenty aircraft and engine plants, employing a total of not more than 2,000 operatives. Facilities for production have been reduced so that if an emergency of defense arose it would undoubtedly be a year and a half before we would raise ourselves to the position of production which we occupied at the signing of the Armistice.

Practically all of the 17,000 pilots, trained at a cost of many thousands of dollars each, have

scattered.

We have failed to make the most of the examples of other countries and of their judgment. While we were in the midst of the war, indeed, while we were debating details with the British, French and Italian missions sent by their respective governments to this country, those governments themselves were properly deliberately proceeding upon the accepted contention that the air arm had become the vital arm of the service. In the report of the English Civil Aerial Transport Committee, appointed by the Parliament in 1917, a report made a few days after the Armistice we read: "Cost what it may, this country (Great Britain) must lead the world in civil aerial transport." The spirit of the report was, that just as the British shipping was responsible for the upbuilding and maintenance of British sea power, so British aviation engaged in commerce would be the bulwark of Imperial defense in the future.

Suicidal methods have been permitted to grow up within the shrinking industry for which the industry itself is to blame.

Opportunity to exploit foreign markets for American aircraft has been neglected, until these markets have been preempted by the leading nations of Europe and Asia. Preaching commercial aviation we have failed utterly to develop it. And serious, too, there is a discouraged spirit and a feeling of chaos within the industry which comes from continual disappointment and defeat.

Face the facts: The condition today is a challenge to the business progress of which we boast and a menace to our national defense. What are we going to do about it? There are two distinct phases of the problem. First, emergency measures to meet the needs of the moment in a constructive way in the correction of any weaknesses and abuses, always with a view to making these steps conform to what must ultimately be developed as a permanent air policy.

Second, the formulation as soon as possible of a definite, comprehensive and continuing program for the thorough development of our American Air Power. Involved in this are the industry, the government, and the public. I make no comment on the failures, if any, in the past on the part of any of the three groups. I praise the accomplishments. I praise the accomplishments of those who invented and developed aircraft. I praise the accomplishments of those who have had the tenacity of purpose, the nerve and the patriotism to stick to the production through all the discouraging times and who propose now to see it through. I praise the Army and Navy in their lofty purposes and their accomplishments, and I praise the fearless spirits who have piloted the machines. The development of the situation from now on is of such vital importance I have no concern about the yesterdays, save only that any mistakes which may have been made may be avoided in the future.

The industry itself has a definite duty to perform. It must be united upon the basis of confidence and cooperation, recognizing that it is not primarily a munitions industry. It must develop and practice a code of proper conduct squaring always with right principles and calculated to aid

itself in the discharge of its duties and the development of its maximum usefulness. The industry itself must give complete and absolute adherence to the design rights principle. It cannot be expected that the buyers of aircraft will respect proprietary rights if the manufacturers themselves ignore them. The protection of proprietary rights carries with it the presumption that the industry must maintain competent and active design staffs, capable of developing new and progressive types, adjusted to peace time requirements, yet capable of quick expansion for emergency needs, and each manufacturer must establish and maintain the highest standards of excellence in his product based upon the highest type of engineering and manufacturing skill and backed by the most rigid and intelligent inspection. There must be competition based upon engineering and designing skill as well as competition of manufacturing ability and price. The manufacturer must take upon himself the responsibility for his products and service. It is as important that aircraft remain sold and capable of operation after sale as it is to sell them. The industry must immediately direct its own best attention and its most consummate skill to the development of types for commercial use, and prove by its own performance its faith in its profession that it is not a munitions business; and prove its faith, too, in the future. Everyone in the aircraft industry should actively participate in the development of landing fields and marine flying stations, cooperating through all agencies to that end. All the creative faculties of the industry must cooperate in the fullest way with the engineering departments of the Services. The close cooperation for study and concerted action effected in the last six weeks between the units of the industry must be further developed and continued. It is a most hopeful eventuation.

The government should join at once with the industry in recognizing and sustaining the principle of proprietary rights and design, and encourage private initiative, thus paving the way for continuity and more rapid scientific progress. It is well always to remember that what we need is “less government in business and more business in government.” (Applause)

The government should develop its procurement programs well in advance, in order to improve and stabilize sources of production and secure the greatest possible economics of manufacture. It might improve its experiment, research and testing facilities, so that they may be sufficient promptly to prove the engineering product developed by the industry. The government can assist in the procurement of non-commercial supplies, and could avail itself as much as practicable of the facilities in the industry for all major overhauling. Above all, it should make certain that its procurement policy, developed in cooperation with the industry, is continuous. Men may come and administrations may go, but the policy must be continuous.

As in England and France, there should probably be set up an approved list of constructors. The qualifications for being designated thereon should be competent engineering, adequate financing and satisfactory facilities for quality and quantity production. Having such an approved list, the government might take another lesson from Great Britain and make a wise and careful allocation of business among those on such list.

Too, the obvious uses of aircraft in the various civil departments of the government should be

immediately developed. Especially can the Air Mail be extended and a complete system of airways established, linking the large centers of population and all points of great strategic importance. This will provide, in accordance with a definite plan and at government expense, all those necessary aids to air navigation, and that type of support which has been given in the development of every other transportation industry, just as harbors have been built on our coasts for shipping, as the rivers have been dredged, and as grants of rights-of-way have been made for railroads, as indeed the great road building projects of today are being financed by state and federal governments, in the aid of the development of motor vehicle transportation and in the aid of transportation generally. Nearly everyone in government for six years has declared that we must have commercial aviation, and we have no commercial aviation. We have proved by the Air Mail that it is real. Then let us go ahead and deliberately develop it. Let the government prove its faith in commercial aviation by performance definitely directed to the perfection of it.

The legislative branch of the government must help. Immediately legislation should be passed which will provide civil aviation with the protection of basic law, with adequate regulation of flying, proper examination of pilots, the licensing of aircraft, and the maximum of safety for goods and passengers, removing the uncertainties which discourage serious financial investment in the air transport projects.

Centralized authority will come, of course. It would be affected in a private business over night. But I urge no action so immediate as to bring confusion. It may be by an independent department

co-equal in importance with those of Army and Navy, as in England, or it may be advisable – and I urge careful consideration of this – to create one great Department of National Defense with one head, under which there shall be an Under-Secretary for War, an Under-Secretary for Navy, and an Under-Secretary for Air. (Applause) All such development, whatever it may be, is ultimate. There is no doubt about the need of somewhere concentrating the responsibility for air activities, and responsibility for attention to the needs of commercial and civil aviation. There should be, too, of course, an aviation budget providing for the whole expenditure.

The foundation of American Air Power must lie of course in the active interest of the American people, even in the most remote corners of the country. The Air Mail enlists the selfish interest of the individual citizen, and to enlist the selfish interest of the individual citizen is a necessity. There has been much talk about America's position in aviation. It may be that it is impossible to overstate our deficiencies, but in the public lies the greatest responsibility. The American public gets what it wants. It wants the right thing always if it takes stock of itself and stops to consider what it wants. Let the public know that the mission of aircraft is to serve humanity and not to destroy it; let it know the facts as to the needs for national defense and what is being done elsewhere, and the support will come to carry out any proper program which responsible factors may deem necessary. The situation presents no unsolvable problem. The things already accomplished are many times more difficult than those of the present or future. The development of anything that man devises comes out of an early period of disorderly confusion. So in this I have great faith in the fulfillment. (Applause)



Mr. Elliott: Gentlemen, as Mr. Hays has pointed out, the development of aerial navigation needs inventive genius, commercial brains, and financial ability. One of the important enterprises in that business is the Wright Aeronautical Corporation. The vice-president of that company is one of our speakers. He is a distinguished and competent aeronautical engineer, and in addition, a practical energetic businessman. So wide his knowledge and so great his interest in the subject that he is President of the Aeronautical Chamber of Commerce. He is a New Yorker, and I am glad to present him to his fellow New Yorkers, Mr. Charles L. Lawrance.

Charles L. Lawrance

Mr. President, and Gentlemen of the Economic Club: As President of the Aeronautical Chamber of Commerce, I wish to voice the appreciation of the Chamber at the public spirit of the Economic Club in bringing together here tonight such a representative body of men to discuss the subject of aviation. It is a privilege to hear Lord Thomson speak and also the other distinguished visitors who have preceded me.

Members of the Aeronautical Chamber of Commerce are indeed happy that the President of the United States, the members of our legislative bodies, the Army and the Navy, and our newspapers, and the great body of the American public, are so vitally interested in aviation.

The idea of forming an Aeronautical Chamber of Commerce dates back immediately after the

war, when the industry thought that the time for commercial aviation was at hand and decided to form a Chamber of Commerce. After some delay this Chamber was finally formed in January, 1922. At the present moment the membership embraces some 62 manufacturing and operating companies and 106 individuals. The manufacturing concerns include manufacturers of aeroplanes, airships, tools, motors, equipment, accessories, instruments, and supplies.

Our hopes for the rapid growth of Commercial Aeronautical Industry were not, unfortunately, fulfilled up to the present time. But I am quite certain that with the proper support of our government and of our people, and with the strong and healthy aeronautical industry, this condition can be brought about. A continuous policy of procurement of aircraft, producing a sufficient amount of up-to-date aeroplanes for the needs of the Army and Navy, and letting of contracts to manufacturers without compelling them to indulge in cut-throat competition, will undoubtedly very much help out this situation. In addition, as other speakers have also told you, we must have an intelligent and constructive policy of airways and air legislation. It has often been said that the aircraft industry is a munitions industry. If that were so, I venture to say that nearly all the men who are now engaged in it would lose interest and turn to other spheres of activity. We are not doing so. We look towards the future.

At present, of course, it is a war industry, but it differs from all other war industries in that it is only going through a transition. Some day it will emerge from this transition and become one of the greatest commercial developments of the country.

It has often been said, in fact, it has been said recently in the newspapers, that the aircraft built in this country are inferior to the aircraft built elsewhere. Nothing could be further from the truth.

The best aeroplanes and engines for military purposes have been designed and built by American manufacturers of aircraft. And, as you know, most of the world's records are held by our planes.

During the past year engineers and businessmen connected with a great many of the foreign companies interested in aircraft have come to this country. They have been exceedingly interested in what we are doing, and they have admired the technical skill and quality of our products. Many of them have stated to me personally that nothing comparable to what we have developed here existed on the other side. As Mr. Hays has already told you, the United States Air Mail Service is the greatest service run on commercial lines that exists in the world today. That Air Mail Service will grow. It will finally reach every part of the country and include it in a great network of communications and aircraft. Modern, up-to-date aircraft and engines will eventually supplant the war equipment which is now being used, and those planes developed for the air mail will be of great use to other users of commercial aircraft, who will be able to purchase them at reasonable prices because they will be in quantity production.

Everyone knows that the improving and quickening of transportation is the greatest factor of civilization. Everyone knows that distrust and jealousy of the different nations for each other is based on the groundwork of misunderstanding and distrust. It is based on misunderstanding of the other man's problem, just as our original 13 states, when this country was founded, looked with distrust upon each other and were more interested in the success and the prominence of their

own little state than in the glory and good of the whole United States, a condition which continued to exist until communications by the railroads during the early part of the 19<sup>th</sup> century made it possible to get a clearer understanding between the different parts of the country. So, every part of the world, every nation, through clearer comprehension of what the other man is doing when aircraft have become more fully developed, will stand closer together, and there will be less danger of war and misunderstanding than there is at present.

Some day people will look back upon the aviation industry. Born of military needs, but grown into manhood as the greatest civilizing agent that the world has ever known, somebody has, I believe remarked, "The aviation industry was sired by Mars and damned by everyone." The wonder of it is how such an offspring can be a thoroughbred. In spite of its lowly beginning, its undernourished childhood and the growing pains which it is now undergoing, it will someday come into its own so that Wilbur and Orville Wright who, with a vision that can be described as prophetic, first conceived this idea in those days of early experiments, and all of you here who are now becoming vitally interested in this subject, will all feel that our efforts have not been wasted and that we have contributed something to the civilization of the world and the greater happiness and prosperity of mankind. (Applause)

Mr. Elliott: Gentlemen, Columbus, after a voyage of 1,784 hours, discovered America October 12<sup>th</sup>, 1492. 432 years later, on October 12<sup>th</sup>, 1924, the ZR-3, now the Los Angeles, left Friederichshafen and reached Lakehurst in 81 hours and 17 minutes, covering about 5,000 miles

at an average speed of nearly 62 miles per hour. Compare the little balloon of the Montgolfier Brothers with the 700 ft. beautiful Los Angeles, with her cubic capacity of 2,400,000 cubic feet, and this Club is most fortunate in having as one of its honored guests the man who was the Senior American Officer on this great dirigible and who will tell you something of that astounding trip.

It is a great pleasure to present to you Captain George W. Steele, Jr. of the United States Navy.

(Applause)

Captain George W. Steele, Jr. U.S.N.

Mr. President, and Gentlemen: The first time I crossed the Atlantic it did not take quite as long as Columbus. It was 25 years ago and in a sailing ship we sailed from Annapolis, Maryland to Madeira. It took us 22 days to go and 30 days to come back. The actual time of crossing the Atlantic in the ZR-3 from a point near Bordeaux to Boston was 67 hours.

On the 12<sup>th</sup> of October, half past six in the morning, after waiting for many months for the engines of this ship to be finished, always in readiness, the crew on board, headed by Dr. Eckner, and the four American observers, took their places in the passenger cabin; the ship was warped out of the hangar and although it was a very drippy, foggy morning, the whole town had turned out, about 7,500 people. They had a band there to play, "Deutschland Ueber Alles", which they played. (Laughter) The ground crew let go their lines, the engines were started without any fuss

at all, the ship rose in the air, pointed out through the fog, and that is the last we saw of Germany. We flew over the fog until some after we had crossed the French border, when it cleared away and we saw the ground again.

This ship, of the capacity of 2,400,000 cubic feet, was filled with hydrogen gas, which has a greater lift than helium and at the time we took off, the ship, in addition to carrying 35 men, oil, water, supplies, quite a pile of luggage, carried 29 tons of gasoline.

The lift of the ship is 80 tons gross, and about 40 tons of that is ship, which leaves 40 tons disposable weight. The power is 5400 horsepower reversible engines of German manufacture. There is a pilot house on the front of the cabin in which the Commanding Officer and his pilots are stationed. There are two wheels in there. One works like a wheel of a ship and the other steers her up and down, with horizontal rudders.

We steered by compass, which was very accurate. There was also on this ship a gyroscope compass which derived its power from a little windmill generator on the side of the pilot house. On the other side of the pilot house was another windmill generator for the radio outfit, and underneath the rear of the cabin was a third windmill generator which furnished power for the cook stove. Not much was attempted in the way of cooking. We ate mostly canned food, but we carried no regular cook. The sail-maker and the off-watch radio man, alternated in the galley. I have fared better. (Laughter)

The first evening, of course, the passengers had not been doing much work but, as all passengers, we wanted all conveniences and we went to the washroom and found that it had been converted into a dining room because the wash water had all run out. That was about the only inconvenience that we had. There are accommodations for twenty passengers, with very comfortable berths which I demonstrated by sleeping nine hours the first night. We flew very low over France in order not to arise and fill the bags and lose hydrogen. I should say about 300 meters was as far as we were off the ground, and at that height there is, on a sunny day, a motion of the ship up and down, but very little roll or pitch. Over the ocean there is scarcely any roll or pitch where the air is all of about the same temperature. Nine hours after we left Friederichshafen we crossed the mouth of the Gironde River into the Bay of Biscay, and our ocean voyage had begun. We saw land again that same evening about 7 o'clock at Cape Finisterre where we took a departure, as mariners say, for the Azores Islands.

The next morning about 8 o'clock we passed over a large steamer flying the British flag, headed in a direction opposite to ours. This ship was rolling, I should say, about 15 degrees in the trough of the sea, but the ZR-3, just above her, was perfectly steady. The Germans had not had much experience in overseas navigation, so they asked this steamer by radio what her position was, and when the answer was received it was found that there was 60 miles difference between the reckoning of the steamer and that of the ZR-3, so not to have any argument about it they adopted the steamer's position and set course for the Azores which we reached about 11:30 that same

morning. I think, aside from the selfish purposes of the public, which Mr. Hays has mentioned, that if they could see the fascination of air travel, if they could have passed over that Island of the Azores over which the ZR-3 passed, if they could have passed over the fields of this country they would see in it a fascination which would cause them to endure a great deal of inconvenience by getting out to the flying fields to get up and have a look at it. This Island, for about 12 miles square, was laid out in small patches, nearly all adjacent fields being of different colors, from light green to the brown of ploughed fields, and ahead of us, above the clouds, and seeing nothing beneath, was the point of the Pico Island.

We left the Azores and continued a course west, because it was not possible to get very good weather reports. The Navy Department had done all its duty in that regard. The Weather Bureau had cooperated. The Navy had sent three vessels out into the Atlantic to serve as meteorological stations, and still we did not get proper communications because the air was filled with congratulatory messages to the ship.

Our course of west continued in a rising wind, and that evening the wind had gone up pretty high. We got a report from the Detroit which was stationed off the Grand Banks at Newfoundland that she had easterly breezes, so the course was changed to northwest and we headed up for Newfoundland. When we arrived there we got the easterly breeze, came down along the Coast of Nova Scotia about 90 knots over the water, and there we were again forced above the fog which was very low, so low that we could not go under it. Ordinarily it is



preferable to keep down so you can see the direction of the waves and estimate the force of the wind to some extent by the size of the whitecaps, but over this fog between the Grand Banks and Nova Scotia we flew for 400 miles. The steamers below us must have been having a very hard time of it, but where we were was perfectly clear above and all around us and only underneath was this vast stretch of cloud.

We came to Boston in the early morning, before daylight, and that was a wonderfully impressive sight, to see all the thousands of lights of the city. On our left was Boston Harbor with its carefully placed lighthouses and aids to navigation, in and out of which I had gone feeling my way on surface ships, but this ship aimed right at the center of the city and went right over it without pause. Then the course was laid out for the Ambrose Light Vessel, because most of the German crew had been recruited from the Navy and they wished to make a proper entrance into the City of New York. (Laughter) We reached New York about 7:30, as I remember it, and when we got to the Statue of Liberty the ship started swinging off her course and kept swinging and I looked inquiringly at Dr. Eckner. He said, "We are saluting the Statue of Liberty. Do you suppose it will know what we are doing?" Apparently the whistles below us knew, because there was a perfect bedlam in the lower North River. Our engines going at half speed, we could hear sounds very plainly. I imagine some of you gentlemen saw the ship that morning. I have talked to a great many New Yorkers since that day and with one exception the ship was passing over each one's head as he looked out, (laughter), a very well timed arrival.

After circling the city two or three times the ship started up to what is known as pressure height. We had used about 23 tons of gasoline on the trip over and there was so much hydrogen in the bags that if the ship had been stopped and her horizontal rudder had become inoperative, she would have gone right up to the sky like a toy balloon. There are two ways of voiding the gas; one is to pull the wire controls in the pilot houses; the other is to ascend to a point at which the safety valves will open and let all the gas out equally, and that is the preferable method, which was used on this occasion. The ship ascended to a height of 13,000 feet and at that point she came in equilibrium, where her course was set for Lakehurst, gradually descending, and at about 9:30 that morning our landing was made in a perfect manner, as if this German crew had been sailing in and out of that port for years.

It was not a tiresome journey. It was not nearly as tiresome as crossing the continent, but there is not as much opportunity for relaxation and exercise as there is on a large ocean steamer. Still, there is a walkway inside of the ship, running along the keel the full length of the ship on which one may walk up and down. It is 8 inches wide, but it has ropes to keep you from falling off. We made one trip through the ship at least in each of our watches, and at places along near the keel were windows through which you could see beneath. That was a little tricky, but when we got down to the end of the walk it descended a ladder into the lower fin, and I never thought that there was anything for me to do down there, (laughter), so I went only half way.

This ship was allocated to the United States Navy for commercial purposes. The Navy

Department was decided upon as the agency to receive and give it its initial operation, and the Navy Department has laid out a program which will simulate, as far as possible, commercial aviation. Next month trips will be made to Bermuda, weather permitting. The time is not very long, ten days, to make that. The mooring mast ship "Patokah" will go to Bermuda and there the ship will moor and communicate with the shore, and then turn around and come back. The next port of call is scheduled as San Juan, Porto Rico, a longer trip. After that the Canal Zone, and as a final wind-up, either to Honolulu or to Europe. Using helium gas the lift is not sufficient to duplicate the trip from Friederichshafen. In addition to that condensers have been put on four of the engines which return water to the ship equal in weight to the gasoline burden. On the transatlantic voyage, due to gasoline, it was necessary to lose about 30 percent of the hydrogen capacity. On account of the limited quantity of helium available, it was necessary to conserve it, and therefore, these condensers have been put on, but of course, putting them out on the stream-line will slow down the ship. We are going to do all we can to demonstrate the practicability of this travel, and we are going to try to make it comfortable.

At the present time there is no provision for charging passage, and under the Secretary of the Navy's orders, male citizens prominent in the community can be carried. I advise you to book your passages early. (Applause)

Mr. Elliott: Gentlemen, before you go, I am assuming the responsibility of expressing your particular thanks and gratification to all of the speakers this evening, particularly to our friend

from the other side, Lord Thomson. (Applause)

We are delighted to have him in this country, and he is going to see more of our great United States, and from what he has already seen he tells me he will want to come back again and again, and when he does I hope we will have another meeting here with him. (Applause)

End of Meeting