THE DEVELOPMENT OF AIR TRANSPORTATION IN CANADA

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"Submitted in partial fulfillment of the requirements for the degree of Master of Arts in the School of Political Science, Ottawa University".

APRIL, 1944.

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CHAPTER I.

INTRODUCTION: EVOLUTION OF TRANSPORTATION

Transportation is almost as old as man, but its major developments have come during the last 125 years. Once modern improvements began, they gained momentum. Every major transportation system existing today, with the exception of the airplane, was perfected during the life of Queen Victoria from 1819 to 1901 -- Transatlantic steamships, steam and electric trains, carriages for persons of average means, bicycles, automobiles, even dirigibles. The first airplane came soon afterwards in 1903.

Now, just 40 years later, scarcely a day passes that some new and startling transportation advance is not recorded. Airplanes have cut the travelling time from Canada to England to less than 12 hours (November, 1943)[1] and short flights are made at 7 miles a minute. Racing automobiles run two-thirds as fast as that. Some steam and electric trains can exceed 100 miles an hour. The Atlantic is spanned by steamships in about 4 days. Modern steamships are enormous palaces, capable of carrying thousands of passengers and fitted to supply every comfort found on land. The new Douglas B-19 Experimental Bomber can carry 125 soldiers plus a crew of 15 at 250

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1. Capt. Richard Allen, an Australian member of British Overseas Airways Corporation which operates the North Atlantic ferry shuttle service for the R.A.F. Transport Command, flew a Liberator bomber 3,100 miles non-stop from Montreal to a British airport in 11 hours and 35 minutes - 21 minutes faster than a record established 7 weeks ago by a Lancaster bomber piloted by Capt. M.B. Barclay, of Perth, Scotland. (Ottawa Journal, Nov. 30, 1943).

miles per hour. Other luxury planes are equipped with diners, sleeping compartments and libraries. In motor cars the trend to-day is toward convenience and attractiveness rather than to size.

Rail lines, both steam and electric, are still supplying the major part of freight and passenger service in leading nations throughout the world. Steam-operated lines provide the principal transit arteries between cities. Many, however, particularly in countries where fuel costs are high, are installing electric engines. Electrically operated subway, elevated, and surface lines still carry the majority of riders in metropolitan centres.

Rapid development of the truck and the bus since the close of World War I has produced tremendous changes on the transportation map. While motors have not been able to take the leadership from rail lines, they have grown into formidable competitors. They have also created new service in territories heretofore untouched. One of their invaluable assets is their ability to go into a community, test patronage, and discontinue service if returns do not justify continuance.

Private motor cars are being run everywhere. The United States has the largest per capita ownership in the world, but the number of owners in foreign lands is constantly growing. Only lack of money or of good roads, or both, prohibits most persons from having machines. Many residents of progressive European Countries have the roads but not the money; while others, such as the citizens of parts of South America, have the

money but not the roads.

Aviation, both commercial and private, has grown tremendously since the close of the World War and to-day serves every country of consequence on the globe. Public flying facilities in Europe, United States and South America are particularly well-developed and reasonably safe. Flying has made travel faster wherever it has been introduced and has given some countries their first national transportation service.

But before we turn to our study of the development of the air, let us briefly review the evolution of transportation in Canada.

The first type of transportation to be found in Canada was a carry over from the mother country, - water transportation. It was the French navigators who braved the unknown waters to cross the Atlantic to start a new life here. Before Jacques Cartier, in 1535, had sailed from Saint Malo to Newfoundland, the Gulf of St. Lawrence and Gaspe, other sailors had already skirted the eastern coast of our northern continent and many more may have done as much without our knowing about their activities, for it was not to their interest to disclose their findings. Breton, Norman and Basque fishermen had, for a long time, been sailing westwards on the Atlantic for cod-fishing. Large boats were used for those Atlantic crossings.

For inland travel, small boats were used. Inland travel, so essential to the early French colonies, was first and always dependent upon the many waterways that nature offered. The characteristic craft of

Canada used on these great fresh-water lakes was the canoe, which, in its various forms, was the sole craft known and used by the Indians, particularly the Algonquins. The canoe used almost exclusively by the French, was that made of the bark of the birch tree. Of paper-like thinness, the birch canoe might nevertheless last for some time if treated with care. It combined speed and carrying capacity with extreme lightness so that it could be carried past unnavigable sections with comparative ease. Yet it was strong enough to stand the rapids down which it was steered. The French were amazed to find a vessel that could carry a heavy load so efficiently. The birch-bark canoes, still being made by the Objibway Indians, are, in all essential ways, the same as those of the seventeenth century variety. The birch-bark canoe, although an amazingly seaworthy craft, was not customarily used while traversing the large lakes where large waves might be met. It had geographical limits which were defined partly by the character of the rivers and partly by the presence of the birch tree and the resinous trees which were used for seams. It was to be found chiefly in the St. Lawrence Valley, not much farther south of the Great Lakes or west of the Rockies.

There were other types of canoes. The Iroquois used the bark of the elm tree and the pine. The Eskimoes made their "kayak" out of seal skins. All of these craft were of Indian invention and manufacture and were adopted by the French. There were, however, some craft brought by the French. In general, they in-

troduced boats, as distinct from canoes. The French boats were built of wood and were meant to be rowed, or sailed, or both. They were much heavier than canoes and their use was primarily in waters where there were no rapids, for example, on the St. Lawrence below Lachine and on the lakes. In the total absence of canals, canoes had to be resorted to for long-distance travel. While canoes retained the monopoly of passing rapids with comparative ease, the common method of water travel below Montreal was in boats.

With the birch canoe as the means and the fur trade the chief object, the French penetrated beyond the St. Lawrence Valley far into the interior of the continent. The trade in furs began as a by-product of the fisheries, but soon was seen to be of great value in itself and came to be the chief commercial interest of Canada.

To obtain furs from the interior, the French first relied on the Indians, not only for the acquisition of furs, but also for their transport. The Hurons in the Ottawa River region became purchasing and transport agents for the French while the Iroquois made a similar arrangement with the English. When the fur-bearing animals became scarce in the region around the eastern lakes, the territory west of Lake Michigan became the main trapping ground. As the French gradually penetrated beyond the Great Lakes, they made fortified forts along the waterways as near as possible to the sources of furs in order to build up an influence over the local tribes and to bring the trading goods nearer

to them. The West was occupied by the Indians alone and was open to explorers of both nations. Led by a love of adventure, the fur trade, missionary zeal, and the search for the western sea, the French steadily worked their way along the rivers and lakes of the western prairie. The discovery of the northern and western limits of the continent was to be left to a later age, but most of the western land was known to exist before the French colony was overthrown.

About this time, in fact from 1679 on, we learn of the colourful "coureurs de bois", illegal fur traders who operated without licences. The Crown attempted to control the activity of this group but to no avail. The only effective means of stopping illegal trading was to make impossible the sale in Montreal of the furs brought by these "coureurs de bois". However, such an action would have defeated the purpose of the Government of New France for the traders would have taken their furs to the competing English at Oswego, New York.

The fur traders continued to spread westward. At the end of the seventeenth century, there were some 1,000 to 1,500 Frenchmen - with and without licences - at the forts or in the woods. Apart from the sporadic attempts to make use of sailing vessels, all transportation was by canoe, and west of the Great Lakes, this was the only craft that could be used. Canoes of moderate size seem to have been the rule, for the normal crew was 5 or 6 men.

The rivalry between the French and English traders was but the first act of the great struggle be-

tween routes to link the fur trade so closely to the history of transportation. It was a battle for the control of the West by way of the St. Lawrence Valley.

The Seven Years' War, last of the series of conflicts between France and England in North America, ended in the capture of Quebec and Montreal, and led to the transfer of Canada from King Louis to King George. The French political empire fell, but French civilization remained.

Up to this time, Montreal was the scene of all fur trading activities, but as time went on, the prairie country began to be the point of meeting for western traders. It gradually narrowed down to a competition between traders from Montreal and those from Hudson Bay. In the end it was the cost of transportation which settled the dispute, and so Montreal suffered. It was not a final defeat for Montreal as expansion continued westward, but only a defeat where expansion was based upon furs and canoes. The weakness of French expansion can be traced to its inadequate system of transport.

An important advance in transportation for the fur trade was introduced by the fur traders from Albany, namely, the introduction of sailing vessels for heavy transportation on the Great Lakes. They operated from Oswego on Lake Ontario to Lake Erie, Detroit and Lake Huron. The advantages of such a route were immediately obvious to the Montreal traders for it enabled them to ship food and other heavy goods through the lakes and still retain the rapid canoe transport on the

Ottawa for furs and light goods. The two routes thus became complementary. We, therefore, have the introduction of the merchant vessel from 1769 on. The characteristic tendency of this period was the steady expansion of the fur trade into the north-west and far west, an expansion which necessarily followed the main rivers.

Apart from canoes and boats, other forms of transport were used to some extent. In the southern prairies, horses were employed. In the winter, snow shoes and dog teams took the place of river travel. The movement of goods and furs, however, was confined almost wholly to the summer.

The trade in furs continued after 1821, but in the meanwhile, other industries had been fast developing and transportation was being organized in eastern Canada to meet the growing needs. The great day of the fur traders passed before the middle of the nineteenth century, but the fur trade was of great significance in the development of transportation and for the economic life of Canada in general. Generations of adventuresome fur traders risked their lives in the unknown western country and, in following their profession, tried out the network of waterways that offered the only means of travel across a great and untenanted empire.

The influence of the fur trade on the development of communications and economic growth was enormous. Opposed as they were to agricultural settlements, the traders were forced to initiate farming to relieve the carriage of food, and left many of their numbers in

the West who turned, out of necessity, to grow their own provisions. Still more important was the opening of the western country. No great settlement came until the day of the railway when pioneer farmers and merchants were calling for new modes of transportation to meet their growing needs.

From 1783 to 1830 there was a steady increase in population. The needs of this new population grew with its steadily increasing size, extent and variety of interest. The economy soon became comparatively diversified. It was apparent from the first that water must primarily be depended upon for communications. Road building was not to be ignored, but in a land of forests and sparse settlements, it could not be hoped that through roads could be built for some years. The rivers and lakes offered an unique opportunity for water transport. Here the fur trader was only partially of value. His canoe was not suitable for other purposes, and his pioneer transportation system in the north-west was not yet of significance to Canada. There remained the shipping on the Great Lakes and the exploration of some of the inland waterways of Ontario.

The main water routes followed for passengers and freight showed no changes until the period when canals were built. Westward from Montreal, the St. Lawrence offered 200 miles of uninterrupted navigation and had to be followed to Lake Ontario.

The types of early rowing and sailboats used in Canada fall into two classes: the open boat propel-

led by oars, poles and sails, and the various kinds of sailing ships that plied the Great Lakes. As settlement, industry and agriculture increased, so did the number of sailing vessels on the lakes. They carried passengers, lumber, potash and other freight; and the steady demand for new vessels led to a thriving ship-building industry at many of the lake ports. Regular services were developed between Canadian, or Canadian and American ports, and vessels carrying either flag might be seen on either side of the international boundary. But travel was not without its risks and delays. "One unfortunate traveller, on his way from Detroit to Montreal in 1810, picked up a boat at Niagara bound for Kingston. The vessel called at York to unload salt, whereupon the captain delayed for ten days on a visit to his wife. After this unfortunate start, they reached Kingston only to be driven to sea by an unfavourable wind and found themselves outside Oswego. There, after eight days, the captain announced that he had taken on a cargo for York, so the patient traveller embarked on an American vessel bound for Montreal. After weathering a storm, they finally arrived at Ogdensburg, but receiving news that the price of cider in Montreal had fallen, the captain decided to turn back and the traveller had to wait for a third boat. At last on the forty-ninth day after leaving Detroit, the unhappy man reached Montreal, ill and exhausted".[1] Steam boats were first used in the

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1. G.P. Glazebrook - History of Transportation in Canada. Page 70.

nineteenth century, but it was long before they superseded or even seriously rivalled the sailing vessels. The first steamboat was the "Accommodation", built at Montreal for John Molson and equipped with a six-horsepower motor. This first steamboat in British North America was put in the water in 1809, eight years after the first pioneer steamer in Great Britain and two years after Fulton's "Clermont" went by means of steam from New York to Albany. Four and one-half miles per hour is not perhaps an impressive speed downstream, but it was the possibilities in this new mode of transport that made a strong appeal to the people of Canada. In 1816, steamboats made the trip from Montreal to Quebec in twenty-four hours and upstream from Quebec to Montreal in thirty-six to forty hours. The charge from Montreal to Quebec was ten dollars per passenger, but was subsequently greatly reduced. Steamship travel on the St. Lawrence became common. A steam ferry between Quebec and Levis was also introduced, the boat giving an hourly service. Tonnage on the lakes rapidly increased and regular services were instituted. In 1828 the Queenston was advertised to sail from Niagara for Prescott via Kingston and Brockville, returning by Brockville, Kingston and York. At Prescott, connections were made for passengers to and from Montreal. A list of sailings on Lake Ontario for 1834 is found in the Courier of Upper Canada, October 21, 1834.

The following were the ships and routes:

St. George	- Kingston - Niagara
Adelaide	- Chippawa - Amherstburg - Sandwich
Peter Robinson	- Holland Landing - The Narrows
Cobourg	- Prescott - Toronto

Canada	- York - Niagara
Constitution	- Hamilton - Rochester
Great Britain	- Prescott - Niagara
Queenston	- Toronto - Hamilton
William IV	- Ogdensburg - Niagara
Oakville	- Hamilton - Toronto

Until 1841 all the steamships were operated by paddle wheels at the side or stern, but 1841 saw the first propeller boat put into service. Iron hulls were introduced, and sails were abandoned with the increasing strength of the engines. An element of risk remained in the navigation of the lakes, as witnessed by the sinking of the Lady Elgin in 1860, with the loss of 330 passengers.

With economic and commercial growth came the development of the canals to aid transportation through falls and turbulent links of water communication. The enthusiasts for canals in Canada were counting not only on their direct value to the country, but also on securing a generous share of the American carrying trade which would enrich the country through which it passed. The first canal of any importance was begun in July, 1821 and completed in 1825 and controlled the Lachine Rapids, on the bend of the St. Lawrence where it curves south around the island of Montreal. Navigation of the St. Lawrence was then extended across Lake St. Louis to the mouth of the Ottawa. In 1834, three more canals were completed - those at Carillon, Chute à Blondeau and Grenville. By this means, the Ottawa River was made navigable from Montreal to the mouth of the Rideau River. Great Britain was responsible for the construction of a canalized

water route through the Rideau River and the chain of lakes nearby. In 1832, the first steamboat passed through and in 1834 the Rideau Canal was finally completed, giving a navigable distance of 132 miles. Attention was then turned to the improvement of the St. Lawrence. Work began in 1842 and was completed in 1845. The total length of the canal was 11¼ miles with 9 locks, each 200 by 45 feet, to overcome a difference in level of 82½ feet. The depth throughout was 9 feet. In 1843 the Cornwall Canal was completed. 11½ miles long, it contained 6 locks, 200 by 55 feet, to overcome a rise of 48 feet, and was 9 feet deep. One last series of rapids between Montreal and Kingston were taken care of by the Williamsburg canals - one at Farran's Point was completed in 1847, a second at Rapide Plat in the same year, and a third, the Galops Canal, was finished last. These three canals overcame a rise of 31½ feet. Thus, large steamers, through canalization, could make progress from Lake Ontario to a point below Cornwall.

The next difficulty came in the narrow but steep isthmus that separated Lake Ontario from Lake Erie, across which isthmus runs the Niagara River on which is situated the most spectacular and most complete break in navigation, Niagara Falls. This was overcome by the Welland Ship Canal which links Port Dalhousie on Lake Ontario with Port Colborne on Lake Erie. The new route as finished in 1833, had forty locks with a minimum size of 110 by 22 feet and a depth of eight feet. Much trouble resulted through the use of cheap wooden locks, inadequately protected

banks, and insecure dams. The canal was taken over by the Government and in 1842, alterations were completed which gave locks 150 by 26½ feet in size with a depth of 9 feet. By the end of the forties, then, a through communication for steamers and sailing boats had been achieved from the St. Lawrence, by way of the Ottawa River and Rideau canal, through Lake Ontario to the western end of Lake Erie, and by way of Detroit to Lake Huron, Georgian Bay, as far as Sault Ste. Marie. There were developed a number of lesser important canals which we cannot stop to consider since they do not aid our study.

The glorious future predicted for the Canadian canals never materialized, however. The St. Lawrence canals provided what was necessary - a trunk line to the West. The great canal age was eclipsed by the railway age and the hopes which had once been fixed on water transport were then diverted to the new plan of rail transport.

A different situation existed in the Maritime Provinces with its natural harbours fit for navigation by large boats. Throughout their history, these people have been builders and sailors of ships. As far back as 1770 there are records of vessels of good size. Trade with the United States played a large part in the commercial affairs of the Maritime Provinces for these people continued to look for trade South and East - to the United States, the West Indies and England, and not as other Canadian merchants looked - to the West. One result of this difference was to accentuate the tradi-

tional lack of contact between Canada and the Maritime Provinces. The people of the Provinces sought to make greatest use of their ports for ocean navigation, for they expected little from St. Lawrence traffic. On the other hand, the Maritime ports might well be developed as the termini of land routes into the interior of the continent. With the coming of the railway, a new vista opened.

As to the development of roads, there is no record of them in Acadia before the English conquest in 1713. In Canada, however, the French made some headway. The Indians had been accustomed to follow narrow trails through the forest, both in winter and summer, and some of these trails were later widened into roads. In winter, the eastern Indians used snowshoes and toboggans, and frequently took to the frozen rivers instead of trails. They did not, however, have any roads for wheeled vehicles. These were first introduced by the French. The French brought both horses and wheeled vehicles into the St. Lawrence Valley. For these, roads were needed, and to meet the situation, a system of road-making gradually evolved in Canada.

The two principal highways in New France were those which ran along the shores of the St. Lawrence. The river was the chief focus of settlement and a road parallel to it therefore served the maximum number of people. The road along the north shore was completed first in 1763 from Cap Tourmente to Montreal. The road along the south shore was intended to serve agricultural areas. It ran from Pointe à Caron through Levis to a

point opposite the River Bastiscan, and from there were broken sections as far as the Lachine rapids. Although the French in Canada were more concerned with road-making than has usually been represented, they always depended largely on water transport. Natural conditions made road-building and maintenance highly laborious, while travel by water was comparatively easy and cheap. The chief occupations were agriculture, fishing, lumbering and the fur trade; of these only the first was dependent on roads.

Thus, control of the construction and administration of roads and bridges rested in the Governments of British North America. The need for roads was felt by a larger section of the community than that which called for the improvement of the waterways for it embraced the agricultural as well as the commercial population. The legislature of the various provinces made use of the judicial authorities for the administration of roads. Two surveyors of highways were appointed for each township. In 1801 we have the assembly of New Brunswick making regular grants for road repair and construction.

Probably every traveller who came to Canada in the first half of the nineteenth century talked or wrote of the curious kinds of roads he found and the acute discomfort of travelling on most of them. Only in winter when the snow covered ruts and mud and stones, and made of the rivers a flat surface, could land travel be comfortable. The spring was the worst part of the year, with the thaw causing mud every-

where. The early settlers probably made use of Indian paths as the basis of a number of bridle paths. People, mail, and supplies could be carried on horseback and were, until comparatively recent times; even with its limitations, this manner of travel was simpler and less discomforting than travel on crude roads with most of the roads in the British provinces remaining in this condition until nearly the twentieth century. Here and there could be found a gravel, plank or macadam road that for a short distance was smooth. Roads were defective, but neither complaints nor a willingness to render active help could readily solve the problem.

According to English standards of the day, or to modern Canadian standards, the roads of British North America cannot be given high marks. Even now in the settled districts of southern Ontario, many roads will be found which are almost impassable for a period in the spring. The financial resources of the provinces could not extend to all the many side roads. What a problem to the traveller who drove a few miles from the town only to be confronted with wooded wilderness! Until well into the nineteenth century, great areas of all the provinces had to be traversed in which there was virtually neither local labour nor local funds. Such are the circumstances to be remembered in discussing Canada's roads. It is impossible to paint a true picture of the condition of roads of British North America, for the scene changes from year to year and from place to place. There was on the whole, consistent progress in all colonies, for roads were opened as they were required.

However, it took a long time before vehicles could attempt to get through. Stone, macadam and plank roads offered better travel while they lasted, and in some districts, sandy soil was a guarantee against mud, the worst enemy of the traveller. By about the middle of the nineteenth century, a fairly adequate road system existed and, under normal conditions, vehicles could be used with varying degrees of discomfort. Land travel on inadequate roads and with horses as the only motive power, could never fully supply the transportation needs of the country. But the coming of the railroad solved the problem. The road, thus displaced by the locomotive, came back to worry its former victor when the motor car challenged the railway train. But for over half a century, the centre of the stage was occupied by this new and noisy invention.

The steam railway came from the combination of two separate inventions, the track for carrying vehicles, used in English mines for some 200 years, and the steam engine, an old invention developed in the eighteenth century in Paris. In England, in the 1820's, the Stockton and Darlington was the first railway to carry public goods. At the end of the decade, Stephenson's famous Rocket made a record run of 70 miles at an average of 15 and a maximum of 29 miles per hour. Similar progress was made in the United States, where the Baltimore and Ohio railroad reached the unprecedented length of 133 miles in 1833. Newspapers in Canada be-

gan to write about railways in 1824, although they claimed to know little about them. The tale of actual construction before 1850 is a short one. There was much talk but little action. The first steam railways were used in the coal industry of Nova Scotia in a short coal line at Picton in 1838. A year later, another six miles of railway came into operation to carry coal from the Albion mines to the Gulf of St. Lawrence. The St. Lawrence and Atlantic is said to have been the first international railway ever built. Two companies, the St. Lawrence and the Atlantic, were incorporated in 1845.

There were two main ways of reaching the West - one by following the lower lakes to the American border near Windsor, and the other by striking north from Lake Ontario to a point on the upper lakes. Both these routes were adopted. The northern route connected Collingwood with Toronto, while the southern route eventually connected Montreal with Detroit. Most of the railroad building went on from 1840 to 1860. The following railroads were known to exist by that time: the Grand Trunk (Toronto - Montreal), the Great Western (Windsor - Toronto), Buffalo and Lake Huron (Buffalo - Goderich), London and Port Stanley, Welland (Point Dalhousie - Point Colborne), Erie and Ontario (Buffalo - Niagara), Northern (Collingwood - Toronto), Midland (Kitchener - Port Hope), Cobourg and Peterborough, Brockville and Ottawa, St. Lawrence and Ottawa (Ottawa - Prescott), Carillon and Grenville, Montreal and Lachine, Champlain and St. Lawrence (Montreal - Rouse's

Point), Stanstead, Shefford and Chambly (St. Johns - Waterloo) St. Lawrence and Industry (Lanorie - Joliette), New Brunswick and Canada (Canterbury - St. Andrews), European and North American (St. John - New Glasgow), and Nova Scotia (Windsor, N.S. - Halifax - Truro).

By 1860, the vigorous railway building of a decade came to a stop, but in those ten years there had been added 2,000 miles of track to the mere 66 in operation in 1850. Ten years had made a revolution in transportation. What did this mean to the country? First of all, it meant for all those people whose districts were reached by rail, the drawing aside of a curtain between themselves and the outside world. To the farming areas and back-woods towns, the railway spelt a link with the main centres of population; and to the larger towns, it brought easier communication with the United States and Europe. Western Canada was more isolated than one can now easily realize. To these came the railway, bearing the mail and the newspapers, carrying passengers in comfort and ease, over long or short distances. The products of the farm could now be carried to market many miles away, and to the farm came the manufactured products of the Canadian and English factories. But there was another side to the picture. Improved transportation extended the area open to the large industries of the cities, and so weakened or destroyed the local industries, and with them, the strength of the towns.

The rapid construction of railways in Canada in the fifties brought with it economic changes that at first seemed to be wholly beneficent, but later caused

dislocation and distress. From the depression in the forties, Canada jumped into the boom of the fifties, mostly because England gave money freely to develop the railroads, and the Canadian Government likewise did not hesitate to spend freely on public works principally canals and railways. With the railways, came a demand for labour and materials. High prices and wages resulted which led to unnatural expenditures, and to difficulties. In the enthusiasm of the moment, and in the hope of profits, there was a degree of overbuilding, more building than was justified by the traffic actually available to meet expenses.

The mutual interdependence of railways and general economic development is a theme which runs through the history of the Dominion, and one which played no small part in its creation. To make possible a stable economic structure, a sufficiency of natural resources was required, and was found in the wheat or grazing lands of the West, the lumber of British Columbia, and the central and eastern provinces, the fisheries of the Maritime Provinces and British Columbia, and the rich mineral deposits of the mountains of British Columbia. These, with the mixed agriculture of the East and Centre, formed a basis of staples on which a superstructure of financial institutions, industrial concerns and transportation facilities could be built. It is possible, then, to link Confederation with the growth of the railroad which linked economically complementary areas. Throughout the fifties and sixties, negotiations went on between the provinces themselves

and between the provinces and the British Government. It was the Intercolonial Railway which made Confederation possible, a government-owned railway which was nothing more than a connecting line between the Maritime Provinces and the rest of Canada. The route which had been chosen carried the line in a sweeping curve through eastern Quebec and northern New Brunswick. It began at Halifax and proceeded to Riviere du Loup, Levis, Montreal and went as far west as Toronto and Sarnia. Although it was never able to achieve a sufficient volume of business to carry its investment, it served its purpose, namely, to aid the political and economic needs of the state by linking the East with the West. The building of the Intercolonial was neither the first nor the last step taken by the Government to meet the peculiar transportation needs of Canada. Like roads, canals and other railways, the expense was met by the taxpayer, and brought him compensating advantages in indirect ways.

The next important achievement in rail transportation, and probably the greatest single enterprise undertaken in the history of the nation, was the building of railways from Lake Superior to the Pacific Coast which, when completed, became the Canadian Pacific Railway. The growing interest in the West, which became effective about the middle of the nineteenth century, was focused on three aims: to preserve it as British (or Canadian) territory; to populate and develop it; and to establish overland communication with the Far East. However, it was not until the Liberal Government

came into office in 1873, headed by Alexander Mackenzie, that the Canadian Pacific Railway became a reality, for although the Canadian Pacific was a privately-owned railroad, it received much government support.

By 1878, the track was laid from Pembina to Selkirk, all of 85 miles. By 1880, the following sections were built or under contract:

Fort William to Selkirk	-	410 miles
Selkirk to Emerson	-	85 miles
West of Red River	-	100 miles
In British Columbia	-	127 miles
Total	-	722 miles

In 1882 work was begun on the line west from Callander, at the east end of Lake Nipissing. By 1883, 100 miles had been completed west of Callander, and 35 miles completed near Port Arthur. Trains were already running between Port Arthur and the Red River. By 1885 rail service from Callander to Port Arthur became a reality and passenger service began in November. From Winnipeg, it proceeded to Calgary and from Calgary to Kamloops and from Kamloops to Port Moody. By November, 1885, by arrangement with other lines, rail connection was established from Montreal to Port Moody, a distance of 2,893 miles. November 7, 1885: "The first train from Montreal is approaching Yale, within a few hours of the Pacific Coast. The last spike was driven this morning in Eagle Pass, some 340 miles from Port Moody. On reaching the Coast, our running time from Montreal, exclusive of stoppages, will be five days, averaging 24 miles per hour". The charter of the Canadian Pacific provided for the construction of a railway from

Callander on Lake Nipissing to the Pacific Ocean, but it was impossible that the railroad should remain in mid-air in northern Ontario, - it must get established with the ports and industrial areas of eastern Canada. Gradually, it bought in the Canada Central, the Brockville and Ottawa, and then the North Shore Railway, which connected Ottawa with Montreal. Its eastern termini were St. John and Halifax. Finally, the route was extended to Farnham and Newport, just across the border. At Newport, connections were made with American railways to Boston and Portland. Until the dawn of a new century, Canadian Pacific had absolute rule of the West.

With the turn of the century, there came the long awaited prosperity in Canada. The years from 1900 to 1913 saw a rapid recovery throughout the world. In 1900 the only railway with any considerable mileage west of Fort William was the Canadian Pacific. Two other companies became interested in the western development: the ambitious Canadian Northern, possessed of a few small lines in the prairies, and the Grand Trunk, which, having failed to confine the Canadian Pacific to the West, was now thinking in terms of transcontinental traffic. Both companies were under energetic and enterprising management and were successful in establishing routes to the West. The Canadian Pacific, with the Canadian Northern and Grand Trunk Pacific, made three transcontinental railways in Canada. The latter two belong to the period of rapid economic expansion in the early twentieth century, a period which came to an end

as abruptly as it began. The policy adopted at the beginning of the century of allowing the construction of two additional railways marks a turning point and crisis in Canadian railway development. It was a mistake which cost the Dominion dearly, and came to create one of the most important contributing causes to what has been called "the railway problem".

The Canadian Pacific Railway, never in serious financial difficulties, was able to carry out a policy of gradual expansion built on a firm foundation. The Company's steamships traversed both the Atlantic and Pacific Oceans, joining Canadian ports with England in the East, and Japan, China and Australia in the West. Their prime purpose was to feed the transcontinental railway. Not so with the other two railways that were dying a slow death. In July, 1916, a Royal Commission was set up to study the general problem of transportation in Canada, the status of the three transcontinental railways, and the re-organization or acquisition of any of these. The commission found the Canadian Pacific able to stand on its own feet, but recommended that the Grand Trunk Pacific and Canadian Northern be put under Government control. In September of 1918, the Canadian Northern became the Canadian National Railways under the management of a Government appointed board of directors and in January, 1923, the Grand Trunk was consolidated with it. Formidable was the task of bringing about unity among the men of the two companies, but more difficult was the task of consolidating and eliminating hundreds of miles of paral-

lel track, with corresponding terminals and other equipment. The year 1923 was the first in the history of the Canadian National System after the addition of the Grand Trunk. It left two railroads in the field - Canadian Pacific, a privately-owned company and Canadian National, a government organization. One was designed on a unified plan, and the other a consolidation of separate railways. One had prestige, ample resources and was in excellent condition; the other was deficient in all these respects. Forward movement in railways paralleled general eras of prosperity, and by the same token, suffered reverses in periods of depression.

The end of the nineteenth century witnessed the introduction of the motor car - driven by an internal combustion engine and using gasoline as fuel. In 1907 there were 2,130 such vehicles in Canada. The first low priced cars in North America were put on the market by Henry Ford, and the number of owners increased rapidly. By 1912, there were over 50,000 registered in this country. Early motor cars were for the carriage of passengers rather than freight, but motor trucks began to be common in the years immediately before the war. The privately-owned passenger car is the successor to the horse and carriage of the previous period, and has the advantage that it can be used to suit the owner's convenience, and can be driven when or where he may choose, provided that adequate roads are available. It had, moreover, the characteristics of speed and endurance that the horse and carriage did not have. Thus, the old system of travel by carriages could

be replaced by an interrupted journey, limited by the endurance of the driver and the state of the roads.

With the increasing use of the automobile there came an additional and powerful argument for better roads. A highway department was established in Ontario in 1913, and in 1917 the Government was empowered to take over any highway, and to assume sole responsibility for construction and maintenance. By virtue of this arrangement, the modern arterial roads began to come into existence. The Dominion Government also increased its participation in road building, and from 1919 to 1931, constant improvements were made.

The contribution in profit, knowledge and pleasure which transportation has made to mankind, is incalculable. It has turned the world into one great market and its people into a huge (though not always congenial) family. War, warriors and their aftermath have contributed to the progress of transportation. New vehicles and equipment are always needed to wage war, and after peace is declared, the need to adjust geographic lines and to satisfy the new wanderlust stirred in combatants, always makes for travel. World War II has done such a thing with the development of the airplane. Once a mere pigeon of the sky, to-day it is the mighty eagle, crossing every far-flung corner of the world.

Let us turn to the last link in the evolution of transportation in Canada, the development of the airplane. The remaining chapters of this paper will be devoted entirely to that phase of transportation.

CHAPTER II.

PROLOGUE TO WAR

One of the most common sights in Canada to-day and most every other day is the remarkable miracle of aircraft, military and civilian, alone and in squadrons, winging their way across the endless expanse of Canada's great geographic boundaries. I use the word "remarkable" rather pointedly for this country 25 years ago was recovering from the shock and wounds of World War I and was unable to devote time or energy to the expansion of transportation facilities, particularly air transport. One might have imagined that with the homecoming of Canada's aces, an air-minded nation would have arisen, and would have early in the post-war period captured available world markets by the use of air speed. However, this was not the case. In July, 1919, three World War I aces, having returned from Great Britain with a few ideas, and a little money, had visions of inaugurating an air-mail service between Ottawa, Montreal and Toronto. Accordingly, they presented their views to the Minister concerned, Mr. A.K. McLean, who boldly and coldly replied:

"Young men, keep your money and try to get yourselves jobs. Canadian fliers have done remarkable work on the other side. But aviation is a war business. There'll never be a place for it in the world of peace".[1]

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1. Roberts, Leslie - Canada's War in the Air, Book I.

How typical of all early reactions to our present mode of life. The plane differed not one iota from the automobile or telephone. Doomed to failure, the critics said, but time proved their undoing.

The years rolled by, and Canada's great northland began to give forth the valuable and diverse minerals which it is her good fortune to possess. Rapid and regular transportation was required and so the plane soon became the freight carrier displacing the dog train used in the winter and the canoe of the summer. Food, fresh and canned, machinery, fuel and the multiple other commodities necessary for the operation of mines, soon began to fly to their destination. The areas covered by these "Freight Jennies" increased daily to eventually all of Canada's northwest and a sizable portion of the east. The City of Edmonton became the world's greatest air freight terminal and Canada the world's largest carrier of freight by plane. To all intents and purposes, the fliers who returned from World War I had served their country doubly well; they had beaten their foe in the air, and at home had found a sensible use for aircraft - namely, peaceful commerce.

As the bush lines expanded into the great uninhabited north and the demand for both additional aircraft and pilots increased, Canada was in the throes of a new and vast industry. The manufacture of aircraft was soon to become a reality and with government orders for amphibian planes to conquer the north land, Canadian Vickers Limited began operating in 1923. This

same company to-day builds the "PBY" Amphibians, the flying boat for coastal patrol. These great flying ships hold the record for the greatest range of any twin-engined bomber in the world to-day, being able to stay aloft for over 33 hours.

From Vickers the germ spread in the successive years to such now world famous names as de Havilland, Fairchild, Boeing and Wright. Actually, the planes were not built in their entirety in Canada for we lacked the necessary facilities for the construction of aircraft engines. A few of these were imported from Great Britain and the majority came from the United States.

And as so often happens in many a virgin industry, the means and the end seem to complement one another. Bush flying as we knew it in the early 1920's gave way to organized airways and many a bush pilot of good standing, especially if he possessed the financial means, wasted no time incorporating his organization and staking his claim on a particular route.

One man, in particular, is noteworthy of mention in the development of Canada's commercial airlines. He is the late James A. Richardson, millionaire industrialist. Imbued with a deep love for Canada, he spent freely of energy and money to help ambitious bush pilots find their mark in the great expansive period of flying in Canada. His intense zeal for thorough Canadianism and complete elimination of the foreign competitors in the field, particularly American, led him to bring to-

gether in 1930 the heads of the Canadian National and Canadian Pacific Railways, to induce each to invest $250,000 in a corporation to be known as Canadian Airways and to commence early plans for coast to coast commercial flying to be subsidized by Government air mail contracts.

Here at last, marked the beginning of a cross-country airline in keeping with the advancing neighbour to the south and fulfilling the long awaited necessity for a transcontinental air route. All proceeded well until a change of government occurred and the incoming government, elected on an economy platform, scrapped the mail contracts.

It becomes obvious, then, that from the end of World War I to the early 1930's, organized aviation in Canada did not progress favourably despite the existence of skilled fliers, reasonably good equipment, and a dire necessity for organized airlines. The body was there but the spirit was lacking. The reason for this situation lay in the fact that neither the government nor the majority of people had yet come to have a belief in flying, and, despite aviation's great contribution to opening the north, still regarded flight as no occupation for a serious, conservative people.

But the awakening was soon to come, primarily because of the conviction that a new clash with Germany was not far off and planes would have to be built on this continent and flown to the British Isles. The first aircraft were still far from the hangar door when the guns began to thunder. Approximately 3,000 people

were engaged in the infant aircraft industry working in less than 500,000 feet of manufacturing space, a production of 40 aircraft a year. That was Canada's aircraft industry when the war began. But no wonder it was stunted in growth! Nobody had ever done anything for it. Nobody had ever taken it seriously, excepting a few determined men with faith in the future of aviation in a young country.

With the growth of the R.C.A.F. to a standing peacetime organization, the demand for semi-military aircraft grew and it was here that the newly organized production centres found their markets. Even the R.A.F. in the late thirties, sensing the impending struggle, began to place orders with Canadian manufacturing concerns for some types of bombers and army co-operation planes. Canada was now a factor, albeit small, in the race for air supremacy. Definitely, now she was a contender and with the advent of war, her success or failure as a modern industrial nation, geared to the times, was to be determined.

During this period, from 1930 to 1939, the dream of Richardson and other far-sighted pioneers was rapidly becoming a reality. From small mail routes in Eastern Canada to organized bush freighting in the northwest, the air bug was beginning to develop and it was not long before it would be fruitful and multiply. The idea of commercial aviation was rapidly taking hold. The two major airways in 1930 were widely separated, both geographically and commercially. Western Canada Airways flew from railheads into mine and bush territory and

International Interprovincial Corporation concentrated on mail in the East. Eventually the two were merged into Canadian Airways. As has already been mentioned, interest on the part of Sir Edward Beatty and Sir Henry Thornton caused each to invest $250,000 in the organization in the name of Canadian Pacific and Canadian National Railroads. In this way, the two major transport companies took their first short steps into aviation. It was a small investment, however, for Mr. Richardson, the newly appointed President, was personally shouldering the biggest financial burden.

The comparative inactivity during 1930 to 1935 as a result of a change of government, caused darkness to loom ahead. The private corporation then in existence had invested heavily in costly equipment, landing fields and so on, based upon governmental air mail contracts. When drastic economy measures were introduced by the new government, commercial aviation came to a standstill.

From 1935 to 1937, however, pressure within and without provoked further conversations and after lengthy debates, plans were made for the formation of a Transcontinental Airline to be operated by the Canadian National and Canadian Pacific Railway Companies and Canadian Airways. However, this joint set-up did not succeed since the government demanded seemingly unreasonable conditions. The government had proposed a jointly owned transcontinental air route with each organization subscribing one-third the capital, but receiving only one-fourth the voting

power. (Each was to have two directors on a board of nine, the government to appoint three of its own directors.) It was here that Trans-Canada stepped ahead and in 1937, under an Act of Parliament, became incorporated as Canada's National Air Service. From then on it was clear sailing for Canada's socialized airline with no competition to thwart its expansion; and with complete governmental facilities, including weather reports, financial backing, air mail routes, etc., to encourage its development. It is no remarkable feat then, that in its six years, its expansion should have proved as tremendous as it has been.

Let us look for a moment at the development of this great airline during the past six years.

Immediately after its creation in 1937, Trans-Canada began to operate over a route 122 miles long between Vancouver and Seattle. The following year air mail and express shipments were carried between Montreal, Toronto and Vancouver, and between Lethbridge and Edmonton. Its staff had increased in the year from 71 to 332 members, and its five Lockheed aircraft trebled to fifteen. Hangars were constructed at the main landing fields, repair bases came into operation and radio facilities became available during this remarkable year of expansion. The successive four years reveal continual progress and rapid expansion until the picture showed a sharp incline in every phase of its activity. It carried 60% more passengers, 50% more mail, and 64% more freight in 1941 than in 1940. In 1942 there was a further increase of 63% in

mail load, 24% in passengers, and 128% in air express. It provides to-day, two transcontinental round trips daily between Halifax and Vancouver, reaches Newfoundland daily, travels twice daily between Toronto and New York and also makes additional local trips daily between the more populated areas in Central Canada.

Trans-Canada, in a period of war, has not confined itself to civilian traffic alone. Besides maintaining a speedy and dependable transcontinental service, it has expanded its facilities across the country to perform such highly important wartime requirements as overhauling and maintaining transatlantic transports for the Royal Canadian Air Force, the Imperial Overseas Airways and the British Commonwealth Air Training Plan, besides manufacturing tools and precision instruments for Canada's aircraft manufacturers, and assisting the National Research Council in important wartime experiments in aviation. It has sent scores of its highly trained flying personnel to the Air Force to act as instructors, pilots and navigators.

Trans-Canada Airline's greatest and least known contribution, however, is its role in connection with the formative stages of the British Commonwealth Air Training Plan. Trans-Canada's parent, the Department of Transport, was in frequent consultation with the Training Plan committee and furnished much needed information on desirable locations for various types of training stations and schools. The Department maintained an exceedingly close check on all preliminary activities of the Plan council, detailing

trained personnel for aerodrome selection, planning and construction. Trans-Canada even went so far as to place at the disposal of the Plan its own actively used airports until stations close by had been completed. Some of them, while not highly practical because of climatic conditions and the nature of surrounding country, were still available even though they could not be gainfully used. However, landing fields used for emergency purposes were made available and the sites of many of these unused strips have developed into top-notch flying stations.

So much for Trans-Canada Airlines. Without it, Canada's wartime expansion certainly would not have attained its present high stage of development; nor would the great Commonwealth Air Training Plan have been so successful; nor would the Canadian war effort have functioned so effectively. To Trans-Canada Airlines go the thanks of a nation at war.

But throughout this period Canadian National Railways great competitor, the Canadian Pacific, had ideas on air travel all its own. Its plans were not thwarted by the formation of the government-owned Trans-Canada Airlines, but rather did it continue to develop in quite another direction.

Canadian Pacific advertises its organization as "The World's Greatest Travel System" and to live up to that statement, it realized that it too, must keep pace with changing conditions and add wings to its world-wide system of transport. It was a problem indeed to Canadian Pacific's brain trust -

for with a government subsidized airline covering the most populated areas, where could a competitive airline function successfully?

Let us look briefly at Canadian Pacific's early history, commencing in 1919 when an Act of Parliament granted it the right to maintain operations within and without Canada. Little or no development occurred in the succeeding ten years, at which time along with the Canadian National, it subscribed to form Canadian Airways. In 1937 came the break; Canadian Pacific was placed on its own, spending the five following years surveying the possibilities of incorporating several of Canada's independent bush companies into its own organization. In 1942, extensive purchases began and within the year, Canadian Pacific Airlines could consider itself a major commercial airline. At least ten separate Canadian Air Transportation Companies agreed to merge with Canadian Pacific. Not only did they place their lines and equipment at Canadian Pacific's disposal, but also a surprisingly large number of the men who had played so important a role in the development of commercial flying in Canada. Such famous names as C.H. Dickens, Grant McConachie, W.R. May and Herbert Hollick-Kenyon, joined Canadian Pacific's staff and immediately engaged themselves in planning the company's policies, their courses and operations in the air.

Canadian Pacific had a tremendous task on their hands. It was one thing to fly on a beam, on level and charted territory, from one major city to another, and

still a different story to operate a chain of separate routes in uncharted territory and without the benefits of a standard policy and planned organization. But the men who formed the executive were, in many cases, pilot, general manager and president combined. They not only knew how to fly a plane, but were well familiar with the land over which they operated and their flying and organizational ability beyond any doubt, aided them in combining to establish and operate a successful major airline in an exceedingly short time.

Let us glance momenterily at the large area of operations covered by Canadian Pacific Airlines by listing the component airlines and locations which have been merged into its wings.

Dominion Airways, Montreal, Que.
Quebec Airways, Montreal, Que.
Starratt Airways, Hudson, Ontario.
Wings, Ltd., Winnipeg, Manitoba.
Canadian Airways, Winnipeg, Manitoba.
Arrow Airways, Le Pas, Manitoba.
Prairie Airways, Moose Jaw, Sask.
Mackenzie Air Services, Edmonton, Alta.
Yukon Southern Air Transport, Edmonton, Alta.
Ginger Coote Airways, Vancouver, B.C.

It can be seen, then, that these lines literally cover the land from Quebec west to the Pacific, and it was Canadian Pacific Airline's task, with the men who organized these bush lines, to commence operations. The result is that to-day Canadian Pacific's traffic routes cover a rather extensive network of points located in that part of Canada that lies west and north of the Great Lakes. Daily, Lockheed Lodestars equipped with the newest of equipment and, of course, stewardesses,

leave Vancouver and Edmonton for Whitehorse, Alaska and down the Mackenzie River to Aklavik. In the mid-western provinces, Canadian Pacific Airlines operates a daily service north from practically all the important prairie cities.

In the East, as in the West, between Quebec, Montreal and aluminum's Arvida, mail and cargo are carried up the St. Lawrence to the eastern tip of Labrador where lie Canada's eastern airports. Huge quantities of freight are hauled into northern Quebec for essential wartime developments which otherwise might never have been achieved.

Operational statistics for 1942 show that Canadian Pacific Airlines carried 60,000 passengers (as against 104,000 of Trans-Canada Airlines) and 1,750,000 pounds of mail (as against 2,300,000 pounds of Trans-Canada Airlines). But Canadian Pacific Airlines carried 10,000,000 pounds of cargo while Trans-Canada Airlines carried a mere 363,000 pounds.

Here is a complete list of Canadian Pacific Airline's peacetime activities briefly stated:

Aerial photography
Aerial survey and prospecting
Aerial timber cruising
Aerial forestry patrol
Aerial forest fire protection
Scheduled flights from established bases
Transporting in bulk fish, furs, etc.
Scheduled northern mail services
Forest and crop dusting
Charter trips for mining engineers, trappers, sportsmen, etc.

The basic reasons for this progress in flying in northern Canada are simple. The only alternative

means of transportation in many cases, the canoe in summer and dog team in winter, are arduous, costly, and slow for the long distances to be travelled. On the other hand, the lakes which dot the country everywhere, automatically provide readily available landing space for aircraft equipped with floats in summer and skis in winter. As a result of these geographic conditions, commercial flying throughout Canada's north country has been able to supply a real economic service without governmental subsidies of any kind, while many public services are being carried out with increased efficiency and economy through the aid of flying.

Types of cargoes carried have already been mentioned - fish, furs, supplies, tools, mining apparatus and the like. But the strangest cargo ever carried by Canadian Pacific Airways took place in 1940-41 when eight horses and four oxen were moved to a point on the Saguenay River, in Quebec. The animals were not doped but were packed in bales of hay and represented the first shipments of their kind in Canada.

Thus, we can see that Canada is particularly well-suited for air freight traffic, particularly in the outlying regions where physical obstacles to surface transport make it both extremely costly as well as slow. And it is Canadian Pacific Airlines which is doing the bulk of this magnificent job.

To a nation at war, Canadian Pacific Airlines gladly gave of its talent and facilities. The outstanding contribution in this field is the operation by Canadian Pacific Airlines of six of the nine privately

managed civilian Air Observer Schools for the British Commonwealth Air Training Plan. These six schools are currently turning out approximately three-quarters of the navigators for the British Commonwealth Air Training Plan and so it is hardly necessary to elaborate on this phase of its contribution. One might add, though, that as far as Canada's war effort is concerned, no greater example of harmony between service and civilian organizations exists than this relationship, all for the common cause.

The Nation's thanks, too, to Canadian Pacific Airlines for aiding the British Commonwealth Air Training Plan by maintaining and managing five repair plants for the servicing and overhauling of aircraft and engines used in the Air Training Schools of the R.C.A.F.

Canadian Pacific has even trained unskilled personnel in the art of repair, and with the growth of the plan, has increased its staffs proportionately, always ready and able to cope with any situation. The civilian staffs have been extremely co-operative with the R.C.A.F. and have been reasonably free of labour difficulties. This indeed constitutes a good argument for those who maintain that civilian enterprise does not contribute freely to the war effort.

Canadian Pacific Airline's boast of "The World's Greatest Travel System" has been borne out on many occasions but the magnitude of its organization can best be gauged by its contribution to the Royal Air Force in the organization of the Atlantic crossing

by the R.A.F. Ferry Command. In 1940, discussions were held between Canadian Pacific Airlines and government authorities regarding the establishment of Atlantic Air Operations for the purpose of providing an essential Canada-Britain mail service and to lay the groundwork for a bomber ferry service between the two countries. In 1940, with the aid of pilots of Imperial Airways in England, the first Hudson Bombers wended their way in ten hours across the Atlantic. Canadian Pacific Airlines looked after the administrative tasks and Imperial Airways did the flying. Soon this small group expanded beyond all expectation and in 1941 bombers by the hundreds were flying the Atlantic daily. New airports, hangars and living quarters were constructed to meet the new schedule. Actually, little publicity was given to these developments at the time but as the organization became known as the Royal Air Force Ferry Command, the complete story of this Canadian pioneered Ferry service became known. Canadian Pacific had again scored.

Another of Canadian Pacific Airline's pioneering feats is that of aerial mapping which is done for the Dominion and Provincial Governments and such private industries as pulp and paper, mining and power companies. Particularly noteworthy is the extensive aerial survey made for the Aluminum Company of Canada in its power development plans of Quebec, which became known as Shipshaw, one of the world's largest hydro-electric plants. Work was also done

for the United States Government in connection with oil developments to service United States Army equipment in Alaska.

In brief, then, we see Canadian Pacific Airlines component parts - on transport operations both passenger and freight, over the entire northland and western territories, on direct war service by maintaining observer schools throughout the land in co-operation with the R.C.A.F., and by its repair plants which service aircraft in the air training schools. These, coupled with lesser services directly concerned with the war effort, are noteworthy indeed. One can point with pride to Canadian Pacific Airline's record - a noble and sincere one.

The Dominion of Canada is generally referred to as the Senior Dominion of the British Empire, a situation which has come about largely due to Canada's great natural wealth, its industrial capacity, and its important position in world trade since Confederation in 1867. But of interest to-day, when the world at war looks primarily to the skies for its balance of power, is the undisputable fact that it was in Canada that the first aircraft was flown in any part of the British Empire. On October 1, 1907, at Baddeck, Nova Scotia, Dr. Alexander Graham Bell, the inventor of the telephone, together with J.A.D. McCurdy, F.W. Baldwin and Glen H. Curtiss, formed what was known as the Aerial Experiment Association. Several months

after the formation of the Association, the first heavier-than-air machine to fly in the British Empire, the Silver Dart, with McCurdy at the controls, made its initial flight off the ice at Baddeck, Nova Scotia, on the twenty-third of February, 1909.

A great deal of interest was manifested in this new military craft, which had covered about 1,000 miles before it crashed during a practice flight.

An auspicious start had been made, however, and it was not long before the pioneering spirit had caught on. Paradoxically enough, it was World War I which aroused an early interest in Air Force organization, for some thousand of our boys who crossed at the outbreak of hostilities soon found themselves members of the Royal Flying Corps. A goodly number of trained pilots returned to Canada in 1917 to establish what was known then as "Royal Flying Corps, Canada", a training organization for Pilots in the rapidly growing air war. This might be called, truthfully enough, the forerunner of the present Commonwealth Air Training Plan. Most of the training was done in Canada but in the winter months, when heating facilities were not too readily available, training was done in Texas, U.S.A.

In April, 1918, the Royal Flying Corps, whose personnel were practically half Canadians, was reorganized under the name of the R.A.F., with such outstanding flyers as Billy Bishop, Raymond Collishaw, William Barker and George MacLaren.

Bishop, now an Air Marshal and Director of

Recruiting for the R.C.A.F., is the only man to have received the Victoria Cross, Distinguished Service Order and Military Cross from the King at one time. His exploits with the Royal Flying Corps from 1917-1918, the 72 planes he shot down, his daring single-handed attacks behind enemy lines, are well known to all. Significant to mention is the fact that at the age of 24, Billy Bishop had won almost all the coveted awards of War Service.

Lieut.-Colonel Collishaw ran Bishop a close second in numerical achievement, having sent 60 German aircraft crashing to their doom. He saw action on many fronts, particularly as Commander of a naval squadron at Dunkirk (World War I). After the war he remained with the R.A.F. and at the start of World War II, was an Air Commodore in charge of Bombing Units in the Western desert.

Most unusual of the Canadian Air Aces of the last war was Colonel George MacLaren who, at the outbreak of the war, was a trapper in Canada's northland and did not learn of the war until 1916. He lost no time, however, and soon had a score of 53 aircraft to his credit. Colonel Barker followed close on his heels with 50 German planes to his credit. It was these men who, with other Canadians in the Royal Flying Corps, were formed into two Canadian Squadrons towards the end of the Great War. The Armistice was signed before they could get into action, but the plans were laid and a Dominion status was given to individual air units whose component numbers were Canadians. And

thus came into existence the Royal Canadian Air Force, date of birth, February 18, 1920.

Two years after the boys had returned, the R.C.A.F. began to function as an integral part of the Government with its duties roughly divided into two parts, half the time and personnel were assigned to the so-called Defence of Canada while the remainder were assigned to aerial mapping, forestry patrol, and surveying. Actually, it amounted to the Air Force breaking down into two distinct sections - the civil and military. The former was the forerunner of the present extensive northland flying and was largely responsible for Canadian Air Freight supremacy - a world record maintained even to-day. It was also responsible for fire watching in Canada's vast forests, so essential as the lumbering industry came into its own. Fish propagation too, came in for a share of Air Force planes. Air mail, a small passenger service, also were carried on in small degrees.

In spite of all this peacetime activity, the Air Force carried on with a comparatively small personnel and hence most aircraft were primarily used for peaceful pursuits - and if in emergency - could be converted to military use.

In 1931, the Air Force increased its allotment by some 2½ million dollars, making a total of 6½ millions for the year - a far cry from the 2½ billions of 1943. In the years following the ups and downs of government economic policy, the Air Force gained or

suffered proportionately. At the beginning of the current conflict, the R.C.A.F. numbered only 450 officers and 4,000 enlisted men. It was obvious that a great deal of organization and many hundreds of millions of dollars would be necessary before the current strength of 250,000 men could be reached.

It was not too difficult, however, to set the vast organization in motion, for the new generation was air-minded. There were 20 or more civilian flying clubs operating throughout the land and those who graduated from these clubs made their way across the sea and enlisted in the R.A.F. long before the war broke out. When war did break out, almost all those actively engaged in peacetime pursuits immediately donned the blue of the Air Force.

And so, on September 3, 1939, when a declaration of war was soon to engulf the earth, there were many favourable factors existing to the credit of the Air Force. The feeling in Canada was rife for aid to Britain. Everyone, it seemed, wanted to do his share. Those who could not fight subscribed money for machines. The bush pilots, too old for combat duties, became instructors, others, test pilots. Already hundreds had seen duty with the R.A.F. and now wished to become identified with the word "Canadian".

And it was not long after Hitler invaded Poland that the Air Ministry in London officially announced:

> "In due course, squadrons of the R.C.A.F. will be playing their part in active air

> operations in Europe. Meanwhile, the Canadian Government have suggested that a Canadian squadron should be formed from the Canadian personnel already serving in the R.A.F. The Air Council have readily agreed, and a new fighter squadron has now been formed from Canadian personnel drafted from the other units. The Squadron Leader is an officer of the R.C.A.F. All the pilots are Canadian. The new squadron is about to take its place in the air defences of this country".[1]

R.C.A.F. Headquarters were opened in London. Canada's wings had sprouted. For the first time in her short history, this nation had its own identity established in the air. What a glorious chapter it was to play in World War II will be revealed in Chapter III.

1. P.J. Field, Canada's Wings Page 27.

CHAPTER III.

WARTIME EXPANSION

When Canada declared war on the German Reich in September, 1939, she found herself like most other allied nations in a complete state of unpreparedness. Her navy and army combined numbered about 6,000 and the air force at home totalled some 4,000. A few fighter planes were available as well as a few skilled personnel. Yet when the war drums began to roll, the Royal Canadian Air Force had a squadron overseas ready for the fray. No. 242, the first fighter squadron of the R.C.A.F. to take its place in the battle line of Europe, had trained in England and while there had lost its identity to the R.A.F. But with the announcement of the Air Ministry, and with a battle to fight, the members of this squadron remembered their land of birth and preferred to fight as Canadians and to carry on in the tradition of their illustrious forebears. In charge of the men was Squadron Leader W.D. Van Vliet. He brought to his command not only a thorough Air Force training, but actual experience of many years of flying in Britain and in Canada, including "bush flying".

It did not take long before the members of "242" went into action. In May of 1940 they began operations over the Channel and France. During the evacuation of Dunkirk, Canadian pilots played their part in holding in check the innumerable swarms of enemy machines. Every day it was the same - British

fighters encountering hordes of enemy bombers and fighters and never hesitating to engage them. When France surrendered, the order came for the "242" to cover the great evacuation of the advanced Air Striking Force. It had the honour, together with a British Squadron, of being the last to leave that unhappy country. How many machines they shot down is not officially known, for in the evacuation, the records of the squadron were lost. It is thought that the score was well over fifty.

Not long afterwards, Canadian trained airmen began arriving in England. In February 1940 the No. 110 (City of Toronto) Squadron landed at a British port - making the beginning of our unending migration of Canadian trained aircrew to the scene of battle. Actually, the City of Toronto Squadron was really an all-Dominion party for its members were from cities and towns from Victoria to Halifax. But a start had been made.

With the No. 110 R.C.A.F. Squadron came the No. 112 which was an Army Co-operation unit and was to act as its reserve.

In charge of the No. 110 were Squadron Leaders E.A. McNab of Regina, with more than 2,000 hours to his credit and R.H. Foss of Montreal. Commanding the No. 112 were Flight Lieutenants C.H. Greenway of Lloydminster, Saskatchewan, and G.H. Sellers of Winnipeg. The two squadrons were moved to a base near London where they were able to work together.

Close associations had been established during the Great War between Canadian and British regiments, but no affiliation between squadrons of the R.C.A.F. and the R.A.F. had ever taken place. The "110", however, became allied with the No. 603 R.A.F. (City of Edinburgh) fighter squadron, thereby fastening another bond between the airmen of Canada and the Old Country. Both squadrons originated as auxiliary air force units.

In August of 1940, just two months after the "110" fighter squadron had arrived and just long enough for the pilots to become accustomed to the territory, the Battle of Britain was launched. It was against the convoys in the English Channel that the first blows were hurled. Then came the attempts to wipe out the ports and coastal towns. After a five day lull, the second phase of the attack was directed against Britain's inland aerodromes, small formations of enemy machines proceeding to south and southwest London. Then came the attacks on London. Throughout all of this fierce fighting, the Canadian Squadrons were right in the thick of it. By the end of the Battle of Britain, the "242" and "110" Squadrons had accounted for a minimum of 100 enemy machines between them.

Canadians in other R.A.F. Fighter Squadrons were also adding to the score of Canada. During the Battle of Britain, a Polish Squadron was led by a Canadian, Flight Lieutenant Christie of Winnipeg. In September, 1940, this Polish Squadron went into action accompanied by the "242" all-Canadian Squadron. Canadians also saw action against the Italian Air Force

when that Air Force tried their antics over Britain. Other Canadian flyers saw action over Germany, Libya and the Mediterranean.

While Goering's bombers attacked London in the third phase of the Battle of Britain, R.A.F. bombers turned their attention to military targets over Germany generally around Berlin in particular. The first British raid on the German capital was made on August 25th, 1940. On the second raid, a day or two afterwards, went a Canadian pilot. Bombs were also being dropped on Italy by Canadians. Attacks, in the summer of 1940, were made on aircraft factories in northern Italy, particularly the Fiat works at Turin.

It remained the task of the British Commonwealth Air Training Plan to produce and train flyers to meet the needs of the war in the air. On October 10th, 1939, talk was first heard of proposals to engage in large scale Air Training on Canadian soil. On that date, the word "Air" appeared prominently in the Nation's press for what was announced was the genesis of what is known to-day as the British Commonwealth Air Training Plan.

Prime Minister Mackenzie King made official announcement of the scheme from Ottawa in a statement which marked the inception of the Plan. But many discussions had to take place among the representatives of the Governments of the United Kingdom, Australia, New Zealand and Canada before a definite plan was reached. On December 17th, Prime Minister Mackenzie King made public the final plan. It was to be a long-term operation designed to give the Allies ultimate

command of the skies, perhaps even to be the deciding factor of the war itself. Since then, expansion and the constant broadening of its functions have made it the greatest strategy in Canadian history and one which already has proved itself of inestimable value in the fight for freedom.

Because of its tremendous importance, I am repeating Mr. King's speech of December 17, 1939, even though it is rather lengthy:

"I am pleased to be able to announce that agreement has now been reached by the Governments of the United Kingdom, Canada, Australia and New Zealand on a co-operative air training plan, to be known as the British Commonwealth Air Training Plan. The agreement was signed last night very shortly after midnight in my office on Parliament Hill. It is based on a proposal made to the Governments of Canada, Australia and New Zealand, on September 26, by the Government of the United Kingdom.

"In addition to a rapid and extensive increase in the air training program of each of the three Dominions, the plan visualizes joint training in Canada, in the more advanced stages, of pupils from Canada, Australia, New Zealand and the United Kingdom.

"The undertaking is one of great magnitude.

"It will establish Canada as one of the greatest air training centres in the world. Its development will result in a rapid increase in the number of air training schools in this country, and will achieve a steadily increasing output of highly trained pilots,

observers and air gunners.

"The plan will enable the four countries to meet the greatly increasing requirements of trained personnel for their respective Air Forces, and for such service as the combined Forces may be called upon to perform in the theatres of war. The aim, in short, is to achieve, by co-operative effort, Air Forces whose co-ordinated strength will be overwhelming.

"In working out the plan, the existing air training programs of all four countries engaged in the discussions, were fully taken into account. As already mentioned, the plan provides for a continuance of training in the United Kingdom, for an enlargement of the training programs of Canada, Australia and New Zealand, and for a joint training program in Canada. As the United Kingdom proposal contemplated joint training to be carried on in Canada, it was appropriate, and, in fact, essential that the details of the program should be worked out at Ottawa.

"The broad problem was to decide on the speediest and most effective means of training the maximum number of pilots and airmen to meet the exigencies of war. In working out the agreement, Canada, Australia and New Zealand had, necessarily, to keep in mind local defence considerations, such as the training, equipment and service of the pilots and other air personnel required to keep up their own air defences.

"To reach the main objective, namely, the rapid training of the greatest number of pilots and airmen, the facilities in these countries, in excess of

local needs, are to be used to train Australians and New Zealanders for service overseas with the R.A.F. The existing training facilities in the United Kingdom will continue to be used by the R.A.F.

"Under the agreement, as it relates to joint training in Canada, the program of training of personnel for the R.C.A.F., already enlarged since the outbreak of war, will be vastly increased. The Canadian training program will be merged with the program of joint training in Canada. In this way, co-ordinated air training will proceed simultaneously in all four countries.

"The joint air training program provides for the training of many thousands of pilots in Canada each year, about three-fifths as many air observers, and a slightly larger number of air gunners than pilots. The pilots, of course, are those who actually operate the planes. The observers handle the reconnaissance cameras and the bomb sights, and as well, do the navigating. The gunners use the machine guns in action, and also act as wireless operators.

"The facilities in Canada will be used, in varying degrees, by all four parties to the agreement. Practically all air recruits in the United Kingdom will be trained at home. In Australia and New Zealand, all air recruits will receive their initial and elementary flying training at home.

"Most of the Australian pupils and some of the New Zealand pupils will also receive advanced training in their own countries. Under the agreement,

however, about one-fifth of the pupils to receive advanced training in Canada will come from the other two Dominions. Some pupils will be received from the United Kingdom, Newfoundland and elsewhere. The great majority of the pupils will, however, be Canadians.

"The first stage of training in this country will be initial training, which is a ground course to prepare recruits for flying and for Air Force life in general. This will be given in three large schools. At the end of four weeks initial training, a selection will be made of those to be pilots, observers or gunners, and they will then go to the appropriate schools.

"Pilots will go to one of the elementary flying schools where they will learn to get the feel of a plane, and to fly light machines. After some eight weeks, they will graduate to the service flying schools.

"It is at this stage that the Australian and New Zealand pilots, who will receive their initial and elementary training in their own countries, will come to Canada to continue their training. In the service flying schools, of which there will be 16 in Canada, pilots will spend about 14 weeks learning intermediate and advanced flying, including night and instrument flying. They will receive instruction in bombing and fighting as well.

"The air observers, including those from abroad, will spend about 12 weeks at the air observers' schools. There will be 10 of these schools at which pupils will be taught navigation, reconnaissance and photography.

"They go on from air observers' schools to bombing and gunnery schools for a course in the theory and practice of bombing and gunnery. The course will take about six weeks. There will be 10 bombing and gunnery schools. Finally, in order to learn more advanced navigation, the observers will spend about four weeks in one of two air navigation schools.

"The air gunners, who also serve as wireless operators, after their initial training either in Canada or abroad, will take a 16 weeks' course in the wireless training schools. There will be four wireless training schools. In them, air gunners will be taught not only the essential principles of radio work, but also operating practices in the air. They will then proceed to the bombing and gunnery schools for four weeks, to learn that phase of work before proceeding overseas.

"Schools will also be needed, at the outset, for training instructors and administrative staffs. And before the training program is brought to full capacity, ground crews and maintenance staffs will be required in large numbers to man the various schools and establishments. Repair and equipment depots, headquarters and commands, recruiting centres and records offices will also be required.

"In addition to the 58 schools for the training of pilots, observers and air gunners, and schools needed, at the outset, for training instructors and administrative staffs, several much larger schools will also be required to train the maintenance staffs,

and personnel for ground crews. The total number of schools required, in Canada, for the joint training program will be 67.

"Nearly 40,000 officers and men will be required to man all the various schools, depots and other parts of the organization when it is in full operation. This will include about 2,700 officers and about 6,000 civilians. The remaining 30,000 will be members of the Air Force other than officers. These numbers do not include the pupils undergoing training, who will also be numbered in thousands. Many of the airmen required for training the pupils will be mechanics and other skilled artisans, who constitute ground crews and maintenance staffs.

"For the program of joint training full use will immediately be made of the existing facilities of the R.C.A.F., as well as of facilities generously made available by Trans-Canada Airways. However, to put the extensive program into full operation, a great deal of construction and production will be necessary.

"Throughout the country, about a score of existing air fields will have to be enlarged, and some 60 odd new air fields constructed. The schools will be established in different parts of Canada. Large supplies of equipment and stores of various kinds will be required to furnish the schools, and also the equipment and repair depots. The construction and other industries of Canada may be relied upon to meet effectively the demands which this program will involve.

"Great quantities of aircraft and their parts will, of course, be required. The United Kingdom, as her part of the costs of the undertaking, has agreed to supply most of the aircraft including engines and spares. Apart from the aircraft supplied by the United Kingdom, the light aircraft for elementary training and a portion of the other aircraft will be made in Canada.

"The aircraft to be made in Canada will be included with the other costs of the joint training program, which are to be divided between Canada, Australia and New Zealand in proportion to the use to be made of the various facilities by the pupils of the three countries. This means that, excluding the cost of the aircraft provided by the United Kingdom, Canada will bear the cost of the initial and elementary training in Canada, and about four-fifths of the remaining costs of the program.

"The duration of the agreement is until March 31, 1943, in other words, a little over three years. This period of time may, however, be extended or terminated by mutual agreement.

"While any estimate of costs made at this time is subject to a wide margin of error, the total cost for the entire program in Canada, for the period agreed upon, will approximate $600,000,000. Canada's share will be around $350,000,000.

"Up to the beginning of next September, the expenditure on the joint training program will amount to about $90,000,000. Of this $90,000,000, Canada's share will be about $48,000,000.

"This amount will be in addition to the $315,000,000 which the Minister of Finance estimated would be the cost, in the first year of the war, of the military program already undertaken before the air training plan was proposed. In other words, in this first year of war, Canada will be spending on her military effort alone about $1,000,000 a day.

"Under the terms of the agreement, the joint air training program which is to be carried out in Canada, is to be administered by the Government of Canada. The organization and executive command of the training schools is entrusted to the R.C.A.F. For the general supervision of the joint air training program, a supervisory board will be established in Canada. The board will supervise the financial administration of the program. It will also, from time to time, inspect the progress being made in the setting up of the organization, and carrying out the training.

"The supervisory board will be under the chairmanship of the Minister of National Defence. It will also include the Minister of Finance, the Minister of Transport, representatives of the Governments of the United Kingdom, Australia and New Zealand, the Deputy Minister for Air of the Department of National Defence, and the Chief of the Air Staff. Contact with the Government will be maintained by the board through its chairman, and with the R.C.A.F. through the Chief of the Air Staff.

"The representatives on the board of the Governments of the United Kingdom, Australia and New

Zealand, are to report to their own Governments regarding the progress of the joint training program.

"They will also have authority to visit, at any time, any stations or units, and to make criticisms or suggestions to the board. It is expected that they will assist in keeping the R.C.A.F. advised as to new developments in training technique which may come to their notice.

"All four Governments will co-operate in the provision of staff and teaching personnel. The staff officers and instructors from the United Kingdom, Australia and New Zealand will, during their period of service in Canada, hold temporary appointments in the R.C.A.F. This further co-operative arrangement should go far to assure the successful working of the joint air training program.

"The air training facilities which were being developed on a less extensive scale before the war, are being brought rapidly to completion. Of about 125 air fields already developed in Canada, 42 are up to the standard set by Trans-Canada Airways. Many of these will be used for the joint training program.

"Under arrangements made with the provincial governments, the highways staff of all the provinces have been used for surveying additional airdrome sites. Full advantage has been taken of the favourable weather, and most of the sites have already been surveyed. The War Supply Board has anticipated the requirements of the program and has organized production to meet them.

"The enormous variety of equipment required for the program is being listed in detail, so that orders may be promptly placed. To prevent delays in obtaining supplies required from outside Canada, protective orders have already been placed. Now that the agreement is in force, the War Supply Board will immediately begin to let the necessary contracts. Plans for the schools have already been prepared, and no time will be lost in their construction.

"The new program is of such magnitude that some little time must necessarily elapse, while schools are being built, equipment obtained, and the training of additional instructors completed, before student pilots, observers and air gunners can be accepted for their training, and before the first pilots and observers trained under the scheme will be sufficiently skilled to proceed to the theatres of war....."

Briefly stated, the plan which came into operation on May 1st, 1940, and sent the first trainees over by November, covered the training of pilots, air gunners, wireless operators, navigators and observers. Canada is bearing most of the initial cost, but will be reimbursed by Great Britain, Australia and New Zealand on the basis of the number of airmen trained. Original cost was estimated at $600,000,000 with Canada contributing $350,000,000. The larger proportion of the trainees are Canadian, but Great Britain, Australia and New Zealand are sending ever-increasing numbers of men.

The complete scheme provides for 67 training

schools as well as 16 establishments for the training of the staffs, which alone are reckoned at 40,000. At least 80 aerodromes, 20 of them old ones to be enlarged, were estimated as necessary for the 4,000 airplanes involved.

The stages of training have been clearly defined. In the ground courses a selection of future pilots, observers or gunners is made. Pilots then spend some weeks at the elementary flying schools. It is at this stage that the Australian and New Zealand pilots, who have received their initial and elementary training in their own country, follow on to Canada to continue their training. Several weeks are then spent learning intermediate and advanced flying, including night and instrument flying.

The air observers spend some weeks in the initial training school, and then, with the airmen from overseas, go to the air observers' schools for several weeks. From there they proceed to the bombing and gunnery schools, followed by a further course at an air navigation school. The air gunners, after basic training, take a course in wireless and then go to bombing and gunnery schools for several weeks.

Much has happened since the historic day when the Commonwealth nations committed themselves to the Plan. On that December day in 1939 the figures were considered "staggering". So was the physical scope of the Plan! Was our construction industry able to enlarge the 20 existing fields and build 60 new ones besides? Could we train, equip and produce 67 schools,

40,000 officers and airmen in the permanent personnel of the Plan exclusive of the lads we had to train?

The answer to the questions proved to be an emphatic "yes"! Much more was done than had been actually planned. Old-time pilots checked in from the bush. The Flying Clubs, the Sunday pilots and all others leaped to accept responsibility. Contractors rushed to complete new aerodromes in record time. Factory wheels turned faster. Every Canadian put his heart and soul in the task before him.

The organization period from 1939-40 was not without its bottlenecks and headaches. There were mistakes and successes for the method was of trial and error. It was a year of disaster and of miracles. But as the year closed, the great machine had begun to show signs of slow movement. Mass production was left to the years that followed. Somehow classes were enlisted, equipped and sent aloft. The first Wings Parades were held. Months ahead of schedule came pilots, observers and air gunners. Canada moved into the mass production of training-aircraft once England could not give us our supply. Canada opened her doors to the R.A.F., and provided schools and aerodromes to relieve Britain's overcrowded countryside. Canada provided the western terminals whence the great bombers flew the ocean in constantly increasing numbers when they were most needed.

The personnel of the R.C.A.F. in Canada and overseas on November 1st, 1941, was approximately 90,000, this in addition to pupils attached to the Royal Canadian

Air Force but belonging to the Royal Air Force, the Royal Australian Air Force and the Royal New Zealand Air Force. It was also in exclusion of 11,000 civilians, half of whom were taking the places of service men who had been released for more active duty. Thus, all told, there were over 100,000 persons under the control of the Department of National Defence for Air. In February, 1942, the figure had reached 106,000 men in uniform and more than 13,000 civilians or approximately 120,000 in all. After two years of war, there were more than 20 Canadian squadrons fighting as units, as contrasted with the original two.

By the spring of 1943, the following situation existed:

"1. No further expansion of the Air Training Plan was intended. In the physical sense of the term, it had reached its peak.

2. Instead of 67 schools, as originally contemplated in 1939, the number of schools was 154.

3. The total output of aircrew under the Plan in the spring of 1943 exceeded 50,000 flying warriors.

4. There were 40,000 R.C.A.F. personnel of all categories overseas.

5. 38 R.C.A.F. squadrons had been formed overseas, or were in the final stages of formation, in addition to operational units serving on the defences of North America and over Canada's two ocean fronts.[1]

6. For every Canadian with the R.C.A.F. outside Canada, eleven were serving with the R.A.F.

7. Cost of operating the Air Training Plan exceeded $40,000,000 a month, almost half a billion dollars a year.

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1. There were 40 R.C.A.F. Squadrons by February, 1944 - February 8, 1944, Ottawa Journal.

8. More than 2,000,000 miles were being flown every day in Canada to train youngsters for the air-fighting jobs of tomorrow.

9. More than 10,000 aircraft were in service under the Plan.

10. Due to greatly increased and improved equipment (such as the Catalina flying-boat, now being manufactured in quantity in Canada) R.C.A.F. operations over the North Atlantic had been greatly stepped up, with highly beneficial results to the anti-submarine score. Canadians were participating in the job of driving the Jap from the Pacific gateway.

11. At the close of four years of war, the monthly output of the Plan was still increasing and would continue to rise for several months to come, although the peak had been reached in the field of equipment. The press announced early in June, 1943, for example, that the greatest aircrew draft of the war had just reached Britain in safety.

12. Canadian young women in thousands had entered the Service, completed training in numerous branches of work and were serving at home and overseas. Every recruit signing to serve with the Women's Division released a man for combatant duties".[1]

Such was the state of affairs, as the fourth year of war drew to a close.

More mention ought to be made of the women in the R.C.A.F. Canada instituted in 1941 a corps first known as the C.W.A.A.F. - the Canadian Women's Auxiliary Air Force, and now as the R.C.A.F., Women's Division. Havergal Ladies' College in Toronto was taken over as a training centre. 150 women from all parts of Canada formed the first class. Of this group, 126 were graduated, and reported at Uplands, near Ottawa, for duty January 5th, 1942. A similar group arrived at Brantford January 12th. Others came to Moncton, Dunnville and Saskatoon in the three weeks which followed. The jobs to be done by the Women's Division were aimed at releasing manpower of the R.C.A.F. ground staff for more

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1. Leslie Roberts: The War in the Air. Page 113.

urgent duties, notably that of aircrew.

The original trades of the Women's Division were basically "woman's work" and included replacement of men as cooks, waitresses, clerks, equipment assistants, dental assistants, hospital assistants, telephone operators and general duties - along with motor transport drivers and parachute riggers.

Before long these young women proved their ability to take over more duties of essential ground staff work so that mid-1942 found them doing the job of the teleprinter, radiographer, meteorologist, postal clerk, wireless operator, (ground), and the responsible, secret work of the operations room.

Airwomen are not enlisted for flying duties and are not permitted to fly in service aircraft. These gallant young women have adapted themselves to the life of the Training Command Stations with ease and are to be praised for their fine performance of difficult duties. Many women's divisions have proceeded overseas where their work is even more urgently needed.

In addition to the organization of the Women's Division, the Air Cadet League of Canada was formed in June, 1941. To provide basic organization for Canada's air-minded youth the Air Cadet League was founded, and with the interest of the R.C.A.F. in the movement, Canada's youth became an integral part of the war effort. Boys from 15 to 18, in good health, are permitted to join. Their training includes theory of flight, how to signal by wireless, how to chart a course or navigate an aircraft. The cadet becomes

familiar with both the theory and mechanics of aero engines. In addition he gets a St. John's Ambulance Course plus drill and physical training which assure him of entrance to manhood, healthy and strong in mind and body.

Early in 1943, the R.C.A.F. assumed all the details of administration and training as well as provision of equipment for Air Cadet Units. In line with this plan, during July, thousands of Air Cadets receive a week's actual training at an R.C.A.F. station. Furthermore, instructors and officers of the League must take a special two week's course with the R.C.A.F. to be sure they are qualified to do their job.

The youth in the Air Cadet League are so well trained and so desirous of actively contributing to the cause, that when they reach eighteen, their enthusiasm, air-mindedness and interest invariably lead them to the R.C.A.F. recruiting stations.

There were enrolled in Canada, as of August, 1943, 27,000 cadets in units divided as follows:[1]

British Columbia,	3,305	Cadets in	47 Units
Alberta,	2,452	" "	44 "
Saskatchewan,	2,360	" "	38 "
Manitoba,	2,538	" "	47 "
Ontario,	7,126	" "	105 "
Quebec,	5,583	" "	52 "
Nova Scotia,	960	" "	15 "
New Brunswick,	368	" "	8 "
Prince Edward Island,	181	" "	3 "

Thus did the germ of aviation spread not only to our finest young men, but to our young women

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1. Statistics from Air Cadet League Headquarters - Ottawa, February, 1944.

and to our growing boys. A wave of interest in airplanes manifested itself into such pursuits as model building and aircraft recognition, and every eye is turned to the sky at the slightest suggestion of the roar of motor above - World War II is a war in the air!

A word must be said about Canada's wartime aircraft industry which has made such remarkable progress in so short a time. As was mentioned in a previous chapter, Canada had a handful of small aircraft plants in 1939. These plants included:

Fairchild Aircraft Limited, Montreal area
Noorduyn Aviation Limited, Montreal area
The de Havilland Aircraft of Canada, Ltd., Toronto area
Cub Aircraft Corporation Limited, Hamilton area
Fleet Aircraft Limited, Fort Erie area
Boeing Aircraft of Canada, Limited, Vancouver area

These six companies were engaged exclusively in the manufacture, assembly and repair of aircraft.

In addition to these there were also:

Canadian Vickers, Limited, Aircraft Division, Montreal, which in 1923 undertook a contract for flying boats for the R.C.A.F. thus leading the revival of the industry in Canada;

Canadian Car and Foundry Company, Limited, Aircraft Division, Montreal, which had designed and built a small engine of less than 200 horse-power;

Ottawa Car and Aircraft, Limited, Ottawa, which was concerned chiefly with aircraft engines and the overhaul and repair of planes; and

Canadian Car and Foundry Company, Limited,

Fort William, which had designed and built both trainers and fighting machines chiefly for export.

These few firms occupied small and inadequately equipped premises unsuitable for mass production. They employed a mere handful of people and their production in a year was considerably less than half of what is now produced in a week!

To-day, 14,000,000 square feet of modern factory area hums with the activity of almost 120,000 individuals, 36,000 of whom are women. At the door of each prime contractor's plant is a modern airport with hard-surfaced runways and all the necessary facilities for test flights.

The creation and equipment of such enormous plant facilities, and the training of these thousands of employees has been a major task. For the first six or eight months of the war, nobody in authority ever contemplated that Canada would build anything but a few trainers and perhaps a handful of flying boats. However, in the summer of 1940, when England announced that she no longer could provide us with the bulk of the training planes for the Air Training Plan, the Anson, we realized we had to face the problem ourselves. The first job was to redesign the Anson trainer and make it here. That became the job of the Federal Aircraft, a government administrative company which became associated with Canadian Car, de Havilland, Ottawa Car and Aircraft, MacDonald Bros., and Victory Aircraft Limited. It was Federal's job to centralize engineering, sub-contracting, the purchase of materials, their movement, and to take

care of the many odd jobs that cropped up from plant to plant. In addition, smaller plants all over the country were included in the picture as suppliers of parts. To-day the scheme is somewhat modified. Innumerable sub-contractors are employed, working in their own plants. Many of these smaller plants did not require much altering or retooling and immediate production took place.

Plant facilities had to be created and equipped, tools had to be made, flying fields improved and manufacturing facilities established for the thousands of items required in the construction of a modern airplane.

As order emerged from chaos and production commenced to flow at an ever-increasing rate, those charged with the responsibility of plane production realized the need for an expanded program. Late in 1941 and early in 1942, long range plans were carefully considered and adopted. At this time the program was streamlined - obsolete types were abandoned and mass production began of fewer types, each the best in its class. From the production of 21 types of aircraft in 1939, the list to-day contains but 9. They are, Fairchild Cornell (elementary trainer), North American Harvard (advanced trainer), Canadian Anson (advanced trainer - bomber), Bristol Bolingbroke (bomber), Catalina (coastal reconnaissance), Hurricane (fighter), Lancaster (multi-engined bomber), de Havilland Mosquito (fighter - bomber), and the Curtiss dive bomber. These are produced, in the order

shown, by Fleet, Noorduyn, Federal and Associated Companies, Fairchild, Vickers and Boeing, Canadian Car, Victory, de Havilland and Canadian Car.

The inauguration of the new plans was a long uphill climb. Swinging from the older to the newer types, production temporarily ceased. But the new program is now off to a good start and production figures in every plant show a steadily rising curve.

Eight prime contractors deliver finished planes to-day. Over 300 miscellaneous sub-contractors furnish these prime contractors with equipment, accessories, and parts necessary to the flow of planes that in steadily increasing numbers are now being delivered to the fighting services. These sub-contractors embrace a veritable cross-section of Canadian industry. They used to be makers of furniture, linoleum, sewing machines and agricultural implements before they rallied to the cause of the aircraft industry.

This is a brief picture of the industry which in the short period of three years has grown from infancy to maturity and has made one of the greatest contributions to the war effort of the allied cause. Each month the output of modern combat types grows larger and larger and as they wing their way across the oceans to the scenes of combat, Canadians can justifiably take pride in the accomplishment of this great new industry which is now capable not only of providing for the training, defence and transportation needs of Canada, but, in addition, is able to contribute in a large measure to the support of our gallant airmen in

the fields of conflict overseas.

In asking ourselves what part the air will play in ultimate victory, let us examine a brief calendar of air activities for 1943:

1943

JANUARY

2 - Allied bombers attack airdromes on Crete.
10,573 enemy planes destroyed by British over Europe and Middle East since war's start.
Formation of first R.C.A.F. bomber group overseas announced.
955 enemy planes destroyed by anti-aircraft fire over Malta in 1942.
Allied bombers pound Palermo, Sicily.

10 - Allied fighters attack Sicily and Lampedusa airfields.

12 - British bombers raid Ruhr 7 times in 10 nights.

14 - First operation of R.C.A.F. bomber group since formation January, 1942.

16 - R.A.F. bombs Berlin 54th time.

FEBRUARY

1 - Canada to increase R.C.A.F. squadrons overseas from 30 to 38.

3 - R.A.F. and R.C.A.F. bombers in 95th attack of war on Hamburg.

19 - Wilhelmshaven bombed for 72nd time.

24 - U.S. bombers attack Naples.

MARCH

1 - Heaviest raid made on Berlin by R.A.F. and R.C.A.F.

10 - Germans produce six-engined troop transport plane "Me-323".
U.S. bombers and fighters attack Jap positions on Kiska Island, Aleutians.

15 - Allied air forces in North Africa using "tank buster" Hurricane fighter planes.

20 - U.S. fighters in 19th air attack on Munda, New Georgia.

APRIL

1 - U.S. bombers make four attacks on Kiska, Aleutian Islands.

3 - R.A.F. raid renders Krupp armament works at Essen almost completely idle.

7 - Third contingent Women's Division, R.C.A.F. arrives in Britain.

12 - 100 Jap planes raid Port Moresby, New Guinea.

13 - General MacArthur says control of skies must be maintained by Allies to keep Japs out of striking distance of Australia.

18 - Allied fighters destroy 32 transport planes, said to be carrying German troops out of Tunisia.

20 - War Department discloses details of American bombing raid on Tokyo, April 18, 1942.

MAY

1 - United States flyers bomb Kiska 13 times.

2 - Darwin attacked for 54th time by Jap planes.

4 - Largest force of four-engined bombers yet sent over Germany drops nearly 1,500 tons of bombs on Dortmund.

6 - Allied planes now heavily out-number Germans on all fronts.

8 - Greatest aerial raid launched from Africa over Palermo.

17 - R.A.F. wrecks Mohne and Eder dams in Germany.

18 - U.S. bombers give Pantelleria worst bombing of war.

19 - Germans report thousands killed and hundreds of thousands left homeless as result of R.A.F. bombing of dams in Ruhr Valley.

21 - R.A.F. and R.C.A.F. carry out greatest raid of war on Dortmund.

JUNE

14 - Canada sets up wartime trans-Atlantic air service.

16 - American and New Zealand flyers achieve

JUNE (Cont'd)

16 - biggest victory of South Pacific - down 94 Jap bombers and fighters and turn back heavy enemy attack on Guadalcanal.

22 - Howe says 8,014 planes produced in Canada since war's start.

24 - 5,000,000 Germans migrate from heavily bombed Ruhr Valley area.

29 - Allied forces land on Rendova Island, and beat off Jap aerial counter-attack, destroying at least 65 planes.

30 - Churchill warns Germans of air offensive of ever greater wrath.

JULY

1 - R.A.F. raids Palermo, Sicily, and Cagliari, Sardinia.

3 - Nine heavy bombing raids on Jap positions on Kiska Island, in the Aleutians.

R.A.F. and R.C.A.F. planes attack Cologne in great strength.

4 - British destroy grounded planes and oil dumps on Axis-held Crete.

9 - New Georgia base at Munda blasted from air and sea.

15 - Naples pounded by Allied airmen.

18 - Four Jap warships sunk by U.S. bombers in northern Solomons.

19 - U.S. planes make first raid on Rome's military targets.

24 - British and Canadian bombers hit Hamburg with 2,300 tons of bombs.

29 - American bombers batter Warnemuende aircraft factory in Germany.

AUGUST

1 - U.S. planes fire Rumania's Ploesti oil fields.

Italians flee cities to avoid promised Allied bombings.

2 - British and Canadian flyers rekindle fires in Hamburg.

AUGUST (Cont'd)

7 - R.A.F. bombs Italian cities of Milan, Turin and Genoa.

12 - British and Canadian planes bomb Berlin.

13 - U.S. planes bomb Rome and R.A.F. hits Milan and Turin.

17 - Allies destroy 120 Jap planes on Wewak, New Guinea.

21 - Allies bomb railway centres near Naples.

22 - Allies blast Salerno, south of Naples.

23 - British and Canadian bombers dump 2,000 tons of bombs on Berlin.

SEPTEMBER

10 - Germans shell and seize Rome and assume "protection" of Vatican City.

16 - Australians capture Lae, New Guinea air base.

21 - Allies bomb Venice.

OCTOBER

1 - Allied bombers from North Africa blast Munich in Germany and Wiener Neustadt, near Vienna.

7 - German air force makes heaviest and longest raid on London in two years.

8 - U.S. heavy bombers destroy 142 German fighters during attack on Bremen and Vegesack.

10 - Axis targets in Greece and Aegean Islands blasted by Allied planes.

12 - Portugal grants United Nations use of bases in mid-Atlantic Azores.
Allied air armada crushes Jap's main south-west Pacific fortress of Rabaul.

14 - U.S. heavy bombers smash Nazi ball-bearing plant at Schweinfurt, lose 60 bombers, but down 91 Nazi fighters.

16 - 104 Jap aircraft destroyed in air battles in Southwest Pacific.

19 - 60 Jap planes destroyed by Allies in attack on Rabaul.

OCTOBER (Cont'd)

24 - Allies destroy 123 Jap planes in raids on Rabaul.

NOVEMBER

3 - 34 Nazi planes shot down when 700 American bombers make heavy day raid on Wilhelmshaven.

13 - British bomb Berlin for second successive night.

16 - U.S. heavy bombers attack molybdenum mine and power station in Norway.

18 - R.A.F. and R.C.A.F. attack Berlin's suburbs, paralyzing traffic and causing heavy casualties.

29 - U.S. bombers made daylight raid on Bremen.

DECEMBER

8 - Chinese recapture Changteh with help from American airmen.

10 - Bulgarian capital of Sofia blasted by Allied warplanes.

12 - Brazil to aid Allies with ground forces and air force units.

15 - U.S. heavy bombers strike heavily at enemy airfields on outskirts of Athens and Piraeus.

16 - Great Berlin arms plant blown up in sixth great raid of month.

20 - Massive air fleets pulverize Frankfurt and Mannheim-Ludwigshafen.

29 - British Navy, aided by planes of the Bomber Command, including R.C.A.F. flyers and the U.S. Navy planes, sink three German destroyers in Bay of Biscay.

30 - Berlin practically knocked out of war by R.A.F. and R.C.A.F.

Thus, our 1943 diary has shown us what an indispensable tool for victory the air has become. The early months of 1944 have gone on to show the destruction of German territory on a still more formidable scale. Millions of tons of bombs and thousands of planes are

participating in the job of bringing this war to a successful and more speedy termination.

BOMBERS OVER LONDON

(Harold Balfour in the London Sunday Times)

Tonight I heard the sound
of Bombers outward bound.
I rest in peace while they
sweep bravely on their way;
and as I lay I knew
that I could give no due
except to pray, with love,
"God guard those gallant few
above."

CHAPTER IV.

WINGS IN THE POST-WAR WORLD.

Apart from the progress and conduct of the war itself, possibly the favourite topic for discussion in the world to-day is the world of tomorrow. Much of this discussion is necessarily speculative, since no one can foretell exactly what conditions may prevail when the war ends. There is, however, one development taking place before our eyes, a development of tremendous current as well as post-war importance - the world is getting smaller.

Transport planes are effecting changes in the geography of the world fully as drastic as those wrought by bombers in the architecture of Berlin during December, 1943. Time distances between London, Washington, Ottawa and Chungking have shrunk to fractions of their former length as hours of flying time replace days or weeks of land and sea travel. (Dr. Charles Camsell, Canada's Deputy Minister, Department of Mines and Resources, reports that he travelled from 1899 to 1903 on foot and in canoes over 1,400 miles of Arctic territory, and 35 years later, covered the same distance by plane in ten flying days, with overnight stops. On his first journey he saw Eskimos who had no iron, whose lances and knives were of sharpened walrus tusks, whose light came from seal-oil lamps, whose clothes were of skin sewn with caribou sinews. On his second visit the men had rifles, outboard motors, and cameras - all transported by air. Some of the women wore corsets!)[1]

Vital materials and key officials fly from Canada to

1. Waldemar Kaempffert, "Who Owns the Air?", Liberty, June 5, 1943.

England between dawn and dark, while Mrs. Roosevelt includes her doings in London in "My Day".

A large number of these international flights follow routes which have been developed in answer to a vital wartime need for getting planes and their cargoes from where they are produced to where they are needed in the shortest possible time. Important implications for Canada's future lie in the fact that, because of the earth's shape, the shortest routes are the northern routes, so far as air traffic between this continent, Europe and Asia is concerned.

We live at the bottom of an ocean of air. Only recently has the meaning of this fact been realized. The air ocean's airplane is revolutionizing the world we live in, and the plane's conquest of time and space is giving new meaning to global geography. To no country is this change more important than to Canada.

Let us examine the magnitude of this statement. The Magellan expedition of 1519-1522 took 1,083 days to go around the world. 300 years later fast-sailing clippers had reduced this to about 160 days. Philias Fogg was described by Jules Verne in 1873 as going "Round the World in 80 Days". In 1929 the airship "Graf Zeppelin" took only 20 deys and 4 hours. Within 10 years from that time, the American flier, Howard Hughes, flew around the world in approximately 92 hours.

Planes have flown from Australia to the United States in 36 hours. The record across the Atlantic from North America to Britain is 6 hours and

40 minutes, the time taken by the fastest train linking Montreal and Toronto. Ottawa is now about 30 air hours from Bombay, and Edmonton only 36 hours from Tokyo. An American airline company advertises, "Nowhere in the world is more than 60 flying hours from your nearest airport." In Canada to go by train and boat from St. John's, Newfoundland to Victoria, would take almost a solid week of travelling time, but Trans-Canada Airline's total flying time is 24 hours and 30 minutes. 3,911 miles in European terms would mean a trip from London to La Hore, India. In terms of Canada, it means a trip from Winnipeg to London![1]

Look at a global map and it will easily be seen that Canada lies on the airways of the world. The shortest routes between North America, Europe and Asia cross the Dominion of Canada. Moscow is just across the roof of the world - Canada is Russia's Arctic neighbor. This conception of geography is very new. We know the world is round, yet almost every one of us pictures it as a rectangle. It is a coloured map with Canada at the top. Beyond British Columbia is the Pacific Ocean across which lies Japan. Beyond Labrador is the Atlantic across which lies Europe. To the south of us lies the United States and to the north is - presumably - the North Pole. Most maps cut off the northern one thousand miles of the world and we never miss them.

Gerardus Mercator, in the sixteenth century, invented the type of projection in common use

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1. "Canada Sits on Top of the World". Canadian National Magazine, July, 1943.

to-day. He supplied sailors with a chart by which to plot their courses. That lands far from the equator are grossly exaggerated in size, or that the South and North Poles do not appear at all, is beside the point. For its original purpose Mercator made an excellent map. Without any doubt he should be included among the leading half-dozen moulders of human destiny. But unintentionally, he blinded almost four centuries of statesmen. With few exceptions, the leaders of every nation to-day find it impossible to think of the world except in terms of Mercator's sailing chart of 1568.

Two months before Pearl Harbour, the United States Army refused to agree that a road to Alaska was strategically necessary. Why? The answer is apparent when you see the wall-maps of many offices in Washington. They are Mercator maps, and Alaska is obviously away off the track between the United States and Japan, while Hawaii is right on it. Many people are still wondering why the Japanese were busily constructing landing fields on islands in the Aleutians. We read of Allied activity on the coast of Labrador, of large planes flying from Southampton Island in northern Hudson Bay and of work being done in Baffin Island. All of these remote outposts seem far off the routes joining the places that matter in this war. The Mercator map proves that, but now we know that map to be incorrect.

For our aeronautical age the world needs to be flattened in another way. Therefore, to-day we use the Azimuthal Equidistant map. On it, directions

and distances from the centre are correct. This centre can, of course, be anywhere on earth and is often placed at the North Pole. On the map which appears on the next page, it has been placed at a point between Brandon and Winnipeg. Such a map is startling, but surprisingly truthful.

Places on the Azimuthal Equidistant map are not where we have always thought they were. Most of the land is seen to be grouped about a central ocean in the northern hemisphere. Hawaii is not between San Francisco and Japan. The straight line from Winnipeg to Tokyo goes nowhere near Vancouver but across Fort Vermillion in Northern Alberta. Honolulu, Georgetown and Murmansk are all equidistant from Brandon. It shows that the Japanese on the Aleutians are half way in a straight line from Tokyo to Vancouver; that Baffin Island is dead in the middle of the shortest route from Seattle to Murmansk, an important factor in ferrying bombers from factories to fighting fronts.

Early explorers, looking for the North-west Passage, were looking in the right places because the shortest way from the Atlantic to the Pacific lies in the higher latitudes or even across the Pole.

To-day we are seeing the ideas of those seventeenth century navigators used by airmen to put the Arctic in its proper place, to make it a focus of long-distance transportation routes.

How does Canada fit into this picture? Our place is, if not in the middle, very close to it. Every direct route between North America and Europe or

Asia crosses the Dominion. About a quarter of the land surrounding the Arctic Ocean is Canadian. Most of the remainder is Russian. One end of the air bridge spanning the North Atlantic is on the lower St. Lawrence and the Maritimes. In practice every plane from Europe or Asia reaching the United States by great circle courses will cross the Dominion. In the North Pacific route to the Orient stand the Yukon Territory and Mackenzie Valley.

Canada is in a strategic position - in peace or in war - only second to that of Russia. This strategic location is already being put to good use, for already three critical areas of Canadian territory in air strategy have been developed:

1. The Northeast: the ferry route to Europe. Montreal is the headquarters of the R.A.F. Transport Command by which large numbers of new aircraft from United States and Canadian factories are reaching Europe.

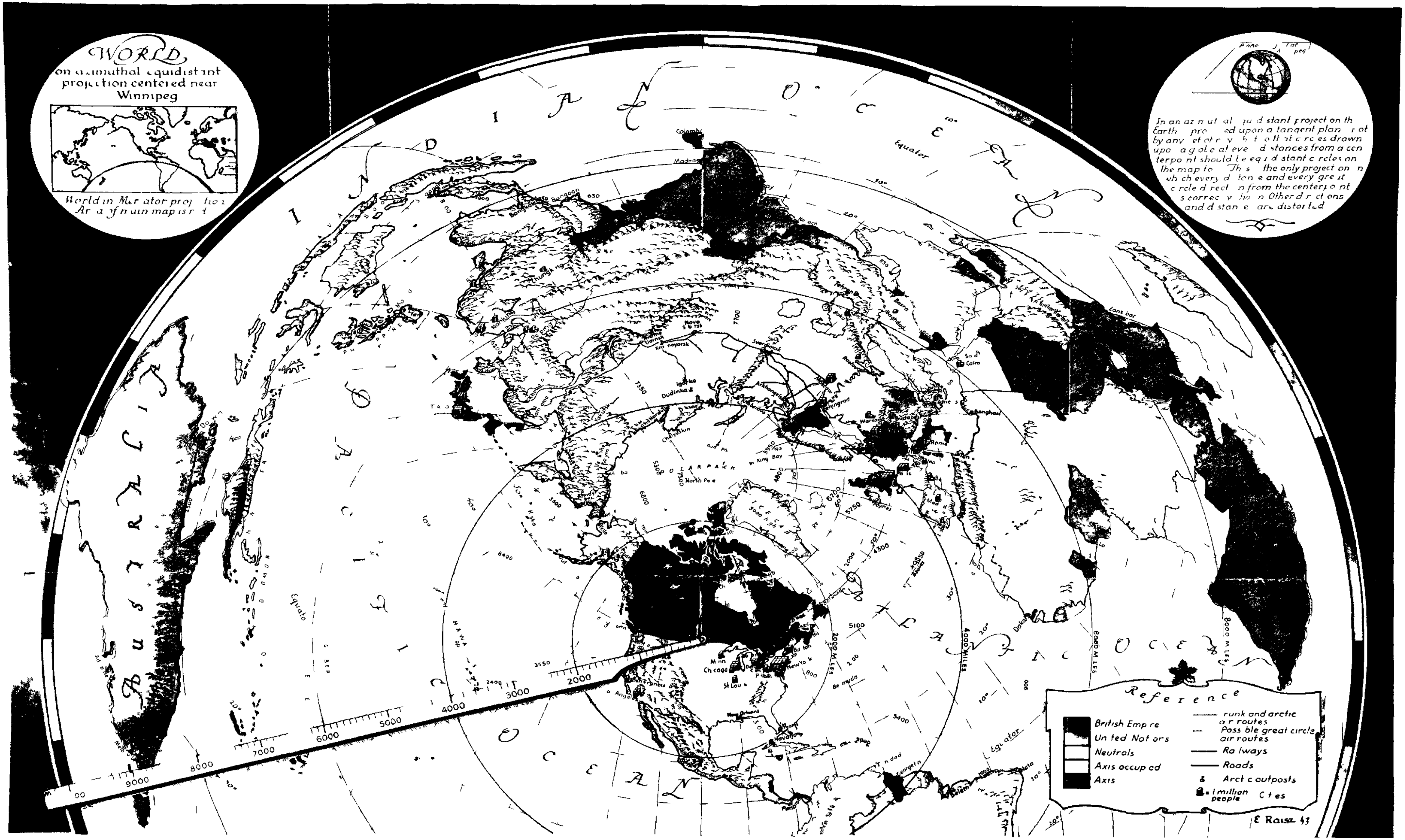
2. The Northwest: the ferry route to Asia. Edmonton is the terminus for aircraft being ferried by the northwestern airway across the Yukon. It also includes Fort St. John, Fort Nelson, Watson Lake, and Whitehorse leading to Fairbanks.

3. A northern mid-continent area used either as a ferry route farther north to Europe, or as a link to the east and west in the sub-arctic.

The coming of war - a war of transportation - found Canada the titular controller of these three vital corridors. Equipment was required together with roads, air fields, radio stations, and skilled

personnel. Sources of oil fuel had to be exploited. Every ounce of Canadian energy had to be utilized to fight the Nazis. There was no other matter that was more urgent. To quote from the Financial Post of August 22, 1942, the article "A Lifeline to Russia via Canada's Back Door" shows the importance of our air routes in war strategy: "It was just two decades ago that General Billy Mitchell, famous air-minded United States Army leader stated: "He who holds Alaska holds the world". This prophetic statement is full of meaning to-day as the war comes closer to this continent and our Allied supply lines lengthen. Already China is cut off except for the Himalayan air ferry. Japan's bombers are settling their sights on India's coast-line. The Nazis are driving relentlessly forward to the rich oil fields of the Caucasus.... Faced with these facts, the whole question of cargo air freight and new routes becomes one of the great issues of the war. And it is in this expanding picture of air supply operations that the air routes through northern Canada become ever more important. Military strategists are now saying that the Yukon and Alaska route is our chief hope for throwing a lifeline to help our beleaguered forces in Asia. Added to the through air route possibilities to Asia is the all-important present problem of moving supplies to the Pacific and Alaska coast defence points.

The United Nations will ultimately have the world's finest and largest air force scattered over the globe. In turn it can only be efficiently


WORLD
on azimuthal equidistant projection centered near Winnipeg
World in Mercator projection
Australia
Indian Ocean
Pacific Ocean
Atlantic Ocean
Equator
North Pole
Reference
British Empire
United Nations
Neutrals
Axis occupied
Axis
Trunk and arctic air routes
Possible great circle air routes
Railways
Roads
Arctic outposts
1 million people
Cities
4000 MILES
8000 MILES
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supplied and serviced by transport vehicles which can keep pace with it - that means air transport carriers. Ten knot boats cannot get to the right place in time to supply carriers travelling at 400 miles per hour. This fact is most important also - present military air cargo planes, unlike combat aircraft, will be highly valuable in switching over to post-war air business. The dramatic aerial events taking place in Canada's northland are a vital portion of a much larger world picture. No longer are we chained to the ground as the airplane weaves aerial network across continents and oceans. A transportation revolution is in the making and Canada is keeping in step with the makers of the new world air structure. It is a known fact that Canada's northern war skyways will be the by-paths for post-war world-girdling commercial planes. Many Canadians yet fail to realize the area of this "New Canada" which lies north and west of Edmonton. It is 1,700 air miles from Edmonton to the Alaskan border, while north to the Arctic it is 1,550 miles. Great mountain ranges have to be hurdled and, until recently, all flying had to be done by daylight and without benefit of radio ranges. To-day all this has been changed, and what the steam locomotive did for the west three quarters of a century ago, the airplane is duplicating in the north to-day".

Canada has long been a problem in east-west geography. To-day there is a whole new country coming into being which runs north and south. What the post-war period holds for this great million and

a half square miles is anybody's guess, but there is no doubt in the minds of those making transportation schemes to-day, that the new northern half of the Dominion up to the shores of the Arctic will see mining and industrial development after the war on an unpredicted scale.

Sooner or later, the world will have to face the vast and complex problems of international air transport - of arranging the routes and bases, of untying the intricate knots of law and usage. It is a problem as big as the world itself, for air transport will cover the whole face of the globe and, what is more important, go five or six miles up into the stratosphere. It is also a problem that has never before confronted mankind, so involved is it with the ways of war as well as of peace, with the needs of trade as well as of transportation, with the dealings of diplomats as well as of businessmen. The people who are working on the problem have looked to history for some solid guidance but they have been able to find only a few crumbs of precedent. There are men of many backgrounds working on the question - the most practical and the most visionary men in the British Empire, in American politics, the heads of airlines, the most far-seeing airplane engineers and pilots. But the diplomats are using the kind of talk that points to their lack of sure ground. Business men seem to feel that none of them has the individual power to control the situation and are seeking alliances.

There have been so many pious, high-minded

utterances about the use of the post-war air, that innocent observers might think the issues were going to be decided purely on the basis of general world welfare. The more this proves true, the better will be the ultimate solution.

The chief controversy is over the phrase "Freedom of the Air" - a phrase which has become a catchword before it has become a definition. "Freedom of the Air" would mean that anybody could fly anywhere at any time for any peaceful purpose".[1]

The British, who use more exact words, refer to "Freedom of the Air" as "Open Sky". "Open Sky" is the opposite of "Closed Sky" or "Sovereignty of the Air". In other words, the "Closed Sky" school of thought believe in each nation retaining control or sovereignty of its own air and allowing the planes of other nations to come in only by agreement. In the "Freedom of the Air" school, the advocates believe that nations should lay aside their claims to sovereignty of the space above their lands in order to assist in the fullest possible development of the airplane as a vehicle of commerce; that any international airplane be given the right to fly and land anywhere without permission, subject only to local rules.

In comparing the ocean of air with the ocean of water, it is a mistake to draw a parallel between Freedom of the Seas and Freedom of the Air. In ordinary times, the ocean is free. No matter what flag

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1. Joseph Kastner - "What to do with the World's Air", Life, November 1, 1943.

a ship flies, she may touch at any port without permission, provided she abides by port regulations and national tariff laws. She may steam through the English Channel, the Straits of Gibraltar, the Canals of Suez and Panama. She may even ascend rivers to discharge or take on passengers and cargo far inland. A peaceful ship on the high seas, three miles away from an inhabited shore, cannot damage anything except another ship. Even after coming into port, a peaceful ship lies anchored in the harbour. If there are any unfriendly members of the crew, shore police can take care of them. Most important, a ship cannot penetrate beyond the shoreline, and is restricted as to the damage it might do.

The airplane, on the other hand, is not free to travel anywhere. The International Convention for Air Navigation of 1919 made that clear in this rule, now a part of the written law of nations: "The High Contracting Parties recognize that every power has complete and exclusive sovereignty over the air space above its territory". The reason for such a law is obvious in the light of to-day's war. More information about industrial centres and strategic points can be acquired from the air in a day than could be acquired by other means in months and years, and international pilots who fly for commercial air lines in peacetime learn exactly where to drop bombs in wartime. Hence, most European countries compelled foreign airplanes to follow stated courses. Along with this closed sky doctrine of sovereignty, most nations recognized the right of

"innocent passage" which gave any private, non-commercial plane the right to fly anywhere except over restricted areas. It also granted the right to land for emergency repair, refueling or refuge from weather. This did not extend to commercial planes and was of no importance, therefore, for air transport.

Post-war air arrangements will undoubtedly fall somewhere between closed and open sky. With air sovereignty as the base, modified agreements can be made for commercial planes, as for instance:

"1. The right to fly over a country without landing.

2. The right to fly to a country, land but fly no farther across the country.

3. The right to fly into and over a country with the privilege of landing for fuel, repairs, or safety. This is simply the right of air transit.

4. The right to fly into a country, land, drop off and pick up cargo and passengers coming from or going to foreign points.

5. All the rights of No. 4 with the additional right to stop anywhere within the country to take on or drop off passengers and cargo at any point for any other point. This is really "Open Sky"."[1]

Point No. 3, the right of air transport, has been suggested by President Roosevelt as the starting point of a post-war air agreement with Great Britain. To give an example, a Canadian airline flying to the Bahamas could be permitted to land in New York and Miami but not carry American passengers between those cities. Arrangement No. 4 would allow passengers from or to Canada or the Bahamas to be loaded or unloaded at New York and Miami.

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1. Joseph Kastner - "What to do with the World's Air", Life, November 1, 1943.

Despite the fact that the world has operated from a closed sky basis, international air transport managed to reach most corners of the world. United States planes flown by Pan-American Airways had the right to fly into 38 countries. Germany had landing arrangements with 33 countries, England with 31, the Netherlands with 27 and France with 22. It would seem that the real post-war issue is how much more freedom or how much less sovereignty may be required in the world's air to guarantee the development of commercial aviation. What international understandings will be necessary to guarantee it?

The post-war period will witness many discussions between Great Britain and the United States. The fight for air supremacy is much more important for the British than for Americans. Britain's economy is more dependent upon foreign trade, and the revenue and influence derived from shipping are vital to her well-being. To the United States, foreign trade is of lesser importance.

The British are also worried about the inroad air transport will make into shipping. Through its Army and Navy Air-Transport Commands, the United States now has become the greatest international air-power the world has ever known. It has the largest and most efficient fleet of modern transport planes. The British have had to build bombers rather than transport planes for the successful prosecution of the war and the result has worried Lord Londonderry.

He has advised Parliament that "our whole existence as a great Empire Commonwealth depends on the position which we shall occupy in relation to the air in the post-war world." Under present agreements the United States loses control of all the air bases it has helped build on British territory six months after war is over. Britain will have the bases, the United States the planes. Great Britain possesses the most complete chain of air bases covering all corners of the world. She can, therefore, be more independent of foreign air bases than any other country and has enough world airline for a closed sky policy. The United States is poor in bases, but by making deals with Portugal and France, whose empires afford stepping stones around the globe, the United States could get along without British bases. Geography aside, the United States has some very important bargaining assets. It has great numbers of transport planes to trade for bases or landing rights. It has vast manufacturing centres plus new designs for planes to come. It has food and other articles of trade. The United States, through Pan-American, knows more about international air transport than any other country, in addition to the fact that it is a great and rich trading centre, a source and a market for other nations.

An encouraging note regarding English opinion on the matter of air bases was made public by Lord Beaverbrook on January 20, 1944: "It is our aim to make civilian aviation a guarantee of international solidarity and the mainstay of world peace. I don't,

of course, propose to deal to-day with bases in the Dominions. Necessarily they must be separately dealt with. They will be the subject for discussions between Britain and the Dominions. But as for bases under our control, the Government has no desire to exclude aircraft from other nations. We demand no prescriptive rights for the use of airfields for ourselves. Rather we mean to use them for the purposes of steadily developing civil aviation throughout the world".

In studying further the existing facts which concern Great Britain and the United States, it can be noted that in Britain, the problem of post-war aviation is largely political, while in the United States, it is largely economic. This difference can be traced to the fact that Britain has been heavily bombed whereas this continent has been spared. The British think of the airplane as a weapon of destruction and not as a commercial carrier. The airplane as a means of transport does have a dual function. A railway engine is a harmless contraption, a passenger ship is not a warship, a motor car is not a tank. But most airplanes could be equipped to carry bombs as easily as passengers or goods.

One has no difficulty in studying the American plans for post-war aviation. It is in the American interest to make the international air reasonably free. That is necessary for her trade. She would like, also, to maintain her present position of leadership. However, that is not the complete stand. "Our approach must be from a positive and enlightened sense

of both the national and world interest".[1] In such a program, national aims would be secondary to those of an international character.

There are many specific American programs worthy of mention:

1. Pre-War System: This maintains two principles of international law:

   (a) Sovereign rights of air space which has already been mentioned - foreign aircraft cannot fly over a nation's territory without permission.

   (b) Closed port airfields - outside aircraft must obtain permission to land on a nation's air bases. Specific routes and landing rights were granted to individual carriers by a government in this pre-1939 system. Thus Pan-American of United States could deal directly with the Government of Portugal, or France, etc. It led to complications. If resumed, nineteen airlines of United States might be dickering with one country for transit and base rights.

2. Use of Lend-Lease: Some Senators and Congressmen are anxious to advance the United States air position through the lend-lease system. They advocate conversion of military air lines now circling the globe into peacetime passenger services with the United States thereby gaining a head start. They feel "We built the bases, why can't we keep them?". True, but United States built them while other nations had other burdens to think about. The State Department opposed attempts to use lend-lease to obtain benefits in commercial aviation.

3. Freedom of the Air: This principle has already been mentioned. Any outsider can come in and do business by air. This is absurd. No nation will open its interior to "any aircraft, any time".

4. Henry Wallace's System: Vice-President Henry

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1. "Logic of the Air"- Fortune - April, 1943.

Wallace advocates a "globe-girdling airways" to be operated by the "air arm of the United Nations" peace force. It would be fully trained for war but in time of peace, would fly commercial planes. Most informed circles consider Mr. Wallace too optimistic. For his "internationalization of the commercial air" he suggested a "United Nations Investment Corporation". It is felt, however, that a United Nations airways cannot be realized until there is a United Nations world. Mr. Wallace makes the ancient mistake of confusing "peace to men of good-will" with "peace and good will to all men", a praiseworthy but not very sagacious maxim for a world with such a powerful minority of evil wills in it.

5. Free world-wide competition: This is desired by 16 domestic airlines who have an Airline Committee for United States Air Policy. They seek private ownership and management of international airlines, freedom of passage in other countries and an active government policy of encouragement and aid. Championing the cause is the American Export Airlines: "We strongly support the thesis of competition. By competition we mean that any American airline interested in providing air service beyond our borders and into foreign countries, should have the right to make application to a properly constituted government body, such as the Civil Aeronautics Board".

6. Pan-American Attitude: This airline is able to boast of more than 215 million miles of over-ocean travel completed. Before the war, it crossed both

oceans and landed in 38 foreign countries. In the scramble for free-for-all competition, it would stand the best chance. However, its president, Juan T. Trippe, begs for one strong American airline to engage in foreign air commerce. It would be owned and controlled jointly by all airlines. Share allotment would be a government task. Such a joint airline - really the "chosen instrument" system of Britain - would compete more favourably with foreign lines which are mainly government monopolies. International agreements would be simple, schedules more efficient and ground organization less duplicated. It is felt that trans-ocean business will not warrant more than one United States competitor with foreign lines on the same routes. Five years from now, they say, fifty planes of one hundred passenger capacity will handle all transatlantic traffic.

7. Right of Commercial Transit: This is the United States State Department plan as advocated by L. Welch Pogue, Chairman of the United States Civil Aeronautics Board. Pogue proposes a "Right of Commercial Transit Convention" to be signed by all nations wishing to aid and participate in international flying. "The Airplanes of all signatory nations would be allowed to fly across each other's territory following designated routes. These planes, of course, would have the right to use airports and receive such assistance as beam service, weather reports, refuelling and repairing. They would not be permitted, however, to take on or discharge

passengers, goods or mail unless so authorized by agreement between the two nations directly concerned. These assignments would be a matter of negotiation and nations seeking commercial outlets would have to grant reciprocal concessions".[1]

8. Governor Harold E. Stassen of Minnesota favours a World Aeronautics Board to licence and regulate international flying - the flying to be done by private companies.

Thus, we can see that much thought is being given the post-war air picture in the United States, but that no official plan has been approved of as yet. Currently we have a war to win, after which our attentions can be turned to the best plan for harnessing this new bird of the sky. Meanwhile, let us give the various plans our careful consideration and hope to arrive at an adequate solution.

As we look towards Great Britain, we find that country somewhat glum about air transport. At the war's end it will have many thousands of trained personnel but it feels its chances have been lessened by concentration on fighters and bombers since the 1940 blitz. Its main worry is the lack of newly developed transports or even of designs in the field for the go-sign of the war's end. Bombers do not convert to transports readily so that the British are preparing to hustle and catch up in peacetime transport progress. To this end the Air Ministry has given specifications to four producers - Avro, Bristol, Handley-Page, and a

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1. Grant Dexter -"Whose Air?" Maclean's - July 1, 1943.

combination of Short & Saro staffs. De Havilland is working on similar projects privately.

Similar to the United States situation, the British picture of air transport can be broken down into several plans.

1. All-Red Route: This is the slogan of those who wish to have expansion on strictly Empire lines. Such was the growth of Imperial and British Airways, the two that formed wartime's British Overseas Airways Corporation. It served to knit Empire lands before and could do so again. With the Empire rid of the enemy, planes could fly global routes and never land in other than Empire or Commonwealth territories. The Australia-Canada run, ignoring the Hawaian Islands, would be risky and expensive. Thus possession of bases is a trump card. It will double in value when the peace makes available the numerous United States built bases in and leading to British territories.

2. Chosen-Instrument Policy: This is now in effect, British Overseas Airways Corporation being the sole British operator. Government controlled and subsidized, it is doing all war flying now on curtailed routes. Some government quarters suggest British Overseas Airways Corporation continue as the British agent when the switch-over to peace schedules comes. This proposal has few backers in the aviation industry, however.

3. International Air Authority: Three international organizations are backing this idea. The authority would license air lines for routes between separate nations but would not touch lines linking areas under

the same flag. They believe also that at the start, there should be parity between international air services of United States and Britain. A monopoly such as British Overseas Airways Corporation should not exist; private enterprise must play a full part. The sponsors are the Association of British Chambers of Commerce, Federation of British Industries and London Chambers of Commerce.

4. Participation of Shippers: Shipping firms, with money from insurance on war shipping losses, would like a slice of air business. Rather than put all this money in new surface vessels, they would buy airfleets to give express service by air. They claim,"Maintenance of our overseas trade will require a balanced fleet of air-borne and surface vehicles". They deplore monopoly and fear competition of their own government if British Overseas Airways Corporation is continued.

5. View of Aircraft Producers: They advocate air transport development by private enterprise along patterns of mercantile marine. "Air transport should be subject only to sufficient governmental control to ensure safety and efficiency". They would like government subsidies on some lines. Open competition is not approved of, however. They advise only one British airline in any single trunk line of travel. Routes should be established along Empire networks. Aircraft design and production should be helped, otherwise the alternative is the use of American aircraft and the consequent loss of prestige.

6. Air League of British Empire: This is more the organization of private flyers and industrialists. They urge in general terms: Imperial and international co-operation; freedom of operation and of passage; government aid limited to ground organization; research and mail contracts; recognition of the importance of air transport to the Empire's future.

7. Government policy. No hard and fast pronouncements have been made. Lord Beaverbrook is responsible for the co-ordination of civil air transport. He called a British Empire Conference in mid-October (1943) with representatives from Canada, South Africa, Australia, New Zealand, India, Newfoundland, Southern Rhodesia and Burma present. Hon. C.D. Howe represented Canada. Unanimous agreement was reached on all problems, Beaverbrook declared. Evidently, the Government is implementing recommendations made last spring by the House of Lords Committee led by Lord Brabazon. These are: Resumption of design and production of civil aircraft; conversion of bombers to transports where possible; creation of bigger and better civil machines.

Said Capt. Harold Balfour, Under-Secretary of State for Air: "We do not want a British octopus spreading its tentacles over the Dominions and territories of the British Commonwealth, but routes run in co-operation and partnership with the government of each territory traversed".

8. Single International Monopoly of all planes engaged in international flying: Adequate air services in Europe can be provided by an international company

controlled by the United Nations. They insist that the Axis powers be disarmed in the air and effectively prevented in the future from making or flying airplanes.

These observations touch but the fringe of this immense subject and leave much unsaid. As Mr. William Burden, Special Aviation Assistant to the Secretary of Commerce of United States remarks: "Any constructive policy must be based on the realization that air transport is a good thing, and that the more we have of it, the better for the human race". Or we may repeat the words of Mr. Joseph Kastner, air authority, "The world must realize how small a suggestion of the awful might of air power this war has revealed; how small and foolish our present planes will seem to the eyes of history, how greatly airplanes will take over future travel".[1]

America and the British Commonwealth see their future in the air. United in war to defeat common foes who have threatened our freedom, we must remain united in the ideal of peace. We can build upon the new foundation a bond which air transport gives us - a better, more prosperous, more closely knit civilization than we have known before.

A peace treaty which does not include, as its chief articles, a general system for recognition and mutual employment of air transport, will ignore the most potent force which has yet been given to the world. Aviation is too great a power to be subjected

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1. Peter Masefield -"Future of Air Transport"- Atlantic Monthly - January 1, 1944.

to traditional and petty limits. Political control of aviation will inevitably lead to a war for "freedom" of the air.

Air control of politics will almost as certainly bring on another war for supremacy of one nation in the air. Only by unbiased and practical determination of the new force which aviation has brought into the political divisions of the world can any orderly post-war life be built. Individuals who use aircraft must be permitted to do so freely, under universally accepted regulations for the common good of all. And individuals include those who direct governments. Political systems and aviation must be partners. Together they can build a new and infinitely wider world of opportunity. Opposed, and mutually antagonistic, they will bring certain chaos and disaster.

How does Canada fit into this picture? Having examined the hopes and fears of England and the United States, let us study Canada's position first internationally, then domestically.

One of the first plans linking Canada with Great Britain was outlined in the Ottawa Journal, May 11, 1943. It concerned the organization of an all-British Commercial Air Transport System before the end of the war and was urged by Lieut.-Colonel George A. Drew, Ontario Progressive Conservative Leader, in May of 1943. In his world-girdling corporation,

each nation within the Empire could retain its own domestic air routes. For instance, Trans-Canada Air Lines would not be disturbed in its operations in any way. The Empire air routes would be operated by one company in which the government of each of the British nations would take a share, in accordance with their relative place in the organization. By participating in such a plan, Canada's place in post-war aviation could best be assured. Said he, "Canada with her 12,000,000 people could not maintain the domestic air routes on a large enough scale to support the material and personnel for world routes. Britain, with a larger population and highly-developed producing capacity, was too seriously handicapped by the lack of international domestic routes to alone create the flow of personnel necessary for a large external air fleet. But working together, we can maintain the greatest air routes in the world. The British Nations in this field are complementary, not competitive. And they possess bases which will permit round-the-world flying landing only on British territory. If Canada attempted to work alone she would sink to relative unimportance as a carrier of international air commerce. The ability to produce aircraft of superior design and quality depends upon the extent of the demand. In war, normal competitive factors are overcome by paying whatever is necessary to get results. But in peace, there must be a large consumer demand for any particular

type if it is to be made on a competitive basis. Canada could not hope to produce machines only for its own use and the time for decision regarding Canada's position in post-war aviation is now. Civil and military aspects of the problem were inseparable and upon the decision might rest the future of the Empire". Such a plan, namely to link the Dominions by an Empire Air Transport, was also urged by Vicount Bennett, former Prime Minister of Canada.[1] What Colonel Drew is advocating is a master Empire plan in which Canada would have a leading role, a plan which he hopes will give Canada force and bargaining power. Such a plan is not altogether satisfactory. It is necessary for Canada to co-operate with the Commonwealth, but not make any discriminatory agreements. A working air plan must be international in scope, a multi-lateral scheme in which all countries of the world could share.

It is a known fact that Mr. King's Government does not share Colonel Drew's point of view. Mr. King feels that post-war air policy must be determined by international agreement, that Canada stood prepared to negotiate and co-operate with other countries, as well as fulfil her obligation as a member of the British Commonwealth of Nations. He contemplates Canada as an individual political unit because he feels that Canada is emerging from her "growing pains" to a full-fledged nation.

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1. Ottawa Journal - May 4, 1943.

In May, 1943, Fortune Magazine carried the article "Canada's Post-War Air Policy" with the sub-heading "The Air Shall be How Free over the Unguarded Frontier Between Us?". In the main, it stated that Canadians are aware of their strategic location. They contemplate the post-war air with a confidence based upon a bountiful geography and a comprehensive ground apparatus on direct routes to the rich markets of Europe and Asia. Mr. C.D. Howe, Minister of Munitions and Supply, estimates that since the outbreak of the war, Canada has spent $300,000,000 on airports and other ground facilities with high post-war conversion values; that the United States Army has added $40,000,000 for installations for its exclusive use, all of which will revert to Canada after the war. The fact that the British Commonwealth Air Training Plan is housed on Canadian soil has also added much interest in aviation. It is estimated that after the war there will be 250,000 Canadians trained in aviation skills (not including aircraft industry workers) - from pilots down to mechanics. For a nation of approximately 11,500,000 people, this is a big pool to draw upon.

Canada, before the war, had no trans-oceanic air services under its own flag. In fact, the only international operation Trans-Canada could speak of was its single service to the United States. However, Trans-Canada is now assigning crews to Ferry Command for training in oceanic operations, and is also working on post-war aircraft designs.

Mr. H.J. Symington, President of Trans-Canada, informed a Parliamentary Committee in March of 1943 that Trans-Canada was going into ocean traffic as soon as possible. A significant milestone in Dominion air progress was the inauguration of an Atlantic service in July, 1943. This has been stepped up to two planes each way each week. In mid-October, a four-engined Canadian built Lancaster flew on the regular route from Dorval airport near Montreal to a Scottish base on the new record time of less than twelve hours. At least three of these Lancasters are now in use. This is Canada's first step into international air traffic on a time-table basis. This transatlantic service is not a commercial or permanent service, nor is it carrying fare-paying passengers, for it operates strictly for government traffic. But the fact remains that it is operated by Trans-Canada Airlines, the government's chosen instrument for international flying. Conversion to a peacetime, passenger-carrying basis after the war will be very simple.

In April, 1943, Prime Minister Mackenzie King stated that the Government "intends to press vigorously for a place in international air transportation consistent with Canada's geographical position and progress in aviation". Mr. King's complete address with respect to international aviation reads as follows: "Canada has a geographical position that will enable it to play an important part in the

development of international air transport routes. During the war, the development of international civil air routes must be deferred in favour of military aviation. Canada to-day is the fourth greatest military air power among the United Nations, and in the post-war period, Canada can make an equally great contribution to civilian air transport.

"The future of international air transport will be determined in large measure by negotiations between the governments of the United Nations. The policy of the Government at the moment in dealing with all questions which affect international air transport is to make temporary arrangements, leaving the issues open so that Canada may be able to support, in international negotiations when they take place, whatever policy appears best at that time. The Government, however, intends to press vigorously for a place in international air transportation consistent with Canada's geographical position and progress in aviation. All concessions and privileges that have been granted by Canada to other countries as part of the war effort will terminate at the end of the war or almost immediately thereafter.

"Trans-Canada Airlines has, by its charter, the right to operate international air transport services and has already been designated as the instrument of the Canadian Government in air transport service across the North Atlantic, and in Canadian services to the United States. The fact that international negotiations of great importance must shortly take place

confirms the wisdom of government policy under which its freedom of action in international negotiations is not limited by the existence of private interests in international air transport services.

"The government has established an interdepartmental committee on international civil aviation to advise it on all matters of international air transport which affect Canada, and particularly on the attitude which Canada should adopt towards post-war developments. This committee has already been at work for a considerable time.

"The problems of international air transport are, of course, immense and cannot be solved by one country. We are determined, however, that our influence on the course of events will be in the direction of international co-operation and collaboration. The Canadian Government is in complete agreement with the United Kingdom Government that some form of international collaboration will be essential if the air is to be developed in the interests of mankind as a whole, trade served, international understanding fostered, and international security gained."

The Canadian Government strongly favours a policy of international collaboration and co-operation in air transport and is prepared to support in international negotiations whatever international air transport policy can be demonstrated as being best calculated to serve not only the immediate national interests of Canada, but also our overriding interest

in the establishment of an international order which will prevent the outbreak of another world war.

Thus, in the international field, Canada's trade will be conducted by Trans-Canada Airlines. Although Canadian Pacific Airlines are anxious to operate trans-oceanic services, it is felt that there will not be sufficient international business to enable the two companies to carry on successfully. The same view is shared in the air traffic of all other nations, namely, that an international air board will have to be set up to give each nation a just share of international air trade. Any approach to the problem will be international in character, universal in scope.

Thoughtful Canadians listed several obstacles to their country's ambitious plans. For one thing, they felt that Canada lacked an integrated aircraft industry. Although it builds many types of British combat aircraft, from the big Lancaster bombers down to trainers, the country had no experience in commercial production or design; it does not build large aircraft engines. The United States and Britain, with their tremendous potential capacity in transport aircraft, will doubtless be pleased to sell Canada all the equipment she can possibly use. But cynical Canadians fear that during the conversion period, their country will be relegated to the waiting list until the United States and the British have satisfied their own needs on the main Atlantic and Pacific routes. Time is proving, and a previous chapter has pointed out

that Canada does have an aircraft industry. This following article, written for the Canadian Press by Ralph B. Bell, Director-General of Canada's Aircraft Industry, appeared only very recently: "Our aircraft industry has conclusively demonstrated that it is capable of building the largest and most complicated types of operational aircraft in the world to-day.... For the first six or eight months of the war, nobody in authority ever contemplated that Canada would build anything but a few trainers and perhaps a handful of flying boats, but late in 1941 and early in 1942, long-range plans were adopted. This program gave Canada nine of the finest modern types of aircraft in the world and definitely established the aircraft industry of this country as capable of building everything from the smallest to the largest plane that flies... To ensure a permanent future for this nationally important industry, two things are necessary:

1. Design staffs, capable of competing with any in the world;

2. Manufacturing costs competitive with those of Britain or the United States.

Many well-informed persons are of the opinion that we cannot hope to compete with the aircraft industry of Britain or the United States. I am one of those who holds to the contrary. Given a fair field and a reasonable chance, I believe the leaders and the men and women in our aircraft industry will once more demonstrate that we Canadians possess the ingenuity, resourcefulness, determination and skill to successfully compete in the fields of design and increased efficiency,

for competition in aircraft in the post-war era is going to be of the most intense character imaginable and the Canadian aircraft industry can compete successfully only if it builds cheaper and better than its competitors".[1] In spite of Mr. Bell's enthusiasm, it must be pointed out that although our aircraft industry has demonstrated that it can build the bodies for complicated types of aircraft, it hasn't demonstrated it can build engines for them, which is an airplane's most important part. Canada has not built, or tried to build, a single aircraft engine in this country during the war. Perhaps we can build them but could we build them economically in a highly competitive market, in competition with Great Britain and the United States? We hope Mr. Bell's views are correct and his enthusiasm warranted.

The war has demonstrated that Canada can build almost anything when cost or the market is not a factor. The question is how much air traffic are we going to have in Canada and how much do we want to pay to operate it. Assuming we have say, thirty or forty four-engine ships in trans-ocean and international traffic, it is quite clear that one plant could never produce these at a comparable unit cost such as we could buy them from the huge factories of the United States. On the other hand, Canada can produce a single-engine Norseman type (used in northern bush flying) better than any country. The question might

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1. Ottawa Journal - January 3, 1944.

be raised why we should try to compete with the United States and Great Britain when they have the plant facilities and design staff already ready to serve us, because certainly the production of a relatively small number of four-engine planes in Canada will never be a major factor in employment or material utilization. It takes three to five years to assemble a design staff alone to create a modern transport type. Whether we can compete or not is quite beside the point insofar as short range policy is concerned, as we certainly have not the design staff now and would have to use the American or British equipment in the stop-gap period after the war. Much of the same arguments apply to airplane engines. Two types are currently assembled here in Canada and could undoubtedly be built here. Personally, I think Canada should maintain a government subsidized aircraft industry for purposes of self-sufficiency and security - even though American and British relations will, I hope, at all times be one of complete accord and co-operation. But we ought not hope for an international market.

A second handicap is Canada's sparseness of population. Canada, because of her great distances, may construct plenty of lines, but there would not be the volume of domestic traffic that exist in other more populated countries.

Likewise, the northern climate demands special preparations for flying. Weather reporting, which must be complete and accurate, requires

meteorological stations situated in remote and inaccessible areas. Radio communication systems must be extensive and emergency services and landing fields have to be spread out over remote and unsettled areas. Special construction of camps is required for northern winters, together with special hangars, and arrangements for care of engines and of fuel in sub-zero temperatures. All of these matters involve careful planning of supply. All of them have been solved, but the expense connected with flying northerly winter routes must obviously be greater than the expense in more temperate climates. Fortunately for Canada, the heaviest outlay is taking place during the war. Questions of cost of operation balanced against the advantages of short northern routes, will have to be considered after the war. As range becomes greater, difficulties will become less. Moreover, the routes already mentioned will be so well established and, as a great deal will be known about conditions on them, there is little likelihood they will be discarded.

Canada and United States signed a first general air navigation pact in July, 1938. It acknowledges the right of innocent passage for touring aircraft in and out of each other's air. But all regular commercial services, "to, over or away from" each other's territory, and "with or without a stop" are subject to each other's consent. In August, 1939, another air-transport agreement was signed which was important for two reasons. First, it requires that all applications be submitted through diplomatic

channels; and second, it states that air transport operations between the United States and Canada be on a reciprocal basis, the details of which "shall be the subject of amicable adjustment." At the moment, there are seven important Canada-United States connections, six of which are exclusive United States operations. They are:

Colonial Airlines	- New York to Montreal
United Airlines	- Seattle to Vancouver
Northwest Airlines	- Fargo to Winnipeg
Western Airlines	- Great Falls to Lethbridge
American Airlines	- Buffalo to Toronto and from Buffalo to Windsor and Detroit
Northeast Airlines	- Moncton to Bangor and from Boston to Montreal (mail and express only).
Pan-American Airways	- Fairbanks, Alaska to White Horse, Yukon.

Several routes were allocated to Canada, but all have been withdrawn in an effort to save short equipment that would have been wasted on non-profitable routes. The only one to remain is the exclusive non-stop service between Toronto and New York.

By agreement in March, 1943, the two governments froze the present route allocations until the end of the war. But one should not assume that Canada will be content to a six-to-one ratio.

The post-war importance of military air routes can be over-emphasized. Such routes are not planned with post-war civil aviation in mind and as a result, may not be suitable for extension and development after the war. Nevertheless, some of them at least will provide a starting point for civil routes. Two

of the three wartime routes which are most likely to interest Canada after the war have already been noted - across the North Atlantic to Europe, and through the Yukon to Alaska, which opens the way to the whole of Asia. The third spans the Pacific from Vancouver to the Orient.

The chief importance of these routes for Canada, politically and economically, will arise from the fact that they will probably be the main lines from the United States to Europe and to Asia. As such, they will carry very heavy traffic. The most direct lines from the United States must cross Canada and will, therefore, become Canadian supply and service lines.

The operation of service to Bermuda and Nassau, popular vacation places for wealthy Canadians, is also being considered in the post-war air map.

To satisfy Canada's aspirations, the United States must admit her airplanes into Alaska and Hawaii, hithertofore "closed sky". It might also mean giving her long-range equipment - at least, to tide her over the conversion period - and working out with England some reasonable division of the North Atlantic and Pacific trade. In turn, the United States would ask to set up some kind of defences along her vast sub-polar frontier as well as state her desire to operate through Canada's air for Canada has all the air routes from North America to northern Europe and the Far East with the exception of Labrador and Alaska. For flights to South America, Canadian planes can stay

far outside the territorial waters of the United States, going straight south to Bermuda, and on to Venezuela, Brazil and other points including Africa. Canada and the United States, obviously, must do more than co-operate; they must be interdependent for their own welfare.

(Because of the limitations of time and space, we have considered Canada's relationship with Great Britain and the United States only. In so doing, we have seemed to ignore Russia and China. That was not our intention. Once Canada has established her proper place with England and the United States, arrangements with China and Russia will follow as a logical consequence).

We turn from the international field to give consideration to the domestic problems facing Canada to-day. We have already learned that Trans-Canada is the government-owned airline, and Canadian Pacific Airlines is a privately-owned organization. Canada's Government had to face the problem - a private or government control of the air? To this question, Prime Minister King made the following remarks in his April speech, a speech which has already been quoted in part:

"I should like to make a statement of the policy of the Government on civil air transport. First, with respect to domestic aviation:

"1. During the war, a remarkable expansion of Canadian aviation has taken place -- in the training of air and ground personnel, in the construc-

tion of airports and air navigation facilities, in the manufacture of aircraft, and in the extension of air transport services. Details of this expansion in aviation cannot be revealed at present, and therefore its magnitude is not generally appreciated. The Canadian Government is aware of the importance of the developments in aviation now in progress and intends that the people of Canada shall benefit from them to the fullest possible extent.

"2. The expansion of air transport during the period of the war has been confined to war requirements. Canada has concentrated on the development of the British Commonwealth Air Training Plan and on combat flying, and, as a result, by agreement with our allies, military air transport in the northwest has largely been undertaken by the United States Army and on the northeast, ferry routes by the ferry commands. When war necessities permit and suitable equipment can be obtained, the Government will encourage the further development within Canada of air transport services, to supplement and form part of an up-to-date transportation system for Canada by land, water and air. Transport by air requires close supervision on the part of the Government. The board of transport commissioners will be responsible for requesting traffic matters and for allocating new routes apart from the lines brought under the Trans-Canada Airlines Act. The civil aviation branch of the Department of Transport will be responsible for the administration of traffic and safety regulations and for the physical

developments of airways. The Government intends to plan a number of routes suitable for post-war air services and offering traffic possibilities that will warrant a service. These routes will make use of airdromes that have been developed for war purposes. The Government will also continue to develop airports and other facilities for weather reporting and communications, which will contribute to the expansion of Canadian air transport.

"While the employment in a peacetime air transport service of all the air and ground personnel of the R.C.A.F. and all the men and women now employed in the aircraft industry in Canada will be impossible, a considerable number will be absorbed into the peacetime aviation industry. To this end, the Government has undertaken the design of distinctive Canadian types of transport aircraft suitable for post-war industry, in the hope that, when the war ends, a part at least of the equipment for Canadian air transport will be furnished by Canadian factories.

"Trans-Canada Airlines will continue to be the instrument of the Government in maintaining all transcontinental air transport services and in operating services across international boundary lines and outside Canada. The Government will encourage the company to obtain modern aircraft which will keep present services up to modern standards and will expand these services to the fullest extent that post-war conditions permit. The development of supplementary routes will continue to be left to private enterprise,

unless considerations of public interest indicate that certain of these routes should be designated by the Government as routes to be operated by Trans-Canada. The operations of Trans-Canada will continue to be limited to important services of a main line character, where the volume of passenger and mail traffic would justify it".

In summarizing the policy of the Canadian Government in air transport, the following points bear repetition: 1. The Government sees no good reason for changing its policy that Trans-Canada be the sole Canadian agency which may operate international air services. ("Three transcontinental railroads taught us Canadians a bitter lesson in senseless competitions; we don't propose to forget it in the air").[1] 2. Within Canada, Trans-Canada will continue to operate all transcontinental systems, and such other services of a main line character as may from time to time be designated by the Government. Competition between air services over the same route will not be permitted, whether between a publicly-owned service and a privately-owned service, or between two privately-owned services. There will remain a large field for the development of air transport in which private Canadian companies may participate and, while preventing duplication of services, the Government will continue to encourage private companies to develop services as traffic possibilities may indicate.

Right here controversy arises. The policy is wholly unacceptable to Canadian Pacific Airlines

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1. Charles G. Power - Minister of National Defence for Air.

which insists upon equality of status with Trans-Canada and plans to go into the international field on a large scale after the war. Canadian Pacific Airlines stresses the fact that United States lines are now using seven points of entry into Canada while we use only one into the United States and argues that if Trans-Canada is not interested in developing further north-south traffic across the border, Canadian Pacific Airlines should be allowed to do so. Canadian Pacific Airlines are more aggressive in their business methods, and are anxious for more business. The same applies in international trade. Officially, the view is held that because Canada is in a strategic position on the world's air routes, we ought not become overambitious and launch air services in all directions. The test should be the importance of the trade interests to be served. One obviously necessary service is across the North Atlantic. There is also a strong case for a service to Alaska, but for the present, no further. Canadian Pacific Airlines, on the other hand, disagrees strongly with this view, arguing that Canadian operations in the international field should be much more extensive. Canadian Pacific has made no detailed declaration of its policy in this respect, but there is reason to believe that the company is thinking in terms of possible Canadian lines to South America, to Australia, to the Orient and to Russia.

It is admitted by all concerned that the Prime Minister's statement regarding domestic control of aviation has only added more confusion to an already complicated situation. A new approach to Canada's

domestic civil aviation policy is now under consideration by the Government. Its purpose is to improve the position of private operators in relation with Trans-Canada Airlines. Canadian Pacific Airlines recently applied for two local air routes (North Battleford to Vermilion to Edmonton and from Halifax to St. John) which, by the Prime Minister's statement, would logically fall into the orbit of private enterprise. Both applications were turned down. Under present confused and irregular control of civil air transport authority in Canada, the Government can hold up any or all local applications while it furthers the ambitions of its own creation - Trans-Canada Airlines.

The two main alternatives under consideration are:

1. Strengthening the powers of the Board of Transport to give it authority and responsibility in the field of civil air transport, or enlarging it to include air personnel and air experts, or

2. Setting up a separate and independent inter-departmental authority or board to have exclusive jurisdiction over air transport - such as the Civil Aeronautics Board in the United States.

Not long ago the Air Industries and Transport Association recommended immediate creation in Canada of a central, free and independent governmental authority for civil aviation. If this were done it would divorce governmental officials, such as the Deputy Minister of Transport, the Director of Air Services, and the Director of Air Mail Services from the Board of Trans-Canada. In

other words, some effort will have to be made to take the control of airlines out of the hands of politicians and place the granting of licences under an impartial and free civil body.

A Government policy of "grab" in the interests of Trans-Canada will quickly kill the pioneering spirit which made Canada the largest air-freight carrier in the world in pre-war days. Canada can become a great country in the air picture. But not if aviation is to be a state monopoly. Only through an independent Civil Air Board, the members of which are not directors of any air line, can commercial operators get a fair deal.

Canada can profit by giving encouragement to eager, competent, experienced and energetic young men - who have shown more initiative than Trans-Canada Airlines in the past and who can be counted on to show more pioneering spirit in the future - to win for this country its deserved position in air transportation of tomorrow. Just such young men have been the chief contributors to the aviation advances Canada has made so far and just such young men appear to be among the chief targets of Government bureaucracy.

If we are to have Trans-Canada in the international air field, then we must permit Canadian Pacific to operate nationally without having unnecessary Government obstacles placed in its way.

As participants in world-wide aviation,

we shall need certain assets besides geography and an aircraft industry which has been mentioned previously. We shall need terminal facilities and intermediate fields, scientific aids to flight, aircraft to fly, men to fly and service them, and overhaul and repair industry capable of taking care of any job which turns up, ... plus traffic. All these are musts in the realm of internal aviation as well. With what, then, shall we face the morning after the war ends?

Canada's problem will not be a scarcity of trained personnel to fly, or to service aircraft. The end of hostilities will see at least 200,000 young Canadians in the R.C.A.F. and R.A.F. Of this number, 20,000, approximately, will be pilots. Others will be navigators, wireless operators, bomb aimers, rear-gunners, those trained to bring death to the enemy, but who at the same time have little connection with peacetime flying. But there will remain 100,000 men who have specialized in servicing and emergency repair jobs and these may be absorbed into the post-war R.C.A.F. It is a certainty that Canada will face no shortage of trained man-and-woman power from the pilot's seat to the work-bench.

With respect to terminal facilities for intercontinental flight, Canada has created a number of the world's finest jump-off bases under the driving necessity of getting the product of North American aircraft factories to the places where that product can do the most harm to Hitler and Hirohito. Examples

are Labrador and Newfoundland. Although not on Canadian soil, they were built by, or for, Canada and Canada operates them.

For domestic services in Canada proper, we have built several terminals and shops for trans-ocean fliers. In the East is Montreal's Dorval, headquarters of the R.A.F. Transport Command and in the West are the routes to Asia, by way of Edmonton and the Alaska Airway. Looking toward the North Pole, Canada has provided herself well with ground facilities for her own use and for anyone else with whom we may deal reciprocally for the use of tomorrow's air. There is no shortage of facilities for long-haul traffic.

On the home front, Canada has developed a number of emergency fields to meet Trans-Canada requirements. All such airdromes are equipped with excellent communications, meteorological services and other aids to flight. For our Air Training Plan and for training R.A.F. personnel in Canada, hundreds of airdromes have been added to the nation's supply. Airdire, Blissville, Bowden, Buttress, Canberry, Centralia, Estevan, Halbrite, Hamlin, Innisfail, Kirkcaldy, Neepawa, Pennhold ....all of these and 60 more, were built especially for the R.A.F. Add to this more than 100 turned out for the R.C.A.F. for both the British Commonwealth Air Training Plan and for the home war establishment. "To-day you can fly pretty nearly anything to pretty nearly anywhere in Canada."

Not all the fields are first-class stations. Some are nothing more than emergency airdromes. Canada's supply of major fields is greater than that of any country on earth when population is taken as the yard-stick. On all but the emergency fields, every known aid to safety in flight, servicing and general repair facilities is in use. Thus, Canada faces no shortage in ground equipment for long hops or domestic flight.

Canada will face the post-war future from a well-established position in the field of over-haul and repair. Especially designed for this service are the Clark-Ruse repair plants across the harbour from Halifax to the Canadian Car Shops at Amherst, N.S., from plants in Montreal and Toronto to the Ottawa Car and Aircraft in Ottawa, from MacDonald Bros. and the Trans-Canada facilities in Winnipeg to repair depots operated by Canadian Pacific Airlines in Edmon-ton and Vancouver.

In addition to this, Canada has vast supplies of strategic material for airplane construc-tion: aluminum, steel, plywood, the finer woods, etc.

Last year 104,500 people rode the Trans-Canada main line. This was approximately 75% of its total capacity, which shows that planes do take off with empty seats. A great number of the 104,500 riders were on war business which is no measure of peacetime travel indications. Nor are pre-war Trans-Canada figures much use - only 21,500 passengers were carried in 1939, because the airway was in its infancy, when war was declared.

It is reasonable to expect that enough domestic passenger traffic will be available which with air mail, will enable Trans-Canada to carry on profitably, at least on its current schedules.

Meanwhile, Canadian Pacific Airlines carried 60,000 people on their feeder and bush routes during 1942, plus one and three-quarter million pounds of mail and ten million pounds of freight. The bush is still potentially big time Canadian operation and viewed by some as the backbone of Canada's internal aviation for years to come after the war.

In 1937, the all-time high year, Canadian bush fliers moved 24,000,000 pounds of cargo into the country. Our nearest competitor was the United States with a mere 9,000,000 pounds. In 1939, with the outbreak of war, Canadian Pacific Airlines carried 20,000,000 pounds of air cargo. The saga of the bush fliers has just begun.

Canada can boast of this situation as of January 1, 1944. She is geared to produce 6,000 aircraft a year, comprised of small ships and bush-freighters, with larger craft designs under consideration. She has a plentiful supply of skilled people to make, repair, service and fly them. She is well-equipped in major terminal facilities, emergency fields and in scientific aids to flight. She can support an internal main line system at least as great as the present transcontinental route and its feeder links. She can look to the North for an increased volume of air-freighting. She is in

a strong geographical position for the post-war global settlement. All these factors spell optimism and progress for Canada's future.

On March 17, 1944, a very important announcement concerning Canada's air policy was made known through the Honourable C.D. Howe, Chairman of Munitions & Supply. In one broad statement he defined the Government's policy on both domestic and international air transport and put Canada out in front of the nations of the world as the first to publish a detailed plan for international control of air traffic.

The main points of the announcement were:

1. Canada has proposed to the nations creation of an "international air transport authority" to license and regulate air traffic between nations;

2. This authority to be based on freedom of licensed aircraft operators to fly over, land in, and carry passengers and freight to or from, but not within any Country;

3. Ownership and operation of Canadian airlines will be separated from ownership and operation of railways; (this to take place one year after the end of the war).

4. Previously announced Government policy on Trans-Canada Airlines as the Government's "chosen instrument" for operation of international and transcontinental services is unchanged;

5. An "air transport board" will be created to regulate air traffic in Canada, including rates, equipment and allocation of routes, and advise the Government on development and planning in aviation;

6. To assure Canadian airlines of a supply of equipment after the war, rights to manufacture in Canada a four-engined transport aircraft believed to be the best in sight for the next five years have been obtained.

The Government's plan for post-war aviation - international and domestic, has answered several of the questions which have come up in the thesis. First of all let us consider Canada's international policy. Canada aims for international agreement, which would be made possible by means of this "international air transport authority". This proposed authority would decide what aircraft operating companies proposed by member nations should operate international routes, except in the case of operations between two adjoining countries such as Canada and the United States which would be decided by mutual agreement.

The international authority would be operated by an assembly in which all subscribing states would be represented, a board of directors and regional boards created under it to handle regulation in such areas as "inter-American", "North Atlantic", "European", etc.

The draft convention would cancel all previous international agreement and laws on aviation, including those which established the right to each nation to complete control of the air over its own territories. It recognizes sovereignty extends to the air over each nation's territory, but provides

for the creation of new "freedoms of the air" by agreement.

The Canadian proposals will give all nations a chance to participate in international air traffic at least to the extent of carrying the goods and passengers from their own territories to those of other countries and back again. They confer no rights for the carrying of traffic between two points in any country by aircraft of another country.

These basic points for international air control are very commendable. It is obvious that Canada prefers a plan for all nations which is more inclusive than any Imperial scheme designed for the British Commonwealth alone. As has been said before, air transportation must take on a universal scope, must be international in character, if we are to avoid trouble in the future for control of the sky.

In the domestic field there are more difficult points to consider. On the main principle of no cut-throat competition in transcontinental operation by privately operated air lines, there is general unanimity for we have only to recall the unhappy railroad problem of years back to appreciate such a situation. But Canadian Pacific Airlines is not concerned with transcontinental competition and has operated far afield from Trans-Canada. In 1942, when chaotic conditions, produced by destructive competition among the small air-line companies, chiefly in Northern Canada existed, Canadian Pacific, with the encouragement and approval of the Government, undertook to

acquire control of a number of the competing air lines and to consolidate their operations. None of these plans were without the knowledge and approval of the authorities, and the Company, in good faith, invested much money which cannot be expected to yield any return for some time to come. Canadian Pacific Airlines has been able to render important service to the nation and should not be driven from the air. There will be widespread public and political discussion on the whole new air policy before final action is taken, and certainly exhaustive studies must be made of both sides of the case. We are not called upon to accept this plan blindly, but to weigh the relative advantages of private ownership as against public ownership and give each its due share.

Of great importance is the creation of the new transport board. This new board will take over the air regulatory functions of the Board of Transport Commissioners which now deals with railways, steamship lines and to some extent highways, bus-lines, as well as air traffic. Specific duties of the board are as follows:

"1. Examine the needs for new commercial services and make recommendations for their expansion in both the domestic and international fields;

2. Receive applications for new services and issue commercial licenses;

3. Establish tariffs and regulate rates;

4. Examine the ownership, financial structure, operations and financial position of carriers;

5. Make recommendations for needed financial assistance.

6. Advise the Government on matters affecting the operation of existing airdromes;

7. Report on the need for new airdromes;

8. And perform such other allied duties as may be determined."[1]

This board will be a great aid in the domestic scene and will, no doubt, iron out the difficulties mentioned previously.

At this moment, the national and international state of the air is very uncertain. I could gather information without end, were it not for the time element involved. Because of the need to submit this treatise in April, the information contained here is complete as of March 27, 1944.

And now, a last word as we take a glimpse into the future. What tomorrow's aviation will do for each of us as private individuals has been a favourite topic of the magazines, radio forums, and the cracker barrels ever since Canadians started looking beyond this war into the future. The subject presents a fascinating field for speculation and a sizeable volume could be filled detailing the ambitious post-war aviation projects now in the blueprint stage and beyond. Strangely enough, most of these projects are not in the least visionary and they are not the products of "crack-pots" and dreamers. This time the engineer is in league with management and labour in a practical relationship to harness the inventions and experiences of the wartime laboratory to a comfortable, rich future.

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1. Hansard - March 17, 1944.

Although more has been said and done about long-range flying, the life of the average person will be more directly affected by small, inexpensive, easily operated craft. Within our own generation, the possession of private planes will become as widespread and as a matter of course as possession of motor cars to-day. Mass production of planes has been stimulated by World War II. An aircraft session of the Society of Automatic Engineers in Detroit heard predictions that the post-war period will bring privately-owned airplanes priced as low as $1,000 and a large market for private planes if industry creates it.[1] This miracle will remain as a permanent heritage for our technological civilization. At the same time, progress in the field of electronics with Radar and the Radio, is certain to make the operating of aircraft simpler than operating motorcars. The mechanicisms of tomorrow's planes will be more delicate and more complex, yet their operations will be so elementary that any child will be able to manage them.

The helicopter, now coming out of the experimental stage into a practical phase, is likely to hold the key to future private flying. These craft, as everyone knows, can take off or land on an extremely small space. Every country home can therefore have its own landing field and its own hangar or airplane garage. In cities, neighborhood landing fields will be made available, and the larger apartment houses and hotels will have their own facilities on rooftops.

The development of what might be described

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1. Ottawa Journal - January 13, 1944.

as a combination helicopter-automobile logically follows. Once the craft descends to earth, the blades of its horizontal propeller will fold in, and the fuselage on wheels will be driven home or to the nearest garage.

Mr. Ralph Damon, vice-president and general manager of American Airlines, has made some startling forecasts of the air age of 1953. Looking ahead ten years, Mr. Damon contends that to calculate the future on the basis of the past is to see supercharged flying wings, rocket-propelled and travelling possibly faster than sound. He believes, too, that commercial transport planes will cruise at better than 400 miles an hour and that high-altitude craft will exceed modern pursuit planes in speed. For the civilian aircraft which he thinks will be quite as popular as to-day's motor boat, he considers the helicopter the best bet.[1]

Private airplanes will change the daily existence for the ordinary mortal in a number of ways. The area around large cities now considered within commuting distance - roughly an hour's ride by car - will be expanded to the distance that can be covered in an hour by plane. In other words, a place 400 miles from the city will be no farther away in point of time than a place 40 miles from the city to-day. This will make for a greater decentralization of life and the spreading of population over larger areas without experiencing any feeling of isolation.

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1. Ottawa Journal - January 18, 1944.

Shopping in the country need no longer wait until the traditional Saturday market. A fifty or sixty-mile trip to town can be covered in half an hour, and the round trip with a little gossip and purchasing thrown in will not take half a day. Vacations for city folk may easily include a ten-day stay in Alaska out of the two-weeks-with-pay. And four days travel going and coming will be no more expensive than the same distance covered in the old family car. Even trips across oceans will not be too expensive. Within a few years special tourist rates to islands in the Pacific may be less than ordinary railway coach fares for a comparable distance.

Beyond these new developments, there stretch vast horizons of potential inventions which will tend to draw the life of the immediate future more and more into the third dimension. But let us not get too far ahead of our story. The present is thrilling enough!

Children born into the air age will find it as difficult and as quaint to imagine a world without planes as we did, in our time, in thinking of a world without motorcars.

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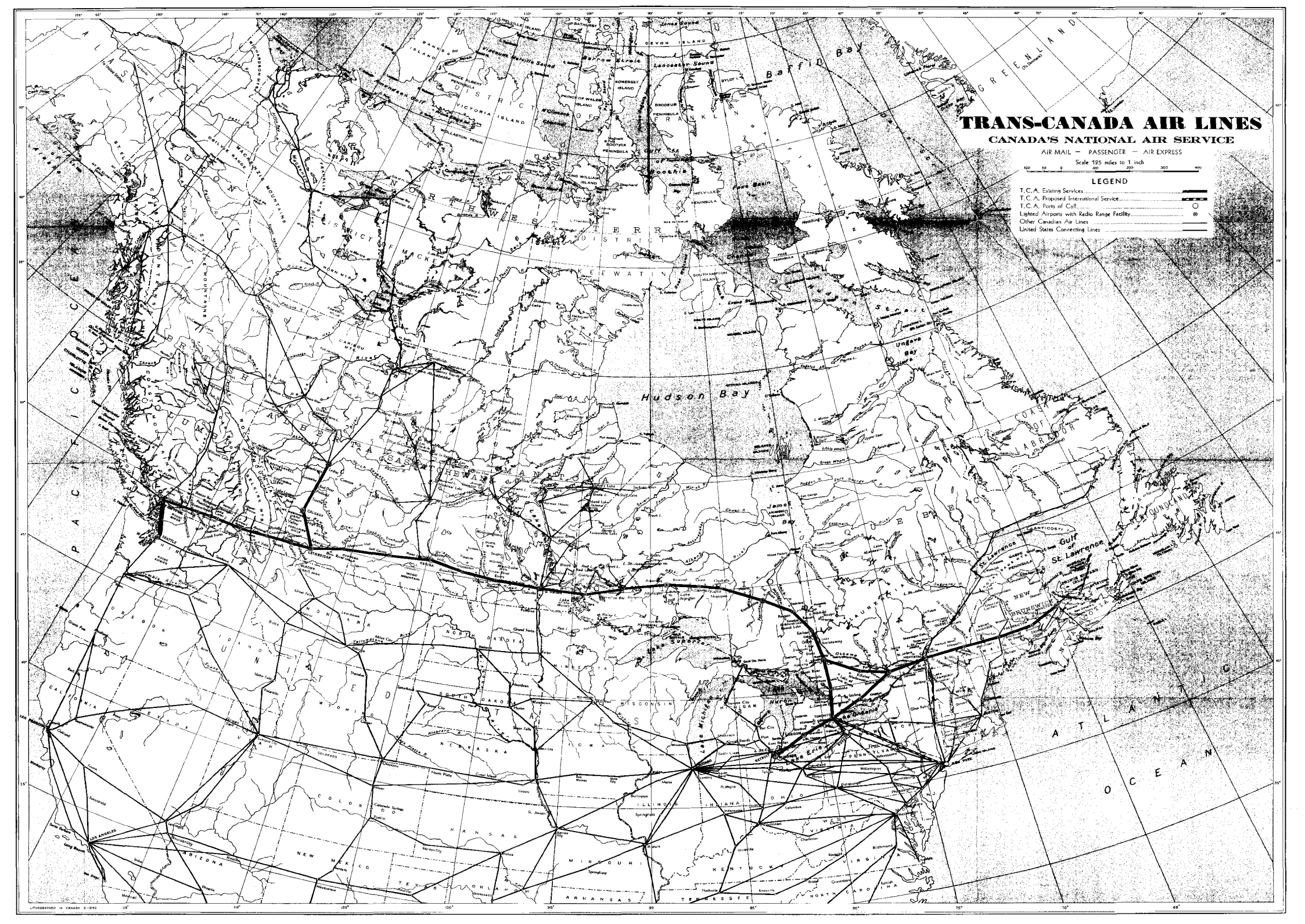
TRANS-CANADA AIR LINES
CANADA'S NATIONAL AIR SERVICE
AIR MAIL — PASSENGER — AIR EXPRESS
Scale 125 miles to 1 inch
100 50 0 100 200 300 400
LEGEND
T.C.A. Existing Services
T.C.A. Proposed International Service
T.C.A. Ports of Call
Lighted Airports with Radio Range Facility
Other Canadian Air Lines
United States Connecting Lines
Hudson Bay
Baffin Bay
Gulf of St. Lawrence
PACIFIC OCEAN
ATLANTIC OCEAN
GREENLAND
NEWFOUNDLAND
NORTHWEST TERRITORIES
YUKON
BRITISH COLUMBIA
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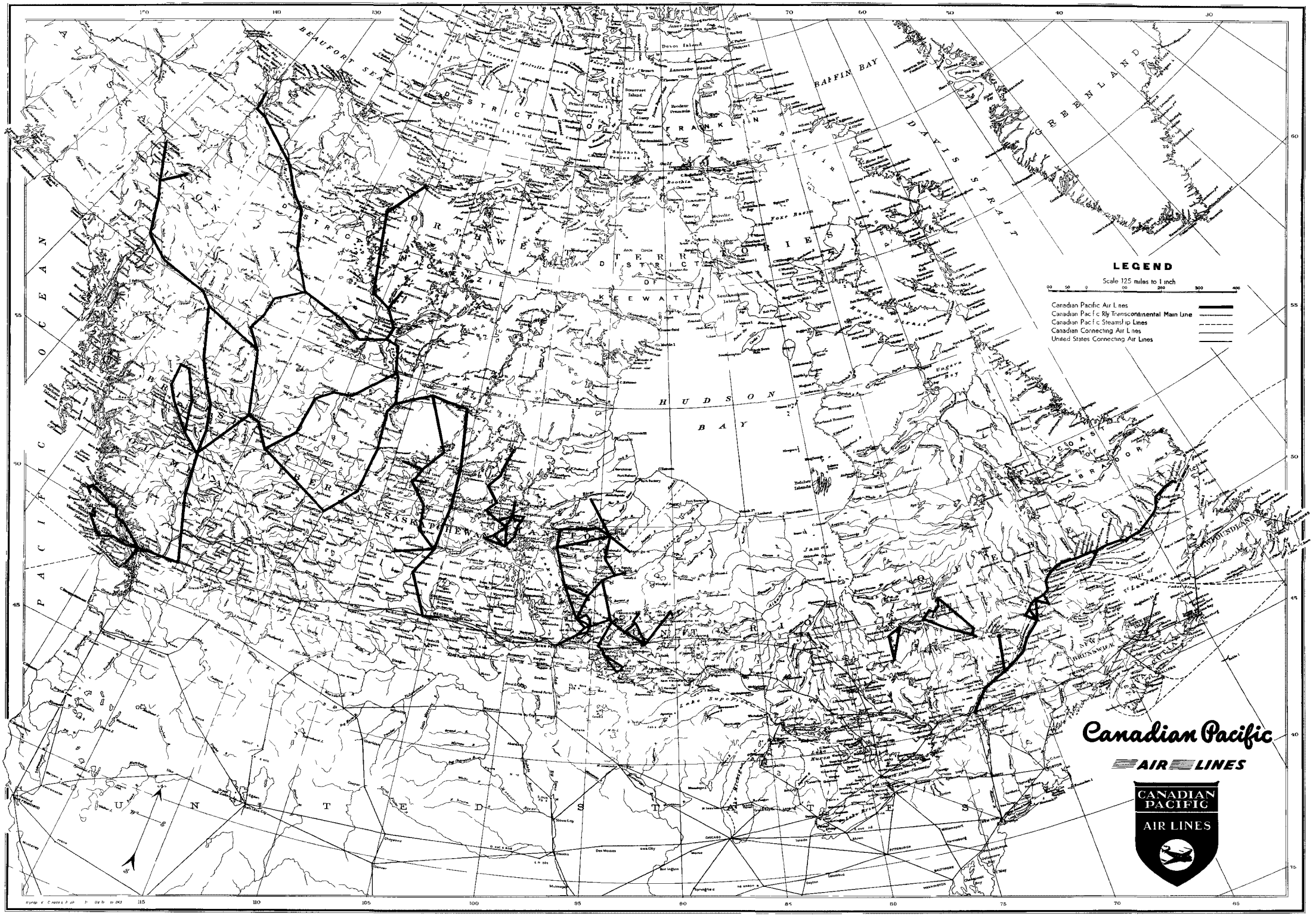
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Canadian Pacific Steamship Lines
Canadian Connecting Air Lines
United States Connecting Air Lines
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ONTARIO
QUEBEC
NEW BRUNSWICK
NOVA SCOTIA
NEWFOUNDLAND
LABRADOR
GREENLAND
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BAFFIN BAY
DAVIS STRAIT
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DISTRICT OF KEEWATIN
DISTRICT OF FRANKLIN
NORTHWEST TERRITORIES