

1991

'A Leading Arsenal of Democracy': American Rearmament and the Continental Integration of the Canadian Aircraft Industry, 1948-1953

IN THE CONTEXT of twentieth-century international relations, Canadian-American relations stand apart, owing to the virtual absence of conflict and coercive diplomacy on one hand, and the two states' extensive common interests on the other. This 'special relationship' between the two North American allies was most notable in the continental integration of their economies in time of war and cold war.¹ After a short period of post-war demobilization and reconversion, Canada and the United States began, between 1948 and the end of the Korean War in 1953, again to co-ordinate their industrial defence production. According to one state department report, Canada was the most valued of the NATO allies because 'its economy was well equipped to play a role as a leading arsenal of democracy' for the western alliance.²

by Aronsen
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A good deal of the literature on post-war Canadian-American relations looks at Canada's strategic importance in the atomic era,³ while studies that focus on economic relations take a stance critical of the

¹ The first systematic analysis of the unique qualities of the Canadian-American relationship was discussed in the series sponsored by the Carnegie Endowment for International Peace from 1935 to 1945. For an overview see Carl Berger, 'Internationalism, Continentalism, and the Writing of History: Comments on the Carnegie Series on the Relations of Canada and the United States', in *The Influence of the United States on Canadian Development*, ed. Richard A. Preston (Durham, N.C., 1972), pp. 32-54. The idea that war and cold war have accelerated the continental economic integration of Canada and the United States is discussed in R.D. Cuff and J.L. Granatstein, *Canadian-American Relations in Wartime* (Toronto, 1975).

² 'Canada's Defense Effort and the Canadian Economy', 16 March 1951, File 742.5/3-1651, RG 84, US Consular Posts Records, Suitland, Md.

³ See, for example, James Eayrs, *In Defence of Canada: Growing Up Allied* (Toronto, 1980); Joseph T. Jockel, *No Boundaries Upstairs: Canada, the United States and the Origins of the North American Air Defence, 1945-1958* (Vancouver, 1987).

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dependency relationship with the 'behemoth to the south'.⁴ However, the contribution of Canada's defence industries to US rearmament during the early years of the cold war has not been closely examined either from a Canadian or a US perspective. For trade, investment, and technology transfer purposes, the Canadian aircraft industry attracted the most attention from US national security planners and officials in Ottawa responsible for post-war economic development.

The help Canada could give to the United States in a future war had been clearly demonstrated during the Second World War. The technological sophistication of Canadian defence production and the unequalled record of Canadian co-operation between 1941 and 1945 convinced US officials that Canada would play an important role in the cold war rearmament ahead.⁵ It was only 'after the experience of the last war', observed one defence department report, that 'the enormous defense production capacity of Canada became apparent'.⁶ The unprecedented continental integration of the Canadian and American aircraft industries – by way of American branch-plant expansion, technology transfer, standardization, and the 'rational division' of production worked out under the provisions of the 1941 Hyde Park agreement – produced spectacular results. When the Second World War broke out in 1939, Canada had a small aircraft industry employing 1,000 workers who produced 40 planes a year; by the end of the war, a total of 16,448 planes had rolled off Canadian assembly lines and employment stood at 122,000.⁷

Canada conveniently supplemented US aircraft production in several ways. First, Canada, owing to her capacity to produce two types of standardized weapons systems, was able to assemble aircraft such as the Lancaster bomber and the Mosquito interceptor for the British, thereby

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⁴ Melissa Clark-Jones, *A Staple State: Canadian Industrial Resources in Cold War* (Toronto, 1987); Paul Phillips and Stephen Watson, 'From Mobilization to Continentalism: The Canadian Economy in the Post-Depression Period', in *Modern Canada: 1930s-1980s*, ed. Michael S. Cross and Gregory S. Kealey (Toronto, 1988), pp. 20-45.

⁵ 'Participation by Canadian Industry in Production of Equipment for the Defense of the North American Continent, 1941-1958', NSC 5822, RG 330 [Office of the Secretary of Defense], N[ational] A[rchives] and R[ecords] S[ervice], Washington; Address, Secretary of Defense Louis Johnson, 22 Oct. 1947, File G 34, Industrial Mobilization General Box 27, H[arry] S. T[ruman] L[ibrary], Independence, Mo].

⁶ 'Directive Pertaining to Analysis of Aircraft Procurement', 5 Dec. 1950, Box 309, RG 330, NARS.

⁷ 'Aircraft Production Branch General Summary', 10 Feb. 1946, Vol. 15, RG 28A, P[ublic] A[rchives] of C[anada], Ottawa; W.B. Burchall, 'The Aircraft Manufacturing Industry: Great Expansion of Productive Capacity', *Industrial Canada*, xlv (1945), 117-19.

reducing pressure on American aircraft companies to retool and supply them. Second, Canada built 800 Harvard trainers and several hundred other trainers for the British Commonwealth Air Training Programme, thereby freeing up American capacity to build frontline bombers and fighters.⁸ Third, the Canadian branch plants of Fairchild and Boeing helped the domestic US aircraft industry to overcome a shortage of aluminium parts, especially propellers. These companies also produced specific types of airframes in great demand, such as the Curtis dive-bomber and the Catalina flying boat.⁹

Despite the shrinking of the Canadian aircraft industry after the war, Canadian aviation companies such as A.V. Roe and Canadair remained highly innovative and technologically sophisticated. In the words of a state department report, the Canadian aviation industry in 1949 had 'a considerable reservoir of technical knowledge, skilled personnel, and excellent supplies of raw and fabricated materials'.¹⁰ One of the most significant developments in post-war Canadian industry was in civilian transport. As early as 1949, A.V. Roe, a leading aircraft manufacturer during the Second World War, had test-flown the Jetstar, a four-engined jet transport. Given the fact that the plane could carry 50 passengers at speeds over 400 m.p.h., and at altitudes of up to 40,000 feet, some authorities believed that Canada was at least three years ahead of the United States in civil air transport.¹¹ the *New York Times* reported that 'our massive but underpopulated good neighbour to the north has a mechanical product that licks anything of ours'.¹² Equally impressive was the fact that the Canadians had developed such an advanced plane so quickly and within an \$8 million budget.

Rising cold war tensions in 1948 convinced the Canadian government that, for reasons of national security, higher priority should be given to expanding the Royal Canadian Air Force and maintaining a healthy aircraft industry. These security considerations reinforced the government's earlier decision to try to diversify the post-war Canadian economy

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⁸ David Godfrey, 'Score Sheet on the Half Century', *Canadian Aviation*, 1 (1978), 42.

⁹ Howard T. Mitchell, 'British Columbia's Industrial War Effort', *Industrial Canada*, xlv (1945), 130.

¹⁰ 'Aircraft Manufacturing in the Dominion of Canada', 24 June 1949, Entry 125, Box 125, RG 304 [Records of the Office of Civil Defense Mobilization], NARS.

¹¹ 'Jetliner Baptism: Canada's C-102 Avro Jetliner', *Newsweek*, 17 Oct. 1949, p. 46; 'Report on 25 years of Canadian Aviation Technology', 7 July 1973, Aircraft Industry File, Canadian Institute of International Affairs Library, University of Toronto.

¹² *New York Times*, 11 Aug. 1949.

into new technology areas.¹³ In April 1948, *Canadian Aviation* called for an increase in the air force budget from \$80 million to \$377 million.¹⁴ The following July, the Aircraft Committee of the Industrial Defence Board, Canada's mobilization planning agency, advised the government to preserve a viable aircraft industry to 'assure Canadian security in the air age' and economic development at home.¹⁵ The theme of 'security and prosperity' was echoed by the Canadian Industrial Preparedness Association, a private lobby for Canadian defence industries.¹⁶

The government did not ignore these warnings and in the summer of 1948 the minister of defence, Brooke Claxton, announced in the House of Commons that the Canadian Armed Forces budget for 1949 would be increased, with the greatest share of the appropriation going to the air force. Soon after the report of the Industrial Defence Board, Ottawa stepped up in November its funding for A.V. Roe's CF-100, an all-weather, Canadian-designed fighter interceptor. Described by the *Financial Post* as 'our greatest industrial gamble', the project was undertaken in 1946 and, by 1948, \$5 million had been spent on research and development.¹⁷ The CF-100 received favourable reviews by the US air force and other aviation authorities in the United States.¹⁸ In March 1949, an additional \$3.9 million was allocated for the production by 1950 of 10 XC-100s, a prototype of the CF-100. An important part of the programme was the production of the Orenda jet engine, later adopted for the Sabre V model of the F-86 interceptor.¹⁹

As the Canadian government began in 1948 to pay more attention to industrial defence planning and production, the connection between economic self-interest and the continental integration of the aircraft

¹³ 'IDB Report', no date, File G.1, IDB/Pubs/5, RG 36/19 [Industrial Defence Board Records], PAC; Isbester to Mackenzie, 3 June 1948, File 289-5-29-1, RG 36/19, PAC. See also Robert Bothwell and William Kilbourn, *C. D. Howe: A Biography* (Toronto, 1980), pp. 180-244.

¹⁴ 'We Need a "Survival" Report for Canada', *Canadian Aviation*, xx (1948), 1. See also, Thomas Sheard, 'Preparedness in the Air', *Industrial Canada*, xlix (1948), 13-15.

¹⁵ 'Aircraft Industry Report', 15 July 1948, IDB Minutes File, Vol. 22, RG 36/19, PAC.

¹⁶ Major General J.H. MacQueen, 'Industry in Relation to National Security', 5 May 1948, IDB Minutes File, Vol. 22, RG 36/19, PAC.

¹⁷ *Financial Post*, 2 Aug. 1948; Canadian Ordnance Association Report, 2 Nov. 1948, D[e]partment of E[xt]ernal A[ff]airs Papers, DEA, Ottawa; 'A. V. Roe: A History', *House of Commons Debates*, 24 June 1952, 3,619-21.

¹⁸ 'Canadian Jet Plane May Be the Most Powerful', *Science News Letter*, 4 Feb. 1950, p. 76; 'Experimental CF-100 on Test Hop', *Aviation Week*, 23 April 1951, p. 16.

¹⁹ 'Canadian Turbojets Now Used in Sabres', *Science News Letter*, 9 Aug. 1952, p. 85.

industry became more apparent. Capital-intensive operations such as American-owned aircraft companies were encouraged to locate north of the border to help to reverse the depletion of dollar reserves in the Canadian treasury during the 1947-8 dollar gap crisis.²⁰ If part of the aircraft industry were controlled by American branch plants, the Canadian government reasoned, the chances of finding stable export markets in the United States would increase. Export markets were particularly critical to the aircraft industry because during the Second World War seventy per cent of production was exported to the allies. The Canadian government also recognized that, given the need of export markets, its aircraft industry would be confined to component parts, especially electronic equipment, and to specialized aircraft.²¹ But Canada was willing to meet the needs of the United States and other foreign markets because, as Claxton pointed out, 'the run is too small and the cost too great' to be simply a supplier for the Royal Canadian Air Force.²²

Before the major US defence buildup in 1950, several steps were taken by the Canadian government towards the continental integration of industrial defence production and planning. In November 1948, a standardization agreement was negotiated regarding the size of screws, nuts, and bolts used in weapons systems.²³ The government also decided that new weapons and equipment would copy US models whenever possible. For example, the British calibre .303 rifle was replaced by the American calibre .300 rifle, and Canadian warships began to replace their electronic equipment with that of American design. In 1950, the air force began to choose new equipment interchangeable with US equipment and adopted similar training and tactical doctrines. The most notable examples were the use of military transports of US design and the adoption of the F-86 fighter to replace the British-built Vampire.²⁴

The next step was an agreement with the United States to co-ordinate the planning of continental defence production. Shortly after the inauguration of the NATO alliance in April 1949, the two governments set up a Joint Industrial Mobilization Committee (JIMC). At its first

²⁰ Kenneth Wilson, 'The External Background of Canada's Economic Problems', in *Canada's Economy in a Changing World*, ed. J. Douglas Gibson (Toronto, 1948), pp. 1-30.

²¹ 'IDB Report', no date, File G.1, IDB/Pubs/5, RG 36/19, PAC.

²² Claxton, quoted in 'Canada and the United States to Fight Together on the Industrial Front', *Bulletin*, 13 July 1949, p. 4.

²³ 'Draft Statement on Standardization', 10 Sept. 1947, File F 2579, Vol. 249, MG 26 J4, Brooke Claxton Papers, PAC.

²⁴ 'Weapons Panel Memorandum', 15 Jan. 1951, File S.15/5, Vol. 17, RG 36/19, PAC; 'Canada Moves Toward Closer Air Power Integration with the US', *Aviation Week*, 27 Feb. 1950, p. 145.

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regular meeting, in Washington in June 1949, the word 'Planning' was added to its official title. In a crisis such as a Soviet invasion of Europe, JIMC would be given executive powers similar to the highly successful Joint War Production Committee of the Second World War. In recognition of the importance of co-ordinating the planning for emergencies of the Canadian and American aircraft industries, an aircraft subcommittee was one of six created.²⁵

In addition to formal bilateral agencies such as JIMC, the two states were linked by an elaborate network of multinational corporations. The growing presence of US corporations in Canada was the result in part of the Liberal government's post-war policy of privatizing Crown corporations.²⁶ The best example of the way in which privatization led to continental integration was the Canadian aircraft industry. In April 1947, the government announced the lease/sale of Canadair, one of the largest wartime Crown corporations, to the Electric Boat Company of New York, predecessor of the General Dynamics Corporation. The sale provided for a fifteen-year lease with an option to purchase at \$3.5 million less depreciation, to be recovered by the government as part of the rent.²⁷

In response to criticism in the House of Commons, the minister of reconstruction, C.D. Howe, explained that the sale of Canadair to a respectable American company would ensure a market for Canadian products in a very competitive industry; access to research facilities was cited as another benefit. Moreover, sale to a foreigner was necessary because no Canadian company was willing to bid for the Crown corporation.²⁸ The new American-owned company immediately began to expand its plant for the servicing and production of aircraft; by 1949, the state department observed that it was 'generally conceded in the trade as the plant best adapted in the entire domestic industry to modern mass production of aircraft'.²⁹

Shortly after the sale of Canadair, the government decided to acquire fifty-six of North American Aviation's F-86s (A series) as part of its air force expansion programme, for use as 'first line' fighter interceptors.

²⁵ 'Report by the Chairman of the First Meeting of the JIMC', 1 June 1949, IDB File, Vol. 198, MG 27 II B20, C.D. Howe Papers, PAC.

²⁶ Government of Canada, *The White Paper on Employment and Income with Special Reference to the Initial Period of Reconstruction* (Ottawa, 1945), pp. 9-10; C.D. Howe, 'Reconstruction Policy in Canada', 3 April 1945, File 5, C.D. Howe Papers, PAC.

²⁷ Heeney to King, 28 Jan. 1947, File 2410, Vol. 240, MG 26 J4, PAC; *Financial Post*, 25 Jan. 1947.

²⁸ Howe to Wright, 12 April 1948, Washington Embassy File, Vol. 2158, RG 25 B-5, DEA Records, PAC.

²⁹ 'Aircraft Manufacturing in Canada', 24 June 1949, Entry 125, RG 304, NARS.

These American-made fighters were selected over the British Vampires for several reasons: the RCAF argued that the plane's manoeuvrability and rate of climb was far superior to the Vampire's; in time of crisis it would be easier to obtain spare parts in the United States; and, should the Canadian-built all-weather CF-100 not be available by 1951, the F-86 could serve as a temporary replacement.³⁰

The adoption of the F-86 encountered one major obstacle, however. The purchase of only a few dozen imposed a serious strain on Canadian reserves of US dollars during the 1947-8 dollar gap crisis. To overcome this problem, the Aircraft Committee of the Industrial Defence Board recommended the manufacture of selected components for, and final assembly of, the F-86 in Canada.³¹ Howe approached the Truman administration with this proposal in November 1948 and was told to deal directly with the manufacturer. Early the next year North American Aviation agreed to allow the Canadair plant in Montreal to assemble the F-86 under licence³² and, within a few months, the plant began to produce the fuselage and other major components. At the time the F-86 was powered by General Electric J-47 jet engines, which were later replaced with the more powerful Canadian-built Orenda engine. The Canadian government enthusiastically endorsed this arrangement and placed an order for an additional 100 of the F-86 Sabres.³³

In 1949, the Liberal government anticipated exporting the F-86 to the United States and other NATO allies, but not until after the outbreak of the Korean War was Canada able to export a significant number. Before the United States could purchase more aircraft and parts from Canada, however, longstanding protectionist measures would have to be altered. The Canadian government was particularly concerned about the Buy American Act of 1934 and asked Washington whether it could be rescinded, as it had been during the Second World War. US officials in the National Security Resources Board (NSRB), the Munitions Board, and the White House were sympathetic, but protectionist elements in the Congress were not. To overcome this problem, the prime minister, Louis St. Laurent, and Claxton made a series of speeches in the United States appealing directly to the media and public

³⁰ L.R.N. Ashley, 'The Air Defence of Canada', Nov. 1958, File 181.009 D55, [Directorate of] H[istory] R[ecords], Department of National Defence Headquarters, Ottawa; 'An Appreciation of RCAF Fighter Aircraft Requirements, April 1949 to March 1951', 8 March 1949, File H.Q. 15-24-51, Vol. 6169, RG 24, Department of National Defence Records, PAC.

³¹ CIIPA Report, 21 Oct. 1948, File C.5 Air/8, Vol. 8, RG 36/19, PAC.

³² Summary of Howe Visit to Washington, 24 Nov. 1948, Vol. 14, RG 2/18 [Privy Council Records], PAC.

³³ *Bulletin*, 20 Sept. 1949, p. 8. The total cost of the contract was \$30,211,190.

opinion. They reminded their American audience of the advantages of integrating the North American economy for the purposes of defence production, presenting it as a measure necessary to meet the Communist threat, and urged Congress to act immediately to amend the Buy American Act.⁴⁴

Meanwhile, the Truman administration was able to give more direct assistance to Canada under the provisions of the Mutual Defence Assistance Program (MDAP). This programme, passed into legislation in November 1949 and the most important part of a US effort to subsidize limited rearmament by its NATO allies, was eagerly welcomed by the St. Laurent government. One official at external affairs commented that 'this may offer a splendid opportunity for us to obtain some of the munitions business of the western allies'.⁴⁵ As the arrangement was similar to the wartime Lend-Lease programme, Canada did not receive MDAP funds directly; instead, the Truman administration asked Congress to permit NATO members to purchase equipment from Canada as well as the United States.⁴⁶

To co-ordinate the arms shipments, a Military Production and Supply Board was created on which Canadian officials played an active role. As part of her contribution to the rearmament of the western alliance during the Korean War, Canada provided \$617 million in military equipment, much of it of US design and paid for in US dollars. However, the fighters sold were of American design, not the Canadian designed CF-100; the largest item was the F-86 jet fighter sold to the British Royal Air Force. Under the terms of the Mutual Aid Agreement, the United States supplied the engines, Canada the airframes, and the final assembly took place at the Canadair plant in Montreal.⁴⁷

To facilitate the production of the Canadian-made F-86 for the NATO allies, Canada was allowed to acquire equipment, materials, and services from the United States. Of particular use to Canadian companies was access to the latest fighter interceptor research and development done, for example, at the Wright Air Development Center in Dayton, Ohio. The department of defence also made flexible financial arrangements with the Canadian government for payment for military equipment. For example, when the Canadian government placed an

⁴⁴ *Montreal Daily Star*, 17 Oct. 1949; *Financial Post*, 18 Feb. 1950.

⁴⁵ Denney to Notman, 16 March 1949, File 14 Reqrmts/Gen/1, Vol. 6, RG 36/19, PAC.

⁴⁶ 'Report on the Mutual Aid Program', Munitions Board Monthly Review, May 1952, White House Central Files, Box 25, HSTI.

⁴⁷ 'Department of Defence Production Report', 8 Nov. 1954, File 200-15-1-5, Vol. 565, RG 49 [Department of Defence Production Records], PAC; RCAF Report, 30 March 1959, File 200-5-1, DHR.

\$11-million order for F-86 parts in January 1950, the state department waived regulations requiring payment in advance, thereby lessening the demands on the limited US dollar reserves of the Canadian treasury.⁴⁸

The process of continental integration accelerated rapidly after the outbreak of the Korean War in the summer of 1950. Shortly after Congress passed the Defence Production Act in September, Truman called for a doubling of the defence budget, 'because more guns, planes, and tanks are needed to protect the world from communist domination'.⁴⁹ For the purposes of industrial defence planning, the NSRB assumed that a major war with the Soviet Union or China would break out in July 1951 and last at least five years.⁵⁰ This new strategic assessment had implications for relations with Canada: the Canadian-American Military Co-operation Committee (MCC) recommended that both states develop an early-warning radar system in the north, and an adequate fighter interception force; update their civil defence; and be prepared to work more closely on industrial defence production.⁵¹

Between 1946 and 1949, the United States budget for the procurement of military aircraft averaged \$900 million a year but, after the outbreak of hostilities in Korea, the purchase of military aircraft rose dramatically to more than \$1 billion a month.⁵² Given the demands for large numbers of strategic bombers, transports (civilian and military), trainers, and fighter interceptors, the aircraft industry was faced by the end of 1950 with a \$2 billion demand for back orders.⁵³ To lessen the strain on US industry and bring new equipment into operation as quickly as possible, the United States turned to Canada.

The state department noted several advantages the Canadian aircraft industry had over the American: lower wage scales and excellent supplies of strategic raw materials, especially titanium and aluminium.⁵⁴

⁴⁸ 'Equipment for Canada', 26 Jan. 1950, File, P. O.- 091 Canada (Section II) Entry 153, RG 330, NARS.

⁴⁹ President Truman quoted in *Commercial and Financial Chronicle*, 14 Sept. 1950.

⁵⁰ 'Assumptions and Levels of Economic Activity to Be Used in the 1950 Feasibility Test', 16 Aug. 1950, Entry 96, Box 4, RG 304, NARS.

⁵¹ 'MCC Planning Report', 12 Sept. 1950, P[ermanent] J[oint] B[oard of] D[efense] Records, PJBD Office, Washington; Marshall to JCS, 13 July 1950, File 381 US (1-31-50), RG 218 [Joint Chiefs of Staff Records], NARS.

⁵² 'Historical Reports on Defense Production', No. 51 *Aircraft*, 15 June 1953, Box 19, RG 277 [National Production Authority], NARS; Carroll V. Glines, Jr., *The Compact History of the United States Air Force* (New York, 1973), pp. 311-12.

⁵³ Andrew McSurely, 'Plans Rushed for Big Spending Program', *Aviation Week*, 31 July 1950, pp. 11-12; Editorial, 'Industry Poised for All-out Mobilization', *Aviation Week*, 11 Dec. 1950, pp. 13-14; Editorial, 'Our Expanding Aircraft Industry', *Aviation Week*, 12 March 1951, p. 15.

⁵⁴ 'Status Report: Aircraft Manufacturing in Canada', 24 June 1949, Entry 125, Box 5, RG 304, NARS.

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From the perspective of the US air force, there was also a strategic advantage in dispersing the aircraft industry throughout North America, thereby reducing the threat of destruction in one surprise attack.⁴⁵ These views were echoed by Canadians: Howe reminded Americans that 'your northern neighbour' could always be relied on 'as an alternate source of supply in the event of another war'.⁴⁶

In July 1950, the NSRB advised that 'the maintenance of Canadian industries in an active and easily expandable condition can be a major contribution to the mutual defense of both countries and the integration of military production in the North Atlantic community'.⁴⁷ The National Security Council (NSC) and the state department gave several reasons why the United States should immediately allow more imports of Canadian aircraft and electronic equipment. If the United States did not take advantage of the spare capacity in Canada's defence industries, it would lose an enormous reserve of scientific knowledge and technical capability, especially in the electronics and aircraft sector. Furthermore, by purchasing more Canadian defence production, it would reduce the strain on Canada's shrinking reserves of US dollars, thereby enabling Ottawa to give more financial aid to Europe. At a time when the US economy seemed to be overheating, Canadian defence production would be a welcome asset. Lastly, the United States would gain greater Canadian co-operation on North American defence and NATO policy in Europe. The NSC also emphasized that US companies engaged in defence production would not be jeopardized by encouraging the expansion of Canada's defence industries. This 'enlightened' continentalist thinking was a response to a Canadian offer to produce either components or finished products for which American defence producers had difficulty in meeting the demand.⁴⁸

Acting on the advice of the NSC and the state department, the Truman administration treated Canadian defence contracts as equal to its own. Thus, in December 1950 steel was supplied to the Canadian shipbuilding and locomotive plants despite shortages in the United

⁴⁵ Lt. Colonel George R. Charlton, 'Industrial Vulnerability in the Atomic Age', *Air University Review*, Fall 1949, pp. 13-23; J. Carlton Ward, 'Air Industry Preparedness', *Aero Digest*, Oct. 1948, pp. 1-5; 'Expansion of the Aircraft Industry Resumed', *Survey of Current Business*, 28 June 1948, pp. 6-7.

⁴⁶ C.D. Howe, quoted in the *Toronto Star*, 30 Sept. 1952.

⁴⁷ Winant to Symington, 21 July 1950, Entry 31, Box 147, RG 304, NARS.

⁴⁸ 'Participation by Canadian Industry in Production of Equipment for the Defense of the North American Continent', NSC 5822/1, 30 Dec. 1950, NSC Papers, NARS; 'Canadian Contribution to Nato', Ottawa Embassy File, 29 Nov. 1951, RG 59 [Department of State Records], NARS.

States, and similarly, American aluminium and highly classified electronic components were supplied to the Canadian aircraft industry.⁴⁹

The US government also took steps to balance the trade in defence products which, up to 1951, had been decidedly in its own favour.⁵⁰ Until the outbreak of the Korean War, US purchases in Canada for its rearmament programme were primarily Canadian raw materials such as nickel, copper, and zinc; after 1950, the import of equipment increased substantially. In December 1950, the ceiling for purchases of Canadian defence production was raised to \$100 million and the following year the secretary of defence, George Marshall, announced a \$300 million limit. These increases came about in part by way of a 'creative' interpretation of the Buy American Act: the vague wording of the act allowed the Office of Defense Mobilization to argue that it did not apply to sub-contracts, as long as the Canadian content did not exceed 25 per cent of the total cost. Also, where the act conflicted with the 'public interest', the secretaries of the armed forces were allowed to grant exemptions.⁵¹

Throughout the Korean War, the primary suppliers of components for Canadian-produced defence equipment were American multinational corporations, and several steps were taken to further their expansion and continental integration. For example, in 1951 the Office of Defense Mobilization gave tax amortization certificates to Canadian branch plants to encourage the northward flow of investment. Regulations governing the transfer of secret weapons technology were also relaxed, especially to companies producing US-designed aircraft or parts. To protect critically important installations such as the Canadair aircraft factory and the Pratt and Whitney engine factory from sabotage, an Industrial Security Agreement was negotiated in 1952: the two states decided which industries needed special surveillance and assigned their own security forces to protect them. Lastly, senior managers in the aircraft industry, as well as FBI and RCMP officers, were allowed to visit factories in the other country with a minimum of delay.⁵²

Other solely Canadian factors contributed to the rapid expansion of American-owned arms industries in Canada. The decline in post-war

⁴⁹ Frederick Winant, 'United States-Canadian Co-operation in Preparedness', *Public Affairs*, xiii (1951), 76-7.

⁵⁰ Appendix 3, NSC 5822, NARS. In 1951, United States defence exports to Canada totalled \$247 million while imports came to only \$46 million.

⁵¹ 'U.S. Defence Purchasing in Canada', File 2422, MG 28 I 230, PAC; *Financial Post*, 17 Nov. 1951; Editorial, 'Interpreting the Buy American Act', *Bulletin*, 21 Nov. 1951, pp. 5-6.

⁵² Department of Defence Production, *Second Report, 1952* (Ottawa, 1953), pp. 18-19; 'Canadian Vital Points Contiguous to USA', 8 Aug. 1951, File 2343-23/0 (DMO & P), DHR.

defence spending ended in 1948 but spending increased only moderately until February 1951 when Claxton announced to parliament that the government was about to begin a new programme costing \$5 billion over three years. 'In view of the close interrelations of the aircraft industries of Canada and the United States and their dependence on common sources of supply for many types of material and equipment', the Canadian department of trade and commerce again reminded US defence planners to 'consider the Canadian and American aircraft industries as an integrated production unit'.⁵³

In reporting on Canadian defence industries throughout 1950-1, the American embassy in Ottawa privately expressed annoyance over persistent Canadian lobbying that the United States should purchase more war materials from Canada. However, in official press releases the state department stressed the technological sophistication and excess capacity of Canadian defence industries and their importance to US security at a time of general mobilization.⁵⁴ The department also stressed Canada's unique relationship with the United States, owing to the extensive commercial ties between the two states – the closer the commercial ties, argued one state department official, the less the need for intergovernmental agencies to co-ordinate defence production.⁵⁵ Moreover, the extensive network of US branch plants in Canada permitted greater standardization, co-ordination of supply, and similarity in production schedules. Eight of the fifteen largest defence contractors in Canada were US companies and, as Table III suggests, the most important were the aircraft, electronic, and automotive industries.

American-owned companies such as Canadair received the largest budget appropriations from the expanded defence budget: nearly two-thirds of the \$2.1-billion Canadian air force budget during the Korean War buildup went towards the purchase of new aircraft and related equipment. In response to this rising domestic and foreign demand for new military aircraft, the aircraft industries, notably the American-owned companies, re-invested earnings in plant expansion and modernization rather than exporting profits or dividends to shareholders south of the border: in 1952, total investment in the aircraft and related industries reached \$7.5 billion, an increase of \$1 billion over the previous year.⁵⁶ This re-investment dramatically improved Canada's balance of payments.

⁵³ 'Aircraft Production in Canada', 8 Nov. 1950, File S. 15/2, RG 36/19, PAC.

⁵⁴ 'Canada's Defense Effort and the Canadian Economy'. See fn. 2.

⁵⁵ Ibid.

⁵⁶ Windsor Star, 15 March 1952.

Canadair, the most important Canadian aircraft company, was also the most important foreign supplier of aircraft and aircraft parts to the US air force. Between 1949 and 1957, the company's largest single production run was the F-86 fighter; by 1953, more than one thousand had been built and by the time production ceased in 1957, 1,550 F-86s had been assembled at the Montreal plant. In February 1952, Thomas K. Finletter, secretary of the air force, announced a contract for 160 F-86 fighters to be equipped with the Canadian-designed Orenda engine.⁵⁷ The 6,500-pounds-thrust Orenda engine produced at the A.V. Roe plant in Toronto was the most powerful jet engine then available. Orenda-equipped Sabres, designated the Sabre V, became the leading frontline fighter aircraft in both the US air force and NATO forces in Europe until the appearance of the F-100 Super Sabres in 1955.⁵⁸ In all categories—rate of climb, serviceable ceiling, and top speed—the Orenda-Sabres proved far superior to General Electric-powered Sabres. The planes also marked a historic precedent for the Canadian aircraft industry, in that they were the first planes fitted with engines built in Canada. Although only 60 Sabre Vs saw action in Korea, more than 600 were built for the US air force and the NATO allies from 1952 to 1955.

As the pace of American rearmament accelerated after 1950, the demand for a greater variety of Canadian-built aircraft increased as well.⁵⁹ Canadair, for example, was awarded several other major contracts by the US air force. In 1952, a \$100 million contract was negotiated for 576 T-33 A jet trainers designed by Lockheed and equipped with the Canadian-made Rolls-Royce Nene engines. The same year the US air force awarded a joint contract worth \$70 million to Canadair and the Beechcraft Aircraft corporation of Wichita, Kansas to produce 300 T-36 twin-engined trainers. Canadair built the rear fuselage and outer wing sections and assembled the component parts. In addition to producing completed aircraft, Canadair was also under contract to supply the US air force with spare parts for the C-54 and C-47 transports.⁶⁰

Several other Canadian companies were awarded contracts to provide aircraft airframes, engines, and parts to the United States. In 1951, de Havilland of Toronto won an open US air force competition for a

⁵⁷ Montreal Gazette, 19 Feb. 1952.

⁵⁸ 'Super Sabres', Aviation Week, 27 Aug. 1956, p. 37; T.F. Darge, 'Century Fighters: F-100 through F-109', Flying, lix (1956), 22-4.

⁵⁹ 'Look at New Foreign Military Trainers', Aviation Week, 14 May 1951, pp. 24-5.

⁶⁰ Wayne W. Parrish, 'Canadair Gaining Top Production Role', American Aviation, 9 July 1951, pp. 20-1; 'Canadair: From Canada's Top Aircraft Producer Comes Fighting and Training Equipment for RCAF, USAF, and RAF', Aircraft, March 1953, pp. 22-3.

Canadair really benefited from rearmament

which could export

light, single-engined plane that could operate in temperatures ranging from minus 65° to plus 120° Fahrenheit. The same year an order was placed for 232 de Havilland Beaver aircraft, used by the US army and air force in Korea as ambulances and for reconnaissance.⁶¹ The plane was slightly modified to meet US air force specifications, mounted with an American Wasp Jr. engine, and redesignated the L-20. About 50 Otters, a six-seater utility plane and a larger version of the Beaver, were also purchased by the US air force for use in Alaska, owing to its ability to take off quickly with heavy loads from small lakes and small landing strips.⁶² In 1952, the US air force placed an order with the Canadian Car and Foundry plant in Fort William, Ontario for 263 Harvard and 50 T6J trainers. The total contract, including aircraft, spares, and ground-handling equipment, came to more than \$33,500,000.⁶³ The Harvard was powered by a Canadian Pratt and Whitney R-1340, the first high-powered reciprocating engine built in Canada and, to meet the demand for it, the company opened a new \$3 million plant near Montreal employing about 1,500 workers with a capacity of 60 engines a month.⁶⁴

engine
The expansion of the Canadian aircraft engine industry is another example of the convergence of US national security and Canadian economic development. There were serious bottlenecks in the United States in the production of engines and parts for them throughout 1951 and 1952: in July 1952 the US air force disclosed that the output of aircraft engines was 12 per cent behind schedule. The most serious production delays occurred at North American Aviation's Los Angeles plant which had 120 'gliders' (F-86s without engines) sitting on the runway⁶⁵ – the delay in engine production was caused by a strike at General Electric and shortage of titanium, a metal resistant to high temperatures used in turbine blades. According to the air force's director of industrial resources, Canada could help by increasing her production and exports of titanium. Also important was the spare capacity in Canada's aircraft engine industry. If Canadair produced Orenda-equipped Sabres for the NATO allies in Europe, the North American

⁶¹ Editorial, 'Busy Beaver', *Aviation Week*, 3 Sept. 1951, p. 18; 'An Anniversary for de Havilland', *Aircraft*, 15 April 1953, pp. 10-14.

⁶² James Montagnes, 'A Survey of Canada's Aviation History', *Automotive Industries*, 15 May 1953, p. 142.

⁶³ Editorial, 'Canada: Factories Full', *Aviation Week*, 25 Feb. 1952, pp. 198-9.

⁶⁴ 'Canada: Factories Full', *Aviation Week*, 25 Feb. 1952, p. 198. Canadian Pratt and Whitney also produced the Wright R-1820 radial engine for the Grumman S2F sub-hunter.

⁶⁵ 'Bottlenecks', *Aviation Week*, 14 July 1952, p. 15; 'Titanium Shortage Blocks Buildup', *Aviation Week*, 26 Oct. 1953, p. 14.

plant in Los Angeles could concentrate on supplying Sabres for the Korean War. The US air force also noted that various Canadian sub-contractors could help to end the shortage of equipment such as bearings, resistors, gyroscopes, and electronic tubes and magnetrons.⁶⁶

The NSRB was particularly impressed with the Orenda gas-turbine engine, which had a longer life and a higher thrust than the General Electric J-47. Moreover, because of greater efficiency and lower labour costs, the Orenda engine was produced at about \$10 per pound of thrust, more cheaply than comparable American engines. The Orenda was particularly valuable, for it could be fitted to both the F-86 and the CF-100, and would increase the thrust levels of future models. Finally, the A.V. Roe Orenda plant had created by 1953 'a reserve of 600 machine-tools, badly needed throughout the free world'.⁶⁷ One NSRB study concluded that, added together, these developments 'demonstrate the excellence of original design and careful production work of which Canadian airplane firms are capable'.⁶⁸

Canadian officials publicly welcomed the opportunity to step up production of Orenda-equipped Sabres for NATO as part of Canada's contribution to collective security. Less publicized but equally important was the economic benefit to the strategy of making Canada a leader in jet aviation. Canada had a competitive advantage over other states in that she was a leading producer of cobalt, nickel, chromium, and tungsten – metals crucial in the making of jet engines. Canadian officials saw jet engines as the best example of their plan to diversify the economy into new high-technology areas by taking advantage of Canada's raw materials.

After Howe's announcement in September 1952 of a contract totalling \$66 million to A.V. Roe Aircraft for Orenda engines, the company began to expand its facilities at Malton, Ontario⁶⁹ and, by 1954, had produced 1,500 Orenda engines and employed 4,000 skilled workers.⁷⁰ The expansion met another government goal: to keep skilled workers from emigrating to the United States by providing employment in Canada.⁷¹ Canada therefore found herself in the unusual position of

⁶⁶ 'Utilization of Canadian Industry in U.S. Production Bottlenecks', 27 July 1951, File 832 (47), RG 341 [Records of the Headquarters of the United States Air Force], NARS.

⁶⁷ *New York Times*, 21 March 1953.

⁶⁸ 'Canadian Aircraft Report', 15 Oct. 1952, Entry 31, Box 147, RG 304, NARS.

⁶⁹ 'Canadian Aviation Expands to Make Orenda', *Aviation Week*, 20 Oct. 1952, pp. 40-1; *Toronto Star*, 29 Sept. 1952.

⁷⁰ Irving Stone, 'Canada and U.S. Weld Air Defense Team', *Aviation Week*, 14 March 1955, pp. 327-8.

⁷¹ H.A. Logan, 'The Canadian Labour Market and Postwar Employment', *Annals of the American Academy of Political Science* 233 (Sept. 1947), pp. 88-97;

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using A.V. Roe's British capital and technology to produce jet engines for American-designed planes to be sold to the British air force and paid for with American dollars from the Mutual Defence Assistance Program.

Howe and officials of the Liberal government emphasized the help given by the aircraft industry in diversifying the economy into new high-technology areas. Avro and Canadair alone had over 400 suppliers from the automotive, electronic, and light manufacturing industries: for example, Ford of Canada received a \$22 million contract to make wings for the T-33 trainer, expanded its facilities at Windsor, Ontario, and provided jobs for more than 1,000 workers.⁷²

The most notable effect of the growing aircraft industry was seen in new high-technology areas such as electronics. In May 1951 the president of Westinghouse of Canada announced a \$15 million expansion programme to build two new plants at Hamilton, Ontario for the production of radar and aircraft fire-control equipment, and in the following year, Canadian General Electric announced the expansion of its electronic division and its turbo-jet overhaul centre.⁷³ Similarly, the Sperry Company of the United States opened new facilities in the Montreal suburb of St. Laurent to produce complete lines of aircraft instruments, including compasses, directional synchros, and artificial horizons.⁷⁴

The development of a sophisticated aircraft industry and the extensive spin-off effects on other industries was evidence to Howe that Canadians were no longer 'hewers of wood and drawers of water for the more highly industrialized countries'.⁷⁵ By 1953, the aviation industry had become the most successful example of the Liberal government's strategy of diversifying into new high-technology areas: the gross value of sales in the aircraft and parts industry approached \$400 million, which put Canada in third place among the NATO allies.⁷⁶ The government was also well aware of the advantages of continental integration. To be sure, British companies played a key role in the Canadian aircraft industry, especially in engine production, but American companies had advantages over the British. For example, American-owned aircraft companies like Canadair had larger research and development budgets than their

electronics industry

Canada, Department of Trade and Commerce, 'Investment and Inflation with Special Reference to the Immediate Postwar Period, 1945-1948' (Ottawa, 1949), p. 177.

⁷² *Financial Post*, 19 April 1952.

⁷³ 'Canada's Electronics Industry', 11 May 1953, PJBD File, RG 59, NARS.

⁷⁴ 'Report on Canada's Aviation Industry', *Monetary Times*, July 1953, p. 24.

⁷⁵ C.D. Howe quoted in the *Globe and Mail*, 28 Feb. 1950.

⁷⁶ *Financial Post*, 6 Nov. 1954.

British counterparts and had developed more efficient assembly lines. It took less time to develop the F-86 than the CF-100, and Canadair had nowhere near the number of engineering or tooling problems as did A.V. Roe. Continental integration would allow the two North American allies easily to adopt common engineering practices while keeping supply lines short.

While the US government made several concessions to promote the growth of the Canadian aircraft industry, it always maintained the upper hand in such important matters as the standardization of component parts, and the choice of aircraft for the front line. The US air force would not, for example, consider the adoption of the CF-100 as an all-weather fighter; although the Belgian air force acquired a few dozen of the planes, the United States did not support its use by other NATO allies. For the most part, Canada was given the role of supplier of less costly types of aircraft, all, with the exception of the F-86, small reconnaissance planes and trainers. At the end of the Korean War, the fiscal restraints imposed by the Eisenhower administration led to the cancellation of the \$100 million contract for T-36 trainers awarded in 1952; the Canadair plant in Montreal consequently laid off 1,500 employees in 1953 and 1954. Work on the F-86 and the T-33, however, continued until 1957.⁷⁷

From the perspective of Washington, the integration of the Canadian aircraft industry supplemented other important developments in the defence of North America.⁷⁸ In 1951, Canada allowed the United States to operate B-47 bombers out of Goose Bay, Labrador, as a key staging area for atomic bomb attacks on the Soviet Union in the event of an all-out war. Agreement was reached the same year to establish a North American early warning radar and interception system against a Soviet bomber attack.⁷⁹ Canada's other contributions to American security included a \$64,500,000 programme to train 3,000 NATO pilots a year, co-ordinated with the US air training programme.⁸⁰ Finally, in March 1951, the Canada-United States Civil Defence Pact was signed.

By the end of the Korean War, the co-ordination of Canadian aircraft production with the US rearmament programme had met three

US supported. Had it been enough, not appropriate aircraft like now

⁷⁷ *Financial Post*, 21 July 1953; 'Airpower Cuts', *Aviation Week*, 19 May 1954, p. 16; 'Report on Canada's Aviation Industry', *Monetary Times*, cxxi (1953), 20.

⁷⁸ Charles E. Wilson, Address, 30 Oct. 1951, Quebec City, File 1952, Vol. 62, MG 28 II, PAC.

⁷⁹ David J. Bercuson, 'Sac vs. Sovereignty: The Origins of the Goose Bay Lease, 1946-52', *Canadian Historical Review*, lxx (1984), 206-22; Joseph T. Jockel, *No Boundaries Upstairs*, passim.

⁸⁰ *New York Times*, 26 Feb. 1951.

primary objectives: Canada's co-operation had allowed aircraft production to be more widely dispersed; Canada's production of parts and some finished aircraft had helped to eliminate bottlenecks within the United States; and the Canadian aviation industry had become a major supplier of aircraft to the other NATO allies. In 1953, military and civil aircraft production in Canada peaked at nearly 2,500 planes, compared with 16,700 planes built in the United States;⁸¹ between 1949 and 1953, the United States and the NATO allies bought just over 1,400 of these planes. Instead of becoming a recipient of NATO's Mutual Defence Assistance Program, Canada became an important contributor. It may have been an exaggeration on the part of John Jay Hopkins, president of the General Dynamics Corporation, to suggest that the joint industrial strength of the United States and Canada was the major reason why Stalin did not decide to start an all-out war against the West;⁸² however, it was not an understatement on the part of a US department of defence study to suggest that from 1950 to 1953 Canada 'provided almost as good emergency insurance as industrial defense and resource production in the United States'.⁸³

The continental integration of the Canadian aircraft industry marks the beginning of a new chapter in Canadian-American economic relations. On the US side, the primary cause of closer ties with Canada was national security, which overcame the traditional peacetime constraints on the flow of capital, classified technology transfer, and import of arms; the efforts of the Truman administration to stimulate the growth of the Canadian aircraft industry were unparalleled by concessions to any other ally. In fact, the special relationship worked so well that issues subject to a diplomatic solution with other countries frequently became matters of administrative decision-making between the two North American allies.

Turning to the Canadian side, it was the Mackenzie King and St. Laurent governments that most frequently took the initiative in integrating the Canadian aircraft industry with the requirements of the US rearmament programme. The aircraft industry case-study, then, is an example of a lesser power extending an invitation to secure a particular national objective rather than being subjected to the will of the dominant power.⁸⁴ The Canadians took the initiative to further continental

⁸¹ 'Aircraft Output Hits Postwar Peak', *Aviation Week*, 9 Nov. 1953, p. 15.

⁸² *New York Times*, 8 May 1952.

⁸³ 'Import Policies and National Defense', Nov. 1953, General File 122-L, Eisenhower Library [Abilene, Kans.].

⁸⁴ For a discussion of the 'invitation rather than imposition' thesis see: Geir Lundestad, 'Empire by Invitation? The United States and Western Europe, 1945-

integration knowing full well the United States would define the new quasi-dependent relationship. Although Canada remained a supplier of small parts and secondary aircraft, none the less she was able to attain some success in the post-war expansion of her aircraft industry. In the end, the interventionist policies of the two governments were the major cause of the unprecedented success of peacetime continental economic integration.

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1952', *Journal of Peace Research*, xxiii (1986), 263-70; John Lewis Gaddis, 'The Emerging Post-Revisionist Synthesis on the Origins of the Cold War', *Diplomatic History*, vii (1983), 171-204.

Table 1:
Combined Canadian-United States Production of
Military Aircraft, 1940-1945

Type	Grand Total	United States	Canada	
			Total	Exports to the United States
Military Airplanes	307,483	291,619	15,864	5,254
Combat	205,581	200,026	5,555	1,652
Trainer	64,061	54,773	9,288	2,850
Cargo and liaison	37,841	36,820	1,021	752

SOURCE: US Civilian Production Administration, *Official Munitions Production of the United States* (Washington, 1947).

Table 2:

*Net Value of United States Government Orders for Defence
Procurement in Canada (Thousands of dollars)*

Programme	1953	1954	Total for period 1951-4
Aircraft and parts	76,559	22,114	259,850
Weapons	1,317	5,522	29,945
Ammunition and explosives	9,993	148	62,289
Electronics and other communications equipment	21,251	26,544	97,021
Other	7,274	1,253	47,498
Total	116,394	55,581	496,603

SOURCE: Department of Defence Production, *Fourth Report, 1954* (Ottawa, 1955), p. 45.

Table 3:

*Leading American Corporations and the Allocation of
Canadian Defence Contracts, April 1951 to April 1958*

Company	Total Defence Contracts
Canadair	\$641,000,000
Imperial Oil	134,600,000
Canadian Pratt and Whitney	122,300,000
General Motors of Canada	76,700,000
Canadian General Electric	75,500,000
Chrysler Motors of Canada	42,000,000
Sperry Gyroscope of Canada	37,000,000
Ford Motor Co. of Canada	25,100,000
Cyanamid of Canada	22,900,000
Lucas Rotax	20,500,000
Canadian Curtis Wright	15,500,000
Douglas Aircraft	14,300,000

SOURCE: Canada, Department of National Defence Report, July 1958, File 200-8-6, RG 49.

Table 4:

*Principal Statistics of the Aircraft and
Parts Industry in Canada, 1944-1953*

Year	Number of Plants	Number of Employees	Gross Value of Sales	Rank in Relation to Other Industries
1944	45	79,572	\$426,981,558	4
1947	12	9,374	44,303,576	58
1951	23	19,198	117,188,078	—
1953	45	35,000	400,000,000 (est.)	9

SOURCE: *Canadian Aviation* (Dec. 1953), p. 29; A.V. Roe, *Probable Developments in the Aviation Industry in Canada and Their Effect on the Canadian Economy* (Ottawa, 1955), Appendix, Chart 8.

Table 5:

Leading Aircraft Industries in Canada, 1953

	Floor Space (sq. ft.)	Employees (approx.)
<i>Aircraft</i>		
Canadair Ltd., Montreal	2,000,000	11,000
A.V. Roe Canada Ltd., Toronto	1,500,000	10,000
Canadian Car & Foundry Co., Fort William, Ontario	700,000	1,600
De Havilland Aircraft of Canada Ltd., Toronto	600,000	2,000
<i>Engines</i>		
A.V. Roe Canada Ltd., Toronto	1,000,000	5,000
Pratt and Whitney Aircraft, Ltd., Montreal	350,000	1,200
Rolls Royce of Canada Ltd., Montreal	60,000	400

SOURCE: Crawford Gordon Jr., 'The Aviation Industry in Canada', *Canadian Banker*, lxi (1954), 45-6.