

# Elements of t

## MAKING CANADA STRONG IN

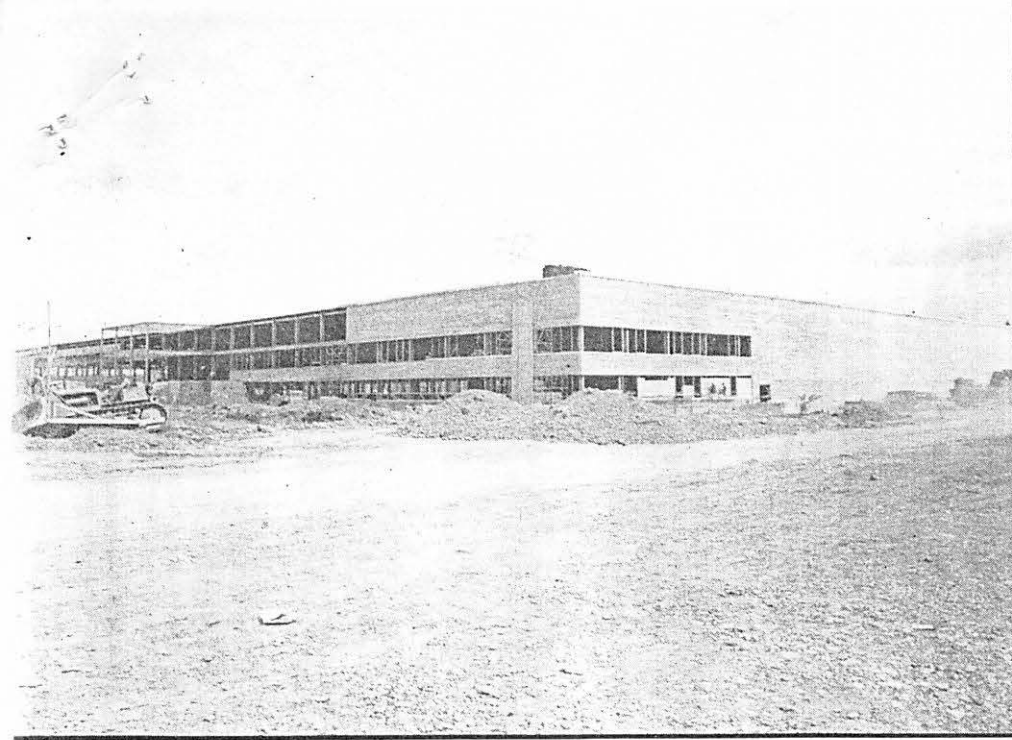
THE GENERIC term "Canada's Aircraft Industry" was not so many years ago being used loosely to describe a small collection of half a dozen overhaul shops and assembly shops operated and staffed by a faithful few. Not so in this modern age: even in the arid period of the postwar years, Canada's Aircraft Industry has been the owner and operator of substantial plant and equipment.

Not only has it designed, manufactured, and sold the most advanced types of airplanes — as well as the simplest — in the highly competitive postwar market, but it has also designed and built two turbojet engines that have evoked the admiration of the aviation world. And now one of these turbojets is going into production and at the same time preparations are being made for the manufacture in this country of a proven reciprocating engine.

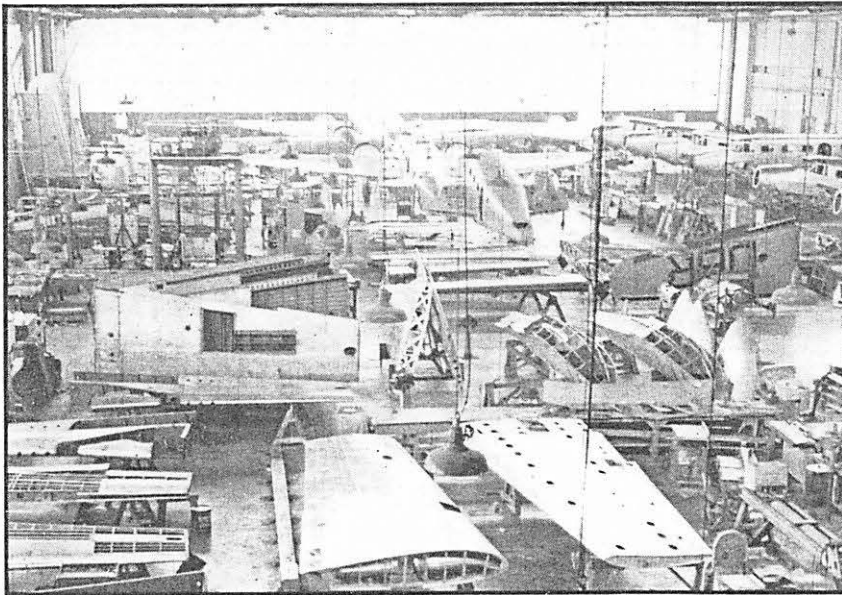
The wartime industry differed from its 1952 counterpart in that it comprised largely government owned and operated companies, or firms who had become engaged in aviation purely as a wartime measure. Once the hostilities had ceased, they were quick to return to their own familiar businesses. The job they did deserves nothing but praise, but for the most part they were not hesitant in admitting that aviation was not for them and in fact they considered it strictly for the birds.

It is true that in its present expansion the Industry will not reach the immense proportions attained during World War II. However, it is just as true that the Industry of today is a much more solid force than it was in the roaring days of 1940-45. This can perhaps be explained by pointing up the fact that the hard core is comprised of firms whose primary concern has been aviation ever since the days of the stone age of the art of flying.

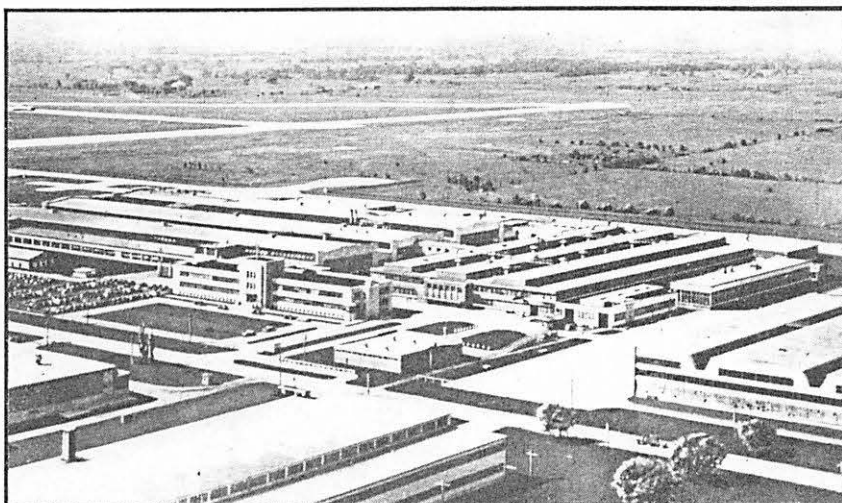
In occasional instances they are purely Canadian in origin and development. In many other cases they are outgrowths of establishments set up on a



AVRO CANADA'S NEW ENGINE PLANT.



BEECH OVERHAUL AT MACDONALD BROS.



AVRO CANADA'S MAIN PLANT.

# f the Industry

## IN THE AIR KEEPS THEM BUSY

small scale by highly respected foreign companies. Some of these have been in Canada so long that with the exception of the connection maintained through a name, their character and product has become as Canadian as Medicine Hat. Other companies have been formed more recently, but they, too, are backed by foreign organizations long established in the aviation industry. Still other comparatively new firms are Canadian to the quick; the majority of these have been formed by Canadians long experienced in aviation, who are not easily discouraged by its sometimes disturbing, but never completely disheartening, ebbs and flows.

Old and new, of native or foreign origin, these companies are the elements of Canada's Aviation Industry.

### Canadair Limited

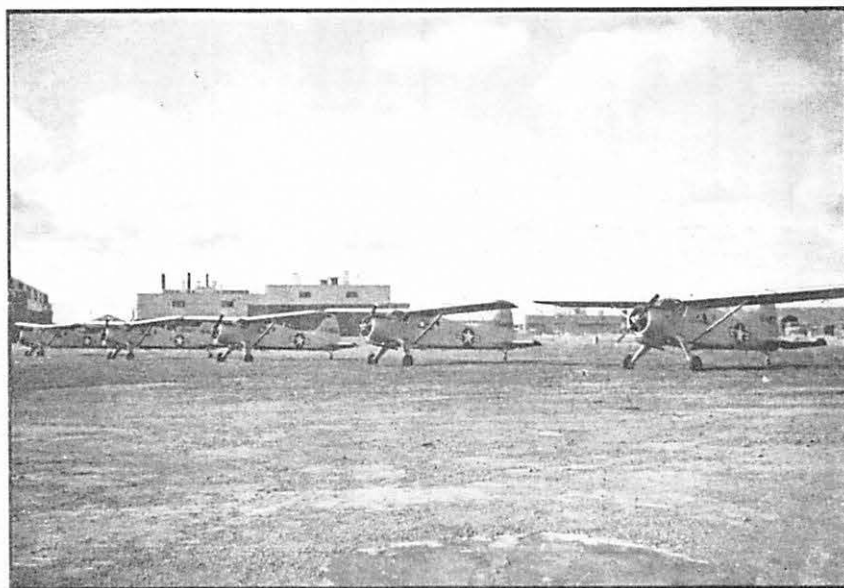
**T**HE BRIGHTEST SPOT in the aircraft production scene in Canada is Canadair Limited, where production of the F-86E Sabre has now passed the 200 mark. This figure would be considerably higher, but the shortage of USAF-supplied GE J-47 turbojets has kept the Sabre production rate idling along at about half speed.

The big job at Canadair is, of course, the production of the Sabres for the RCAF, as well as for the USAF and for NATO. Those supplied to NATO are to be manned by the RAF.

Canadair's other major projects consist of orders for 576 T-33A jet trainers and something like 250-300 T-36A twin engine crew trainers. The former is being built under license from Lockheed Aircraft Corporation and the latter from Beech Aircraft Corporation. The tooling program for the T-33 is now several months old, so 1953 should still be fairly young when the first airplane comes off the production line. The T-36 project has advanced to the stage of the construction of a mock-up, and it will probably be a bit longer getting into production than the T-33 since it is an entirely new type and involves considerable detail engineering work and tool designing.



HARVARD OVERHAUL AT AIRCRAFT INDUSTRIES.



DE HAVILLAND BEAVERS FOR THE USAF.



CANADAIR LIMITED PLANT NO. ONE.



AT OTTAWA, SPERRY (LEFT) OVERHAULS INSTRUMENTS WHILE AT FORT WILLIAM CANADIAN CAR (RIGHT) PRODUCES THE HARVARD.

This company continues also to be one of the main suppliers of replacement parts for C-47/DC-3 aircraft, listing among its customers some 100 different air lines in 45 countries. Its biggest single customer for these parts is the USAF. In addition a substantial business in C-54 replacement parts is carried on by this company. However, the C-47 overhaul and repair work that used to be carried out in large volume has had to make way for other more important projects.

Located at Cartierville Airport near Montreal, Canadair currently employs about 8,500 persons, a figure which is eventually expected to rise to around the 18,500 mark. In existence it has two factories providing 1,700,000 square feet of covered factory space plus 75,500 square feet of hangar area. Under construction are two warehouses which will provide an additional 178,000 square feet of space, thus making much more space available in the main factories which may be devoted to production work.

The company offers an all inclusive aircraft manufacturing facility ranging from design and engineering to fabrication. Its huge machine shop is considered to be one of the most modern in North America and has a complete range of lathes, milling machines, duplicators, profilers, grinders, drills, and related equipment.

#### The de Havilland Aircraft

**T**HE MOST ADMIRABLE and most admirable aircraft manufacturing company in Canada today is The de Havilland Aircraft of Canada Limited. Few aviation companies anywhere in the world have shown such determination in getting a share in the postwar

airplane market. Even fewer companies have been able to do this without substantial government assistance. While de Havilland has received a trickle of repair and conversion contracts from the RCAF since the end of World War II, its existence today can be attributed only to the success of its own products, the Chipmunk and the Beaver.

Though now out of production, the Chipmunk was a popular aircraft with air forces all over the world and in all 153 were sold by the Canadian company. They are still in production by the parent company in the U.K.

Production of the Beaver is now the most important project under way at de Havilland, with production aircraft going to the USAF, the U.S. Army, and civil operators. Production is about one a day, and approximately one machine a week goes to a civil operator. As far as civil deliveries are concerned, this is the same rate as has been in effect for the past two years. In all over 150 civil models have been delivered. Initial orders from the U.S. services for military models totalled 108 machines, but this is expected to be revised upwards.

Insofar as the Beaver project is concerned, the de Havilland factory at Downsview Airport is mainly an assembly plant. With the exception of the forward section of the fuselage and the undercarriage (which de Havilland makes itself), all the major components are fabricated by three main subcontractors, these being Fleet Manufacturing Limited of Fort Erie, Ontario; Sanderson Aircraft Limited of Malton, Ontario; and Air Vent Sheet Metal Incorporated, Montreal.

Considered the second most important program at Downsview is the

Lancaster overhaul and modification program. Though this was originally started as a sub-contract to Avro Canada, it is now being carried out under direct contract with the RCAF. The necessary modification kits are still obtained from Avro Canada, however.

Other projects include the Vampire overhaul work — this being more in the nature of a repair program than one of overhauling time-expired machines. There is also the program of overhaul that has been under way for several years on Goblin turbojets from the Vampires. Still another phase of the de Havilland business has been the sales and service of de Havilland Doves to U.S. firms (22 have been sold), but the Canadian company has now given this up and it will henceforth be handled directly through American distributors.

This company's latest iron in the fire is the de Havilland Otter, which has already started to make a name for itself as a true son of a Beaver. Financed jointly by the RCAF, the DoT, and de Havilland, one prototype has been built and flown; the second prototype is well advanced, but this machine is being financed entirely by de Havilland. The government investment would indicate that substantial orders will be forthcoming from the RCAF.

To carry out this wide and varied program, de Havilland now employs about 2,200, which it considers the peak figure required to meet its present commitments. The three main de Havilland subcontractors employ another 280 people exclusively on the fabrication of Beaver components and bits and pieces.



LEFT IS THE INTERIOR OF THE BIG AVRO CANADA ENGINE PLANT. AT RIGHT IS BRISTOL AEROPLANE ENGINES (WESTERN) SHOP.

### Canadian Car & Foundry

**P**RODUCTION of Harvards at the Fort William facility of Canadian Car & Foundry Company Limited has gained considerable momentum since the first machine was delivered last October. At time of writing over 30 had been turned out, assembled mainly from wartime manufactured parts. However, the 41st machine and those that follow it will be manufactured from completely new parts. Orders from the Canadian government are for 200 Harvard IV aircraft and for 300 Harvard T6J aircraft, the two orders having a total value of nearly \$36,000,000.

At the company's Point St. Charles plant in Montreal, Harvard propellers, undercarriages, and hydraulic units are in production. Insofar as the propellers are concerned, inability of the Canadian government to obtain blade profiling lathes has limited Canadian Car's effort to date to the production of hubs. The blades are coming out of surplus stock and the first propeller will be delivered in August. The first unit complete with CanCar-made blades will be delivered the following month.

The St. Laurent plant (at Cartierville Airport) continues its long-standing program of Harvard overhaul and production of Harvard parts. In regard to the latter, Canadian Car receives practically all the Harvard parts business, supplying every air force in the world that is using the familiar trainers . . . including the USAF.

The Norseman VII project, while still officially alive seems to be playing a poor second fiddle to the Harvard work.

Employment on aircraft work at the

St. Laurent is about 800; at Point St. Charles, about 500. Employment at the Fort William plant is about 4,000 and this is expected to hit 5,000 when Harvard production hits its peak. Since a considerable volume of buses is also produced at this plant, those engaged in aircraft work probably number about half the total.

The Fort William factory has about 1,000,000 square feet of floor space.

### Avro Canada

**A**DMITTEDLY behind schedule is the production of the CF-100 all-weather fighter at the Malton plant of A. V. Roe Canada Limited — though how much this is due to actual delays at Avro Canada and how much it may be attributed to unrealistic production schedules is source for considerable thought. There is much to indicate that in its eagerness to promise that the RCAF would build up to strength in a remarkably short time, the Government was prone to an overly optimistic view of how fast CF-100s could be made available.

Of course, a gamble was taken that the fighter's snag sheet would be kept reasonably clear. Had it been, then without doubt the situation would be much better than it is now as far as CF-100 deliveries are concerned. As is only too well known, at least one major snag did develop following delivery of the first machine to the RCAF. While eliminating this snag is not an insurmountable problem, it is involved enough to cause considerable delay.

It will be recalled that the initial RCAF order was for 12 aircraft, including the two prototypes. Most of these have been completed, but de-

livery has been held back on the majority until the modifications found necessary in the first delivered machine are incorporated in those that follow.

Actually, the machine that will go into large-scale production following the solving of the present difficulties is to be the Mark 3, an advanced version of the Mark 1, which will have, among other improvements, more powerful Orendas.

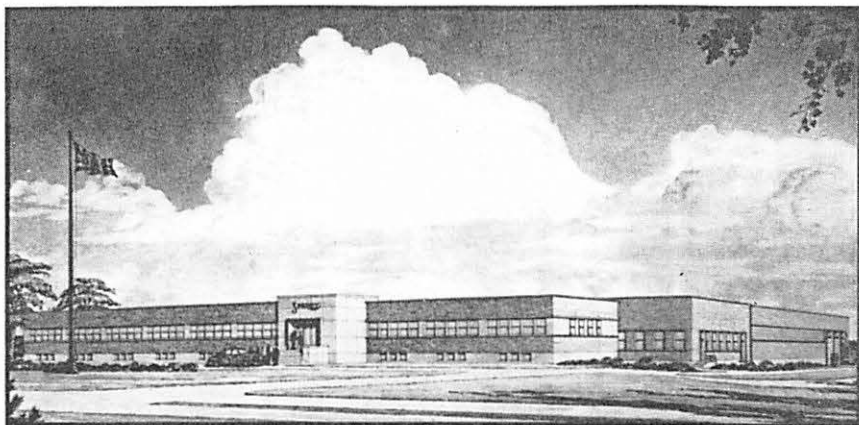
Orenda production seems to be coming along as well as can be expected, considering that they are now being turned out in the tool proving shop and the experimental shop. When the new plant gets going about the middle of this year (it is completely closed in now and the interior work is shaping up very nicely) there should be no delay in rapidly increasing production on this engine.

Avro Canada currently employs about 8,500 persons and when both its Aircraft and Engine divisions are in full production, employment is expected to reach around 15,000.

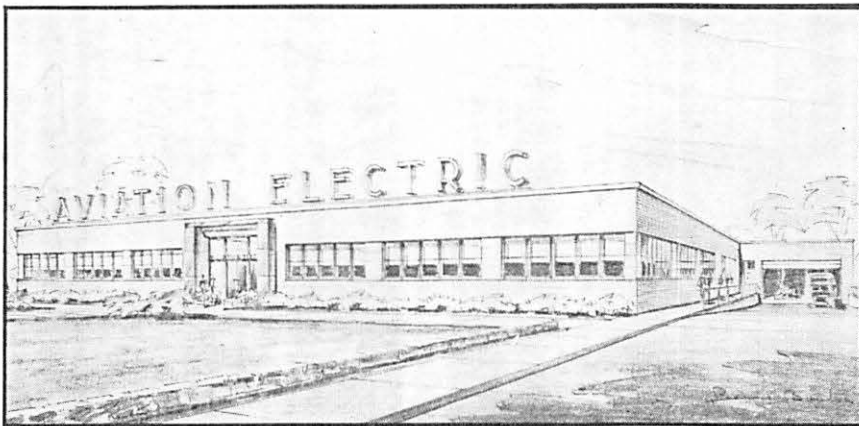
The main plant, which will eventually be devoted almost entirely to airframe production, has over 1,000,000 feet of floor space. The new engine plant has about 400,000 square feet. In addition, a new flight test hangar of considerable size is being constructed close to the main plant, at Malton Airport.

### Canadian Pratt & Whitney

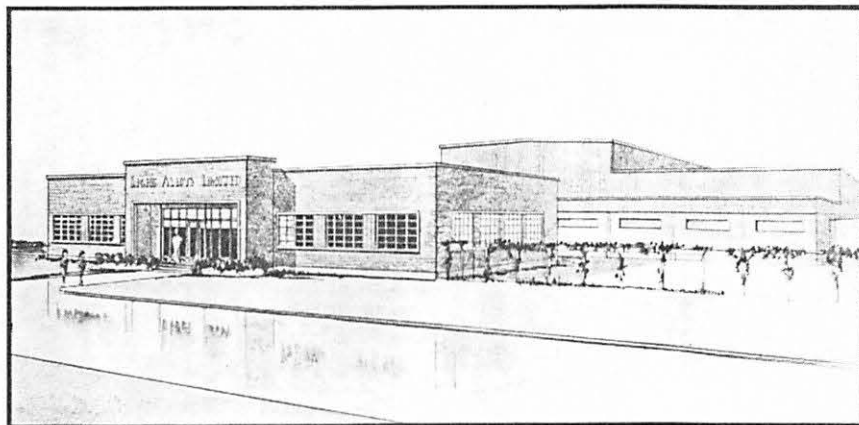
**N**OT FAR from completion is the new engine manufacturing plant being built in the municipality of Jacques Cartier, P.Q., by the Canadian Pratt & Whitney Aircraft Co. Ltd., who have an order from the Department of Defence Production for 1,000 R-1340



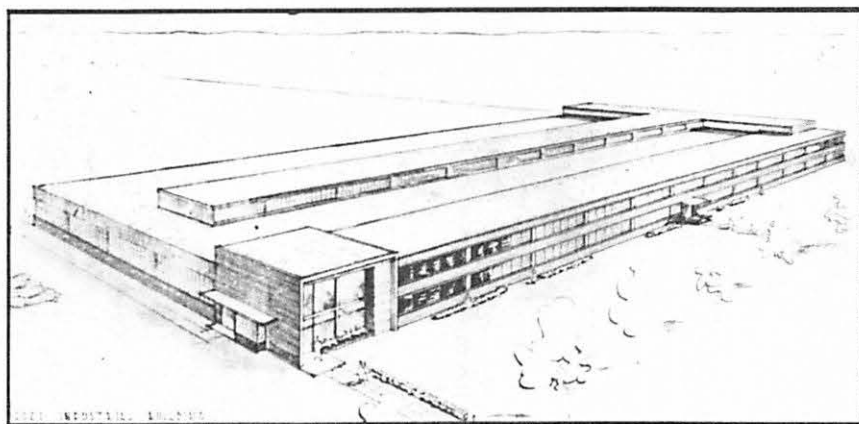
SPERRY PLANT AT MONTREAL FOR INSTRUMENT MANUFACTURE.



AVIATION ELECTRIC'S NEW MONTREAL PLANT.



HERE (HALEY, ONT.) LIGHT ALLOYS WILL MAKE CASTINGS.



THOMPSON PRODUCTS NEW TURBINE BLADE PLANT.

Pratt & Whitney engines. These will, of course, be used to power the Harvard trainers being produced by Canadian Car & Foundry Limited.

The plans are that the new plant will be ready for occupancy before many more months pass and that the first engine will be delivered towards the end of 1952. The additional staff necessary to produce these engines have been under training for some time.

The new factory is a big one, the combined office and plant area providing about 320,000 square feet of floor space. It will not, however replace the existing extensive overhaul and service facilities maintained by Canadian Pratt & Whitney at Longueuil about one mile away from the new establishment. This aspect of the business currently employs some 500 persons.

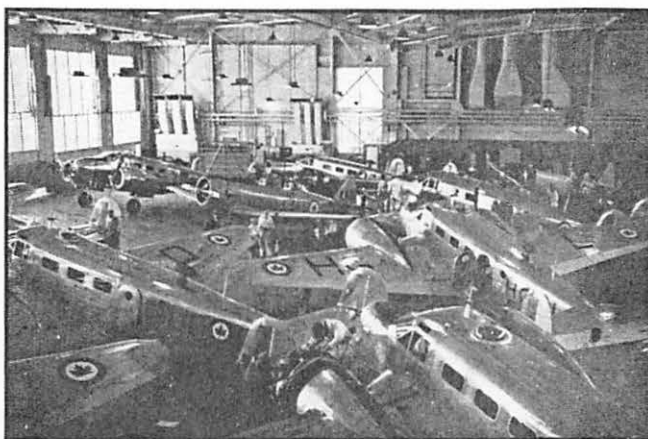
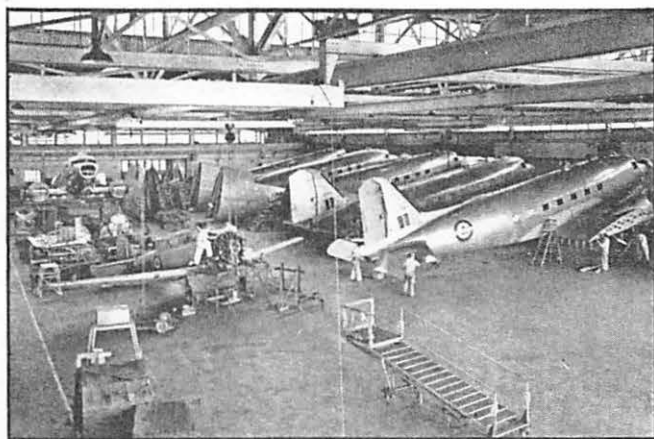
Now in its 24th year of business in Canada, this company is a subsidiary of the United Aircraft Corporation and sells and services Pratt & Whitney engines, Hamilton Standard propellers, and Sikorsky helicopters, all products of various divisions of United Aircraft. It also sells and services Pesco Aircraft accessories.

Chairman of the Board of this company is James Young; President, Ronald Riley; Vice-President, Manufacturing, John W. R. Drummond, formerly Sales-Engineering Supervisor, the position now filled by Gene H. Schweitzer.

#### MacDonald Bros. Aircraft

**L**OCATED AT Stevenson Airport on the outskirts of Greater Winnipeg, MacDonald Bros. Aircraft Limited is at present expanding personnel and plant facilities to carry out national defence and other contracts-in-hand exceeding \$5,000,000. Staff of 1,000 and floor space of 200,000 square feet at time of writing are divided between departments employed in aircraft conversion and overhaul for the RCAF and sheet metal manufacturing work subcontracted from Avro Canada.

The overhaul program is concerned chiefly with two types, the F-51 Mustang and the Beechcraft 3T Expeditor. Processing is carried out on a production line basis. It includes the periodic reconditioning and overhaul of time-expired aircraft, repair and rebuilding of crashed aircraft, and conversion and modification of serviceable units. Special modifications to the Expeditor



AT NW INDUSTRIES (L) DAKS AND HARVARDS ARE REBUILT. AT TCA (R) THESE PLUS EXPEDITORS GET ROUTINE MAINTENANCE.

include structural and aerodynamic changes designed to modernize it from its original wartime design.

A feature of conversion work on both types is the replacement of existing radio communication equipment with units of the most modern type. The company's radio department is also overhauling electronic ground station equipment for the RCAF, including both transmitting and receiving sets.

As an auxiliary service, MacDonald Bros. maintain a mobile field crew who travel between RCAF stations in Manitoba rural areas. The crew prepares aircraft for storage, re-activates stored units, and performs on-the-spot modifications and weatherization changes to aircraft in service.

Supplementary to the overhaul program, the company is manufacturing quantities of Mustang and Mitchell parts for the RCAF under license from North American Aviation Inc. The Winnipeg plant has also been approved as a Beech Certified Service Station.

Within the past two years, the com-

pany has developed facilities for a new type of precision sheet metal manufacture, that of stainless steel components for high temperature application in turbojet engines. Current work, carried out on subcontract from Avro Canada, is the production of three components comprising the exhaust portion or "hot end" of the Orenda. These components are tailcone, jet pipe, and final nozzle. Assembled as an engine unit, they form a component of over 14 feet in length. Approximately 3,000 spot welds, 95 feet of seam welding, and 30 feet of argon arc welding are required per unit.

A 150 KVA Seam Welder and 100 KVA Spot Welders have been installed for carrying out this type of work. Included in the special production equipment developed by the company staff is an automatic inert gas metal-arc seam welder, and a hydraulic pressure chamber for forming the tailcone bullet.

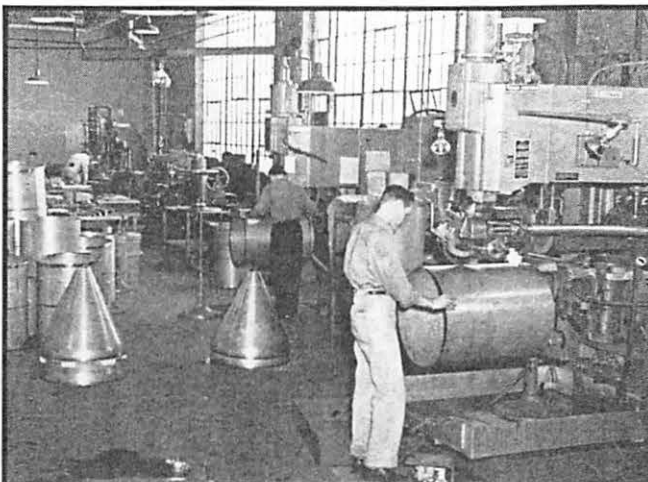
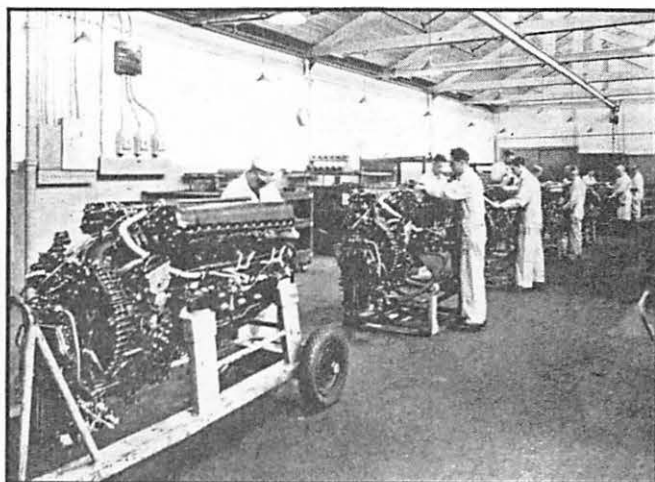
All phases of the job—through tooling, development of prototypes,

and production—have been the responsibility of MacDonald Bros. The company is planning for greater activity and a long term expansion of its production facilities in the turbojet component field.

Production of Edo floats has continued without interruption since the company was first incorporated in 1930. They are manufactured under license from the Edo Corporation, New York. Current float commitments are for Norseman, Otter, and Beaver aircraft. Part of the latter production is for use on aircraft manufactured by de Havilland for the USAF.

#### Bristol of Canada

THOUGH the name Bristol Aeroplane Company of Canada Limited has only recently been added to Canada's aviation roster, it comprises elements that have been long established in this country. One of these, Bristol Aeroplane Engines (Eastern) Limited of Montreal, was formerly Canadian Wright Limited and first came into



LEFT, ASSEMBLY OF OVERHAULED ENGINES AT BAE (EASTERN). RIGHT IS MACDONALD BROS. ORENDA COMPONENT MANUFACTURING.

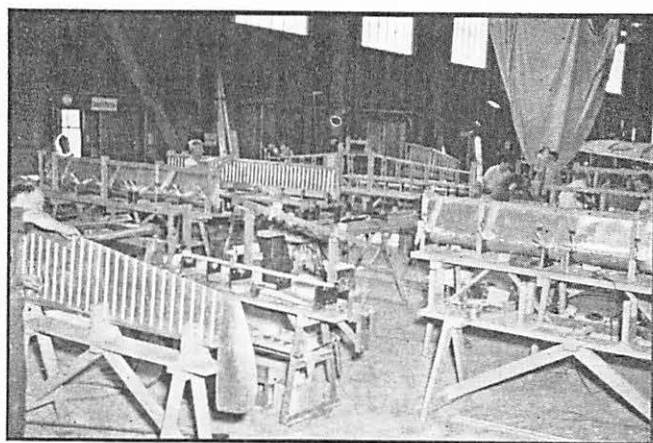
existence in 1927. The other main Bristol component is Bristol Aeroplane Engines (Western) Limited, Vancouver, formerly British Aeroplane Engines Limited.

Bristol Aeroplanes of Canada itself is at present a sales organization and as such has been successful in introducing the Bristol Freighter into this country by selling four to the RCAF and one to Associated Airways Limited. At present it has no aircraft servicing or manufacturing facilities in Canada but of course this is always a possibility for the future, though the company seems more interested in eventually branching out into engine manufacture than in expanding its activities in the

engines from RCN Sea Furies. It also does overhaul of Pratt & Whitney and Wright engines of the larger sizes. Originally established in 1928 at Montreal as Bristol Aeroplane Engines, it shared quarters with Canadian Wright Limited. In 1937 it was re-organized as Bristol Aeroplane Engines, but continued to share quarters with Canadian Wright. However, in 1942 British Aeroplane Engines was moved to Vancouver and at the close of hostilities, all connection between Canadian Wright and BAE was severed, the former going on its independent way while the latter continued as a subsidiary of The Bristol Aeroplane Company of England. The relationship was

was entrusted with some confidential design work for the Naval Research Establishment at Halifax, which is a branch of the Defence Research Board of Canada. Then again, in 1950, Fairey Aviation of Canada took on the design and manufacture of a conversion of a small number of Avro Lancaster long range navigation trainers for the RCAF.

But all this is only a beginning, according to General Manager Hibbert. The time is envisaged when the plant will be manufacturing and assembling complete aircraft, including power plants. To this end work has started on an extension to provide an additional 57,000 square feet of floor space.



BEAVER COMPONENTS ARE MADE BY SANDERSON AIRCRAFT (LEFT). AT RIGHT IS THE PROTOTYPE OF DE HAVILLAND'S NEW OTTER.

airframe line.

Bristol Aeroplane Engines (Eastern) is currently engaged in carrying out a \$17,000,000 program of engine overhaul, repair, and modification, for the RCAF and the RCN. Now occupying about 85,000 square feet of space on the eastern outskirts of Montreal, this company employs nearly 600 persons and is working up to an overhaul rate of 100 engines per month (total of 150,000 hp. per month). The overhaul program currently under way takes in Merlins for RCAF North Stars and Lancasters (including complete North Star powerplants), as well as for RCAF and USAF Mustangs. It also does Wright 2600 Cyclones for RCAF Mitchells and RCN Avengers.

The western subsidiary is somewhat smaller, but at present only half of its overhaul capacity is being utilized. Employing about 200 persons, it occupies modern quarters (32,000 square feet) at Vancouver International Airport and overhauls about 40 engines per month, mainly Bristol Centaurus en-

renewed in July of last year when the newly established Bristol Aeroplanes Company of Canada purchased Canadian Wright Limited.

#### Fairey Aviation

IT WAS a little over three years ago that a staff of six, headed by C. E. Hibbert, MBE, took over a modern aircraft factory at Eastern Passage, N.S., five miles from Halifax, and close to the Naval Air Station at HMCS Shearwater. And from this small beginning The Fairey Aviation Company of Canada Limited has grown until today it is a major industry employing 550 men and women, and with prospects of a further increase to bring the labor force to 700 before the end of 1952.

During its short life Fairey of Canada has helped, in no small way, Canada's policy of providing her own military aircraft. To the Company went the task of converting for anti-submarine work a number of Grumman Avengers purchased by the RCN in the spring of 1950. Early in 1951 the Company

When this is complete the total floor area will be 208,500 square feet, of which 154,000 square feet will be available for production. There is space for further extensions totalling 180,000 square feet, all under one roof, and it is the intention of the Company to utilize fully this expansion space until it is fulfilling the definite need for a self-contained aircraft facility on Canada's East Coast, to serve those forces which must protect shipping in the event of war. Because of the pressure of its military commitments, Fairey is at present doing no civil work.

#### Rolls-Royce Limited

THE RECEIPT of a \$33,355,000 Government order for 900 Nenes has prompted Rolls-Royce to proceed with the construction in Montreal of a large permanent engine assembly plant. The Nenes are for use in the 576 T-33A trainers being built by Canadair Limited. When the new factory is completed late this year, it will employ initially about 400 workers.

# LOCKHEED

## SUPER CONSTELLATIONS TO GET TURBO-PROPS

The U.S. Navy has selected the new R70-1 Super Constellation as ideally designed for vital conversion to turbo-prop power. Only minimum modifications are required, according to BuAer. No structural changes of the empennage, fuselage or basic wing are necessary.

Significance to airline operators is that Super Constellations with Wright 3250-h.p. compound engines can later be converted to turbo-props. This conversion to Pratt & Whitney T-34 Turbo Wasp engines will put the Super Constellation in the 450-mile-per-hour-class.

The Super Constellation offers any airline operator any performance he desires, from high-density coach travel, to luxury over-ocean travel, or it can be used for efficient, economical cargo purposes.

Never before has the basic structure of any aircraft provided so adequately for *growth*, assuring the operator many years of competitive performance. Compared with any of today's certificated aircraft the new Super Constellation is superior in versatility, speed, payload, range and ability to earn greater profit.

### NEWS NOTES FROM LOCKHEED

Eight international airlines have now ordered Super Constellations—most recent: Seaboard & Western Airlines and Braathens S.A.F.E. Air Transport . . . With Navy and Air Force orders, the total demand now exceeds 200. . . A new "White House Squadron" of Lockheed F-94 All Weather Jet Fighters is guarding Washington, D.C. . . Lockheed is occupied with aircraft using six different kinds of power, including reciprocating engines, turbo-props, jets and rocket power. . . For pilot comfort every Lockheed jet fighter has a cockpit cooling system equivalent to 100 household refrigerators. . . The single Allison jet engine in the Lockheed T-33 jet trainer is more powerful than all four engines of the B-17 bomber of World War II fame. . . Pilots of many nations learn jet flying in Lockheed T-33 trainers, and recently when two T-33's were delivered to Turkey they were inaugurated in preflight Mohammedan rites including a lamb sacrifice.

### FROM THE WORLD PRESS

Under the headline, "New Facts on Jet Combat," *Aviation Week* reports from Tokyo: "The Lockheed F-80 (*Shooting Star*) still is considered to be the best ground-attack jet in Korea. There is considerable belief here that development of an airplane along the proved lines of the F-80 is the answer to the interdiction-close support requirement." Thus another Lockheed design continues to prove its basic "rightness" even though more modern types have replaced it in Lockheed's production line.

This program is expected to fall into three phases, in the first of which completed engines are to be imported from the U.K. When the plant is completed, assembly and testing facilities will come into operation in Canada and Canadian resources for manufacture will be utilized on a growing scale.

Of course, for some years now Rolls-Royce (Montreal) Limited has been providing sales and service to the Canadian aircraft industry from its headquarters at Montreal Airport, most of its business being with TCA, the RCAF, and until recently, CPA.

### Northwest Industries

**T**HE LARGEST and most versatile aircraft overhaul and repair depot west of Winnipeg is Northwest Industries Limited, which is now using every inch of its 140,000 square feet of space to the north and east of Edmonton Municipal Airport. At present this company's more than five hundred employees are engaged in the overhaul, conversion, modification, and weatherization of Dakota, Mitchell, and Harvard aircraft, as well as the reconditioning of miscellaneous aircraft components and the overhaul of aircraft instruments and radio equipment. It also has the job of winterizing the four Bristol Freighters purchased by the RCAF (one of these is to be turned over to Associated Airways by the Air Force, and it will be replaced by a fifth machine to be delivered soon). Due to the pressure of defence commitments, Northwest is at present doing no civil work.

The aircraft division of Northwest Industries came into being as the result of the postwar re-organization of Aircraft Repair Limited. At that time, Northwest started manufacturing the Bellanca Skyrocket, a number of which are now in use in Quebec, Ontario, and Manitoba, as well as in Alberta and the N.W.T. This was the first time that complete aircraft had ever been manufactured in Western Canada.

Since 1946, the company has been a Douglas-appointed Douglas Service Station for DC-3 aircraft and has overhauled many Dakotas for the RCAF. One notable Dakota project was the RCAF Radio Trainer. This successful conversion was designed, prototyped, and built by company personnel to general specifications provided by the RCAF.

### Sperry of Canada

**M**ARKING AN important addition to Canada's aviation industry is the construction of a modern aircraft instrument plant at Montreal. First official announcement of the project was made last month by the Sperry Gyroscope Company of Canada Limited. The plant, for which steelwork has already been erected, is located on Cote de Liesse Road in the Parish of St. Laurent (near Montreal Airport). According to Sperry's Managing Director, B. W. King, the company will begin assembly of aircraft instruments for the armed services before the end of this year.

The new facility will have an area of approximately 85,000 square feet and eventually will employ 600 people, according to present estimates. Following completion of the factory section by May 31, every effort will be made to begin machining operations in August and instrument assembly and test in late 1952. Work was first begun on the plant site in late August of last year. Interior features of the new building and factory equipment are especially designed to meet the exacting requirements of efficient manufacture of precision instruments and controls.

In order to meet critical delivery schedules of aircraft instruments to the armed services, a subcontracting program has been initiated among a number of Canadian companies. Utilizing parts obtained in this program, Sperry will accelerate deliveries of instruments in answer to requirements in advance of full scale production at the Montreal plant.

The Sperry Gyroscope Company of Canada Limited was formed late in 1950 to meet the expanding demand for Sperry instruments and controls in Canada. In February, 1951, the Ottawa firm of The Ontario Hughes Owens Company Limited was purchased and operations at the plant at 3 Hamilton Ave., Ottawa, were expanded to meet repair and overhaul schedules for Sperry marine and aeronautical equipment and the products of a number of other companies. Comprehensive test and overhaul facilities at the Ottawa plant are supplemented by limited manufacturing areas where a number of special items are produced. In January, Ontario Hughes Owens became Sperry Gyroscope Ottawa Limited.

Since its formation, Sperry of Canada has handled in Canada the sales of marine and aviation equipment of Sperry Gyroscope Company of Great Neck, N.Y., and Sperry Gyroscope Company Limited of England, leading manufacturers of precision aeronautical, marine, and ordnance equipment. It also represents Kollsman Instrument Corporation, and under a licensing arrangement will produce Kollsman equipment in the new Montreal plant.

It is understood that the first units scheduled for production in Canada are aircraft compasses, directional gyros, and artificial horizons.

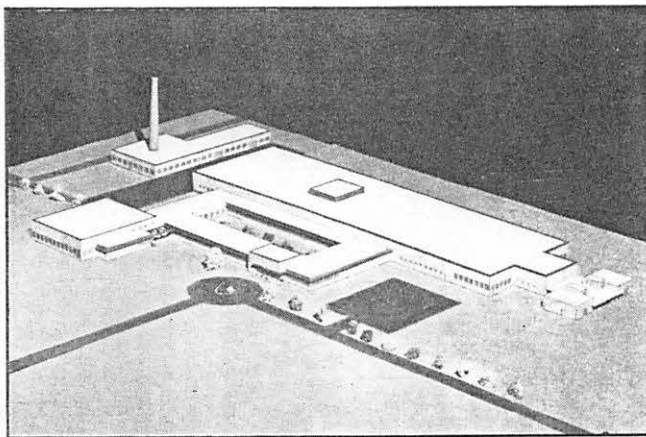
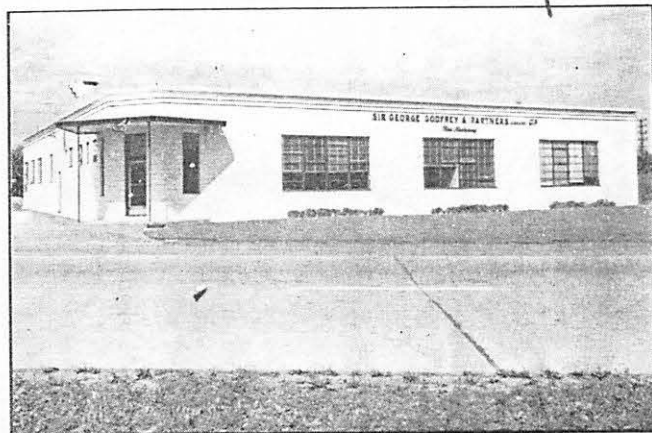
Until the company actually moves into the new plant in the near future, some production of bits and pieces and assembly of Orenda fuel systems is being carried out in small temporary quarters near the new plant. In addition, the Montreal shop remains in operation as the overhaul and repair center for all Lucas and Rotax equipment in use in Canada. It will continue to carry out this work even after the new Toronto factory is opened.

Lucas-Rotax Limited is a comparative newcomer to the aviation industry in Canada, though the parent companies' products (especially those

tural outline of the factory. The plant consists of main factory with executive and engineering offices attached, power house, test houses (completely detached for safety), and cafeteria.

#### Standard Aero

**S**TANDARD AERO Engine Limited of Winnipeg has recently completed a move of its entire shop from the MacDonald Bros. Aircraft plant into No. 6 Hangar. This is a standard RCAF double hanger—giving Standard approximately 25,000 square feet of space—and the whole interior of the building has been com-



AT LEFT IS THE MONTREAL PLANT OF GODFREY ENGINEERING. RIGHT IS THE NEW LUCAS-ROTEX LIMITED FACTORY NEAR TORONTO.

#### Lucas-Rotax Limited

**A** NEW FACTORY of the most up-to-date design is being built for Lucas-Rotax Limited on the outskirts of Toronto. When completed it will employ some 1,500 people and will provide 119,000 square feet of floor space for the production of aircraft engine ancillary equipment to the designs of the Lucas and Rotax companies in the U.K.

Specifically, the products scheduled to go into production in the new plant are: the fuel system for the Orenda, the fuel system for the Rolls-Royce Nene, a newly-developed cordite-actuated Turbo-Starter, the electric starter for the Nene, starting panels for T-33s, magneto parts, spares for Rotax and Lucas equipment already in use in Canada, and the Demon Mk 3 burner for marine boilers (for the RCN). The Turbo-Starter and the Orenda fuel system will be in production first, while the full list will be in initial production by the end of 1952. It is expected that maximum output will be reached during the second half of 1953.

of Rotax Limited) have long been well known and widely used in this country. Until recently it was known as Rotax Canada Limited, the name under which it was incorporated early in 1949 to provide sales and service of electrical and gas turbine equipment made by Rotax Limited and by Joseph Lucas (Gas Turbine Equipment) Limited. Later, operations were expanded to embrace the overhaul of much of this equipment. Last year it was decided that the demand for many items of Lucas and Rotax equipment in Canada was sufficient to warrant their manufacture here and, subsequently, construction work on the new factory was started last August.

Because most of the products which are to be manufactured by Lucas-Rotax are fuel system or electrical components, cleanliness is of the highest importance. Consequently, the plant is equipped with air conditioning and cleaning equipment. The buildings are so laid out that considerable expansion may be effected without noticeably altering the architec-

ture of the factory. The plant consists of main factory with executive and engineering offices attached, power house, test houses (completely detached for safety), and cafeteria.

Standard at present has a contract with the Air Force for the overhaul of Pratt & Whitney R-1340 Wasps together with a contract for the overhaul of practically all types of accessories. The amount of this work runs in the neighborhood of \$2,500,000 covering a period of two years. Employment at the present time is approximately 150.

This company is considered to have the most diversified shop in Canada, and is able to undertake the overhaul of almost any type of small aircraft engine up to the Wasp H (R-1340), including Franklin, Lycoming, and Continental. It also has the facilities to overhaul and test Franklin Helicopter 178's and 200's. Standard's experience goes back to 1937 and since then it has overhauled approximately 10,000 piston type engines and several

hundred thousand accessories. It is receiving engines in its plant from commercial operators from the head of the lakes to the Yukon, and carries out the majority of commercial overhauls in Western Canada.

#### Aircraft Industries of Canada

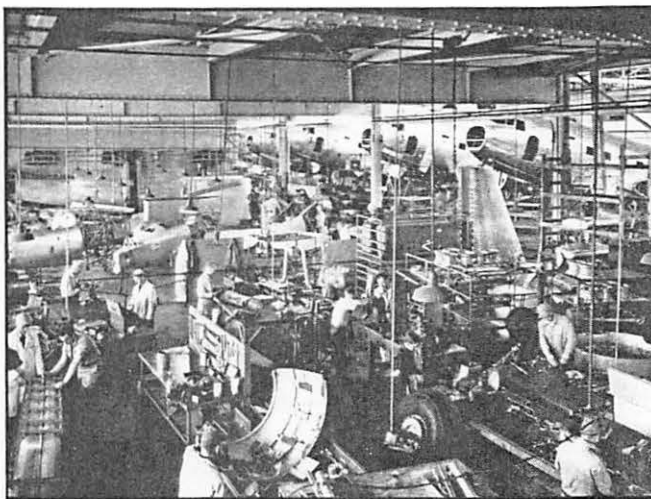
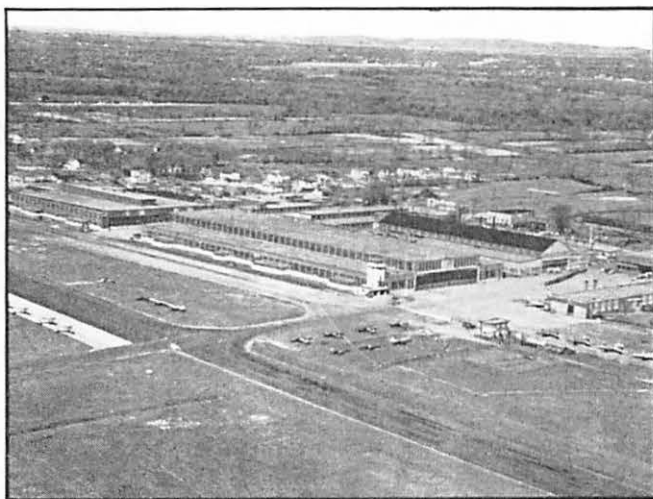
Aircraft Industries of Canada Limited is located at St. Johns, P.Q., and employs about 250 people on the repair, conversion, and overhaul of Harvards, Cansos, Dakotas, and also a wide variety of large civil aircraft. This company occupies over 85,000 square feet of floor space and has shops for sheet metal, electrical and radio, fabric, wood, dope and paint, instrument check, hydraulic, sand

also being carried out under subcontract from engine overhaul contractors. It is equipped to repair or manufacture almost every type of aircraft instrument or accessory.

#### Godfrey Engineering

Formerly known as Sir George Godfrey & Partners (Canada) Limited, Godfrey Engineering Company Limited employs 40 people in a 10,000 square foot factory at Lachine, P.Q. The well equipped plant is currently producing cabin superchargers, cabin refrigeration units, pressure cabin testing trolleys, portable blower units, oxygen servicing trailers; shock strut charger, and hydraulic hose testers. Development is continuing on other

at the present time occupies in the order of 60,000 square feet and employs approximately 250 people. This company is engaged in the manufacture of undercarriage and hydraulic equipment for the defence program and, in addition to other types, is producing all such equipment for the CF-100. Under license with the Aviation Division of Dunlop England, wheels, brakes, and brake equipment are also being produced. A sizable repair and overhaul program has been undertaken for the revitalizing of an accumulation of undercarriage and hydraulic equipment for such aircraft as the Avro Lancaster produced in Canada during the last war.



LEFT IS THE CANADAIR PLANT NUMBER TWO WHILE AT RIGHT IS A SHOP INTERIOR VIEW OF THE NORTH WEST INDUSTRIES PLANT.

blast, Magnaflux, and Magnaglo. The biggest phase of Aircraft Industries' present program is the Harvard work for the RCAF, and an increasing proportion of this involves the rebuilding of aircraft after "C" type crashes.

#### Aviation Electric

Now occupying about 40,000 square feet of plant space in downtown Montreal, Aviation Electric Limited is soon to move to its new and larger quarters at St. Laurent, P.Q., near Montreal. The new plant has 71,000 square feet of space and when it is occupied early this summer, Aviation Electric's employment is expected to rise from its present 270 to about 400. This company specializes in the repair and overhaul of aircraft instruments and electrical accessories. In its machine shop it also carries on mold, die, and hobbing activities, as well as manufacture of a number of aircraft components and parts. Modification and salvage work on engine parts are

items of specialty air conditioning equipment, both for airborne and ground servicing use. The company was established in 1947 as a sales and service subsidiary of Sir George Godfrey & Partners, Ltd., England, and early in 1949 it was decided to construct a small manufacturing plant in Montreal to produce specialized items of cabin pressurization equipment for the CF-100. At the same time arrangements were made to manufacture several specialty items of aircraft ground servicing equipment required by the RCAF. Actual manufacturing operations were commenced late in 1949. In the same year TCA adopted Godfrey Cabin Superchargers as standard equipment on North Stars, these units being manufactured by the parent company.

#### Dowty Equipment

At Ajax, Ontario, (near Toronto) is the head office and plant of Dowty Equipment of Canada Limited, which

#### Sanderson Aircraft

Sanderson Aircraft Limited has for some time now been engaged in turning out Beaver components under subcontract to The de Havilland Aircraft of Canada. This company employs about 40 people on this work, which takes up about 10,000 square feet in the double hangar leased by Sanderson at Malton Airport.

#### Field Aviation

One of two big jobs being carried out by Field Aviation Company Limited at its Oshawa, Ontario, base is the routine servicing and maintenance (including engine changes) of all the Harvards, Dakotas, Mitchells, and Expeditors based at RCAF Station Trenton. The other job is the servicing, repair, and overhaul of the fleet of aircraft operated by Kenting Aviation Limited for Photographic Survey Corporation, both affiliate companies of Field. In addition, Field subcontracts a variety of jobs, including sheet metal work and cable



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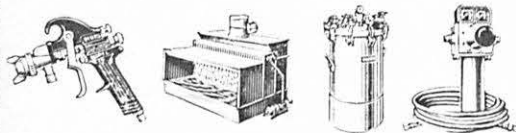
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swaging. The company currently employs about 200 people and has about 45,000 square feet of plant space.

### Light Alloys and Domal

Dominion Magnesium Limited (Domal) is Canada's largest producer of magnesium metal, the greater proportion of which is sold in the form of ingot. The company also has an extrusion plant devoted to the production of structural shapes in magnesium alloys and is the only domestic producer of specification grade magnesium alloy extruded sections for Canada's Aircraft Industry. Domal is the sole producer of titanium in Canada and at present is in pilot plant production of this new metal. There are as yet no facilities available for conversion of the metal as produced to ingot or mill product form, such as bar, rod, sheet, wire, etc., but these may be expected to be provided as demand increases.

Light Alloys Limited, a wholly-owned foundry and fabricating subsidiary of Domal, is now working in its original Renfrew, Ontario, foundry, but in a short time will be moving to operate in the Government-owned facility at Haley, Ontario. The new foundry has 70,000 square feet of floor space, will have an estimated capacity of 400,000 pounds of light metal castings per month, and will eventually employ about 400 workers. As a major subcontractor to Avro Canada, Light Alloys will use its new foundry to produce magnesium casings for use in Canadian-built turbojet engines and aircraft.

### Canadian Steel Improvement

Late last month, the new steel forging plant of Canadian Steel Improvement Limited was officially opened at Etobicoke, Ontario (near Toronto). The main initial activity of the new plant, which is at first employing about 180 persons, is the forging of turbine and compressor blades for Avro Canada Orendas. Plant area is about 41,000 square feet. Canadian Steel Improvement is a wholly-owned subsidiary of Steel Improvement & Forge Company of Cleveland, Ohio.

### Canadian Flight Equipment

The most recent arrival on Canada's aviation scene is Canadian Flight Equipment Limited of Cobourg, Ontario, which holds North American manufacturing rights for all the products of the Martin-Baker Aircraft Co.

(Continued on page 66)

# Some of Those Who Guide the Aircraft Industry



RT. HON. C. D. HOWE  
Minister of Defence Prod.



J. G. NOTMAN  
Canadair Limited



PETER A. REDPATH  
Canadair Limited



ROBERT A. NEALE  
Canadair Limited



CRAWFORD GORDON, JR.  
Avro Canada



T. S. McCRAE  
Avro Canada



FRED T. SMYE  
Avro Canada



EDGAR H. ATKIN  
Avro Canada



JAMES FLOYD  
Avro Canada



R. J. MOFFETT  
Canadian Car



P. C. GARRATT  
de Havilland



W. D. HUNTER  
de Havilland



C. H. DICKENS  
de Havilland



JAMES YOUNG  
Canadian P & W



R. T. RILEY  
Canadian P & W



EDWIN MACDONALD  
MacDonald Bros



D. A. NEWHEY  
MacDonald Bros



R. J. REYNOLDS  
Bristol of Canada



H. V. WRIGHT  
Bristol of Canada



A. BANDI  
Aviation Electric



C. E. HIBBERT  
Fairley of Canada



B. W. KING  
Sperry of Canada



E. H. MONCRIEFF  
Standard Aero



DR. E. WARLOW-DAVIES  
Rolls-Royce



DAVID BOYD  
Rolls-Royce

it and took delivery on February 4, more than six months ahead of the contract date. Prior to receiving its first aircraft, the Corporation has been operating a Comet on loan, and already over 750 hours have been logged in crew training and development flying.

## Briefly

- A record 26,829,485 ton miles of commercial and military air freight were lifted over the Atlantic and Pacific oceans during 1951 by Seaboard & Western Airlines, international air

freight carrier operating from the U.S. This represents an increase of over 17,000,000 ton miles in one year.

- Northwest Airlines showed a net profit of \$1,668,155 for the calendar year 1951, compared with a net loss of \$135,478 for 1950.

## RCFCA MEETING

(Continued from page 5-1)

bution of the aircraft and new tasks for them. One reason for this was that in some areas the pools of Re-

serve officers were running low.

The Brandon Flying Club would continue training Army pilots on Tiger Moths, with a minimum of 12 to be trained in 1952.

**Ab Initio:** A/C Carpenter noted as well that while it was not possible to bring the clubs into the training of ab initio RCAF pilots because the Harvard was now being used as an ab initio trainer, experiments were to be carried out this year with Chipmunks, primarily to give the Air Force experience with this type of aircraft. However, if a switch was eventually made to the Chipmunk as a primary trainer, then there was a possibility that the clubs could help. (See "The Airborne Services" also).

Guest speaker at the annual banquet was Lt. Col. J. B. Hartranft, general manager of the Aircraft Owners & Pilots Association, who described the work of the OAPA and also spoke commendably of Canada's place in the world of aviation.

## INDUSTRY ELEMENTS

(Continued from page 44)

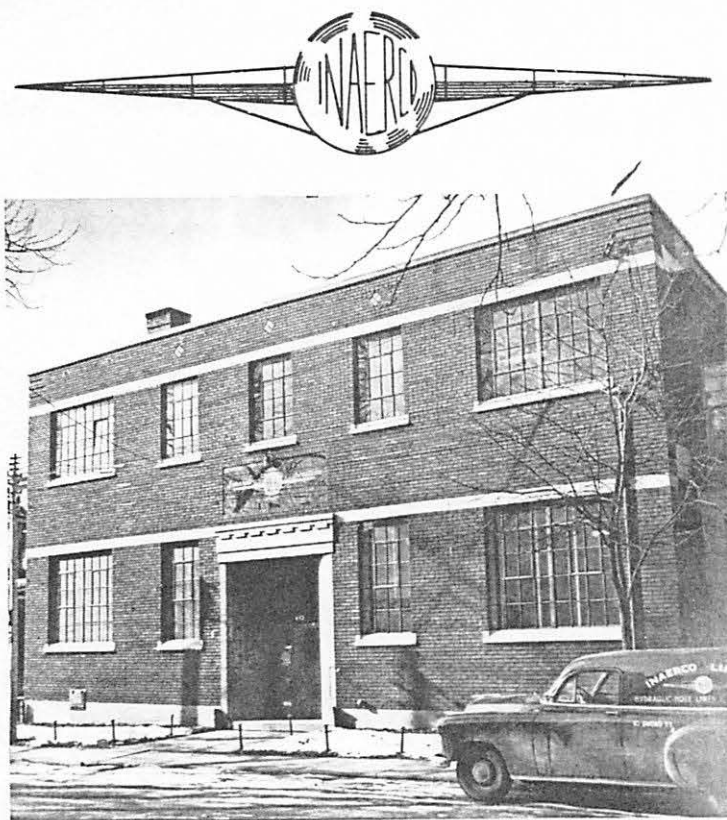
Ltd. of England, the most important of which is currently the Martin-Baker Ejection Seat. Initially this company is to employ about 40 people on the assembly and then manufacture of the Mark I version of the seat, now used in the CF-100. It will later manufacture the Mark III automatic seat.

### Fleet Manufacturing

Fleet Manufacturing Limited of Fort Erie, Ontario, which dropped out of the aviation business for about two years, is now a major subcontractor to de Havilland, Republic Aviation, and Avro Canada. It is producing major components for all three manufacturers and currently employs about 900 people on this work. In addition, it is helping out in the electronics program as a subcontractor to General Electric and Northern Electric.

### Chatco Steel Products

A major component manufacturer in connection with the CF-100 program will be Chatco Steel Products Limited of Tilbury, Ontario. The program at Chatco is expected to require about 800 to 1,000 workers, but it will not get into full swing until engineering difficulties are ironed out of the fighter. This company is to make rear center section



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fuselages, rear fuselage sections, tailplanes, rudders, fins, and tail cones. Tooling and installation of necessary equipment was started about nine months ago.

#### Canadian General Electric

Just about ready to go into operation is the new Canadian General Electric Company Limited plant for the overhaul of GE J-47 turbojets now in use in the RCAF's Canadair-built F-86E fighters. With about 25,000 square feet of space available, the plant will probably employ about 200 persons. It is located at Downsview Airport, adjacent to a similar plant operated by The de Havilland Aircraft for the overhaul of Goblin turbojets.

#### Cockshutt

Cockshutt Farm Equipment Limited is currently tooling up to produce combustion systems for the Avro Canada Orenda.

#### Trans-Canada Air Lines

TCA is now employing about 100 men and two hangars to carry out routine maintenance on all RCAF Harvards, Expeditors, and Dakotas operated out of Air Force stations at Winnipeg, Gimli, and Macdonald, all in Manitoba. It is expected that by the middle of this year the air line will be servicing about 120 aircraft per month.

#### Canadian Pacific

CPA is now operating RCAF No. 10 Repair Depot and in this capacity handles routine maintenance of RCAF aircraft in the area generally bounded by the Pacific coast in the west, the Manitoba-Saskatchewan boundary in the east, and the Arctic Ocean in the north. In addition, a mobile crew works out of Calgary, servicing aircraft as far east as the head of the lakes.

#### Thomson Products

Canada's Aircraft Industry will see one of its newest units under construction this spring in Ontario's Niagara Peninsula. The new Thompson Products Limited plant at St. Catharines will be a key producer of aluminum compressor blades for turbojet engines. The company will manufacture these and other turbojet parts for delivery to engine manufacturing and assembling firms in Canada and the U.S. Additionally, Thompson Products is doing development work leading to production for Avro Canada Limited, Rolls-Royce Limited, and Canadian Pratt & Whitney Aircraft Company Limited.

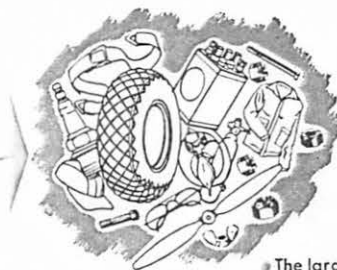
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Thompson Products' new plant will cover an area of 150,000 square feet, just slightly less than the neighboring 175,000 square foot TP plant, which now turns out automotive parts for Canadian automobiles, trucks, and tractors. Employing more than 1,000 persons at present, the company will have a payroll of more than 1,600 when the new plant is in operation late in 1952.

Long a leader in the automotive parts industry in Canada, Thompson Products Limited is a subsidiary of the Thompson Products Company, whose six plants throughout the U.S. have made them what is claimed to be the largest manufacturer of jet component parts in the world. The American firm has been making aircraft engine parts since 1918.

#### Carriere and MacFeeters

Occupying nearly 5,000 square feet of shop space in downtown Toronto the specialist firm of Carriere and MacFeeters employs about 50 people on the overhaul and servicing of all types of aircraft electrical accessories as well as such specialist items as dynamotors used in connection with radar. While most of its work is for the RCAF, it also serves commercial customers from coast to coast.

#### Crystal Glass & Plastics

Crystal Glass & Plastics Limited produces molded Plexiglas cockpit canopies for use on Canadair-built F-86E and Avro Canada CF-100 aircraft. It also produced the bubble canopy used on all of the last production de Havilland Chipmunks. Located in downtown

Toronto, it fabricates as well other plastic items for use on aircraft.

#### Inaerco Limited

Inaerco Limited employs about 40 persons on the production of high pressure hydraulic hose lines and fittings and allied products. Its plant is located in downtown Toronto.

#### Western Propeller

Specializing in propeller overhaul and repair, Western Propeller Company Limited, handles a large volume of propellers for the RCAF, the RCN, and commercial operators. Its up-to-date shop is located on Edmonton Municipal Airport.

#### Genaire Limited

Genaire Limited is currently carrying out a program of overhauling bomb release mechanisms for the armed services and is also negotiating to obtain additional aircraft contracts from this source. Located on St. Catharines Municipal Airport, it occupies a single hangar.

#### Cub Aircraft

At Cub Aircraft Company in Hamilton, a wide variety of aircraft bits and parts are being turned out for de Havilland, Avro Canada, Fleet Manufacturing, and Avco Manufacturing Co. of Williamsport, Pa.

#### Leavens Bros.

Leavens Bros. Air Services of Toronto, holding no large subcontracts at present (except for such Beaver parts as rudder pedals), is nevertheless well equipped for component manufacture.

## AERONAUTICAL RESEARCH

(Continued from page 50)

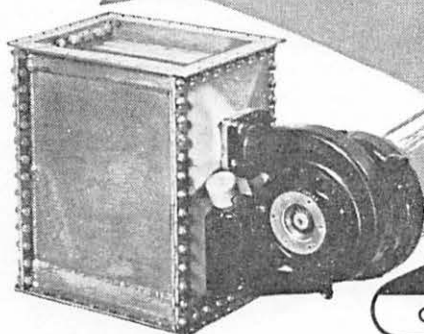
recently it has been reported that a second wind tunnel has been added to the facilities at the Institute. This unit has been described as a "hypersonic" wind tunnel and is said to be capable of providing air velocities up to Mach 10. It will be used to study blast effect as well as high speed aerodynamics.

Avro Canada's Gas Turbine Test Establishment at Nobel, Ontario, while a development rather than a research centre, nevertheless supplies a considerable volume of basic information. It is engaged in testing, with a view to improving, the aerodynamic and thermodynamic characteristics of the Orenda. It also conducts long term programs to provide design information for future designs of jet engines. Included in the facilities at Nobel is a variable incidence cascade wind tunnel which is intended to provide basic information for the design of turbines and compressors.

**Two Men:** Although aeronautical research in Canada represents the product of the brains of many brilliant men, the responsibility of guiding this research along the most fruitful channels lies with two men—J. K. Parkin, CBE, Director of the National Aeronautical Establishment, and Dr. Gordon N. Patterson, Director of the Institute of Aerophysics.

As already noted, in 1917 Mr. Parkin was responsible for Canada's first wind tunnel and from that year until 1929

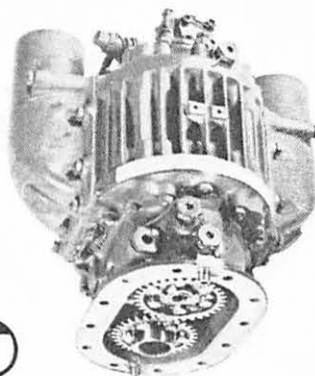
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