

Obituaries

PAUL DILWORTH, AERONAUTICAL ENGINEER 1915-2007

Rejected as a pilot, he turned his attention to what powered aircraft, writes **SANDRA MARTIN**. Working for Avro Canada after the Second World War, he helped develop some of history's first truly powerful jet engines

A frail young man who loved the outdoors, Paul Dilworth failed his medical when he tried to enlist in the Royal Canadian Air Force in 1939. Instead, he became an aeronautical researcher at the National Research Council in Ottawa in the race to develop turbo jet engines during the Second World War. Later, at A.V. Roe, he helped develop the Orenda series of jet engines, one of the most successful aeronautical engineering projects ever undertaken in Canada. At his own company, Dilworth, Secord, Meagher and Associates, Mr. Dilworth also laid some of the groundwork for the Spar Aerospace "Canadarm."

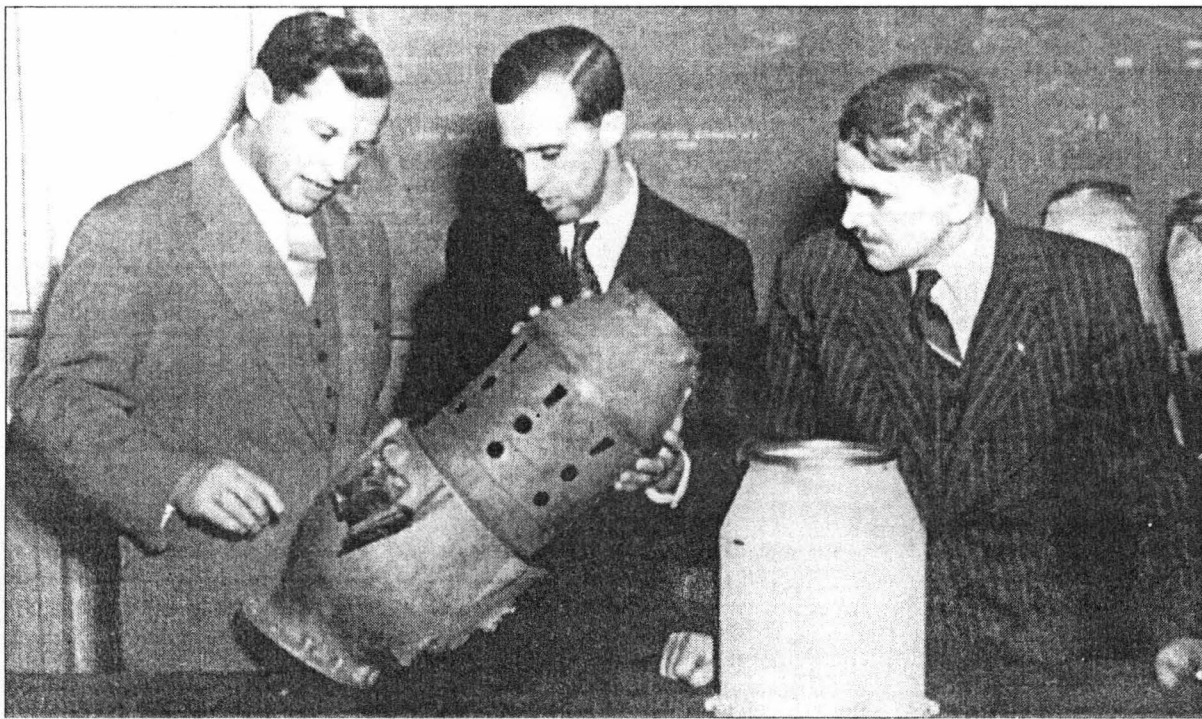
"He was a good engineer," said James C. Floyd, designer of the Avro jetliner among other planes, "but to me he was a great guy and a wonderful, wonderful friend. I never found him without good advice." The two men, who met in 1946, when Mr. Dilworth was designing engines and Mr. Floyd was designing airplanes for A.V. Roe, were friends for 61 years.

Paul Bernard Dilworth, the youngest of four children of chartered accountant Robert James and singer Ida J. (née McLean) Dilworth, was born in Toronto in the middle of the First World War. Two years earlier, in 1913, his father had become a named partner in the firm Clarkson, Gordon and Dilworth (now Ernst and Young). His mother was a soprano who sang in the Toronto Mendelssohn Choir — that's how his parents met — and performed occasionally at Massey Hall, and the first woman to sing live on Canadian radio.

The family lived on Baby Point Drive in the west end of the city, and Paul went to Humbercrest Public School. He was frail and suffered from asthma, a lifelong ailment. In 1928 he entered Appleby School in Oakville, a private boarding school for boys. The family spent summers at a cottage called "Come Hither" on Peninsula Lake just east of Huntsville, Ont. It was at the cottage that Paul learned to fly a bi-plane in his late teens, thanks to family friend Paul Trethewey, who kept a plane at his summer place on a nearby lake. Paul got his pilot's license and even won a trophy for the accuracy of his landings.

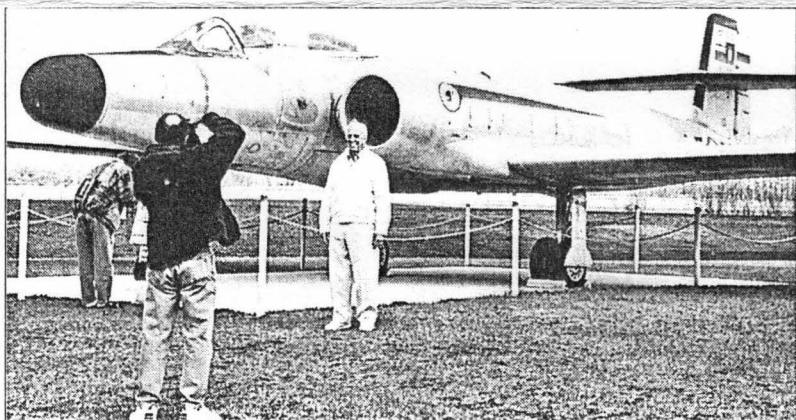
After graduating from Appleby in 1933, he enrolled in the University of Toronto, but left after his first year because he was suffering from depression, an illness that plagued him periodically throughout his life. Mr. Trethewey suggested to Paul's father that the boy should spend a year up north at the Argosy Gold Mine on Casummit Lake north of Sioux Lookout. "They moved my dad, a little frail pampered city kid, up with all of these hard rock miners, and it seemed to straighten him out," said his elder son, Geoffrey Dilworth. He returned to school and graduated from U of T in 1939 with a degree in mechanical engineering.

That December, Mr. Dilworth married Olive Livingstone. Their elder son Geoffrey, a dermatologist in



DILWORTH FAMILY PHOTO

In 1942, Canada began researching jet engines. Wynn Boyd and Paul Dilworth, centre, were briefed by Sir Frank Whittle, the inventor of the world's first jet engine. In 2000, Mr. Dilworth was inducted into Canada's Aviation Hall of Fame. That's him at the wing of a CF-100, an aircraft that was powered by two of his engines.



London, Ont., was born in 1942 and their younger son Robert, a retired financial adviser, was born in Toronto in 1947. The Dilworths divorced in 1969 and the following year Mr. Dilworth married his secretary, Yvonne Pascoe, a divorcee with two teenage children. The break-up was very hard on his children, as these things usually are, but his sons never lost respect for their father, according to Geoffrey Dilworth. The first Mrs. Dilworth died in 1998.

"He was a mentor, a friend, a financial adviser," said his stepdaughter Christine Geiger. "I was the daughter he never had — that's what he told everybody." As for her, she considered him "my dad, definitely my dad," at least partly because her own father lived across the country in Vancouver. "He was always there for me."

As soon as war was declared in 1939, Mr. Dilworth tried to enlist in the air force. Much to his frustration, he was rejected because doctors detected a heart arrhythmia during his medical. It turned out to be both genetic and mild in nature, according to his elder son Geoffrey, but the doctors took away his flying license. Instead, Mr. Dilworth did his equivalent of war service by working on defence projects for the National Research Council in Ottawa,

where he worked under M.S. (Mac) Kuhring and Dr. J.J. Green, head of the NRC aerodynamics lab.

The Royal Canadian Air Force was keen to develop its own military aircraft, if only to decrease its dependence on the British and American equipment during the Second World War. In 1942, Mr. Kuhring and Dr. Green were ordered to compile a dossier on British aeronautical research activities. Coming out of the Kuhring-Green report and subsequent meetings among the RCAE Canadian government officials and the British Ministry of Aircraft Production, the NRC decided to send a team to England to study British turbo and jet engine development. They were to report back on how Canada could both support the British war effort and work on producing its own engines. The three-man team, consisted of Charles A. Banks (a senior Canadian military official in the United Kingdom) Ken Tupper (head of the NRC Hydraulics Laboratories) and Mr. Dilworth. The Banks Report (based on a five-month survey of suppliers, research laboratories and the work of Wing Commander Frank Whittle, the inventor of the jet engine), which was released in May 1943, "laid the foundation for Canada's entry and rapid rise to become one of the

world leaders in the development of gas turbine technology," according to former Avro Arrow design engineer, James C. Floyd.

Establishing a cold-weather test station (CWTS) to determine a jet engine's performance and compressibility limits at high-altitude temperatures was one of the report's recommendations. Accordingly, Mr. Tupper and Mr. Dilworth were sent to Stevenson Field in Winnipeg to set up the CWTS. They performed the first engine test on Jan. 4, 1944, on a Whittle-type, Rolls Royce W2B, which had been flown to Canada on a U.S. military transport plane via Senegal and Brazil. It was the first time that "the roar and whine of a jet engine" was heard in this country, said Mr. Floyd.

There's a family story from about this time that Mr. Dilworth's sons tell of their parents going to Lake of the Woods near Kenora, Ont., for a holiday at Minaki Lodge, a cluster of three large log buildings made out of red cedar. The manager loaded 20 guests, including the Dilworths, into his motor launch for a cruise on the lake. Alas, he struck some underwater rocks and the boat began to sink. Panic broke out, but Mr. Dilworth calmed everybody down and persuaded them to tread water and cling to the overturned boat while he, a very strong swimmer, launched a canoe that had been stored on the cruiser as a substitute life boat. He helped the floundering guests aboard and then towed them, a few at a time in the canoe back to shore. There was only one death, an elderly woman who suffered a heart attack. The manager wrote a letter of thanks to Mr. Dilworth, but he didn't save this testament to his bravery, according to his son, because he was far too humble to savour such things.

Following another of the Banks Report's recommendations, the Canadian government established Turbo Research as a Crown Corpora-

tion in March, 1944, in Leaside, which is now part of Toronto. Mr. Tupper left the NRC to become chief engineer, Winnett Boyd joined as combustion engineer and later became chief designer. Meanwhile, the Hawker Siddeley Group purchased the former Victory Aircraft firm in Malton, northwest of Toronto (near what is now known as Pearson Airport), and renamed it A.V. Roe Canada, although it was known generally as Avro, Canada. (A.V. Roe, which had been founded by aviation pioneer Alliott Verdon Roe and his brother, H.V. Roe, in 1910, was a prestigious British aircraft manufacturer with a pedigree that included the Avro 504 trainer in the First World War and the Avro Lancaster bomber in the Second World War.)

In the spring of 1946, Canada sold Turbo Research to Avro and Mr. Dilworth returned from the CWTS in Winnipeg to become chief engineer of its Gas Turbine Division. His section was later named Orenda Engines Ltd., and it was under his leadership that the company designed and developed the Orenda engine, one of the most powerful engines of its era. During Orenda's test program in February of 1949, the prototypes ran for more than 1,000 hours, a record for the era. The Orenda, one of the three most powerful engines of its era, went into production that same autumn and was used in the Avro CF-100 and the Canadair CF-86 Sabre jet fighter — enabling that plane to win world speed records. Between 1949 and 1956, nearly 4,000 Orendas were built at Malton. Among other customers, they were sold to the Canadian, Dutch, West German, Belgian and South African air forces. A more powerful version, the Orenda Iroquois, was later designed for the Avro Arrow.

Mr. Dilworth left Orenda in 1952 to establish the engineering consulting firm of Dilworth, Secord, Meagher and Associates. At its peak, the company was involved in many breakthrough technologies related to aviation wind-tunnels and automotive testing facilities and the Space Shuttle Manipulator "Canadarm" as a sub-contractor to Spar Aerospace. He retired in 1980.

He was inducted into Canada's Aviation Hall of Fame in 2000. The citation reads, "His constant search for perfection in all of his aeronautical endeavours and his pioneering leadership in the field of aero-engineering development have been of lasting benefit to Canadian aviation."

In the last several years Mr. Dilworth suffered from asthma, heart disease, and a number of falls that resulted in a broken hip and a wrist, and generally weakened his health.

Paul Bernard Dilworth was born on Jan. 31, 1915, in Toronto. He died of pneumonia and heart disease in Toronto on Feb. 18, 2006. He was 92. He is survived by his second wife, Yvonne, two sons by his first wife, Olive, two stepchildren, 11 grandchildren and his extended family.