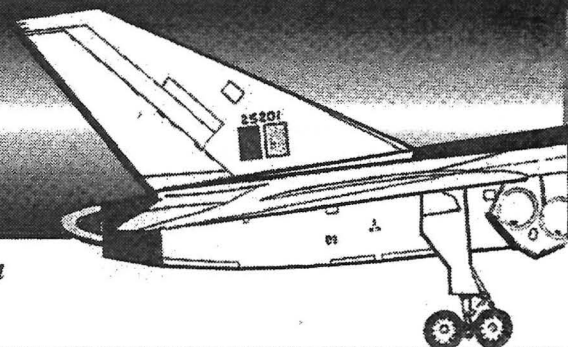


Pre-Flight



*A Publication of the Aerospace Heritage Foundation of Canada
P.O. Box 246, Etobicoke "D", Etobicoke ON M9A 4X2*

Vol. 22, No. 2

March - April 2011



Central Tech, circa the '40s.

The Central Technical School

by
Gerry Barbour

My schooling began. I was surprised and pleased to find the Central Technical School was within easy walking distance of my parent's apartment. I quickly saw their wisdom in choosing that location since the University of Toronto was close by. That certainly benefitted Brother Doug who was into his third year at that institution.

That apartment was tiny. So very tiny. There is a saying that "familiarity breeds contempt." Not in our case. There was too much love and consideration for one another for any nonsense like that. Mac? Me? We did a bunk up to the top.

Founded 1989

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From the President

This, the second issue of Pre-Flight for 2011, although a bit late, continues the story of Gerry Barbour and how he dedicated his studies and graduated to a lifetime involvement in the Aviation business.

I wish to thank Gerry for sharing his early life memories with us, and I encourage other members in the aviation field to also share with all of us their experiences.

I look forward to future issues that will include many interesting insights into the wonderful world of aviation based mainly on the Malton, Ontario experiences of many Avro employee's.

Frank

Central Technical School (continued)

Our landlord had seized the furniture of the preceding tenant for non-payment of rent and had deposited same up on the third floor, which was actually one small room. There, after a good sweep and dusting and shuffling of furniture we took up residence, in our aerie so to speak. There was no heat in winter and it was boiling hot in summer. Who cares? We were a family again and nothing but nothing beats that. I liked the aeronautical course. Deeply interested as I was in all aspects of aviation, I wished to learn the very beginning of man's first attempt to leave the surface of the earth. If aeronautics was so appealing to me and was to be my chosen vocation, then I would not be satisfied until I had delved into the complete history of aviation.

The staff of the Reference Library on College Street saw me daily and provided the answers to many questions and the original editions of The Book of Knowledge supplied the remainder. We take so much for granted in this busy world of ours. Airplane travel is so much a part of our everyday life. We tend to accept it without giving a thought to the brave men who dared to experiment, build their rickety machines and risk their lives in the oftentimes vain hope that they could successfully leave the earth and return to it safely. It is said "A little knowledge is a dangerous thing." Don't you believe it. Knowledge is a very light load to carry around. What follows may pique your interest and give you a deeper insight for what is to come.

I was astonished to find that away back in 200 B.C., Archimedes the Greek mathematician and inventor, discovered how and why objects float in liquids. Roger Bacon 1214-1294, an English friar, astronomer, chemist, philosopher and mathematician had ideas that with a better understanding of science might have led to the invention of a balloon. Studying the work of Archimedes. Bacon wrote that air, like water, had something solid about it and concluded that if the right kind of machine could be built, then air would support it, just as water supports a ship. Because of his forward thinking this poor man spent a great part of his life behind bars. This was Europe in the dark ages.

The great artist Leonardi da Vinci in the 1500's, actually made plans for ornithopters; flying machines with wings designed to flap like those of a bird. None of my research gave any clues to the first manufacture of a balloon.

I suspect the idea was around for a good long time before the balloon was put to any practical use. It wasn't until 1783 that a real attempt was made to travel through the air. A ram, a cock (barnyard variety) and a duck were the first creatures to ascend from the surface of the earth in a flying machine. Now how do you like that? Those dumb creatures beat us to it. Before man dared venture into the unknown regions of the upper air, he sent those three creatures before him, just, as we are told; Noah loosed the dove from the ark. The ram, the cockerel and the duck were sent aloft in a balloon from the city of Paris, France, on June 5, 1783 by the Montgolfier Brothers manufacturers of balloons. The balloon rose to a height of 1,500 feet and gradually descended. Can you imagine the cacophony of cries emanating from those startled animals? Too bad it couldn't have been captured on tape. It must have reached the ears of the assembled multitude below.

History tells us the balloon descended into a farm yard whereupon the animals made good their escape. The farmer however, thinking the balloon was an invention of the devil, hacked it to pieces. On November 21, 1783, man himself embarked on his first voyage into the upper air. Jean Francois Pilatre de Rozier, a young naturalist and the Marquis d'Arlandes, an infantry major, whose job it was to keep the home fires burning in this case the fire to heat the air in the balloon. They were the first recorded human beings to fly in the upper air, that is, in the modern era.

As a student of Greek Mythology, I knew Daedalus, a skilled artificer, had fabricated wings from feathers secured by thread and wax, and was successful in rising into the air. Making a set for his son Icarus, he warned the young man not to fly too high, but Icarus in the way of the young, paying no heed, flew too near the sun, the heat melted the wax, and he plunged into the sea and drowned. I leave it to you to decide who was the first man or men to rise into the upper air. These two intrepid aeronauts, de Rozier and the Marquis d'Ariandes remained aloft for 25 minutes in their HOT AIR balloon and came gently back to earth some 5 miles away from the launch site at the Butte-aux-Cailles, France. Interest in aviation now reached a fever pitch.

On December 1, 1783, Professor Jacques Charles of the Academy of Sciences and Noel Robert made the first manned flight in a HYDROGEN-FILLED balloon. A flight of more than twenty miles. Sand was carried as ballast, which, when dumped, would allow the balloon to ascend and a valve at the top of the balloon, when activated, allowed gas to escape and the balloon would descend. However, the risk of a spark igniting the hydrogen gas was enormous.

These were very brave men who were prepared to take the risk of being instantly fried in order to further their experiments with manned flight. Early in 1785 a Frenchman, Jean Pierre Blanchard, and an American, Dr. John Jeffries, made the first crossing of the English Channel by air. Their balloon was hydrogen-filled with a boat shaped contraption beneath it and with oars (in case it came down in the water) and a hand driven propeller. A hand driven propeller? To propel the boat in the choppy English Channel? Or more properly-since France was the centre of this feverish activity and interest in flying-the choppy La Manche. No self-respecting Frenchman would call that stretch of water the English Channel, now would he?

Jean Francois Pilatre de Razier later attempted to cross the Channel using a hybrid balloon. Hydrogen and hot air. In none of my research have I been able to find out much about its construction but I suspect that one section of the balloon, the outer envelope, contained the hydrogen, and the other section, the inner envelope, contained the hot air. That would make some semblance of sense in a nonsensical concept.

A spark from the combustible material used to heat the air could ignite the hydrogen gas and bingo? INSTANT ROMAN CANDLE. That's what happened. KA-BOOM! A very brave man went to his death along with his companion Monsieur Roumain. He was the first man to ascend into the upper air, along with the Marquis d'Arlandes, and the first man to die, along with Roumain, in a lighter-than-air vehicle. Most of these early contraptions were hot air balloons. Add the primitive firebox and the risk of flames igniting the fabric of the balloon which at that time was composed of linen and paper, and you have some idea of the problems these airmen faced with such bravery.

For over a hundred years no way was found to control the flight of a balloon. Whichever way the wind blew the balloon moved in that direction. The invention of the internal combustion engine changed all that.

An important improvement was made when, by attaching a small engine with a propeller and a rudder to the basket of the balloon, some maneuverability was attained-providing a gale was not blowing. It remained for Albert Santos-Dumont, a Brazilian residing in Paris, to use a sausage-shaped balloon with a framework suspended below it, the framework containing a seat, the engine, the propeller and the rudder. In 1901 he won a prize of \$520,000 for circling the Eiffel Tower and returning to the starting point in 30 minutes. All of these machines, however, were lighter-than-air. The interest now turned to a flying machine which was heavier-than-air.

America was intrigued by all the goings-on in France. In the American civil war, Mr. Thaddeus Lowe had used a balloon to report on the movements of the Confederate

Army but nothing more was done upon cessation of hostilities. It remained for two bicycle repairmen to become interested in the possibility of building an airplane powered by an internal combustion engine and which was capable of leaving the earth and returning safely. We know them today as the Wright Brothers. Much work had been done with gliders, and much was learned from their use both in Europe and elsewhere.

Doubtless inspired by all the experiments taking place in France with lighter-than-air balloons, an Englishman, Sir George Cayley, set about solving the problems associated with heavier-than-air machines. By 1799, he felt he had mastered the principles which he then proceeded to write in a series of articles. "The problem of heavier-than-air flight is confined within these limits-to make a surface support a given weight by the application of power to the resistance of air." This man knew a thing or two. By 1809 he had built the worlds first model glider. I am certain that if he had had the internal combustion engine at his disposal, significant advancement in the world of powered flight would have taken place at a much earlier date. He is now regarded as the Father of the Science of Aeronautics. I was happy to make his acquaintance through the aviation history books. Hats off to Sir George Cayley!

It would be 100 years later before the Wright Brothers took to the air at Kitty Hawk. Wilbur and Orville Wright had the good fortune to study the work of Sir George Cayley. The design of his glider was far in advance of its time. In May of 1899 Wilbur Wright contacted the Secretary of the Smithsonian Institute in Washington and subsequently received a copy of Sir George Cayley's articles of 1809-10 on aerodynamics. The Wright brothers were the beneficiaries of the findings of the Father Of The Science Of Aeronautics.

Between 1891 and 1896 Otto Lilienthal of Germany made the first successful manned flights in which a person actually piloted the glider. Not to be outdone Percy Pilcher of Great Britain and Octave Chanute of the United States made similar flights. Unfortunately, Otto Lilienthal was killed during a test flight of his glider. Two brave men, de Rozier and Lilienthal gave their lives to further their interest in aviation.

Man was beginning to understand wing design, the importance of the air passing over wing contours, the controlling mechanisms required to keep the glider stabilized and much much more. Sir Hiram Maxim, an American who became a British citizen and Professor S.P Langley, of the Smithsonian Institute in Washington were both working on the problems associated with powered flight. Both these men produced machines which, although failing to rise into the air, did have characteristics which were used much

later by forward thinking inventors. Professor Langley's contribution is noteworthy. He built a steam-powered machine in the 1890s that, unfortunately, proved too heavy for flight. It was now accepted that the steam engine was much too heavy for the amount of force it could develop. About this time the gasoline engine, was much improved, and those two young Americans decided to try and make it drive an airplane.

Orville and Wilbur Wright had a bicycle shop in Dayton, Ohio, U.S.A. and had experience with internal combustion motorcycle engines. In 1900 they chose a remote place in North Carolina, Kitty Hawk by name, and began experimenting with gliders. They were smart; they had queried the U.S. Weather Bureau as to a location where the wind blew strongly and steadily. Using nearby Kill Devil Hill (aptly named don't you think?), as the site for their experiments, they succeeded in overcoming several of the worst problems associated with flight; stability being one of the greatest. A major forward step was taken when they discovered that, by warping the tips of the wings, they could make a banking turn.

Later it was found that by moving the rudder from its usual place at the front, to the rear of the glider, it made for better control. Leafing through pictures taken during these glider flights, I noticed that the pilot, in later versions of the glider, sat upright whereas during the first series of glider and powered flight, the pilot lay in a prone position, I thought that would give any pilot a crick in the neck. Certainly the prone position did provide better streaming. Perhaps-I thought-the Wright boys felt the hands and feet could better handle the controlling mechanism if the pilot was lying in the prone position.

All these experiments took place during the winter months far it seemed that was the time the wind blew its strongest. Returning home they commenced work on a lightweight gasoline powered internal combustion engine, the vast majority of its components being manufactured from aluminum. Returning to Kitty Hawk in the fall of 1903, and with their new lightweight engine mounted in what was no more than a beefed-up glider containing all the modifications which they deemed necessary for powered flight, they continued their experiments taking turns in their much modified glider, flying from Kill Devil Hill. These brave men were in fact, actually learning to fly.

On the morning of December 17, 1903, the weather seemed propitious. The aircraft was removed from its tent hangar and placed on a track. With Orville Wright at the controls and the wings stabilized by men from the nearby weather station, the engine was started, the machine ran a short distance down the track and rose into the air.



There it remained for 59 seconds covering a distance of 120 feet, all this being recorded by Wilbur Wright using a hand cranked camera. With Wilbur now at the controls a much longer flight took place. That flimsy airplane flew a distance of 852 feet in 59 seconds. Powered flight was now a reality. The Wright brothers packed up and went home. They had proved their point. Their powered, heavier-than-air flying machine had successfully flown in the upper air. History tells us that they didn't wish to miss their Christmas dinner.

On a personal note, the youngsters of the Town of Penetanguishene sold dew-worms to fishermen who regularly put into the harbour from their fishing club "up-the-racks", as the 30,000 islands are locally known. Brother Doug, being much older, was doing a thriving business one summer day I, being much younger was guarding the merchandise and the cash when a boat arrived and veering in, tied up to the jetty. I could read. I noted the name. "KITTY HAWK."

It didn't mean a thing to me. A pleasant looking man leaped upon the dock, advanced and said, "Worms for sale, Sonny?"

Used to singular transactions at the local candy store, I replied. "Yes, Sir. One worm or two? One cent each." A short pause. "Two, please." Carefully placing two "wigglers" in his outstretched hand, I received two cents (American) in return, and added the two cents to our pile of cash. Brother Doug turned. saw what was happening, cuffed my ear and said, "Here's a hundred Mr. Wright. On the house." Orville Wright! I had actually touched the hand of the first man to fly a heavier-than-air flying machine. The boat? The Kitty Hawk? Today, it's beauty lovingly restored by patient hands. The Kitty Hawk glides through the sparkling water of Georgian Bay. When I gaze upon it with something a kin to awe, the familiar cry of the used car salesman rings in my ears. "It's in mint condition, buddy. Driven to church on Sunday by a little old lady ... when it isn't raining." Except for a few inventors, the Wright Brothers achievement attracted little attention. However, these intrepid airmen continued to make improvements.

By 1906 they had built and flown the FIRST airplane that was fully maneuverable and which could remain in the air better than 30 minutes. These flights were not officially recognized since no important official had ever witnessed them; so careful were the Wright brothers to guard their secrets of powered flight. In 1908 at Le Mans, France, Wilbur Wright made the longest official public flight recorded up to that time. He covered 56 miles. It was fitting, that this flight should take place in France, that country being the site of man's first excursion into the upper air. These two young Americans had been able to do better

than all of the trained scientists and the most skilful workmen of the world. My further research into aviation pioneers led me down the trail to Alexander Graham Bell, and such was my admiration for him and the young people with whom he came into contact, that it is necessary to continue the history of aviation and the part he played in its development.

The Dominion of Canada now assumed a major role in the history of powered flight. That's right! Canada, just 14 years after Confederation, was about to take her place in the annals of aviation history. In Brantford in 1876, Alexander Graham Bell invented the telephone, the instrument which changed the world of communication so dramatically. Few people know or perhaps care that this genius played a monumental role in the further development of the heavier-than-air flying machine.

Alexander was born in Scotland on March 3, 1847. His father Alexander Melville Bell, invented "visible speech", a written code useful to people with hearing deficiency. This code indicated exactly how all-human vocal sounds are made and young Alexander followed in his father's footsteps teaching this code. He taught in London England, at a school for the deaf until moving to Brantford in 1870.

Tuberculosis was rampant around the world at that time and two sons having died of this disease, the elder Bell decided the clean air of Canada was just what was needed to preserve the life of young Alexander, and so it proved. Alexander, his health now restored, worked with his father on speech therapy for the deaf in Canada and the United States. With such a background in communication it was inevitable that the invention of the telephone came next. With the patent rights secured, Alexander, being a Scot and therefore an astute businessman, realized the vast potential for success, which existed south of the border. Taking up residence in Washington D.C., he promoted the telephone's commercial development in that country and after founding the Bell Telephone Company in 1876, became at the ripe old age of 35, a very wealthy man. Such was his forward thinking that he refused to rest on his laurels and so turned his considerable talent and wealth to scientific research, both in person and by paying for the experiments of others.

In the United States he collaborated with Professor S.P. Langley, builder of that steam-powered aircraft in the 1890,s and funded early atomic experiments. He worked on the photoelectric cell, the iron lung, the desalination of seawater and the phonograph. Most people think he only invented the telephone. This man was not only a genius but a philanthropist as well. How fortunate are all Canadians that he settled in Canada.

Central Tech ... *cont'd.*

Doubtless aware of the success of the Wright Brothers at Kitty Hawk, Bell nevertheless felt the field was wide open for improvements in the design and construction of flying machines. He set out to study the principles of aeronautics-start from scratch, so to speak.

Cape Breton reminded him strongly of his native Scotland, so he arrived in the village of Baddeck in 1885, looking for a likely spot to build a summer home and fortunately, for us, he found a suitable location. His experiments were conducted from the laboratory of his newly built house, which he had named Beinn Bhreagh meaning "beautiful mountain" in Gaelic. He began by kite flying; studying the effects of air currents and air pressure. This of course delighted the small boys in the neighbourhood, one in particular being J.A.D. McCurdy who was destined for future greatness. This lad, while growing-up, had worked with A.G.B. during the summer months. It seemed A.G.B. and his family returned to their home in the City of Washington, U.S.A. during the winter months, at least for some years. As his experiments with powered flight grew to fruition, more and more time was spent at Baddeck.

At the age of sixteen, J.A.D. McCurdy attended the University of Toronto aiming for a degree in Mechanical Engineering. When summer holidays arrived, he brought back another student, F.W. Baldwin, known as "Casey" and the experiments continued, the tetrahedron showing the most promise. These three men, knowing they lacked knowledge of internal combustion engines now invited an American, Glenn Curtiss, a manufacturer of motorcycle engines to join their group. Curtiss had established his business in Hammondsport, New York. U.S.A.

It does seem we owe much to the motorcycle engine. Remember the Wright Brothers? Bicycle repairman and conversant with motorcycles and motorcycle engines? Now we have 4 men Bell, Baldwin, McCurdy and Curtiss. Three Canadians and an American. Another American was added, First Lieutenant Thomas Selfridge, a graduate of West Point. Alexander Graham Bell was such a notable person that the President of the United States of America, Theodore Roosevelt, made Thomas Selfridge, this expert in the science of aviation available to A.G.B. and his group.

All the elements for success were now at hand: the brains, the required financing and boundless enthusiasm for the project; to produce the finest heavier-than-air flying machine yet devised. But wait! Enter the distaff side of the Bell household, "Ma" Bell. I throw in that name because of the affectionate phrase used by so many investors in Bell Telephone stock. All the elements for success were now at hand.

Mabel Gardiner Hubbard, because of her deafness, met, and became the wife of Alexander Graham Bell. So sure was he that this romance would last forever, A.G.B. turned over to his wife Mabel, a major portion of his stock in Bell Telephone, retaining only 10 shares. Can you imagine a husband doing that in the world of today? Possible, but not very likely. Right?

This astute lady, on October 1.1907, suggested the formation of The Aerial Experiment Association and set aside funds for the use of its members. They actually succeeded in getting Thomas Selfridge installed in a huge kite and towed behind a steamboat on nearby Bras D'or Lake. into the air. A very dangerous undertaking and one that very nearly ended in disaster. Obscured by the billowing smoke from the wood fired propulsion unit and descending into the water. Selfridge was dragged on and occasionally below the surface of the lake until spotted by the towing crew. Thomas Selfridge survived ...that time.

At the onset of winter. operations shifted south of the border to Hammondsport. New York. Their experiments with kites now a thing of the past. they turned their attention to gliders, aware that much work should be done before attempting to build a machine capable of putting a man into the upper air.

(To be continued!)

Members Matter

Greetings from the Membership Secretary. I understand the weather here in the snowy north was not as delightful as it was in the sunny south. Now that I have returned from the sunny south, I am ready to go, and by the looks of these Renewal Forms in front of me, I have work ahead of me.

I would like to thank all those members renewing so quickly, one does not know how the process is sped up by working on many forms initially, than one or two forms at a time.

To members that have sent along cards, emails and comments with their renewal forms a special thank you. It does brighten my day.

When I have processed the PreFlight and have mailed it. I am very disheartened to open our mailbox and receive a returned envelope marked deceased. Over the many years I have been processing renewals, I have got to know a lot of our members, I try my best when my wife and I are traveling to drop by and say hello to members living in the area.

