

# Scenes from Meteorology and Early Years of Transatlantic Aviation

by Neil J. Campbell

## Foreword

This article describes some of the early beginnings of transatlantic flight and the RAF Ferry Command based on interviews with P.D. McTaggart-Cowan, a former Director of the Canadian Meteorological Service, by Dave Phillips. Dr. McTaggart-Cowan joined the Meteorological Service in England and was later posted to Newfoundland and charged with the responsibility of establishing weather services for transatlantic flights before WW II. He and his group continued their meteorological forecasting services after war broke out and served the RAF Ferry Command from its formation to the close of the war.

The interviews of prominent figures in the Canadian Meteorological Service by Dave Phillips were undertaken as part of an Oral History of this Service. Permission was given to CMOS to research relevant interviews for the 125<sup>th</sup> Anniversary of the Canadian Weather Services in Canada. There is a wealth of historical material and personal anecdotes in those interviews which turned this project into an enjoyable experience. I am deeply indebted to Dave Phillips for providing me with these manuscripts and also to Morley K. Thomas who suggested other references, principally "Ocean Bridge - The History of the RAF Ferry Command" by Carl A. Christie which has been used to expand on McTaggart-Cowan's account of transatlantic flight. Morley's own book "Forecasts for Flying" served as another source of valuable information, in particular his chapter on "Forecasting for Transatlantic Aviation".

## Avant-propos

Cet article (Scènes de la météorologie et des premières années de l'aviation transatlantique) décrit certains des premiers vols transatlantiques et les débuts du RAF Ferry Command basés sur des entrevues avec P.D. McTaggart-Cowan, un ancien directeur des services météorologiques canadiens, recueillies par Dave Phillips.

Dr. McTaggart-Cowan s'est joint au "Meteorological Service" en Angleterre et fut ensuite muté à Terre-Neuve où il avait la responsabilité de mettre sur pied des services météorologiques pour les vols transatlantiques avant la Deuxième Guerre mondiale. Son groupe et lui ont continué leurs services de prévisions météorologiques après le début de la guerre et ont servi le RAF Ferry Command de ses débuts jusqu'à la fin de la guerre.

Les entrevues de personnes importantes au sein des services météorologiques canadiens par Dave Phillips ont été enregistrées pour faire partie de l'Historique oral de ces services. La SCMO a obtenu l'autorisation de sélectionner les entrevues pertinentes pour le 125<sup>ième</sup> anniversaire des services météorologiques au Canada. Il existe une mine de documents historiques et d'anecdotes personnelles dans ces entrevues qui ont rendu ce projet une expérience très agréable. Je suis extrêmement redevable à Dave Phillips de m'avoir donné ces manuscrits et également à Morley K. Thomas qui m'a suggéré d'autres références, plus précisément "Ocean Bridge - The History of the RAF Ferry Command" par Carl A. Christie qui a été utilisé pour développer le compte-rendu du vol transatlantique de McTaggart-Cowan. Le livre de Morley "Forecasts for Flying" a également été une précieuse source d'information, tout particulièrement le chapitre sur les prévisions pour les vols transatlantiques.

## **Early Start**

Experimental transatlantic aviation flights from Britain to Newfoundland and return were under consideration as early as 1932, during which time an agreement was being drawn up by Canada, Britain, the Irish Free State and Newfoundland pledging to develop a transatlantic air service. Nothing much took place until the Ottawa conference of 1935 which basically set out the goal to create an imperial transatlantic service in three stages. Imperial Airways would first undertake a series of survey flights and follow up with an experimental airmail service and finally passenger and airmail services. A further

conference in Washington confirmed a grant of privileges to Pan American which had actually obtained landing rights in Newfoundland and Canada some years beforehand.

The Canadian government agreed to provide meteorological services for Newfoundland and the western half of the Atlantic Ocean, a service which was brought about in view of the fact Newfoundland was virtually bankrupt and could not contribute financially to the agreement despite the fact the island was strategically positioned as the western terminus of the main Atlantic

crossing. Britain agreed to build an airport for land-based aircraft - a vision or an idle promise in that no land-based aircraft of the day could fly the Atlantic.

### **New Meteorological Service in NFLD**

John Patterson, the Director of the Canadian Meteorological Service, was charged with the responsibility of establishing a full-fledged meteorological service for Newfoundland. Archibald and Jacobson from the Service were sent out to set up the observing network. It eventually was made up mostly of lighthouses and previously-established observing stations at Cape Race and in the Strait of Belle Isle which was used for storm warnings.

Pat McTaggart-Cowan, a Rhodes scholar, born in Scotland, was coming out of Oxford University in 1936 when John Patterson, head of the Canadian Meteorological Service, offered him a position with the Service. McTaggart-Cowan was immediately sent to Croydon to join a group that was engaged in writing a Green Paper for the British Government on the feasibility of Atlantic flight. McTaggart-Cowan, who knew nothing about meteorology at the time, was taken in by S.P. Peters, who later became Deputy Director of the British Meteorological Service. It was under his watchful eye that McTaggart-Cowan became a self-taught meteorologist. Besides Peters and McTaggart-Cowan, others in the group included Pat Meade, Arthur Davies and Portas, all of whom worked one way or another on the problems of weather forecasting for transatlantic flights and subsequently established their reputations in the British Meteorological Service and World Meteorological Organization.

The Croydon group became expert in Atlantic marine meteorology and when McTaggart-Cowan was posted to Newfoundland in 1937 to head up its meteorological services, he brought his marine and European climate expertise with him which then had to be passed on to his Canadian-trained colleagues who were more specialized in continental meteorology.

### **Flying Boats!**

Experimental transatlantic flights began in 1937 with a Pan Am flying boat departure from Botwood, Newfoundland, to England and an Imperial Airlines "Empire" flying boat out of Foynes, Ireland. These flights and others that followed marked the beginning of transatlantic aviation but at this point no mail or passengers had been carried. The "Empire" flying boats had no room for cargo when carrying fuel for the crossing. To solve the problem the British piggy-backed a powerful four-engine float plane on a flying boat for launching (see front cover), a procedure developed by the Mayo Composite Aircraft Company. In July of 1938 the seaplane "Mercury" was carried out over the coast of

Ireland on top of the flying boat "Maia" where she was launched under their combined power. "Mercury", flown by Don Bennett, flew non-stop to Montreal carrying a load of mail and newspapers, the first ever commercial air mail cargo flown across the Atlantic.

In-flight refuelling techniques were also practised with the flying boats in order to increase their range. By doing so, such aircraft did not have to land in Ireland flying to England or in Newfoundland on return flights.

The early experimental flying boat flights from Newfoundland were conducted initially by pilots from Imperial Airways and Pan American Airways and then later by American Export Airways. The Germans also successfully conducted flying boat exercises from a mother ship in the Gulf of St. Lawrence using the meteorological forecasts from Gander and Botwood. The Italians were in the act as well with flights of military aircraft across the northern part of the North Atlantic through Hebron on the Labrador coast, again using Newfoundland weather forecasts for the Atlantic.

"Wrong-way" Corrigan, the American aviator who filed a flight plan from New York City to San Francisco and ended up flying the Atlantic availed himself of the forecast services from Newfoundland by asking about Atlantic weather on his fly-over. His identification marks were spotted, leaving little doubt as to who he was and what he was up to.

The French were also flying a huge flying boat, the "Latécoère", across the Atlantic using the weather services from Newfoundland. This aircraft was described as being built like a cruiser with six engines, requiring about five miles of open water to get airborne, but once up it could fly a phenomenal distance. The plane was of such a size that it had an open deck on the outside of the hull to allow the crew to handle anchor chains.

Construction of a land-based airport (Gander) was already under way in 1937. At that time, the main forecast office was located at Botwood, the flying boat base, but in December 1938 the meteorologists along with the communications group, about fifty men in all, were moved to Gander in expectation of land-based aircraft that would start flying overseas by the summer of 1939. Botwood continued to serve the flying boats, making it necessary to maintain two forecast offices. In those days there were no teletype or facsimile services and weather reports had to be relayed by radio morse code to Botwood. A twenty-four hour service was run for all flights, or until the flight was past the point of no return over the Atlantic, or control was turned over to New York or Boucherville, Québec.

## Meteorological Products

A full set of weather maps and forecasts were made every day for the flying boats. The only break came when flying operations had to cease due to ice build-up on the wings from propeller spray. During the winter months the staff were then busied improving their knowledge of winter weather, how to forecast it, training and trouble-shooting observing stations.

What was practised during the transatlantic flight trials were the procedures and protocols worked out at Croydon. As meteorologists and pilots on both sides of the Atlantic gained experience in weather forecasting, ocean flying and exchange of terminal data, the procedures were carefully refined and improved. It was a very deliberate process, bearing in mind that only morse code radio communication existed. There was no voice contact between base and aircraft and base to base. The methodologies that evolved from these trials continued right into the war years.

In practice the staff at Botwood would go aboard the aircraft with weather maps in hand and be briefed by the crew on weather conditions encountered. McTaggart-Cowan was on a first-name basis with many of the pilots some of whom were his colleagues in the Croydon group; they were the cream of the Imperial Airways pilots and, like McTaggart-Cowan, totally dedicated to see a successful conclusion of the trials. He was known to them as "McFog".

The first intended land-based aircraft scheduled to fly the Atlantic was the British-built, all-wood "Albatross". Unfortunately, it broke its back on an overload test before it ever flew the Atlantic. The next aircraft slated to fly was a French Farman-built aircraft but war broke out and the flight was first delayed then cancelled altogether; the plane had the range and could have flown the Atlantic quite handily.

## War Time

Transatlantic flying was on a very small scale by the time war broke out; there were virtually no ground support systems, or radio aids to navigation. Flying boat operations ended in October because of icing conditions. When war broke out the two British flying boats, the "Caribou" and "Cabot", were taken into service by the RAF and British transatlantic flights came to an end. Pan Am turned its attention to the Azores. Oddly enough, transatlantic flying received no military attention until the tide of war turned against Britain in the Atlantic.

In the fall of 1939 the fate of Atlantic aviation hung in the balance. On one side were the three individuals at Gander determined to prove that Atlantic flight was possible and practical: McTaggart-Cowan, Pattison, an RAF Squadron Leader, who was the senior Operations

Officer in Newfoundland, and Feaver, a senior communications officer. They believed that flying the Atlantic was going to prove to be a critical factor in the war.

The British and Canadian governments on the other hand, were of another opinion and instructions were issued by the two governments that operations were to be wound down at Gander and the runways mined in the event the Germans attempted to use them.

Needless to say, the meteorological staff at Gander were dumbfounded by the decision to "close down" Gander. To maintain some semblance of activity, the staff busied themselves with observational records and maintenance of equipment. Incomplete interim reports were issued and winding down activities were stalled. The situation continued into the spring of 1940 when the RCAF in Halifax realized its Digby bombers used for anti-submarine warfare lacked the range and were ineffective for patrol off the coast of Newfoundland. This situation resulted in a request to use Gander as a base for anti-submarine patrol.

This British position to close down Gander was not too surprising in view of the opposition of the British Air Ministry and the RAF to the creation of the Atlantic Ferry Service in the belief that it was suicidal to fly aircraft across the North Atlantic in winter. It eventually took Lord Beaverbrook and the Ministry of Aircraft Production to push the opposition aside and set the wheels in motion to organize the transatlantic service.

The "re-opening" of Gander was welcome news with the arrival of the RCAF No. 10 Bomber-Reconnaissance Squadron. By this time transatlantic flights were on again and Taffy Powell, a colleague of McTaggart-Cowan's from Croydon and a seasoned flying-boat captain with Imperial Airways, arrived to take charge of ground operations in preparation for transatlantic bomber flights. The meteorological section at Gander, including McTaggart-Cowan, were made available to the ferry service and he became the ferry service's chief weatherman in North America.

The first flights were organized by the Canadian Pacific Air Services under Powell who had been loaned to them by the RCAF. All flights were controlled by Powell and McTaggart-Cowan. McTaggart-Cowan would present the weather conditions for the North Atlantic while Powell had the authority to say "go" or "no go". Later on Powell convinced Patterson that McTaggart-Cowan should be seconded to the RAF. Don Bennett, the pilot of the seaplane "Mercury" and another colleague of McTaggart-Cowan's, was sent to Canada as flying superintendent; he was instrumental in overseeing the delivery of the first aircraft to Britain and personally tested the pilots and radio operators who had to qualify for ferry service.

In the early part of the war, civilians and private companies were ferrying aircraft overseas; the original pilots were from Imperial Airways and "pilots of fortune" from all over the world who received handsome pay offers of up to \$600 a flight with two trips a month guaranteed, plus expenses.

The first land-planes across the Atlantic were Hudson bombers. Everything had to be stripped out of the cabin to provide for additional fuel tanks to give them the range. At that time there was only a handful of civilian pilots and RAF navigators and the decision was made to send them off in groups of seven with one navigator in the lead aircraft. They were supposed to play follow-the-leader across the Atlantic. McTaggart-Cowan and his colleagues knew this was an impossible task especially on night flights. Despite their misgivings they prepared detailed forecasts and flight plans with compass headings for each of ten zones covering the Atlantic. The first transatlantic delivery attempt of six Hudson bombers was undertaken on November 10, 1940, with Bennett as the leader and designated navigator.

Routes were picked that kept the aircraft south of the centre of any pressure depression so if the storm was deeper than anticipated, they would first drift south and then drift north. The pilots were never aware that they had been off course because it was self-correcting. Self-correcting courses were a necessity since the planes could be off-course within an hour. On no account could the planes get north of the centre of a depression because if they encountered head winds they would simply not make their destination. The range capabilities of the Hudsons were that marginal.

### Limited Instrumentation

It was a miracle that the pilots ever found their designated landing fields; there were virtually no navigational aids in place for the approach to Britain. One small marine beacon on Storrey Island, a little rock off the north coast of Ireland, served as the only aid to home on. In thinking back from the time of his interview with Dave Phillips, McTaggart-Cowan thought it signalled for only two minutes out of twenty minutes!

As the number of flights increased there were many stormy rows with security people in Britain over the location of additional navigational beacons and the use of cypher language or plain English. Finally, a beacon was approved and set up at Durnacross for incoming aircraft and the pilots were able to receive information in plain English.

The tempo of the overseas operations increased incessantly as more aircraft appeared on the scene for delivery; the shortage of experienced pilots emerged as a critical factor. The resolution of the problem was far

from simple and not without acrimonious debate, but eventually the civilian operation was turned into the RAF Ferry Command with remarkably few changes of the personnel involved. It came into existence in July of 1941. The gain in the changeover was the increased size of the aircrew pool.

The success of the airlift operations depended on the skills of the weather forecasters and the trust that grew with the operational people. Each one played a role in the decision as to whether flying was a "go" or "no go".

By war's end almost ten thousand aircraft were successfully ferried across the Atlantic Ocean but in so doing some five hundred aircrew and sixty passengers lost their lives in accidents. Tragically, Sir Frederick Banting, the co-discoverer of insulin, was killed in the very first fatal crash of the ferry service.

### Job Well Done

As the need for meteorological services wound down, McTaggart-Cowan was assigned to the Canadian team involved in the establishment of the International Civil Aviation Organization (ICAO). He served as the Secretary for the Air Navigation Commission of ICAO. He was later appointed Director of the Canadian Meteorological Service in 1959, a position he held until 1964. From there, he was appointed the founding President of Simon Fraser University and later the Executive Director of the Science Council of Canada. He is now retired and lives in Bracebridge, Ontario.

### References

Christie, Carl A., 1995, *Ocean Bridge - The History of the RAF Ferry Command*, University of Toronto Press, 458 p.

Thomas, Morley K., 1996, *Forecasts for Flying*, ECW Press, 264 p.

About the author: After having completed an impressive career with the Federal Department of Fisheries and Oceans and having played a major role as an oceanographer both on the national and international scenes, Dr. Neil J. Campbell is now the Executive Director of the Canadian Meteorological and Oceanographic Society.

Quelques mots sur l'auteur: Après avoir complété une brillante carrière au sein du ministère fédéral des Pêches et Océans et avoir apporté une contribution importante autant sur la scène nationale qu'internationale en tant qu'océanographe, le Dr Neil J. Campbell est présentement le directeur-exécutif de la Société canadienne de météorologie et d'océanographie.