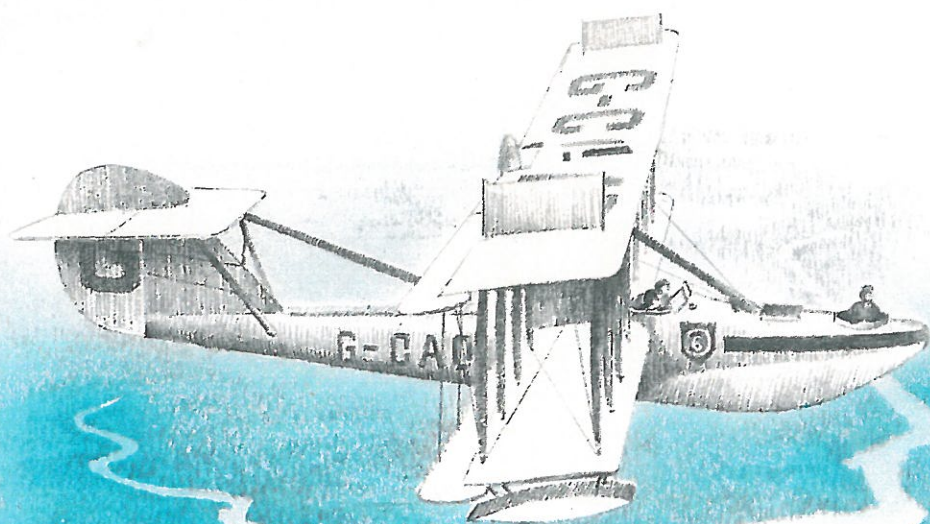


THE FIREBIRDS

BY BRUCE WEST



How bush flying
won its wings



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In 1944, a revolutionary new idea in the aerial suppression of forest fires was born within the O.P.A.S., later to be taken up and implemented in forest protection by virtually all countries which had the means to use it and the kind of fire problems to which it could be practically applied. The idea at first occurred in a casual kind of way, as such inspirations often do. Carl Crossley, a veteran Air Service pilot, was sitting around chewing the rag one day with Pete Marchildon, the District Forester at North Bay. Pete had been reading the newspaper reports about all the heavy bombing raids which were then taking place in war-torn Europe.

"You know, Carl," Pete remarked. "It seems to me that if we put our minds to it, some way could be worked out to bomb forest fires the same way things like bridges and factories are being bombed over there in the war. Only with water, instead of explosives. You know how a small fire — like the kind you get in a *chicot* sometimes after it's been hit by lightning — will sometimes smoulder away

in some hard-to-get-at spot for days and then be fanned into a *real* fire by the first strong wind, before it can be put out by men trying to get at it overland in some place a long way from any lake where an airplane can land. Supposing you could just fly over that danger spot dropping water on it until it was doused . . . Seems to me lots of small fires could be put out like that, before they could get away on us . . .”

At first Carl Crossley thought Pete’s suggestion was a little far-fetched. After all, using “bombers” to put out fires, instead of starting them! . . . But the germ of an idea had been firmly planted in his ingenious bush pilot’s mind during that casual chat and the more he thought about it the more exciting it became.

Now, how would you go about a thing like that? Carry some water in a tank in the airplane? Or in a tank slung in some way under the belly of the machine, between the struts of the landing gear? Crossley thought about it and thought about it, from many different angles. Jack C. Dillon, who was Forest Fire Control Officer at headquarters in Toronto until his retirement in 1961, and has recorded many interesting pieces of history concerning the Lands and Forests Department, described in this way how the idea that had been bothering Carl Crossley began to jell one day in 1944 while he was flying over Algonquin Park in the KR-34:

“He encountered a mild weather front which held a bit of rain and generated some lightning. As he entered the disturbance, he noticed a small fire, just getting started and quite possibly, caused by the lightning. He had no radio to report it so he continued to his destination. On the return flight, he noted that the fire seemed to be completely subdued. He reported it to the park officials on landing to refuel, but that bit of light rain sort of spelled out the Marchildon suggestion a bit more impressively.”

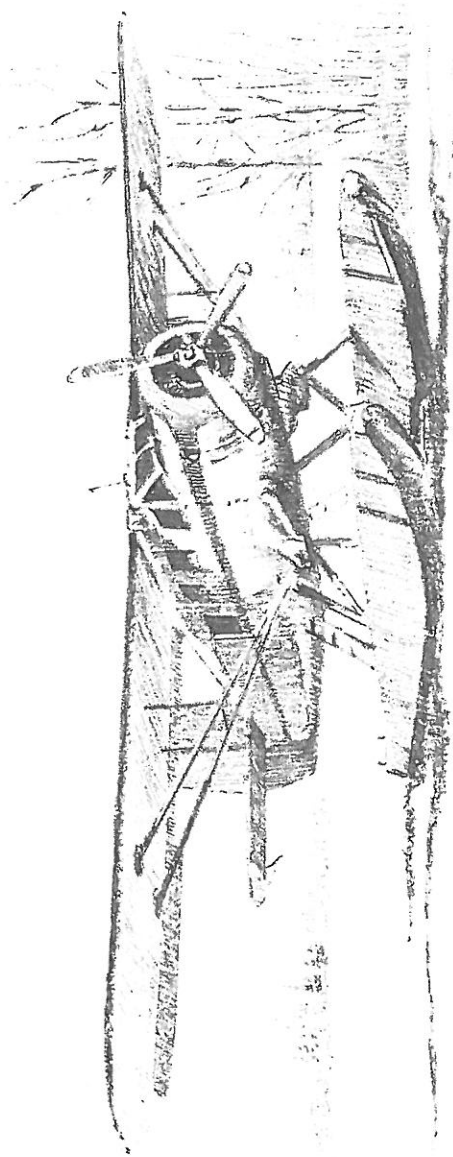
Crossley decided to do some experimenting, making use of the little KR-34. He installed a 45-gallon steel drum in the front cockpit, into the bottom of which he had welded a 16-inch length of pipe, three-and-a-half inches in diameter.



Carl C. Crossley

"This pipe extended below the fuselage and was intended as a sporkel'," Dillon relates. "From that protrusion, with the use of elbows and nipples, he made a further extension which carried the inlet to a fixed point adjacent to the float water rudders. He planned to inject water into the barrel while taxiing. Although this idea worked fine on his initial test — in which he managed to fill a canoe being towed along on the water beside the float — he found he could not create quite enough pressure while taxiing to drive the water up to the barrel in the cockpit."

But Crossley wasn't about to give up his promising idea just because he hadn't managed to work out such details as quick and easy water pickups. Phil Hoffman, who was then Chief Ranger at Timagami, the scene of these early experiments, suggested that Crossley just forget for the time being about the snorkel system and merely fill his water barrel up with a fire pump and get along with the tests. Which he did.



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A small brush blaze was started, to be the target of the trial run, and away went Crossley in the KR-34 to make firefighting history. On his first pass over the target, with the water rather feebly spraying out of the drum in the front cockpit, Crossley missed it clean. But on the next couple of tries — guided by some hand signals from Hoffman and Crossley's air engineer, Rene Simard, down on the ground, he hit the small fire fair and square on each pass, soaking it into almost complete extinction (and in the process, thoroughly wetting down Simard, who had been standing a little too close to the bullseye.)

It was at least a beginning, and a fairly encouraging one, at that.

"One must bear in mind," wrote Dillon, in describing this historic occasion, "that no one had carried out such an innovation previously. There existed no text books or set of directions to follow and therefore each step was pretty elemental, but none-the-less a concrete advancement of the plan. Frank A. MacDougall . . . flew into Bear Island a few days later and during his visit had a chat about the experiments with Carl, Rene, Phil and Frank Miller, Forest Protection Supervisor at North Bay. Out of that get-together a major idea emanated. MacDougall suggested to Crossley that he thought the idea might be better served by using the aircraft *floats* as a water container, rather than the barrel."

During the fall and winter of 1944-45 Crossley busily went about the job of refining this new water-dropping idea, in the Air Service shops at Sault Ste. Marie. He sized up the various available aircraft and decided that the sturdy and reliable workhorse, the Noorduyt Norseman, with its 600-h.p. Pratt & Whitney power plant, would be the best machine for the job. Next he made detailed drawings of the equipment he wanted to install in the Norseman's floats, such as a scoop-up gear for water-loading, a release mechanism, and the required baffling in the pontoons. A set of pontoons was then sent to the plant of the float manufacturing company of MacDonald Brothers, at Winnipeg, together with Crossley's detailed drawings, where the necessary changes were made and the special

equipment was installed. A Norseman was then flown to Montreal (to the Noorduyn plant) where, guided by another set of Crossley's plans, the controls for operating the water-dropping gear were fitted into the cockpit in front of the pilot's seat.

"This took time," wrote Dillon, "and it was not until August 25, 1945 that the Montreal work was finished and on that date Carl flew the Norseman to Timagami. He was now all set for action and did not have long to wait. With each float properly baffled and capable of holding between 54 and 55 gallons, which was scooped up in a matter of seconds while taxiing and took only nine seconds to jettison, Crossley had an aerial fire engine at his disposal."

On the very day after Crossley's arrival at the Timagami base from Montreal, a lightning fire was reported to Bill Adair, Chief Forest Ranger at Elk Lake. It was located in a comparatively inaccessible area in hilly country, and was made to order for such an event as the first real test of a specially fitted water-dropping machine. Crossley was more than willing to oblige when he was asked to see what he could do about the awkwardly-situated blaze.

"Carl made three drops over the fire, which was crowning on a ridge," wrote Dillon of that break-through day in a whole new technique of aerial firefighting. "This point he tackled first and then proceeded to douse the remaining area, which he described as being about 300 feet in length and approximately 30 to 40 feet in width. Rangers got into the fire that night and found it completely dormant.

"Well, that was the start, and then followed numerous tests on fires fed with various types of fuel. I was present at some and considered the idea workable and effective. In fact, I have always felt that any time we could get water on a fire from the air, whether it be created by man or nature, we were making suppression headway fast. R. N. Johnson, Chief of the Division of Research, was also present during the tests and held the same opinion."

Yet, for some reason, this water-dropping method

wasn't fully utilized until some time after these first successful experiments had been completed. Interest of the Air Service seemed to stray from the float-tank system and move for a while toward another method, which seemed much more simple and less expensive — except that it didn't work very well. This involved the dropping of actual water bombs upon the fires. These bombs consisted of special wet-proof paper bags containing about three-and-a-half gallons of water. At first, they were dropped one at a time through a hatch in the floor of the aircraft, with the idea that they would break open and shower the fire with water droplets upon impact with the ground. The trouble with this system was that if the first bag missed the target or didn't have much effect, the aircraft would have to circle for another pass before dropping the second one. The method was then improved, somewhat, by fitting the aircraft with a roller-equipped chute device down which several bags of water could be dropped by a single salvo as the machine flew over a blaze. But this evidently didn't work out very well, either, and the whole idea was finally discarded. One drawback of the water bombing method was that occasionally, when a drop scored a direct hit upon a smouldering fire, the resulting impact of a solid 35-pound blob of paper-enclosed water hitting a bed of embers, scattered them for yards around in all directions, and sometimes even started new fires in the underbrush, if they were thrown far enough.

Although it probably didn't have anything to do with the final assessment of the water bombing system, one incident during the experimental stage of the project did give Pilot Reg Parsons some guilty concern for a while during a test flight one day at Sault Ste. Marie. The discharge mechanism for the water bags would sometimes start dropping them on its own unless the hatch in the aircraft cabin's floor and the release device were securely closed and locked. On this particularly embarrassing occasion, Parson's aircraft suddenly started discharging water bombs just as he was making part of his take-off circuit across the river over the American Soo. Fortunately, the water-filled bags landed in various backyards

doing nothing more harmful than watering the grass. But Parsons shuddered for some time after that whenever he thought of the international complications which might have followed had the accidental bomb salvo made a shallow mockery out of the highly-touted undefended border between Canada and its friendly U.S. neighbor by splashing a wet and startling pattern of bursting water bags right down the main street of the American Soo!

At any rate, the water bombing method was finally given up and even then some years were to pass before serious attention was again given to the "spray" system which was eventually brought to the present high state of refinement by the introduction of various improvements. At least one O.P.A.S. pilot who was thoroughly sold on the water dropping method, and doggedly went about trying to prove its worth at every opportunity, was Tom Cooke, present Director of what is now known as the Air Service Branch of the Ministry of Natural Resources.

Following the pioneer trail blazed by Carl Crossley, Cooke went about the task of trying to develop some method by which the water could be dumped more quickly from an airplane in one mass, instead of spraying out in relatively feeble fashion from small openings in the rear of the floats, as was the case in the system achieved by Crossley at the point where the project had been temporarily abandoned. The first try at a better method was the study of the possibility of fitting the cabin of an Otter with a large tank situated near the aircraft's centre of gravity which, by the opening of a gate, could dump a concentrated load of water out the side door. The big problem associated with this idea, however, was to work out some practical way in which an opening in the side of the tank large enough to rapidly dump a large quantity of water could effectively be sealed when the tank was full. A gate which opened outward would present considerable difficulties when it came to keeping the water intact without leakage until it could be dropped. On the other hand, a gate which opened inward also presented a problem. The same water pressure which might keep it



Thomas C. Cooke

firmly closed could also make it extremely difficult to open in the rapid way needed to discharge a sufficient volume at the precise moment when it was required during a fast pass over a fire.

Cooke did a lot of pondering and head-scratching about that, and even had a wooden mock-up produced on an inboard tank. But try as he would, he didn't seem able to come up with a really satisfactory solution. Then one day air engineer George Gill, during a coffee break in the Soo hangar, casually offered a suggestion which may have been based on an earlier discussion with George Phillips. At any rate, Gill's remark to Tom Cooke, over that important cup of coffee, offered a brand new and startlingly simple approach to the whole matter.