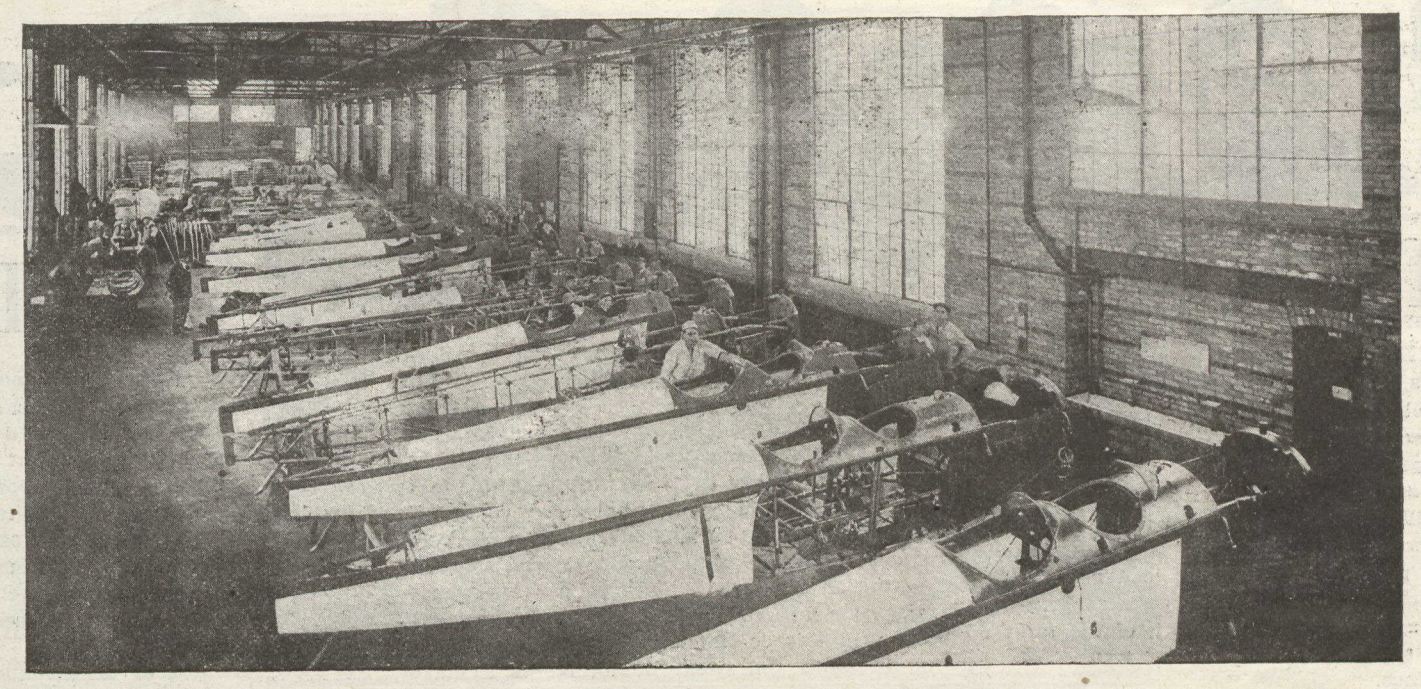

Canada's Conquest of the Air

MANY Facts in Few Words about the Astonishing Progress of Aviation in this Country. The Business of Airplane-Making as Illustrated by the above Photograph of—just a few—has Kept Pace Tremendously with the Art of Flying.

By GEORGE W. AUSTEN

HOW many Canadians know that the first airplane flown in the British Empire was flown in Canada? Or, that, in the summers of 1915 and 1916 six hundred Canadian young men were graduated as flyers here, entirely through private initiative, and on Canadian-made machines? These flyers—Canada's first contingent to the R. N. A. S., and the R. F. C.—then formed almost one-half of the British service. And how many know that, even if Canada is now turning out about 14 flying machines a day, and training many, many thousands of aviators, several years ago battle-planes were manufactured here, and sent to the Western front? These were of the double-engine, double-propeller type, the prototype of the great Italian Capronis and the American Liberty planes. The real accomplishments of Canadian aviation enterprise and skill, have not been paraded abroad, for very good reasons. This country has played a part much bigger than it is given credit for. Even now, one-fourth of the entire British flying corps on land and sea is composed of Canadians.

The Imperial Munitions Board now has in hand the production of airplanes, and the supplying of the numerous training camps of the Royal Flying Corps in Canada and the United States. Here is the brief history of that. In the early part of 1917, it took nine acres of vacant land, and erected a factory with 136,000 feet of floor space, and now housing 2,200 employes. In December, 1916, it took over the plant of the Curtiss Aeroplanes Company—the real pioneer in the field—and in the following February the Curtiss school. Out of the one it organized the new plant, and out of the other the R. F. C. training system. What was, in the first two years of the war, a small but growing airplane industry and school, privately managed and financed, blossomed out under British Government auspices into a tremendous adjunct of the British air service. Ten millions have been spent on plant and training grounds, and this spring about ten thousand flyers will be training at the half dozen camps in Ontario.

The pioneer in this Canadian aviation work was Mr. J. A. D. McCurdy. The Wright Brothers in 1903 had made the first flight with a heavier-than-air machine. They did nothing more in this line until about 1908. Mr. McCurdy saw the possibilities of flying, and in 1907 began experiments at the home of Alexander Graham Bell, at Baddeck, Cape Breton. By 1908 he had four machines, and though they were crude in some respects, yet they pointed the way. The propeller, for instance, was at the rear, instead of in front doing tractor duty. In 1912, the America, the hydroplane built to cross the Atlantic by the Curtiss organization, emphasized the possibilities of air-travel, and Mr. McCurdy put in most of his time, flying for exhibition or experimenting. His first hydroplane came in 1911.

Then came the war. Mr. McCurdy established a school at Toronto Island for hydroplanes—the machines with a boat bottom—and one at Long Branch for land machines. On Strachan Avenue, in Toronto, the Curtiss Aeroplane factory was established, and there were built the four hydroplanes and seven land machines used in the schools. There were seven instructors for these. In this factory, also were built the big battle-planes sent overseas. The first big one was named the "Canada." It had two engines, each of 240 horse-power, capable of 107 miles an hour. Considering that the Rolls-Royce, the favorite in Britain out of 32 types of British engines, now develops about 270 horse-power, and will make, in a suitable body, about 135 or 140 miles an hour, the "Canada" was not so for inferior, even as planes now go. The engines were, of course, brought from the United States. It is only now that Canada is making engines, about a thousand of them being in hand. While training his hundreds of students—with never an accident—Mr. McCurdy went to the Government at Ottawa repeatedly, but he got practical help only from the Duke of Connaught.

FINALLY, in the autumn of 1916, Mr. McCurdy went to England, with a letter of introduction from Premier Borden. There he outlined the great work his private organization was doing. The cost of the plant he was handling was a million dollars. The British Government saw the point, and through the Imperial Munitions Board—its Canadian organization—decided to take over the Curtiss organization lock, stock and barrel. The organizer and president of the Canadian Cartridge Company, Mr. Frank Baillie, was selected to head the new aviation concern. Such was the organizing ability put into this, that, even starting in 1917, a thousand airplane bodies were completed within the year. In 1918 its output is about 300 a month. The machines are, of course, for training purposes. Without the engine, the value of a training machine of the type produced is about $4,500. The engine is valued at about $3,000. The output of bodies alone, therefore, represents an industry of about $1,350,000 a month, or nearly $17,000,000 a year, not including the big item of repairs and parts for the machines in use. Training machines have an engine of about 100 horse-power, and make about 75 miles an hour. They are a little less than 40 feet across the wing, compared with 97 feet in the battle-plane "Canada." They weigh 1,250 pounds with the motor, and 950 pounds without. In each plane is 400 square yards of linen, about 400 fee of wire, about 400 board feet of spruce. The body of even such a moderate-sized machine contains 3,000 parts!

Making an airplane is not, as many people seem to think, the slapping together a few pieces of wood, metal, wire and linen.

The spruce, for instance, comes from British Columbia. Nearly three-fourths of a million dollars worth of spruce every month is required for airplane purposes from there. To get the flawless pieces required, about 4,500 feet have to be inspected to yield a final 400 feet. Even then, it is impossible to get perfect pieces of the thirty or forty foot lengths required. Three short pieces are joined together in as pretty a bit of workmanship as a cabinet-maker would wish.

The ash required for the fuselage, or long body, is bent in a steam-chest. It also is inspected and tested at every stage. Everything is tested. Large machines pull wire rods, aluminum sheets, metal pieces, until they break. Turn-buckles, bolts, braces, etc., are smashed. There are no such uncertain things as castings. All metal parts are either cut out of tested metal sheets, turned to shape, or are forged out of 3½ per cent. nickel steel. Not a piece of wood is left to lie unbound in a metal socket. The end is first covered with a metal cap, put on with great care, then set into the socket.

THE linen is flawless. It is slipped over the wing frames like an envelope. In the "doping" room it is covered five times with the varnish solution that makes it weather proof. Individual knots along the frames and cross-supports prevent a break in any one place from loosening the linen in any other part of the wing. Both oxo-acetylene and electric welding are used to make solid metal work. Girls are employed at the electric welding. The propellers and other fine wood work are "laminated"—that is, four or five thin layers are glued strongly together.

Yet the whole organization that turns out 300 airplanes a month, at a value of $25,000,000 a year, has been devised and carried through by Canadians. It is a far cry in airplane manufacture from the day in 1909, when a Canadian machine won the Gordon Bennett prize for speed in France, by making 47 miles an hour.

According to the latest report, in April four thousand cadets of the Royal Flying Corps will be returning from Texas to the Canadian camps. It is expected that ten thousand will be in camp altogether, along with seven hundred United States flyers. A new camp for aerial gunnery and fighting is expected to be located at Beamsville. Since on the Western front there are fighting machines that carry three guns and five men, the development of the fighting side of flying is as important, in many respects, as training in the operation of a machine.