

hundred yards. They also used it in the construction of pill boxes, which formed the framework of their defence system in the Flanders area, where it was not possible to make a dugout. These pill boxes were a very hard nut for us to crack in the third battle of Ypres, 1917.

We favored the Champagne type of emplacement. This consisted of a tunnel, often running one hundred yards or so out from a living trench, and coming up to the ground in a six-foot opening, carefully camouflaged. The crew would live in the tunnel with their guns and ammunition supply; and when the hostile attack developed they would take up their position in the opening, a place entirely unsuspected by the enemy. Some hundreds of these machine-gun emplacements formed a large part of our defences in the Lens area. In the latter part of the war, when the fighting became more open, the main defence consisted of a loose pattern of machine-gun strong points. These were simply circular pits, dug into the ground, camouflaged whenever possible, and of a sufficient size to hold the crew and ammunition.

Mining and Tunnelling

I have made reference to a mining and tunnelling detachment with the engineers. Defensive mining was carried out to protect our lines from attack underground by the enemy, and to ascertain his whereabouts underground, and his intentions. This form of warfare began in 1915; was very popular in 1916; and ceased in 1917, when we got the upper hand along practically the entire front.

The tunnellers would dig down into the ground and burrow along until they heard the hostile miner working. Listening sets were installed and incessant watch was kept. When we concluded the enemy was in a position to blow his mine we would endeavor to anticipate him. In such close proximity have the miners worked, that our listeners could frequently hear the Boches talking; and on several occasions we quietly broke into their tunnels, killed their miners, carried away anything that was valuable and destroyed the workings.

Offensive mining is carried out to attack the enemy's workings; to destroy enemy strong points; to defile the fire from machine-gun nests which cannot be reached; to break a hole through the enemy's first defensive system; to blow communication trenches intended to connect our system with his; and to provide for our own troops a passage covered from view.

An attack of ours in which mining played a great part was at the battle of Messines, on June 7th, 1917, when we blew up, on the Messines and Wytchaete front, some twenty miles, practically destroying the enemy front-line system and so shocking the defenders that rapid progress on our part was possible. So completely did we demonstrate our superiority in mining in that battle that thereafter the enemy practically ceased this form of warfare. The decision was greatly welcomed by ourselves, because we believed that insignificant results were obtained from the enormous amount of work entailed. It was a form of warfare forced upon us by the enemy, and one which we most gladly gave up. The Canadian Corps had a good deal of experience with mining activity on the Vimy front, Hill 60, Hooze and Mont St. Eloi front.

Mining at the "Bluff"

Up to June, 1917, the day on which the battle of Messines was fought, the largest mine blown by either the Germans or the allies on the Western Front was blown at the "Bluff" during the latter part of July, 1916. The events in connection with this form an interesting story.

In February, 1916, the Germans had blown a mine under that portion of the Bluff nearest to their lines. It might be well to explain that the Bluff is the spoil bank from the Ypres-Comines canal. Immediately upon blowing the mine in February they attacked and seized the Bluff; were counter-attacked several times in the following few days, but unsuccessfully. They remained in possession of the Bluff until the next month—March—when they were driven off. The casualties on the British side, resulting from the operations in

February and March at this particular point, were about 4,400.

The Canadians took over these lines about the first of April, the 2nd Division extending their line northward, including Mount St. Eloi and up to the canal; the 1st Division, from the canal, including the Bluff, up to Mount Sorrel; and the 3rd Division, from Mount Sorrel to Hooze.

Towards the latter part of May the 1st Division turned over Mount Sorrel defences to the 3rd Division, and it was in this area the Germans made their very violent attack on June 2nd.

To enable the 1st Division to make the counter-attack, their troops were withdrawn from the Bluff sector, which was turned over to the 2nd Division, the 1st Division not getting back to that area until the latter part of July.

On resuming responsibility for the Bluff area, I sent for the mining officer and asked him the mining situation on the front. He informed me that we were almost sure to be blown underneath the Bluff, and that we might be blown under the Bean and Pollock. Upon this information, instructions were immediately issued to the brigade concerned, to hold the Bluff as lightly as possible, to prepare a crater-jumping party, to place additional machine-guns in position to cover the area in front of the Bluff, while the artillery were asked to lay their S.O.S. night lines to cover the Bluff. The brigade reported at 8 o'clock one evening that the instructions given had been carried out, when, strange to say, the Germans blew their mine that same night at 10 o'clock, making a crater 450 ft. long by 160 ft. wide.

A Canadian Victory

Before the earth had fallen, the crater-jumping party were on their way to consolidate the crater, the machine-guns immediately opened up, while all the artillery in the division came down with a crash on "No-Man's Land." The Germans, no doubt anticipating the same measure of success which accompanied their former effort in February, left their trenches in large numbers once more to seize the Bluff. They were caught in the machine-gun fire and barrage, and suffered very heavy casualties. This annoyed them very much, and they opened a heavy bombardment on our lines which they kept up practically all night. We were fortunate in getting off with only 42 killed and wounded during that night's operations, a very small number when compared with the number it had cost to hold our lines intact in the previous February and March.

There is another curious co-incidence in connection with this event: Shortly before 10 o'clock on the night in question, a young engineer officer, accompanied by a wiring party of about fifteen, was on his way to put out additional wire entanglements east of the Bluff. The sentry on duty told him that he ought to be careful as the Germans were going to blow a mine. The engineer officer asked him when, and strange to say the sentry answered: "About 10 o'clock tonight."

The engineer officer wrote a note to his company commander setting forth what he had just been told, asked for instructions, and despatched it to his company commander. While waiting for the reply, the mine went up, and the orderly who was delivering the message was the only one of the party not a casualty. The message sent by the engineer officer in question to his company commander is on file.

The Germans were so disappointed in their intentions that they delayed re-opening their mining operations in that vicinity. Our miners, anticipating such a thing, went out to "No Man's Land," which was here some hundreds of yards wide, sunk a shaft and were fortunate enough to break into the German mine gallery, so that the works there definitely passed into our possession. Some may say that this was luck, but it was the luck that usually accompanies foresight, energy and initiative.

Accommodation

Leaving the question of engineer services in the active work of defence, we come to accommodation; and to appreciate this we must remember that the Canadian Corps