THE TESTING OF SHELLS AT PETAWAWA

When in Pembroke a couple of weeks ago a representative of the Toronto News visited Petawawa camp and was accorded the privilege of inspecting the Russian quarters there, as well as of witnessing the testing of shells by the Russian officials. In Monday's News appeared the following interesting description of what he saw:

Although it is not generally known by the Canadian public, samples of all the field-ammunition manufactured in Canada for the Russian Government, as well as much of that manufactured in the adjoining States of the Union to the South, are being tested at especially-constructed grounds to the east of the main buildings of the camp at Petawawa. These testing grounds are so complete in every detail that recently a party of United States engineers paid a visit to them and obtained plans and specifications so as to be able to duplicate it in the United States.

The plant was designed and constructed by Col. Mackie, a big, good-natured Scotchman—one of those men who appear to do big things as successfully and easily as the average person shells a peanut. Anyone can see at a glance that he takes a pride and delight in his work and knows it in every detail, from top to bottom.

An Ideal Location.

No better site for the testing-grounds could have been chosen than this beautiful stretch of country near the banks of the Ottawa. The nearest town, Pembroke, is 10 miles away, permitting of the carrying out of experiments with the greatest secrecy. Night and day the camp guards are on duty, challenging everyone who comes within two miles of the grounds. Beyond the soldiers, the prisoners, and an occasional deer, which wanders into the camp site, no one even hears the boom of the big guns as they hurl the three-inch shrapnel shells across the four-mile range. Even the blue ridges of the Laurentian Hills, stretching away in the distance, are too far away to throw back the echo of the discharge. Petawawa Camp was designed by Nature as a testing-ground for ammunition, where secrecy and a wide stretch of country are both necessary.

90 out of 25,000.

Only three-inch shells are tested at Petawawa. When manufacturers have completed a batch of 25,000 shells they are set aside for testing. Ninety of such shells are picked out, indiscriminately, and packed off to Petawawa. Here they are loaded on the camp laboratory, and next day are ready for testing. If the test shows only a certain number of defects, the word goes forth, "Let the shipment go," and it is sent on its way to Russia. If they are faulty, the necessary changes are ordered. But it is a fact that the quality of the shells has been an agreeable surprise to the authorities, very few being defective, either as to workmanship or material.

Targets Four Miles Away.

The gun-house is placed on a ridge overlooking a valley. Away across the valley, on the hill at the other side, are the targets and the shelters for the men who watch the effect of the breaking. These targets are placed at from two to four miles away, and are almost invisible to the naked eye. Shooting begins about nine o'clock in the morning, at present. It is under the personal supervision of Col. Mackie. The long, gleaming shells are placed in the gun, the latter is trained on the target, by means of field glasses, and the word given to "fire." There is a roar, a flash, and then, away on the hills across the valley is seen the sudden puff of smoke where the shell has exploded. Is it satisfactory? That is for the men at the other end to say.

Where Moments Count.

These men are safely stowed away in their splinter-proof shelters, which are constructed of earth and look for all the world like mounds. Through little "peep-holes" the watchers see the effect of the bursting shell. How wide an area is covered by the flying bullets? Supposing that particular shell had burst over a German or Austrian trench, would the messengers of death take their full toll of lives; or would they fly off in a wrong direction and be wasted? Again, did the shell burst at the right moment? That is one of the most important points. If it burst a fraction of a moment too soon, it would hurl its contents into the trenches of the Russians, instead of passing over their heads and striking the enemy. If too late, the bullets would simply be buried in the earth behind the German trenches. Moments and fractions of moments count in the bursting of shells

Other Considerations.

Practically all of the shells used in the field are fired or exploded by means of a time-fuse. The making of these time-fuses is a most important and delicate operation. The time between the firing of the gun and the exploding of the shell is controlled by the length of the fuse or the time it takes to burn and reach the exploding charge. Two shells may have the same mechanism, yet there be some slight variation in the composition of the powder. As a result, one fuse would burn a fraction of a second longer than the other, and hence the shell would travel a longer distance before exploding. This must be guarded against, so the samples of powder are all carefully tested before the shells are "loaded."

How will the shell break? That also is an important point. Here is a sample which looks exactly like its fellows. It is taken to the exploding-chamber and an electric wire attached. This chamber is nothing else but a heavy cast steel cylinder constructed of sufficient strength to withstand the explosion of a three-inch shell inside it. The button is touched: there is a muffled roar, and then the chamber is opened. Plastered hard against the sides of the chamber flattened as flat as a fifty cent piece, are the bullets which were designed to help clear the way for the advance of the Russian infantry. The fragments of shell are then examined to see the nature of the steel and how it broke.

A Hit Every Time.

The accuracy of the firing at the camp is a marvel, although Colonel Mackie and his men make no boast of any superior skill. That little speck yonder, which can just be made out with the naked eye, is a target measuring six by six feet in area. How often can the gunners hit it at two miles? Every time. They would be disgraced were they to miss it. Six times out of six is the average.

The Russian gunners have a legend that their gun was "blessed by the Little Father, the Czar," before it was shipped over to Canada to be taken to Petawawa Camp. They point with almost reverence to the inscription on the piece, which, they declare, indicates that his Imperial Majesty really did pronounce a blessing on the gun.

Unique and Vital.

The quarters of the officers and men at the testing station are most modern and up to date. When Col. Mackie arrived on the grounds early last spring there was nothing but a wide stretch of bush and open ground stretching for miles and miles into the distance. To-day there are several comfortable brick dwellings, steam-heated, lighted with electricity supplied by a private plant, a big open fire-place in the living-room, and all appointments of the very latest. Day after day sees manufacturers from all parts of the country motoring out to see the tests of their own shells. In a word, out here in the wilderness has sprung up one of the most interesting and most vitally important plants to be found anywhere in Canada. Certainly there is none other of its kind in Canada. None so beautifully situated, and none which is playing such an important part in the big war now being waged in Europe. On the care with which the tests are made here at Petawawa may depend the safety of whole Russian armies. When faced with the hordes from Germany and Austria, Canadian ammunition, made in Canadian factories, and tested at the Canadian camp at Petawawa, will be used to throw the invaders back. The booming of these guns will be but the heralds of the thousands of guns which will hurl the shells against the trenches of the enemy. Well it is that the work is being done with such care and thoroughness. When the war is over, tourists will travel to this, where, for months, perhaps years, the Russian ammunition was tested before being certified satisfactory, and sent on its long journey to the front.

CAPT. CALDWELL PRAISES BOYS OF 21st BATT.

Capt. Thos. Caldwell, who is in charge of D. Company of the 21st Batt. in which are all the Pembroke boys who joined that force, writes as follows to his parents, Mr and Mrs T. B. Caldwell, of Lanark:

"The apples arrived in good shape and you never in your life saw anything disappear so quickly. Apples from home—from Canada—was enough. I cannot tell you how much that meant to us, situated as we are.

"We came into the trenches twelve days ago and stayed in the front trenches for seven days—rather a long stretch—the hardest we have yet put in. Such a time for rain and hail mixed; it certainly was trying and disagreeable. This made the trenches very bad—some places up to my hips. Of course I am short in the running gear, which in mud and water has its disadvantages. We have long rubber boots, "waders" we call them, and we are able in this way to keep our feet fairly dry. I told the boys we had given up the army and joined the navy; personally I don't know whether I should claim to be a diver or just an ordinary seamen. At the end of the seven days we went to the Brigade Reserve, where we rest