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The Engineers' Work at the Front in the War.

[The following article, compiled from information obtained from Canadian Engineers' officers, who have been at the front in Belgium and France, some of them having gone over with the Canadian Expeditionary Force's first contingent, will undoubtedly prove of considerable interest to a large number of Canadian Railway and Marine World readers, as many of the Canadian Engineers—officers, non-commissioned officers and sappers—were engaged previously in railway construction, maintenance, and mechanical and electrical work.—Editor.]

One of the trench descriptions of an engineer is: "One who always does his best; always finds still more work for the infantry to do; and often thinks he can make water run up hill." This no doubt originated from the perspective of the infantry and other combatant units get of the engineers' work. They realize that most of the engineers' work is for their protection and their comfort, and they therefore have a kindly feeling towards him, and concede that he is one who always does his best. This kindly feeling is tempered somewhat, however, by a feeling of exasperation, because the infantry are so often called upon to supply working parties to carry on various forms of engineering work. As is well known, engineering work in France is carried on by working parties drawn from the infantry, the pioneers and other units, each sapper (a private in the engineers) laying out, supervising, and helping the work of a working party of from 50 to 150 men. It therefore appears to the infantry as if the engineers were always finding still more work for them to do.

Men in the trenches are always conscious of water, mud or slush, depending upon the season of the year. The engineers always try to sight the trenches so as to get natural drainage to the front or rear, that is through the parapet, or through the parados, but this is not always possible. Sometimes the enemy objects, and makes certain positions so unhealthy that the engineers are forced to compromise in the position for the trench. At other times the nature of the ground along the ideal sighting for the trench is such that it is impossible to dig. For instance, the Somme battle fields have been ploughed up repeatedly by shell fire, and the ground is a mixture of mud, remains of wire entanglements, corrugated iron, steel beams, shells and other materials destroyed by our own or the enemy shell fire. Therefore a trench is often sighted, by necessity, where drainage is very difficult, and no wonder the infantry sometimes think the engineer counts on the water running up hill.

As in other branches of the service, the methods of carrying on engineers' work in France have been materially altered since the opening months of the war, first by the settling down to trench warfare, and second by the immense amount of engineer work necessitated by the style of warfare. In the original British Expeditionary Force the Royal Engineers were divided into two classes: 1st, Divi-

sional engineers, under which was allotted for each division 2 field companies, and 1 signal company. 2nd, Engineer units on lines of communication, comprising fortress companies, works company, railway company, signal companies, and printing company.

The works company was split up into sections, one being at each base. Assisted by French civilian labor contractors and by working parties from any infantry available, they erected base camps and looked after all work in connection with them, such as water supply, drainage, lighting, sanitary arrangements, road making, etc. They had to provide store accommodation for the large quantity of supplies and ordnance stores as they arrived. At present the function of these works companies is the maintenance and upkeep of all the base camps, and the work is very similar to the works department of any large city, with all luxuries eliminated. The fortress companies did not come into active use until the operations on the Aisne, and from that time their work was essentially connected with that of the field companies. In the Royal Engineers, army troop companies have taken the place of these fortress companies and are at the disposal of the chief engineers of the different corps, and their work is to assist the field companies in the construction of defensive lines.

Late in Aug. 1914, in the retreat from Mons, the field companies of Royal Engineers played the prescribed role of engineers in battle. They assisted the infantry in the preparation of defensive positions, and put special positions into a state of defence. They were kept very busy, collecting tools, such as spades, shovels, etc., from the neighboring districts. One test of a good engineer is his ability to "rustle" engineer materials and tools. Eight sections of field companies, each consisting of one subaltern, 20 sappers and a tool cart, were ordered to demolish the bridges over the Mons canal. Some of these were successfully demolished, while the Germans had possession of the others before the engineer section arrived.

Later on in the British advance, after the German defeat almost at the gates of Paris, the Royal Engineer field companies work changed, and they were engaged on engineer reconnaissance of roads, river crossings, demolished bridges, etc.; and at the River Aisne, five permanent bridges which had been demolished were at once made passable for infantry in single file and later repaired to take mechanical transport. Some idea of the work and material involved can be gathered from the fact that to make a satisfactory approach to one of the bridges over the Aisne, a road, about 200 yards long, had to be made. This necessitated collecting brushwood for the construction of over 2,000 fascines, their transport to the site of the bridge, and the collection of all available road metal in the neighborhood.

In his book, *The British Campaign in France and Flanders*, Sir Arthur Conan

Doyle pays a marked tribute to the Royal Engineers as follows:—"The more one considers the operations of the line of the Aisne, with the battle which followed it, the more one is impressed by the extraordinary difficulty of the task, the swift debonair way in which it was tackled, and the pushful audacity of the various commanders in gaining a foothold upon the farther side. Consider that upon Sept. 12, 1914, the army was faced by a deep, broad, unfordable river, with only one practicable bridge in 15 miles opposite them. They had a formidable enemy, armed with powerful artillery, standing on the defensive upon a line of uplands commanding every crossing and approach, while the valley was so broad that ordinary guns upon the corresponding uplands could have no effect, and good positions lower down were hard to find. There was the problem. And yet upon Sept. 14 the bulk of the army was across and had established itself in positions from which it could never afterwards be driven. All arms must have worked well to bring about such a result, but what can be said of the Royal Engineers, who built under heavy fire, in that brief space, nine bridges, some of them capable of taking heavy traffic, while they restored five of the bridges which the enemy had destroyed! Sept. 13 should be recorded in their annals as a marvelous example of personal self sacrifice and technical efficiency."

After this the campaign settled down to trench warfare, which the Canadian army had to handle when it arrived on the scene, and the Canadian Engineers have had experience only with trench warfare. There are now four Canadian divisions in France. The Canadian Engineer organization for this army is made up as follows: The Chief Engineer, Canadian corps, is a Brigadier-General. He has under him the four colonels in command of the four units of divisional engineers, each consisting of one divisional engineer headquarters, and three field companies. He also has directly under him all corps troop companies, and independent engineer officers attached to his staff, who do the miscellaneous engineer work required behind the general headquarters lines. Corps troop companies and the engineer officers attached to the Chief Engineer's staff, look after the installation of water supplies for all units billeted behind general headquarters lines; look after the construction of g. h. q. lines, construction of strong points between g.h.q. lines and subsidiary lines; special railway construction immediately behind g.h.q. lines for the use of the artillery; construction of all roads in the corps area up to the g.h.q. lines, and all main roads from there forward to the most advanced point of motor transport; also construction of artillery route roads, both highway and railway, for supplying the heavy artillery with ammunition.

The C. R. E., or colonel of divisional engineers, has at his command divisional engineer headquarters, three field companies, the ordering of the work of one pioneer battalion and one tunnel com-