LIGHT RAILWAY WORK IN FRANCE*

By Lieut. J. H. McKnight

DURING the Somme offensive in 1916, the advantages and importance of light railways were realized, and later in the year the Canadian Railway Corps was organized. At the cessation of hostilities, over 12,000 Canadian troops were engaged on railway work, besides 10,000 men from labor units.

Light railways act as arteries or distributors from the standard gauge railheads and bases of supply, which were from 6 to 15 miles behind the front lines. These railways are 60 cms., or nearly 2 ft., gauge. At first, rails 5 ms. long and 9 lbs. to the metre, were used and made in sections at the factory, the steel ties being riveted to the rail. These could be laid rapidly but were unsatisfactory, and a heavier rail of the same length, 15 lbs. to the metre, also made in sections, was used. The sections were connected by fish plates and bolts, and while satisfactory, took so much space in transportation that some other design had to be adopted.

Surveys Under Trying Conditions

A steel tie was designed 8 ins. wide, 4 ft. long, with edges flanged downward, and two pair of small rectangular holes were punched so that the base of rail would lie between each pair at nearly the required gauge. The ties were fastened to the rail by means of a bolt and clip which gripped the base of rail. The ties were shipped in bundles of ten, weighing approximately 100 lbs., and the material was assembled at any desired place. A still heavier rail, 20 lbs. to the metre, and of the same length, was used.

It was soon found that for satisfactory work a survey had to be made and levels taken. Conditions under which this work was done were at times most trying, but as fair a degree of accuracy was obtained as the work warranted. The work was plotted and maps blueprinted showing location of all lines, ammunition dumps, railheads, material yards, important roads and other information. This work naturally fell to the lot of the surveyor, as also did the supervision of grading.

The rules called for a maximum grade of 2%, but we tried to keep well below this limit. On all grading in the forward area, the work was done chiefly by men from labor units attached temporarily. On large cuts and fills, mules were used when possible. Bridge building and trestle work was done by a special party of our own men, and piles were driven by power from a petrol-electric tractor.

Filling old shell holes gave us the most work and trouble, as they were usually filled with water, and where they could not be drained they were often baled out by hand or with pumps. On main lines over shell-shattered ground, wooden ties were used, 4 and 6 ft. long, laid alternately. As soon as the steel was laid, it was immediately ballasted with sand, mine earth, poor gravel or brick from ruins.

Transferred by Carloads

Push cars hauled by mules were used on the first mentioned type of rail, but with the heavier rail the motive power was entirely steam and gasoline. At first a 20 h.p. gasoline tractor was used which was very satisfactory for small loads and could easily be replaced if derailed. A 40 h.p. gasoline tractor with splinter-proof covering was also very efficient, and also a 60 h.p. petrol-electric tractor for hauling heavy loads and furnishing light or power to small motors. Steam engines up to 15 tons in weight were used, but not on forward areas unless weather conditions were favorable or in cases of emergency.

Two standard types of cars were chiefly used, one a flat car 20 ft. long and 4 ft. 6 ins. wide; the other, the same size, but with sides and ends 26 ins. high. The sides were hinged and could be dropped down. The cars had hand brakes and were coupled with a link and pin. Their capacity was from 9½ to 10 tons, and as the average capacity of standard-gauge trucks was 10 tons, the loads could often be transferred directly, car for car.

The chief use of light railways was in delivering ammunition (especially to the larger guns), gravel and cement, and material for the engineers and tunnelers, besides carrying troops to the line and helping to bring back the wounded. Duck-boards, planks and facines were often brought directly from the mills and yards far in the rear.

Light Railways vs. Motor Lorries

The railways hauled nearly all the salvaged material of all kinds to points where it could be sorted. Many guns, especially the 6-in. guns, were carried on flat cars to positions where it would be almost impossible to take them otherwise. Even water tanks were hauled for supplying drinking water at forward points.

One illustration will show the saving of motor lorries. An average train of four cars, loaded with 300-lb. shells, would equal twelve 3-ton lorries, and the trip could be made as quickly by train, besides saving considerable labor in handling.

There were stations at suitable intervals, connected by telephone to a central control. The usual plan was for a train to get right-of-way from one station to the next and if the line was clear, it would be signalled to proceed. This method was used because of frequent blowouts and breaks, and consequent diversion of traffic.

Where possible, a single loop system was used on forward areas. The distance around this loop would be from 7 to 10 miles, with the greatest width, of about 1½ miles, nearest to the front line.

Spurs lead off to battery positions, engineers' dumps and support line of trenches. All the traffic was in one direction. Movement of ammunition and troop trains was usually done under cover of darkness.

Section gangs were kept on maintenance and repair work. All main lines were patrolled day and night. All breaks reported were repaired at once during the day, and a special party (with an engine and repair car) was used for work at night. This work was most trying on the men, partially because everything had to be done without a light and partly because of frequent gas attacks, alarms and shell fire, causing greater nervous strain in the dark. As many as 18 breaks have been repaired in one night, all ammunition trains reaching their destination and being unloaded.

Old Lines Used for Spurs

Except during a barrage, the enemy's shell fire was chiefly directed to battery positions, junction points, yards and points where the line would parallel or cross a highway or plank road. Material was always kept handy near these places for repairs. During an advance, new lines are laid very rapidly to help keep up the supply of ammunition and other material. Old lines not needed were torn up and used again as sidings or spurs.

The daily casualties in railway battalions was not large but was constant, and a good number have given their lives for their country. While not much has been said about the work done by the railway troops, I believe that they have a record which compares favorably with other branches of the Canadian service.

*Paper read last week at the annual meeting of the Association of Ontario Land Surveyors.

City Engineer Fellowes, of Vancouver, has reported to his Board of Works that the Connaught bridge is safe, and that the part destroyed by fire some years ago (which is now bridged by a temporary structure) should not be restored to its original condition until the prices of materials decrease.

The Board of Works of Vancouver has been advised by City Engineer Fellowes that they should not hand over the city's sewers to the Greater Vancouver Joint Sewerage Board. Mr. Fellowes objects to the surrender by the municipality of the control of maintenance and all other expenditures. He also states that it would be a great handicap to other city departments to have an outside board in control of the sewers, and that it would create confusion, overlapping and financial loss.