

position to feed their men in a more substantial way and at a lower relative cost than they can do it themselves, or have it done for them by contractors. Better and more sanitary living quarters, combined with good food, will increase the efficiency of the worker and go a long way toward establishing a contented body of men willing to stay on the job until the work is finished. Railway maintenance work should appeal to the laborer, on account of its variety and its outdoor environment. The railways should be as keen to obtain and hold men as the contractor or manufacturer. Railway maintenance work has not in the past been regarded with favor by the better class of men. If a quick improvement in the housing and feeding conditions can be effected, then a little work by the publicity department of the railways, setting forth the attractions of railway maintenance work might work wonders. Railways buy a lot of advertising space in the daily papers, and a live advertisement once in a while, appealing to labor, would undoubtedly help. If we give our track laborers as good quarters as are enjoyed by the bridge and building men, we will have taken a long step in the right direction.

I read the other day of the experience of a prominent American railway in doing some track elevation work in a large city. It hired 2,874 laborers in six months to keep a working force of 400 men filled up. In other words they hired the men over seven times, and the average working time of each laborer amounted to a trifle over 21 days. In the same article the experience of a firm of contractors doing public work adjacent to another large city, by force account, is given. The work consisted of ordinary hand work in a lock, which is about as hard and unattractive as you could make it, yet very few changes in the working force took place, in spite of the fact that the rate of wages paid was on the whole considerably below the scale obtaining in the vicinity, and that labor agents from munitions plants endeavored to entice the workmen away by the promise of higher wages. The reasons for the successful holding of the men on the job were quite simple. The contractor saw to it at the start that comfortable buildings were provided in which to house the men, and that a supply of good food, cooked and served in the way the different nationalities desired it, was on hand. These two influences were the main things which kept the men satisfied and on the job for a year, in spite of the efforts to get them away. Keeping the men on the job has the big advantage of a larger output of work per man, and a more efficient working gang. It is obvious to anyone familiar with the various features of maintenance work that the longer a gang works together and the fewer the changes made, the more the work goes with a better swing, and a higher class of work and more of it will be turned out in the working day.

So much has been said about the vast amount of money to be saved by the care, rehabilitation and the re-use of old material, that one is prone to approach the subject with fear and trembling. We can, however, by a freer use of the rail saw, treat our released rails to advantage and prolong their life in branch line service. My idea would be to do the sawing work in the winter when the work is slack, maintaining a small gang for this purpose, or the work might be carried on throughout the entire year, if there were enough of it to justify it. Take a year when main rail renewals were fairly heavy. The re-

leased rail could be sorted over, and after the main line repair rail had been set aside, the remainder could be gathered up and hauled in to the saw, there to be treated and laid in a branch track the next season. In this way we would get a pretty fair sample of branch line rail, and one calculated to last a good many years under light traffic.

Handling the rails after this fashion should not tie up cars for any great length of time, if the location of the saw were carefully chosen to provide ample piling and handling space. The work of relaying would be facilitated in the end, as holding the rails over the winter would permit of a start the first thing in the spring, instead of in the early fall, as is usually done under present methods of handling. Care should be taken to oil all bolts to be wrenched off a sufficient time in advance of the wrenching to soften the rust. As many as can should be carefully wrenched off and oiled, packed in boxes and sent into the reclaim yard, to be held there until the sawn rail goes out again. I think this way of handling bolts a better one than the usual one of putting them through the joint bars and leaving them to rust. Many bolts, which have been successfully wrenched off, have been lost because they had to be cut off from the angle bars later. In the opinion of many men, second hand bolts cannot be successfully used in relaying rail. I think this is a mistake, as they will keep tight if equipped with a good spring lock washer. Angle bars and tie plates should be similarly reserved to accompany the rail when laid.

A process for rerolling worn rails into rails of slightly lighter section, with heads of an altered shape, both symmetrical and unsymmetrical, for use on branch lines, has been patented in the United States, and several of the prominent railways over there have had some of their rails treated in this manner. In the majority of cases the alteration to the rail is so slight that the old fastenings can be used. Briefly, the process consists of a reshaping of the worn head. This process is worth looking into.

We can make better use of our locomotive cinders than we have in the past, by spreading them on the sides of new cuts and banks, where vegetation is slow to start, and the material slides. Cinders will prevent sliding to a considerable extent, and are useful in keeping down the dust. They make good ballast in rock cuts, and in other places where rails batter because of a hard, unyielding subgrade.

There is an extensive field for the introduction of motordriven section cars to convey section crews to and from their work. The time saved in pumping a hand car will, under the right kind of foreman, be used to the railway's advantage in increasing the day's output of work. Having employed the man, it is essential that he be kept working profitably and effectively during the hours of work.

I think it can be safely estimated that the use of motor-driven section cars will save one hour a day per man employed on the track section. This saving under present schedule hours will amount to about 10% of the day's work, and this time, if properly and efficiently employed, would add just so much more work to the upkeep of the track. In other words, the gain of one extra day in every ten would be made, or say three days each month. Apart from the gain in time, I believe the motor section car would help to attract men to, and hold them on the job. The

railway maintenance practice of the future will bring labor saving machinery into more extensive use; the tools will be improved, so that a larger output of labor, with the same or less effort on the part of the men, will be obtained. The tendency will be towards permanency of the gangs, both section and extra; our men will be better trained by keeping them steadily employed. I believe the extra gangs will be smaller and more efficient, made so through training, and a more liberal use of labor saving machinery. The large, unwieldy, not very efficient, and wasteful extra gangs will gradually disappear.

In concluding I wish to make an appeal to the maintenance engineers of Canada for closer co-operation in the detailing of track material. The conditions on each of the various railways do not differ so widely that we cannot get together and adopt a standard to which we can all work. With one type of material in each class or weight, better deliveries and slightly lower prices from the manufacturers will be obtained, as they will be under a lighter investment expense and providing fewer machines than they are to date. With one type of bolt, spike, or angle bar, they would carry larger stocks, as they would feel more certain of a ready sale for their product, than if they waited to see which railway was going to come into the market and buy. About the only thing in railway track material which is interchangeable today is the track spike; our angle bars, bolts, and rail drilling are pretty much all different, not in any important feature, but in the little unimportant details. Yet these small differences prevent the material from interchanging.

The foregoing paper was read before the Canadian Railway Club in Montreal recently.

### Set Slope Stakes a Foot Outside.

A deviation from the usual manner of setting slope stakes for railway grading has been used successfully by L. M. Mitchell, Assistant Engineer, Minneapolis & St. Louis Ry, Oskaloosa, Iowa. Instead of the stake being driven slanting at the toe of the embankment or top of the cut, it is moved out 1 ft. farther and driven down straight. Thus, each centre line stake is practically referenced by two hubs, which are much less likely to be displaced than if set at the edge of the slope. If the contractor is advised of the method of setting the stakes, it has proved easy and convenient for him to make his measurements accordingly.

The Winnipeg Traffic Club has been incorporated under the Manitoba Companies Act, with authorized capital of \$5,000 in \$10 shares, to establish and maintain a social club in order to promote closer relations between the shipping and travelling public and transportation interests by personal acquaintance and the friendly discussion of traffic problems. The provisional directors are: C. A. Taylor, local freight agent; D. W. Thomas, steamship company manager; P. G. Denison, traffic manager; E. W. Travis, clerk; R. K. Gemmill, railway agent, all of Winnipeg.

United States Military Transportation in France.—W. W. Atterbury, Vice-President, in charge of operation, Pennsylvania Rd., Philadelphia, Pa., has been appointed Director General of Transportation for the U.S. expeditionary forces in France.