By J. W. Powers, Supervisor, New York Central Railroad.

With the advent of spring come many of the hardships of trackmen. The roadway, having passed through the rigors of winter, is frequently in a condition which requires vigorous and immediate attention. As the frost leaves the ground, the heaving often goes out in an irregular manner and shimmed track must be watched closely in order to avoid accident. This is particularly true where there are shims on curves, as any settlement which will effect the elevation must have prompt attention. Thick shims should be removed gradually as the frost leaves the ground. When necessary thin shims should be substituted until the track resumes its permanent position. The necessity of shimming is due to insufficient or poor ballast or drainage. Such points should be located and steps taken to eliminate the necessity of shimming.

During this season of the year, some roads are troubled with bank slides. Such slides sometimes occur in cuts, filling in ditches and burying the track. In some cases the embankment of the road will crumble away to such an extent as to endanger the safety of traffic. The magnitude of such slides depends on circumstances and varies from a few yards to landslides which interrupt traffic for several days, requiring service of steam shovel or ditcher to remove. In connection with land slides, washouts have to be contended with, as they usually occur at this season of the year, causing more or less damage, due to heavy rains together with melting snow. It is remarkable how quickly a flood of water under certain conditions can destroy the works of man. Embankments and bridges which required considerable labor and skill extending over years, perhaps only to be washed away in a few hours or minutes, showing how little man's efforts mean when attacked by natural forces. It also shows the necessity that in order to make our work of a permanent character, we must plan it so that it will not conflict with the unchangeable laws of nature.

While some washouts cannot be prevented by the efforts of trackmen, when the forces of nature combine to produce unusual volumes of water without adequate avenues of escape, there are, however, a great many washouts which can easily be averted if proper precautions are taken. Thus by keeping the ditches and waterways open, removing rubbish from under bridges and cleaning out culverts as often as obstructions may gather there, observant foremen can save the expensive washouts, company many which shows that safety of trains depends to a large extent upon the degree of energy, intelligence and integrity dis-played by trackmen.

The most important regular work of the spring season is the renewal of ties, which should be taken in hand as soon as roadbed is in condition for it. The constantly increasing cost of new and suitable cross ties, coupled with their ever growing scarcity, makes it imperative that trackmen should handle the track question with the greatest circumspection and care, hence facts tending to reduce waste in this direction should be encouraged, as our timber resources are no longer boundless.

The best method of putting in ties is one of vital importance, but on account of the widely diverse conditions existing

on many roads, it is apparent that but few general remarks are applicable to all. A matter of great importance in the renewal of ties is to determine what ones should be taken out or just what ties, if left in another year, would by further decay weaken the track to such an extent as to be detrimental. Several weak ties should not be left together, the ties on curves should be inspected very closely and decayed ones should not be allowed to remain in curved track. A tie on a tangent will sometimes last much longer than on curves, thus a tie may be safe for one year in one place where it would not be safe in another. This means that the inspector when he condemns ties to be renewed must exercise good and clear judgment and should not injure good ties when testing for renewals. But it is false economy to allow ties to remain in track that are not sound enough to support the rail properly, for ties not furnishing their proportion of rail support increase the load on the adjacent ties and cause excessive rail cutting and rough riding track. Similar defects will be caused by new ties if not put in properly. The roadmaster or supervisor or their assistants should examine all ties which are to be removed, so that no good ones will be taken out, as many ties have to be pre-maturely removed from track on account of injuries inflicted upon them during Still more injury is done by renewals. not plugging spike holes, as an unplugged or improperly plugged spike hole in a tie is by far the quickest road to its destruction, as it acts as an easy avenue for the absorption of water, which very thoroughly permeates throughout the body of the tie. Great care should be used when putting in new ties. Much can be done during the process of renewal to shorten or length the life of the tie. Tie tongs should be used to pull new ties in track and men should not be allowed to use picks for this purpose as the holes left by the picks will make an easy place for water to lodge. Neither should they be placed heart side up as this accelerates the destruction of the tie by the converging fibres. If placed heart side down, the fibres of the timber tend to shed water away from the inner timber.

The renewal of ties naturally causes disturbance in the general condition of the track that cannot be immediately corrected, therefore the old bed should not be disturbed unless it is absolutely necessary. In order to reduce the period of such disturbance to a minimum, the renewals should be carried on without interruption. It has been a matter of much discussion whether it is best to put the final surface on track as ties are renewed, or put in ties and leave track in fairly good condition in order to expedite the work of renewals. Both methods have very strong adherents and arguments to sustain them, but the most logical conclusion is that conditions govern as to which is the best course to pursue on any particular road. Where the old ties to be removed and the new ones to be in-Where the old ties to stalled are of different dimensions, much time can be saved by using new ties about the same sizes as the old ones, and if old ties were properly spaced it helps to keep the spacing uniform. To obtain the best results, ties should be of the same length and of uniform cross section. With perfectly uniform ties laid at right

angles to the track and evenly spaced, the maintenance expenses would, undoubtedly, be greatly decreased without incurring any heavier expense in the first cost of ties.

The necessity for using appliances and adopting methods of economy and efficiency in these days of sharp competition and adverse railway legislation must be apparent to all officers who are responsible for the expenses in their respective departments. With this idea in view, the maintenance of way departments are economizing by a more liberal use of chemically treated ties with tie plates. The necessity of properly constructed tie plates has become more and more apparent. With the increase in weight of motive power, carloads and speed of trains, the demand for good ties, chemically treated, is increasing as the forest supply decreases and prices advance. The life of a tie is shortened by two principal causes, that is by the chemical process of decay and the mechanical wear under the The life of some ties can be doubled rail. and trebled by proper chemical treatment. Yet this would by no means solve the tie question unless provision is made to prevent the rail from wearing away the tie. It is a fact that many ties are removed from track, not because of decay, but on account of being weakened by rail base cutting into the wood. A properly con-structed tie plate will increase the life of the tie, decrease the cost of tie renewals, maintain the rails in their normal positions, prevent excessive wear on the side head of rail, affect a large saving in the labor of track maintenance and increase safety in operation.

There is a diversity of opinion among track men as to the economy and efficiency of using a bevel tie plate. If such plates were used on every tie, we believe they would give good results. But we all know that after an ordinary rail has lain in track for a period of time, it is not the same shape nor has it the same bearing on ties as when it was first laid, because the wheel loads passing over it have canted it to a certain extent. Opinions vary as to the practicability of their use in rails adjoining frogs and switches. If bevel plates are not placed on all ties, the rail bears on such plates only on the outside of the base of the rail, which places it in torsion and tends to cause half moon breaks. Therefore all of these things have to be considered and properly adjusted or else we have an imperfect device.

There is one feature which should be observed in all kinds of track work and that is the safety of trains and men. This forms the main part of a trackman's responsibility and attention has been called to it so often that it would seem unnecessary to do so again. Still, we believe that we cannot be reminded too often of the necessity of using extra precautions for the protection of the traveling public, our fellow workmen and ourselves. Safety of the track is all important, but we must have intelligent safety or safety that is not wasteful either in labor or material.—Maintenance of Way Bulletin.

M. E. McLeod has been appointed agent, Canadian Ex. Co., Prince George, B.C., vice A. Sholey, who has resumed his former position as messenger.