

bed: (1) A layer of stones such as will pass through a 2½-inch ring; (2) on this a layer of stones such as will pass through a 1-inch ring; (3) on this a sprinkling of screenings—that is, the dust and chips created in crushing.

CONSOLIDATION.

The road metal, gravel or broken stone, should be consolidated as quickly as possible. Loose material absorbs the rain as it falls, even before it is cut into ridges by wheels and the feet of horses. When it has been cut into this condition it acts as a receptacle to hold all the moisture its surface will receive. In this way the whole surface and foundation of the road is softened, is readily cut up and destroyed.

The best remedy for this waste in roadmaking is to spread the road metal to conform to the required surface of the finished road, and then thoroughly consolidate it by the use of a heavy roller. It can be largely remedied, also, by taking proper care of the road, if a roller cannot be had. By raking the loose material into the ruts and wheel tracks as fast as they appear, or drawing it in with a grading machine, nearly the same end will be accomplished, but less perfectly, and requiring a longer time. The first vehicle passing over the road does comparatively little injury; it is when ruts have been formed which hold water, and other wheels follow in these tracks, that the greatest damage is done.

It is a serious mistake to secure consolidation by using dirty and inferior gravel, or by spreading loam or clay over the surface of broken stone. Clean stone, with the least possible amount of earth, is the object to be sought, and for this reason rolling is strongly recommended. Gravel and stone, if it cannot be rolled, should be raked until consolidated. Broken stone should have a light coating of "screenings," or even of clean gravel, but on no account should loam or clay be used. The road grader, in the absence of a roller, may be used instead of the rake, to fill the wheel tracks with gravel that has been crowded outwards.

It is not the even roll of the wheels over a smooth surface that causes injury to the road, but the rough jolting over stones into ruts. Loaded wagon wheels, dropping into ruts or from loose or protruding stones, batter their way through. A smooth surface is always essential to a good road. A rough surface is necessarily such as will impede the flow of water from the center to the drains. To such roads rain is always an injury. With roads properly built, on the contrary, a good dash of rain will flush away the dust which has accumulated, and which, if it remains on the road in time of steady rain and slush, acts as a sponge to absorb moisture and soften the surface of the road.

A. W. CAMPBELL,

Provincial Highway Commissioner for Ontario.

The Silo is Not an Alcohol Distillery.

A correspondent wrote to the Pennsylvania Experiment Station, asking for information regarding the manufacture of alcohol. Since the late law has been passed by Congress, the thought occurred to him that it might be extracted from silos in some way, and as there are a large number of them in his locality, he suggested that it might be a good opportunity to begin work. The Station authorities reply as follows:

"This correspondent's impression that alcohol is formed in the silo appears to be shared by many, both in this and other States. The following statement has been prepared to aid in correcting this erroneous impression, and to warn farmers against the expenditure of time and money upon a hopeless project.

"Common alcohol is commercially produced only by a yeast fermentation of liquids containing sugar, such as fruit juices, molasses, the liquids of the mash, or solution of glucose. No other method of production has been found commercially practicable.

"The silo is the seat of extensive, complex fermentations, it is true; but these are quite different from the common alcoholic fermentation.

"Yeasts are not active in the silo. They are either absent, or present only in very small numbers. The high temperatures often attained in the silo kill the yeasts or suppress their action, and thus prevent them from forming alcohol. Ensilage fermentation was formerly supposed to be due to the action of bacteria; but recent studies demonstrate that it is really the result of the abnormal action of the dying protoplasm of the stored plants, and of the action of soluble ferments secreted by the protoplasm. The products of these actions are chiefly carbonic and lactic acids, to the latter of which ensilage owes its acid flavor.

"Silage contains only traces of alcohol, as has been shown by Richardson, Manns and Irish. The gases evolved from the silo have also been carefully studied by Manns and Whitson. They consist chiefly of carbonic acid and nitrogen, together with small amounts of acetic and other acids. No alcohol has been observed.

"We must conclude, therefore, that, despite

the fact that ensilage is a fermentation process, and that it results in a loss of dry matter, chiefly starch and sugars, amounting to from 3 to 40 per cent. of the dry matter originally stored in the silo, the process is useless as a commercial source of alcohol."

Seed-growing in the Province of Quebec.

Paper read before the Third Annual Convention of the Canadian Seed-Growers' Association, by J. C. Cote, Quebec Representative of the Seed Branch, Department of Agriculture, Ottawa.

It is gratifying to note the progress that has been accomplished by the Quebec members of the Canadian Seed-growers' Association in the art of selection. Evidently the members understand perfectly the aims of the association, and endeavor to carry out the directions given. The results obtained are such as to foster enthusiasm. Among the results observed by the older members, the following might be mentioned: First, better quality of straw; secondly, plumper grain; thirdly, increase in yield; fourthly, freedom from fungous diseases.

Of all the arguments offered in favor of the system, the latter is perhaps the most important, especially in localities where damp climate obtains.

I have often heard the statement made that the protection of the crop from fungous diseases would amply repay the trouble of practising selection.

Though great progress has been accomplished



A Cooling Drink Between Meals.

in the Province of Quebec in the growing of crops, thanks to the intelligent directions given by the Canadian Seed-growers' Association, still perfection is not yet attained. Some farmers are still under the impression that it is impossible to carry out the instructions given them. This is no doubt due to the fact that those instructions appear rather complex.

Among the failings which can easily be remedied, I notice, first, lack of uniformity of the grain, due to impurities in varieties. More attention to the growing of standard varieties would undoubtedly be most beneficial to the farmers, as they would thereby be in a position to meet the demands of the buyers; secondly, neglect in the use of the fanning machine. Many farmers appear to ignore the great advantages which accrue from the intelligent use of this machine. The officials of the Association cannot emphasize too strenuously the importance of this point. Thirdly, excess of stooling, produced by light seeding. The practice of light seeding has been attended with rather poor results. Several cases have come under my observation when the grain was light and immature, owing to the practice. So far the members of the Association seem to have restricted their efforts to the production of improved cereal crops. Very few have given thought to the improvement of seed potatoes. This field of work is one to which attention should be devoted. In certain districts of the Province of Quebec potato-growing is an industry of considerable importance, and there is no doubt that, by a proper system of selection, great improvement in the yield and the quality of the

tubers can be effected. I believe that the Association would do good work in furnishing farmers who desire to operate with the most profitable varieties, with information that would enable them to procure the required seed from reliable sellers.

During the present year I attended the seed fairs which were held in the Province, and it is my pleasure to testify to the quality of the exhibits which came under my observation. A great number of the samples of seed were of the highest quality, which amply proves that the Province of Quebec can produce grain of unsurpassed quality.

Horse Sense and the Automobile.

Editor "The Farmer's Advocate":

As there is a high feeling of indignation against the twentieth-century means of locomotion, it affords me much pleasure to give your readers the experience of one who has owned and driven horses over the country roads for years who also, at the present time, operates a farm, and can sympathize with the farmer and his goodwife in their fear of the "devil-wagon" that is "putting their horses off their roads which they, at their own expense, have built and maintain."

I used an automobile in my work for the greater part of two summers, and covered about 4,000 miles without causing the death of a single individual, without having a single leg to mend free of charge, or without causing twenty-five cents' worth of damage to any horse-drawn vehicle or its driver. My experience was that,

nine times out of ten the driver was more afraid of the horse and the automobile than the horse was afraid of the automobile; in other words, the driver had not very good "horse sense."

The automobile on the country roads is a wider question than the owners of horses are willing to admit. The automobile is a mark of the age of progress in the means of locomotion, the same as the traction engine of the threshing outfit marked a new era in the threshing business, and saved the farm team many a weary lug in pulling the machine from place to place. Horses are becoming accustomed to passing traction engines on the road, and will soon become accustomed to the automobile, if the more fanatical do not succeed in having prohibitive legislation passed, and interfere with what should be another's privilege in travelling in his own way.

There is room for improvement in the education and training of a great many horses. It is a fact that most horses are intelligent enough to receive a far better education than they have. Patience and kindness will take almost any horse by an automobile, and a few lessons by the above means will make the horse and the automobile friends.

The country road being the public highway, everyone, whether from town or country, has a right to be taken over the road in the form of locomotion he prefers, so long as his way of going does not interfere with the rights or privileges of others, or endanger their lives.

If your horse becomes afraid of an automobile which it meets on the road, the driver of the machine should be no more liable than your neighbor's ten-year-old boy who scares your horse by drawing his little express wagon down the street. But the little fellow sees your horse is scared, and stops—so should the automobilist, and if he does not, I say give him the full penalty of the law, and for the second offence, take away his license and give him a term in prison making so small as \$10. The country roads are so rough that they soon cause the expensive automobile to go to pieces. The result is, it very soon becomes a burden on the streets.

Yours truly, J. H. WESLEY.

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