

low in an administrative district where the mileage of roads is sufficient to warrant the continuous employment of a man who is either a highway engineer or a competent road builder, whose interest is primarily in road work, and who has charge of road matters in his district. Where such a man is employed from year to year he can select competent men for road work, and he is able to plan with confidence systematic improvements, which must wait for successive annual appropriations. Good business organization in road work demands an adequate book-keeping system from which unit prices for various classes of work can be easily derived. Too frequently road accounting presents an accurate list of men to whom money has been paid for material or labor, but from which no estimate of the cost of future repair and maintenance work can be established.

It will be more and more necessary in the future to study the service of various roads by accurate traffic censuses. From the investigations that have already been made, it appears that for any civil subdivision a relatively small percentage of all the roads carry nearly all the travel. In France a traffic unit called the "collar" is used. The "collar" is a single horse harnessed to a vehicle, and all other traffic is reduced to "collars," including automobile traffic. The "collar" has not been adopted in the United States as a traffic unit. It is unfortunate, moreover, that no agreement exists among road men at present as to the detailed method of measuring traffic. It is well established that an improved road draws to itself increased traffic. To determine the future use of roads, it will be necessary not only to know the travel passing over the road before improvement, but also to know the increase of travel which is likely to be diverted to the road when it becomes improved. It is undeniable, moreover, that travel upon roads in general is rapidly increasing numerically in tonnage and in mileage of travel radius. Preliminary study is clearly necessary, therefore, to enable road men properly to relate the first construction costs to probable maintenance charges. There should be an ample "factor of safety" in road design to allow for increased service.

Under a competent and continuous administration there are many details which can be worked out for road betterment, which are otherwise neglected. It is necessary for economy to have the location of deposits of all road material within a road district placed on the road map, and the quality of each deposit carefully recorded. The care of all road machinery should be in competent hands, and it should be housed and ready for use when the season commences. A gradual improvement in the grades of more important roads can be undertaken with an established profile toward which some work is directed each year. It is quite probable that the prevailing lack of permanent culverts and bridges on highways is partly due to the unwillingness of short-term road officials to spend a considerable amount of money in one place. Under a continuous administration some permanent culvert or bridge work may be undertaken from time to time along a plan which contemplates the final improvement of all such structures. Concrete culverts and bridges require almost no maintenance charges, whereas wooden bridge floors and culvert bridge floors must be renewed every few years.

Whatever system of road labor is adopted, the work should be organized early in the year, and experienced men developed and retained as far as possible. The foreman of a repair gang on road work should have sufficient knowledge and experience to justify spending his entire time in supervising and planning the work without attempting to labor with his men. The element of thoroughness in details, such as complete cleaning of mud holes, sufficient material, swift repair of water-breaks, etc., can not be over emphasized. There is always enough necessary planning and supervising to keep a good foreman occupied.

On the continent of Europe, where road repair and maintenance have been conspicuously successful, it has been the practice to issue printed instructions covering the smallest detail to all men engaged in the work. It is also the plan to require reports of work done, and quantities of material used at frequent intervals, and sometimes daily. Roads are frequently inspected, and accurate estimates of all quantities of work are made from year to year.

Larger jobs of repair are usually more advantageously handled by contract. Contract work must, however, be done under competent inspection and with proper plans, profile and written specifications. When road work is in continuous charge of one competent man, it is possible for him to gain information from time to time which fits him to draw up proper specifications, avoid the repetition of mistakes, and benefit by the experience of other highway engineers. With a rotation of road officials there is little incentive

for a man to familiarize himself with the best practice. He is not interested primarily in road matters and cannot be expected to educate himself by reading road journals or attending road gatherings. Repair and maintenance have not been given sufficient consideration in planning road finances.

Increased knowledge is needed of the actual relations between first cost and interest, and of the life, service, and maintenance cost of the road. In future investigations for determining the type of road to be built it will be necessary to provide for larger increases in traffic and carefully to balance the advantages of long-lived road surfaces, such as concrete and brick, with low maintenance costs, against the lower-cost road surface, with little or no factor of safety and immediate and high maintenance costs.

A Star Fakir.

Editor "The Farmer's Advocate":

I feel it my duty to inform your readers about a fakir who is going about just now imposing on farmers, claiming to be an employee of the Dominion Geographical Survey Co. He was carrying a field-glass and a telescope, pretending to be a very busy man among the stars. He was of medium height, with black hair turning grey, and long dark mustache. Has been in Mono and Adjala Townships for a week or more giving his name as a nephew of Arthur McCarron of Mono. If any farmers or townsmen meet with this character, let them not spare the sole leather as long as their wind stays with them.

Simcoe Co., Ont.

S. McCULLOCH.

Trees as Fence Posts.

Editor "The Farmer's Advocate":

I notice enquirers in "The Farmer's Advocate" re using trees as posts for wire fence. I have more than two miles of wire fence on trees. I put a strip of 2x4x5 feet long of cedar or its equivalent, and fasten same to trees by two six-inch spikes, driven through a hole in an elongated washer made from old wagon tire, the washer being slightly curved towards the tree and full width of the strip for preventing the strip from splitting by stress of wire, and as the tree grows, the washer being strong will draw the spike out and will make a permanent and tasty job.

Oxford Co., Ont.

N. SILVERTHORNE.

The addition of small quantities of quicklime to field and garden soils, according to a British investigator, stimulates general bacterial growth, but large quantities cause an initial depression in the numbers of bacteria and the destruction of a certain protozoa, and a cessation of all biological process. Conversion of the lime from the caustic form into the carbonate, or combination with soil compounds, is followed by a great increase in the numbers of bacteria and increased ammonification of soil compounds. The length of the period during which the bacterial growth is suspended, would appear to be determined by the quantity of lime applied, the initial reaction of the soil and the amount of organic matter present.

Few race horses last as long as Caper Sauce, and none have equalled his record of winning the same race for eight consecutive years. He is now in his eleven-year-old form, as sound as a bell, and on Wednesday last galloped home at the Woodbine with the Whitby stakes for the eighth consecutive time. He is a Canadian-bred horse, having been foaled the property of Jos. Seagram at his Waterloo stables. He has changed owners three times, and is now the property of Sol. Mintz, of Hamilton. His winnings have been spread over nine years and more, and have been very consistent. He pulled down his largest haul at eight years of age, when he won, all told, \$4,605. His grand total winnings now amount to \$19,060.

E. A. Howes, B. S.A., a graduate of the Ontario Agricultural College, in 1911, and afterwards connected with the Dominion Seed Branch, a position which he left to become Professor of Field Husbandry in the University of Nevada, at Reno, is to return to Canada, having been appointed principal of the Provincial School of Agriculture at Vermilion, Alta. Professor Howes was for four years prior to his graduation from the O. A. C., principal of the Macdonald Consolidated School, Guelph, Ont.

A Better Farming Special in Ontario.

Last week there started out through Western Ontario from the Ontario Agricultural College and over the rails of the Canadian Pacific, two specially equipped coaches, travelling from place to place where stops of a day's duration are made to allow the specialists in charge to show the people by actual demonstration a few of the thousand and one things which make up "better farming." "Farming specials," are not strictly speaking a new departure, but they have not as yet been worn threadbare, and all those within a reasonable distance of one of this train's stops should lay aside the work in hand and spend a day with the train. If it is scheduled to stop in your district you will already have received, or will very soon receive through the mail a notice, or will be informed by posters in conspicuous places as to the exact time and place of the demonstration. The coaches, when visited by a representative of "The Farmer's Advocate" in London last Friday, carried three Yorkshire and three Berkshire pigs, three Leicester and three Shropshire yearling lambs, one Holstein, an Ayrshire, a Jersey and a Shorthorn cow, and a cross-bred beef yearling, a Percheron and a Clydesdale filly, together with poultry and poultry appliances, dairy demonstration apparatus, facts, figures, and equipment on farm drainage, and examples of weeds, grains, and grasses together with comparative yields in the case of the latter two. One or more specialists are in charge of each branch included.

The train is meeting with good success, but morning meetings have not been very well attended. Afternoon and evening sessions are most in favor. This is so no matter what the meeting. People do not very often turn out in a body before noon, but in this case if the train is in your section no matter whether there is a crowd in the morning or not it will pay to visit it then. In many cases more of the information which is wanted on the problems confronting different individuals may be threshed out personally with the men in charge to even better satisfaction than when a large crowd is present.

The London stop also proved that to meet farmers the centre of a large city is the poorest location possible. In these days of rush of work the train must be taken as closely as possible to the farmer. But if those actually engaged in agriculture were not as numerous as they might have been there was a large crowd at the London demonstration composed chiefly of school children and teachers in training at the normal school. The interest which these young people manifested must have been very gratifying to the different speakers and the ideas which they carried away with them could not do otherwise than elevate their opinions of agriculture, because to know it is to like it, and they were given the solution of many farm problems in the course of their short sojourn in the coaches. To reach the rising generation is one of the best works the train can do.

The live stock is taken out of the cars at each stop and the various points of distinction in types demonstrated and explained to the crowd in attendance, as they are comfortably seated on elevated seats carried along for the purpose. This is an excellent opportunity for live-stock enthusiasts.

The department devoted to the products of the field contains samples of varieties of grains in the straw and threshed. Such good varieties as mammoth winter rye, giant millet, Japanese panicle millet, O.A.C. No 72 oats, O.A.C. No 21 barley and many others being in evidence. The different yields from seed selection are interesting. Large, small, shrunken and broken seeds were used in comparison. The yields in bushels being as follows:

Grain.	Large.	Small	Shrunken.	Broken.
Barley.....	53.8	50.4	46	43.2
Oats.....	62.0	54.1	46.6	
Winter Wheat.....	46.9	40.4	31.9	9.1

The results from seeding on six different dates, a week apart after the earliest possible time each year at which the land will work are also valuable showing early seeding to advantage. The following is the comparison in bushels:

Grain	1st	2nd	3rd	4th	5th	6th
Spring wheat.	21.9	19.2	15.4	13.0	8.4	6.7
Barley	46.2	45.9	39.8	37.1	27.6	18.4
Oats	75.2	76.0	64.2	55.8	45.2	37.0
Peas	25.4	28.8	28.5	25.0	21.5	19.5

Tubes are carried showing the comparative yields of the various mixtures, and oats and barley are shown to give the highest yield of grain. Annual and permanent pasture mixtures are also shown.

The poultry department contains 50 young Leghorn chicks in a hover. Water troughs, house models and feed hoppers of all the approved kinds are carried, and the different rations for laying and fattening stock shown. For fattening, a mixture of butter-milk, ground oats,