

definitely what characteristics in a lightning rod as a protective device (when properly installed and kept in repair) will give maximum efficiency, I wish to point out the duties which a rod has to perform. The original conception of a charge of electricity on a cloud to be got rid of by attracting it to the earth by means of a lightning rod, the end of which projected upward to meet the cloud, called for a rodding system made up as follows: A rod of sufficient capacity as a conductor to take a quiet discharge of energy in the form of a direct current of more or less constant value, was all that was required. The upper end of this rod extended into the air for a few feet above the building on which it was installed, and the lower end had to make only a more or less inferior connection with the ground. "The arrangement" of rod on the building was of little or no importance. The latest conceptions of conditions to be dealt with by means of an efficient and efficiently installed rodding system are as follows:

1. Between the cloud and the earth there may be produced during an electrical storm a steady electrical strain of the atmosphere separating two oppositely charged bodies "cloud and earth." This strain must be got rid of by neutralizing the oppositely charged bodies concerned, or a dangerous violent discharge is the result.

2. Between an upper and a lower cloud a sudden discharge may take place which raises the potential of the lower cloud very suddenly. This lower cloud charge then overflows, as it were, to the earth beneath in the form of a sudden and violent rush of electrical energy. Rods cannot prevent the flash under these conditions.

The first duty of a rodding system is, therefore, to neutralize slowly the difference of potential between the cloud and earth by letting the earth charge leak off points, thus causing the cloud to rise higher in the air due to the reduced electrical attraction and prevent any sudden dangerous discharge. This first duty may be satisfactorily performed by a rod or cable composed of any conductive material even of inferior grade and small cross-sections of any shape, if the system has a few points properly located and at least a fair ground wire connection. The conducting cable forms a path between the points referred to and the ground wire. The second duty of a rodding system is to carry off harmlessly those flashes which cannot be prevented. It is in performing this second duty that the up-to-date rod is called upon to possess certain special properties and characteristics. The lightning discharge being very sudden must be dissipated in an extremely short space of time. The conductor and rodding system which will permit of this dissipation in the most efficient manner is the one to be selected. Such a conductor must have the following characteristics:

1. It must be and must remain continuous mechanically and electrically from point to ground. (A flexible, non-corrosive conductor which will permit of expansion and contraction without breaking will permit most readily the fulfilling of this condition.) The more flexible the cable the easier it is to establish good connections between all metal parts.

2. It must have sufficient body, or capacity to insure against fusing or deflagration. Surface area has a great deal to do with this capacity.

3. It must have sufficient ohmic resistance to dampen the discharge, and dissipate it in the form of heat, to prevent a surging of energy in the conductor which is dangerous unless metal parts of the rodged building are properly grounded.

4. It must be as far as possible non-corrosive, to prevent if possible replacing during the lifetime of the building on which it is placed.

5. It must have as large an available surface layer of metal as possible in order to avoid inductive resistance which is liable to cause side flash if not guarded against.

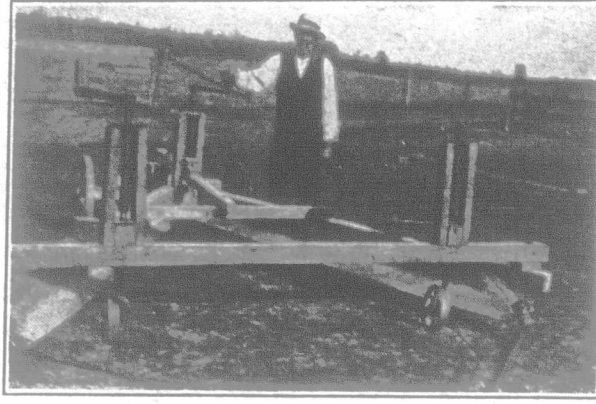
6. They must be made of as many wires as possible without interfering with the mechanical strength of the cable. Numerous wires reduce induction in the cable. These wires should run in as direct a path as possible from end to end of cable to avoid abrupt turns in the path of the current.

7. A point should extend about 18 inches above the highest point of building on and near which it is located and should be fairly sharp. Use a sufficient number of points to allow brush discharge and weaken flashes that cannot altogether be prevented.

8. Ground connections should be made as perfect as possible, special attention being given to grounding whenever and wherever difficulties arise due to local conditions.

These I consider to be the fundamental characteristics of an efficient rod. I trust that through the efforts of the Fire Marshal's Department, legislation will soon be enacted which will make it impossible for any rodding company to place on the market any rod which will not measure up to the standards mentioned in the above list. Practically speaking, a poorly rodged building is not much safer than one which is not rodged. It is poor workmanship which has in the past given to the general public the idea that lightning protective rods cannot protect. It is left for lightning rod makers to clear the atmosphere in this regard, and by intelligent and honest workmanship to give to the public a service which will speedily disabuse their minds of the erroneous idea above referred to.

These remarks are taken from a paper on lightning rods, read before the Royal Society of Physics, London, at a convention of lightning rod men, held at London early in April, 1919.

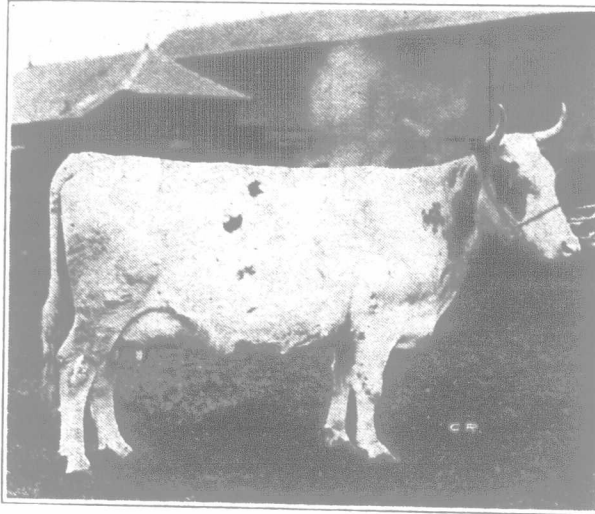


A Road Scraper that Does Good Work.
Made by Geo. R. Barrie, Galt, Ont.

THE DAIRY.

Co-Operative Cheese Selling.

Co-operation in Ontario seems now to be fairly rapidly adjusting itself to the needs of the situation and in such a way as should tend to bring to producers a fairer share of the price that their products bring on the larger domestic or world's markets. In February, 1919, the United Farmers Co-operative Company established a live-stock commission department on the the Union Stock Yards, Toronto, and has since done a phenomenal business, which we believe to have been greatly to the benefit of live-stock shippers the Province over. This business has since been extended to the Montreal market, to which a great deal of the live stock of Eastern Ontario goes. Just recently the same company has actively taken up the question of egg marketing, a matter that has long given those interested much cause for thought. It looks very much as though this business, too, is going to develop in a thoroughly satisfactory manner with a capable man at its head; and greatly to the advantage of the producers and their company. There is also some discussion of the co-operative manufacture and sale of creamery butter, but we do not understand this matter to have advanced very far as yet.



White Beauty.
First Ayrshire cow at Kilmarnock, 1920.

Some two years ago the matter of co-operative cheese selling was broached and it has since been more or less before the dairymen of the cheese sections of the Province, backed by the benevolent interest of the U. F. O. Co-operative. Some time ago The United Dairymen Co-operative, Limited, was provisionally organized and a charter obtained. When the matter was first broached to the dairymen of the Province a giant combination of scores or hundreds of cheese factories was contemplated which would involve the buying outright by a central company of all local factories included, stock to be taken by the patrons of local factories to the approximate amount of the price paid for the local factory in which they were interested. It was thought that the proposed company, operated along the lines of the Saskatchewan co-operative creameries, but on a much larger scale, would be eminently successful and a great forward stroke in Ontario Agriculture. This giant scheme has been gradually reduced by the laws of practicability to more moderate proportions, until it has finally, we believe, reached the level of feasibility. This has necessitated the abandonment of the scheme for factory ownership except for the co-operative ownership of single factories by the patrons, which plan had developed to some extent prior to the advancement of the larger scheme. It has, we understand, been recently decided to confine the operations of the United Dairymen Co-operative, Limited, to the co-operative marketing of cheese on the Montreal market for the benefit of all factories that desire to affiliate with the company. The plans as so far advanced, call for the assembling of the cheese at Montreal in a warehouse provided by the company, grading of the cheese (probably by the Federal Government) and its sale by auction under the auspices and control of the manager of the company, whose office will be in

Montreal and who will look after the interests of the producer. The adoption of some such scheme should provide considerable prospect of success for the new venture in co-operative selling.

The present proposed basis of co-operative cheese selling was first suggested, we believe, by J. A. Ruddick, Dairy Commissioner, Ottawa, and was fully outlined in an address delivered at the 1919 convention of the Dairymen's Association of Eastern Ontario held at Belleville, January 9 and 10. "The Farmer's Advocate" at that time referred in a very complimentary manner to Mr. Ruddick's proposal and gave it considerable prominence in an early issue thereafter. The following paragraphs will serve at the same time to recall this proposal and to outline the principles of the present plan as decided upon by the United Dairymen Co-operative, Limited with the exception that butter was included by the Commissioner in his suggestion, whereas cheese only is under contemplation at the present time.

"All cheese and butter would be shipped regularly from the factories to a central warehouse at Montreal, where it would be graded by a Government grader and then offered for sale by auction to the highest bidder and according to the real quality of each lot. I do not advance this scheme for the sake of proposing something new, but because I believe, after long and careful consideration that it offers substantial advantages to the individual factory and to the industry at large without imposing corresponding disadvantages. It would reduce the cost of marketing and add that much to the price of butter or cheese as the case might be. The individual factory would make a direct saving in not having to employ a salesman. There would be an indirect saving by the elimination of the commission or salary paid to the country buyer, which amount would come back to the factory in the higher price which the exporter could afford to pay. The charge of auctioneering would be a mere trifle and all other expenses such as freight to Montreal, cartage, cooperage, and warehousing, must be paid in any case.

"Of course I anticipate that there will be some opposition to this proposal. The country cheese buyer—and by that title I refer to the man who buys for a Montreal house on salary or commission—could hardly be expected to look upon such a proposition with favor and possibly some of the exporters located in the country may see reasons to object. One is always sorry to propose anything which may be inimical to the interest of any particular class of the community. In this case the regret is all the deeper because I number among my good friends many men who are country cheese buyers. The interests involved, however, are too large to permit of these personal considerations having any influence in the matter. Every improvement, or reform entails a measure of inconvenience or hardship on someone.

"It is quite possible that some of the Montreal exporters may have reasons for opposing the central selling, but I know that some of the leading houses would welcome the inauguration of such a plan. Opposition or no opposition I feel convinced that this system will eventually prevail. There is so much in its favor and so little that can be put in the balance against it, that it seems to me there can be only one outcome. It will not likely come all at once. I do not think it would be desirable to make the change all at once. A gradual turn over would be more likely to succeed.

"As I see it there are two ways in which this scheme can be carried out: First, a co-operative organization among the factories, to provide warehouses and facilities for handling the business at Montreal. The alternative is to have a private firm or company undertake the auction business at a fixed rate. There are likely to be some new warehouses erected in Montreal in the near future and they will afford excellent facilities for handling a business of this kind."

We are informed that arrangements have been made with a Montreal dealer to warehouse the cheese at a fixed rate per box, which is in the neighborhood of 5 cents. When cheese stored in the company's warehouse is sold to dealers in Montreal, the latter will be given storage for a certain length of time at fixed rates. Grading of the cheese will be done upon a basis not yet thoroughly determined upon, but in all probability the work will be done by the Federal Government, the Dairy Branch of which has been actively interested in this phase of marketing work for some years. This branch did contemplate the institution of grading for export purposes, but it is doubtful if this method of grading would meet the needs of the present case. Until recently it had been practically arranged that the grading work for the new company would be done by the Ontario Department of Agriculture, but in view of the fact that grading is really a national rather than a provincial problem and because the Federal Government already had in mind a system of grading, it was apparently thought better for the latter to do the work. The Quebec Agricultural Co-operative Society has already instituted much the same system of selling cheese, but in this case the grading is done by the Provincial Government on the basis of sale only. This is somewhat different from the method of grading for export, in as much as the latter grades are determined primarily upon the requirements of different markets. Thus what might be number one cheese for the Manchester market in Great Britain might grade only number two for the Liverpool or London market, which fact would apparently make it impossible for the grades established on the basis of sale to Canadian exports only, to become finally applicable. The present practice is for the dealers who buy cheese in Montreal on the basis of sale, to re-grade them for the various markets

in which they are of number two might be 100 lb. It would seem a system of grading. We have an existing grading system of eggs. Our one, two or three Government regulations are meant much to grades, we believe similar way, no exporters of grade market.

What will happen new system of that must be operated these but they originate to a certain extent for the cheese operates in the tracts, the cheese premium over districts. It is which is sold to frequently not though it may be ment of permanent districts would price, although from the very to this grade quality. We a grades is the s with eggs has importer can be

It is to be by auction will will support a to the primary export market. and rightful co-operative developed.

Udder Tr

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This condition enlargement of diseased or p the commencement of the glands.

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