do their work, they must first be understood and then applied

Men have railed against science, and its teachings. They have ridiculed some of its discoveries as applied to agriculture and horticulture. But what, we ask, would the condition of the fruit industry be to-day had not science come to the rescue? Our agriculture, and more especially our horticulture, owes science a debt which it would be difficult to estimate.

This fight, or this war, as it may more properly be called, has no discharge in it. The insect and fungous foes must be given no quarter. If given any quarter one season, they are likely to be more numerous the next; and, in addition to the increased labor of fighting them the second year, there is the increased loss from the greater present injury which they would work.

It may be possible in some instances to find the labor of the conflict more costly than the value of the fruits that grow out of it. It has been thought that so it is in some instances with the blight that has affected apple orchards for some years past, and more especially has this been found true in seasons of frequent showers in the summer. The spraying materials are thus washed off the leaves to so great an extent as to be measurably ineffective. Under these conditions it may be wiser to cut down the orchards, more especially when they are old or of kinds that are not highly remunerative, even though good crops should be secured. The increased energy required to fight the blight successfully would probably give better results expended in growing other kinds of fruit.

The Dairy.

The New System of Paying for Milk

In previous issues we have called our readers' attention to the new system of paying for milk proposed by Prof. H. H. Dean, of the Ontario Agricultural College, Guelph. This system consists in adding two per cent. to the butter-fat reading, which Prof. Dean claims is a fairer method of paying for milk for cheese-making than by its butter-fat value alone. We notice that the Dominion Cheese and Butter Manufacturing Co., Elma, Ont., which was the first factory to adopt the system of paying for milk according to its butter-fat value, as indicated by the Babcock tester, has, at its annual meeting, decided to adopt Prof. Dean's system during the present year, so that we shall learn, after awhile, whether the new system proves satisfactory or not to those concerned.

The Oleo Combine in the United States

Our cousins in the dairy business in the United States have been feeling keenly the effect of the competition of oleomargarine against the pure article of butter. The oleo men are organized, and have been able to defeat what few attempts have been made by friends of dairymen to introduce bills into Congress to prevent the oleo fraud. The dairymen, on the other hand, have no organization, and are unable to withstand the determined stand taken by their opponents. The National Dairy Union is now appealing to dairymen all over the United States, asking for contributions of one dollar apiece in order to continue the war against the oleo men. It would certainly be a wise move on the part of the dairymen to do so, as, if the Grout bill, which is aimed against oleo, should pass, it would mean a good many dollars in the pockets of dairymen, inasmuch as it would prevent oleo entering into competition with butter, and would thus raise the price of the latter. We in this country should be thankful that we have a law on this subject already on the statute books.

How the Prize Butter Was Made at the London, Eng., Dairy Show.

In a late issue of *The Dairy*, Miss Elsie G. Cook, who won the champion cup at the London Dairy Show for making the best butter in the fastest time, relates her method of making on that occasion: "We entered the dairy," she writes, "to prepare utensils about 11 a.m., after doing which ice was given to us, and then a little before 12 o'clock 10½ lbs. of sweet, rather thick, cream, to which I added about three pints of cold water and strained into the churn at a temperature of 57 Fah., to which the churn was already cooled, the temperature of the dairy being about 60°. I then commenced churning, turning rather quicker than the usual rate for Bradford's end-over-end diaphragm, the churn I was using. In twenty-five minutes my butter came, having risen in temperature 1 Fah., when I added cold water, to reduce the temperature and prevent the grains gathering. I then churned rapidly for two or three minutes, till the grain was of the right size. The temperature was now 54°. I drew off the buttermilk, added cold water, turned the churn a few times, drew off the water, and added brine (made of 1 lb. of salt to 1 gallon of water), turning the churn again and drawing off the brine before I took the butter from the churn, the temperature of which was 45 Fah., when I placed it on the worker (one with a straight-grooved roller). The butter was of an even grain, if anything, a size too small, but very dry and firm, falling apart like wheat. I felt quite satisfied with it, though it was not quite as good as on the evening before, when I believe I had the most perfect grain on the worker I have ever had. Being firm, it allowed of all superfluous moisture being expressed without injuring the grain. I believe the steward gave my weight at 6 lbs. ½ oz., or 6 lbs. 1 oz., which I made up into 1 lb. and ½ lb. prints, all of different but neat patterns. Putting them on the board, with muslin wrung out of iced water under and over it, I placed pieces of ice about, taking care that they did not lie on or close to the butter, as undoubtedly it destroys the flavor to freeze it, and many judges object to our laying ice near our butter; and, although I do not advise it at other times, still, in a competition, if laid around properly, it protects the butter from the warm atmosphere, so that I think its merits outweigh its faults. My butter was finished and on the table at five minutes past one (ten minutes before the expiration of the time allowed), and by twenty minutes past one I had cleaned all utensils."

For The Canadian Live Stock and Farm Journal.

Bossing the Cow.

"Whilst in Latin," said Prof. Robertson, at the Central Farmers' Institute, "the cow is always spoken of as bos(s), too often she might properly be thus designated in our own phraseology." On many a Canadian farm the cow is boss of her owner, and exactly in proportion as he is overbearing in his treatment of her is she strenuous and hard in her dealings with him. The art of bossing the cow is one that is as yet far from being generally understood and further from being generally practised. When a man undertakes, in the commonly accepted sense of the term, to boss a cow, the latter invariably comes out ahead. Every time he abuses her his pocket suffers, for if he has her so under subjection that to bring her from the pasture on the run he only requires to whistle for the dog she retaliates by obliging him to give her six months' board during the winter for which she pays him not a single cent. She, as it were, has the money bag, the strings of which are relaxed or tightened according as her treatment is intelligent and kindly, or thoughtless and abusive. Intelligence, and not brute force, is the power by which man must rule in bringing the cow under subjection and compelling her to comply with his will.

But at what period should he commence to exercise his authority? A minister once said, in speaking of the authority of a parent over a child, that it should commence about twenty years before the child was born. Thus it should be with the case under consideration. A man, to rule even a cow, must have first learned to rule himself well.

The ungoverned temper of the owner is often as disastrous to the milk flow of his herd as are the parching droughts of July or August. Intelligent persuasion is the power, above all others, by which the dairy cow is to be ruled. He alone who is capable of running this milk-making machine, the cow, up to her fullest capacity can properly be said to be her master.

Dealing, then, with the treatment which the animal should receive at the hands of her owner, it may be said that the aim to be ever kept before him from the day the heifer calf is dropped is that he is rearing her to make of her a milker. With this end in view, all his dealings with her must be of the most kindly nature. If cattle look upon their caretaker as a friend, and are always glad to see him come into the yard or stable, then is his management in this regard good; but, if this be not the case, money is being squandered through the mismanagement of the herd.

Regarding the feed, suffice it to say here that during the period of growth this should ever be nourishing and sufficiently moderate in quantity to stimulate proper physical development without giving any tendency toward fleshiness.

A most important point, however, is the handling. Early in the life of the heifer handling should commence, and, as the udder is the most important organ in milk production, it should receive the greatest amount of attention. Odd minutes may be spent in grooming or rubbing the young heifers, taking care never to neglect to rub and work with the teats and the loose skin which must ultimately form the milk vessel. Heifers receiving such treatment will never require to be broken into milking, as they will enjoy rather than dread the operation. While the handling during early life may be done simply as the attendant finds it convenient, when the udder properly commences to form it should be carefully handled twice a day up to the period of calving, and after each milking for between two and three months from the time of coming in. It is scarcely necessary to say it, except for the sake of emphasis, that the milking should be performed as regularly as the clock strikes, and should be performed thoroughly, and that the time of milking ought to continue for ten months, whether the heifer is inclined to favor the practice or not.

A small bite of feed of a desirable character supplied at a regular hour is a much more profitable means of bringing the herd from the pasture than the use of a dog.

Pages might be written upon the subject of this article, as it naturally embraces feeding and breeding, as well as general management; but, to put it in a word, nothing but the most careful, intelligent, kindly treatment will bring the cow under subjection to the owner's will so as to be profitably productive. By a blue beech she may be driven through a gateway, but only by the treatment we have mentioned can she be made to act as a machine paying a goodly dividend upon the capital invested.

D. B.

The Dairy School at the Ontario Agricultural College.

Dairying being one of the most important industries of this country, a short description of the Dairy School at Guelph and its work may prove interesting to your numerous subscribers.

The main dairy building is solidly built of red brick, and is two stories in height. On the first floor is the live-stock class room, testing room, store-room, refrigerator, and the separating and churning room.

The live-stock class room is so arranged that animals can be brought in and lectures delivered on them by Prof. Dean before the class.

The furnishings of the separating and churning room consist of five separators, five vats for whole milk, a skim-milk vat, and one for buttermilk, three power churns, two butter-workers, two cream vats, and all of the necessary appliances for buttermaking. A gallery runs along one side of this room, where a score of visitors can be comfortably seated, and watch the various operations of the school. Judging by the numbers who avail themselves of this sight, we must conclude that it is very interesting indeed. The students, while in this room, become expert at running the different kinds of separators under the superintendence of Mr. Sprague, while Mr. Rogers gives them a thorough drill in the complicated methods of manufacturing first-class creamery butter. An average of 4,000 lbs. of milk is daily received for use in this room.

The milk-testing room is in charge of Mr. Miller, who spares no pains in making this branch as clear and interesting to the students as possible. This room is furnished with all of the modern machines and instruments that are commonly used in testing milk, cream, whey, etc. There are seven Babcock testers of different manufacture, with which the students daily test whole milk, buttermilk, cream, whey, and cheese. The lactometer is used in connection with the Babcock test. Cream is also tested in the oil-test churn. The Russian Babcock tester in this room is worthy of special notice. It is driven by a jet of steam. The bottles are graduated finer than usual, which gives a closer reading; the bottles are more easily cleaned, and the water can be added while the machine is in operation, thus a considerable saving of time is effected in making tests.

The second story contains a class room capable of seating 120 students, Prof. Dean's office, the library, sitting-rooms for ladies and gentlemen, with cloak rooms, lavatories, and bath rooms attached. There is also a Pasteurizing room where milk can be Pasteurized (heated to a temperature of 130° to 150° F. for a short time, and then rapidly cooled), in order to