the large creameries, where a detailed record is kept of all work, that a churn filled two-thirds full with cream will give a much higher per cent. of overrun than one filled one-third full under normal conditions. A large churning is not influenced by atmosheric conditions so much as a smaller churning, and the butter gathers in a more flocculent condition; that is, the fat is not driven so firmly together as in a small churning. When over 16 per cent. of water is incorporated in butter, it is usually accomplished at the expense of the body, as when butter takes up an excessive amount of water it must become somewhat soft or pasty in character. It has been known for years that some farm or dairy butter contained in some cases 25 or 30 per cent. of water. Some of the butter contained so much water that it affected its color, giving it a light, pale, lifeless color. Excessive churning, or churning it in large lumps or large rolls, will give you a high per cent. of water. It is unnecessary for me to spend any time here in discussing the different fat contents of butter. Taking butter as a whole, there is more moisture incorporated in summer months than in winter months, as butter has a lower melting point at this period. In the winter months, when butter contains more stearin, it will stand much more working to bring about the same condition as in summer. To demonstrate this more fully, I will give you a crude illustration. The majority of you are familiar with putty. You take a piece of putty that is somewhat dry, and you invariably use oil to soften it. When you just crush it in the oil very little change takes place. After a time, however, the putty assumes a pasty condition, and takes up the oil very quickly. If, however, you continue to work it in the oil, the putty becomes short and brittle in the grain. Butter acts very much the same with water as the putty does with the oil. The method usually used by those creameries that have incorporated an abnormal amount of water is as follows: They churn at a low enough temperature to get an exhaustive churning, and churn butter in large granules. They wash the butter very little, and then place enough water on it to make it float, or about 50 or 60 gallons to a churning. The rolls are then placed in slow gear, and the butter is worked the same as when working in the salt. The number of revolutions they give the churn will depend on the amount of water they wish to incorporate in the butter. In the winter months they usually give it about 20 revolutions, and in the summer 8 or 10. This, of course, depends entirely on condition of butter or temperature of cream when churned. Prof. Gray, of Washington, D. C., who is now associated with our school, and who used to be chemist for the big Continental Creamery Co., has told me that so completely did one of their makers have this system under his control that he did not vary the moisture content of his butter over 1 per cent. during one month, where Mr. Gray made chemical analyses daily. When you first begin to work butter in water, the moisture content is expelled from the butter, but after it softens up it takes water very rapidly; so the greater number of revolutions you give the churn at this period, the higher your water content will be. Of course, excessive churning will give the same result, but the water content cannot be kept as uniform as in the other method. To get uniform results in churning, cream should be cooled at least two hours before churning. It would be better to cool it four hours. After the butter has been worked the desired number of revolutions, the water is removed and the butter is salted at the rate of about 7½ pounds salt to every 100 pounds of butter-fat. This leaves about 3½ per cent. salt in the finished product. It takes about 20 revolutions with the Disbrow churn to incorporate salt, and 15 with the Victor churn. Where extreme fancy butter is desired, it is better to avoid the excessive churning or working the butter in water. Would advise churning in middling large granules, and have the butter gather in about 30 or 40 minutes, not hard or very soft, but pliable to the hand. Remove buttermilk as quickly as possible, and wash with water at about the same temperature as the butter. Apply salt as soon as wash water is removed, while the butter is yet soft. It is the water in the butter that largely dissolves the salt; hence, if salt is quickly mixed with the butter when it is in a moist condition it will require less working to get the salt thoroughly dissolved. Many creamerymen make the mistake in the winter months of permitting their butter to drain too dry and become somewhat chilled before applying the salt. This invariably means extra working or mottled butter, and a low per cent. of moisture. If one creamery gets 5 per cent. more overrun than another creamery, or a gain of 5 pounds on every 100 pounds of butter, it is only reasonable that they can pay more for butter-fat. Some of the best butter-makers that we have in our State, men who are getting 1 or 2 cents per pound premium on their butter, are the makers who are thoroughly posted on the moisture question, and who always get a good overrun and do not go to either extreme.

The whole question of excessive water and salt is one of second consideration to the butter-maker. Quality should always be the first consideration; therefore, if you cannot make the highest quality of butter and incorporate 14 per cent. of water, go back to 12 per cent.

I believe it is possible to make just as good butter with 14 per cent. water as with 12 per cent. This, of course, is just my private opinion. In the making of butter, cheese, or anything else, the maker must be guided by the requirements of the market, and should endeavor to make the quality of his goods suit the demand.

Caution should always be exercised in making any radical changes.

A Nut for the Professor to Crack.

To the Editor "The Farmer's Advocate":

Kindly allow me a short space in your valuable paper to reply to some statements made by Prof. Dean at the Dairymen's Convention recently held in Ingersoll, which I though reflected on the integrity of breeders of pure-bred cattle. The case in point was, that he and his worthy father had bought some pure-bred cattle to replace the ordinary stock then kept on the home farm, but after having them a year they found them not any better if as good as their old stock, and came to the conclusion that they had only bought pedigree about a yard long without the animal, and that many farmers were gulled in that way. I will admit that not all breeders are as straight and honest as they should be, but will say right here that these are as few among breeders of pure-bred stock as among any other class of people. Had the Professor used more brain in connection with the dollars he spent, I do not believe he would have had the unfortunate experience he relates. The old saying is that "money rules the world," but my belief is that brain is a much stronger controlling power than dollars and cents, and if farmers would make use of it, and exercise a little common-sense judgment, they would in most cases escape being imposed on by the unscrupulous breeder. Are they not themselves to blame. Is it not, in very many cases, the dollar that decides the purchase? Ten — yes, even five — dollars often decides the deal, regardless of the quality or performance of the animal, being satisfied if the animal has only the color of his breed, and a pedigree. Should not a little common sense tell them that the breeder who, at a heavy outlay, secures the best possible breeding stock, cannot afford to sell his stock so low as the man who breeds from any ordinary stock of the respective breed? Or, have they the mistaken idea that all pure-breds are superior animals? When they, with open eyes, buy pure-bred, pedigreed scrubs, have they a right to condemn the honest breeders or the breed? I think not. As a remedy and safeguard, the Professor strongly advocates and urges the yearly official testing for milk and butter, under the supervision of competent and disinterested officials, citing Denmark as an example, where this system is in practice, and is producing great results and marked improvement. This looks very well in theory, but what would it work out in practice? The existing conditions of our country and Denmark are so widely different that no comparison can be arrived at. There dairying is their sole occupation; every farmer depends upon dairying for his living; labor is plentiful and comparatively cheap, and this work of yearly testing can be carried on with a minimum of expense, while here, take it even in the grand old County of Oxford, noted for dairying, one man keeps horses, his neighbor feeds cattle for beef, and only makes the dairy a necessary side issue, while, of course, many make the dairy the most prominent part of their operations; but under these conditions, with the necessary crowding of work on account of our shorter seasons and more varied farm operations, with the scarcity and high price of labor, it seems to me to be a scheme very difficult to carry out, and I believe it will be a long while before the ordinary dairy farmer will put it into practice. As far as my knowledge goes, Holstein breeders in this country are the only men who have adopted and are conducting official testing, and this only for seven consecutive days, which, by the way, has been of the greatest benefit to the breed, and yet, only some 27 out of over 240 members, and probably that many more non-members, have gone into this work. I feel confident that still fewer will feel like taking up a whole year's, or year-after-year test, not that I do not believe that in time it would bring good results, providing the class of dairymen who really are in need of practical demonstration could be reached, which will be a nut for our highly esteemed professor to crack.

H. BOLLERT.

Oxford Co., Ont.

A Credit to Canada.

Please find enclosed $1.50 for "The Farmer's Advocate" this year. Am well pleased with paper. It's a credit to Canada.

HENRY BROUGHTON.

Lambton Co., Ont.

POULTRY.

Make Your Hens Lay when Eggs are High in Price.

Are your hens laying? If not, why not? You can make money out of your flock of poultry if you just give them a little extra care, but you must remember management is the whole trick. The first thing they want is a warm house, and the second thing is feed, and the right kind of it. Give your fowls a hot, soft mash in the morning, with some good poultry food in it. Give them the usual feed at noon, and at night give them hard feed—corn, wheat or barley is best—and make them scratch for it. Always keep fresh, clean water before them, also grit and meat scraps or cut bone once in three days. A head of cabbage, hung about eighteen inches from the floor, will afford the hens great exercise, and the cabbage is good for green food. Cut clover is also a good green food. Keep an egg record this year, and give your hens proper care, and keep track of how much feed is used; see the profit. If each farmer would give his poultry as much care as he does his horses, cows, sheep or swine, he would find that the hens are among the leaders for profit. It is also much easier to work after and care for a flock of poultry than any other kind of stock on the farm. A man not far from me sold one turkey for the net sum of $6.25. The bird weighed 37 pounds, and sold for 17 cents per lb. It will soon be time to mate up your breeding stock for next season. The early-hatched chicks make good winter layers and best show birds. Raising poultry must be a money-making business, or what would make it increase so rapidly? Leghorns, Minorcas, Houdans, Wyandottes, Orpingtons, all make good layers. Of course, everybody has his own choice. It does not pay to keep hens that only lay in the summer months, eat all they can get, and stand on one foot in the winter when eggs are high. But it doesn't all need to be blamed to the hen. Remember the word "grit," as it is good for more than hens.

Renfrew Co., Ont. ELMER L. DORAN.

Combating Parasites on Poultry.

The frequent unprofitableness of a flock of poultry at this season may often, as the result of a careful examination, be traced to the presence of parasites. These may be divided into three distinct groups—fleas, lice and mites.

Of the first-named variety only one species, the bird flea, lives upon fowls. They are provided with a sharp, piercing mouth, which enables them to suck the blood on which they live, and aside from the constant irritation caused, considerably weaken the vitality of the birds.

There are some eight different kinds of lice that attack fowls, and it is a peculiar fact that the different species favor different parts of the bird's body, the favorite parts being the head, neck, rump, and under the wings. These lice subsist on portions of the skin and feathers; hence they do not require piercing mouths as do fleas, but one adapted simply for biting. Their bite is sharp, producing an itching sensation that causes considerable pain when the hens are infested with large numbers. Fleas and lice are true insects, having six insect legs, and are therefore quite distinct from the mite, which has four pair of legs. The mite, however, has the sucking mouth of the flea, and in this respect is similar. The most injurious of the mites is the red mite, which varies in color from a yellowish white to a dark red, according to the quantity of blood it contains. When the poultry-house is infested with this pest, every crack or crevice will afford a harboring place for astonishingly large numbers, and there they remain during the day. At night they come out of their hiding-places and feed on the birds, the effect being most detrimental to the condition of the flock. Their presence can generally be detected by the prominence of a certain white dust under the perches, or in the crevices where they stay during the day. The microscope shows this dust to be the eggs of the mites, and if means are not taken to destroy them these eggs will remain vital for months, under any exposure or in any kind of weather.

It will be seen that a brief study of the parasites above mentioned will suggest ways and means of protecting the fowl from their ravages. In combatting these mites, the perches should be placed so as not to come in contact with the wall at any place; thus they will have less opportunity to hide, and may be practically surrounded. An application of kerosene emulsion is instantly fatal to them, and in my experience has proved a most effective remedy in keeping them away. A quantity may be prepared by dissolving one-half pound of soap in a gallon of boiling water, and stirring in while hot two gallons of kerosene. This emulsion, before being used, should be diluted with ten times its bulk of soft water, and for the best results, should be applied with a spray pump. By adopting this method, the kerosene may be applied to the holes and corners until every part is thoroughly saturated. This