see—a difference in favor of richer milk. The more "fat," the less "holes."

In regard to color, we find, again, that 15½ points have been counted against the richer milk in 1894, but double the number of experiments in 1895, with greater differences in richness, show it to be possible to get just as even a color with richer as with poorer milk, so I conclude that those 15½ points should not count against the richer milk on account of its richness, but should be accounted to mistakes from other sources.

Then, as to "texture," we find that 26½ points go against the richer milk in 1894, but in 1895 we find them scored almost equal, so I conclude the same as above in this regard. Thus it was that 43½ points were counted in favor of cheese from poorer milk in 1894, while in the greater light of 1895 these same things look differently. But this only shows that great caution should be exercised in giving results of a series of experiments, *when these results seem to be unreasonable*, until further light is got in the matter, and also that the multiplication of experiments is much better than one series, as we can then compare one season's work with another and get a more conclusive view of the matter. I hope that with a greater difference still in richness of samples to see what I always thought to be reasonable, viz., that, "all other things being equal," additional fat will give additional quality of cheese as well as quantity. The results given are very close, but as they are the "*scoring of the only man in the world who can score to half a point*," and other thorough judges as well, we should notice every point and one-half point given. Doing so, I have found that richer milk gives a gain in *flavor* and *closeness*, with no loss in *color*, *texture* or *finish*, and I would expect to see, with greater differences still in *richness* of *samples*, a more clearly defined difference in *quality* of *cheese* also. Others may form different conclusions, and I will not be surprised if they do so, as we find that while one Professor advocates the addition of 2 per cent. to fat readings, through the press, another Professor from same college, within two weeks after, at Institute meetings advocates using a sliding scale of addition, increasing the addend as the milk increases in richness, both systems being results of same experiments. This last is a slide in the right direction, and I believe will eventually slide into the division by the straight butter-fat as per Babcock test. The "*standard for the world*" in quality spoken of I would say is "*fine Canadian Cheddar cheese*." The World's Fair proved this, and our world-wide reputation proves it also. Americans say that the "*controlling element*" in our "*continuing to hold this reputation*" is the fact that we do not allow any skimming to be done. The *holding* of *this reputation* is the *main thing*, and I thoroughly believe that if we are to brand all our cheese as "*Canadian*," it will also be to our best interests to keep everything that tends towards skimming, and that would encourage in the slightest degree a poorer quality of milk out of our cheese factory systems. Thus we will be saved from such a sliding scale of prices as we see reported in New York, viz., from 2½ to 11 cents, as the cheese varies from skims to full creams. I believe that dividing by straight butter-fat will do much to encourage better quality of milk, and the maintaining and improving of the standard of "Canadian cheese."

ROBT. MCCULLOCH.

POULTRY.

Broiler Raising.

BY R. C. ALLAN, NORTHUMBERLAND CO., ONT.

The judicious selection of stock from which the supply of eggs for hatching is to be obtained should be the first consideration with the broiler-raiser. So much depends upon the laying stock, their care and feed, that many become discouraged, owing to the inferiority of the eggs they are compelled to use. What is wanted is a breed that will produce a plump, yellow-skinned chick, one that will mature early, and be as free as possible from black pinfeathers, which often render an otherwise fine bird very unsightly. Each of the different breeds have their advocates, and their different merits cannot be discussed in an article on broiler-raising. I have used several different kinds, but as we combine egg-production with the broiler work, using an incubator for hatching, the sitting breeds are not necessary for us to keep. I find B. P. Rocks very good, White Rocks better, S. C. W. Leghorns and their crosses upon the heavier breeds very satisfactory also. Leghorns have one drawback, viz., the tendency of the cockerels to develop too much comb, which makes them appear older than they really are. We are importing another pure white breed for broilers, which we think will be superior to any of the others, and will let your readers have the result next season.

It is advisable for every one who contemplates broiler-raising to be prepared to produce the eggs he uses from his own flocks. We have purchased eggs from farmers, but, as a rule, they do not hatch well, owing to the absence of judicious feeding, inbreeding, and other causes. Many prove infertile, and the chicks are often weak or deformed. The hens should be fed a liberal, well-balanced ration. Cut clover, steamed and mixed with middlings, ground green bone and meat, with good, clean wheat, will go far towards giving you a supply of eggs that will hatch out a large percentage of large, vigorous chicks. In cold weather the eggs must be gathered several times during the day, especially if your poultry house is not kept at a temperature considerably above freezing. They must be handled carefully, and kept in a moderately cool place. We find that eggs set soon after being laid hatch better than those kept for some time. Discard all misshapen, very large or very small eggs, also pullet eggs if hen eggs can be obtained.

We must now consider the means employed to do the hatching—whether by incubator or by hens. If a winter business is to be conducted, an incubator becomes a necessity; if summer work, hens only may be employed. A number of hens should always be set at the same time, because it is easier to feed and care for a small number of flocks of uniform chicks than for a great number of hens having chicks varying a few days between each lot; and forty sitters can be fed and cared for as easily as a dozen, if you keep them all in the same building. It is not practical to manage a large number any other way. Laying stock must be excluded. The nest boxes should be thoroughly sprinkled with coal oil, and filled with clean, soft material. If an egg becomes broken, the remaining eggs, if soiled, should be gently washed in luke warm water, dried and replaced under the hen. The eggs should be tested the seventh day, and the infertile ones removed. They will serve nicely to feed the young chicks. The fertile eggs may be given to part of the sitters, and a fresh supply given the others. The hens should be fumigated when they first begin to sit, and again just before the eggs are hatched. I have made and used a fumigator which is very simple and effective. It is a much speedier and less expensive method than using insect powder. It does its work thoroughly, and I am more than satisfied with it. (A future letter will describe it.) After the chicks are hatched, leave them in the nest twenty-four hours. They will not eat before that time, as nature has provided a supply, and they are not hungry. Then remove the hen, and place her in a coop that will at least keep out wind and rain. If the ground is dry, the coop may be without a bottom, and can be moved to a clean place each day. But if the ground is damp, the coop should have a movable bottom, which can be taken out and cleaned. Little chicks will not thrive in filthy quarters, and where vermin abound. If you wish to raise large numbers of chickens, cleanliness is absolutely imperative. I believe more chicks hatched and brooded by hens are lost from living in dirty coops, and being infested with lice, than from all other causes combined.

The first food I give little chicks is egg-custard, made by adding one tablespoonful of milk to an egg, and cooking in the oven until firm. Bread soaked in milk and squeezed out dry is good. Always give a variety of food. Corn meal, oatmeal, and ground wheat, mixed in equal quantities and baked like biscuit, is relished very much. Onions chopped fine, cabbage or young clover will help to supply the green food required. If much soft food is fed, no water will be required for the first two weeks. Meat must be given unless large quantities of insect food can be obtained. We feed meat and ground green bone, one tablespoonful (heaped) to a dozen young chicks per day, increasing the amount as they grow older. For the first two weeks we feed every two hours, but not all they will eat. No food should be left on the feeding boards when the meal is finished. After that age they should be fed five times per day. Never let them have all they can eat, except at the last meal. Even then be careful that they do not gorge themselves and bring on indigestion. I like to see them eager for their food each meal. Slipshod methods of feeding, namely, neglecting them long after the usual hour, and then giving them all they will gobble up when half famished, feeding meal mixed up with cold water, or grain too coarse for them; also neglecting to supply a quantity of fine grit, such as broken glass or crockery, are most certainly the cause of most of the ill-luck people complain of. If the weather is warm the hen may be taken from them as soon as they are feathered. They will do better alone if the coop is comfortable. Chicks do not want too warm a place to sleep in. They will sweat off at night all the flesh they put on during the day if confined in closed coops. See that the coops are properly ventilated. So much for natural incubation and brooding.

(TO BE CONTINUED.)

Nine Ways to Make Hens Lay.

1. Warm and dry houses for them to roost in.
2. A shelter shed alongside each pen for bad weather.
3. Corn should be given on cold mornings.
4. All grain should be buried under chaff or straw, to induce exercise.
5. Mashes of ground grain with meat scraps for morning meal: good feed of grain at night.
6. A liberal supply of green food.
7. Fresh water daily or twice a day in warm weather.
8. A constant supply of sharp grit and broken shells.
9. Perfect cleanliness and freedom from vermin.

GARDEN AND ORCHARD.

Practical Gleanings from Farmers' Institute, Division No. 4.

PROPER CARE OF AN ORCHARD.

Good *cultivation* is essential in an orchard, but a mature orchard should not be plowed. Cultivate as early in the spring as possible and preserve moisture. Use a spring-tooth cultivator. Sod should not be allowed in an orchard, unless in the case of one growing wood very rapidly. Hoed crops should be produced in a young orchard to procure return from soil till the trees come into bearing.

Manuring.—Do not attempt to grow fruit year after year without applying manure; a hungry fruit tree can be easily detected. When the tree has only a few small apples and the leaves turn yellow early in the season, you can conclude that your tree needs manuring. Barnyard manure should be applied freely. Wood ashes are the best fertilizers which we can apply to an orchard. Manures should be spread over the ground as far as the branches extend, as the roots penetrate that distance, and often farther.

Pruning.—Start your trees at a uniform height. Do this when trees are small. The trunk of a tree does not increase much in height after head is started. Three main branches are enough. Prune so that you will have a spreading growth, that the sunlight may enter freely. Always remember in pruning: aim to direct growth rather than cut out what has been produced. The best time for pruning is March or April, before the growth starts.

Spraying.—Spraying is practiced for the destruction of insects and the prevention of fungous diseases. The first spraying should be copper sulphate mixed at the rate of one pound to 25 gallons water, and applied with a force pump having a very fine nozzle; the finer the spray we can produce, the more effective. This should be applied before the leaves open. After leaves open, use what is termed Bordeaux mixture. Bordeaux mixture should be applied before the blossoms open. Paris green should be applied at the same time, one-quarter pound to fifty gallons of mixture. Spray again after the blossoms fall to the ground. Keep codling moth in check by letting hogs run in the orchard.

Thinning.—Never allow a tree to over-bear in a good year. Thin out the fruit even as much as one-half; what is left will grow so much larger that you will have more baskets of better fruit. The core and seeds exhaust fertility much more than the pulp of the apple.

The whole process may be summed up in a few words: *Cultivate thoroughly, manure liberally, prune intelligently, spray regularly*, and when you get a large crop *thin judiciously*.

POTATO GROWING.

For Seed.—Small potatoes should not be planted; medium-sized and well-formed tubers should be used, and should be selected while digging. Keep seed from growing by storing in a cool place. Seed should be cut, but only to a large size; every piece should have from three to four eyes. Good buds can be produced by keeping in a place where sunlight can shine upon the potatoes; be careful and do not break off the newly formed buds.

Soil.—Potatoes do best on a soil full of humus or vegetable mold. A good clover sod plowed down is excellent for potatoes.

Planting.—The last days of May or first of June is the best time to plant. Plant in hills or drills; the latter preferred. Plant rather close together in the drill, and plant deeply—about five inches gives good results. Potatoes always grow above the seed. Plant as soon as possible after cutting, in a furrow. Cultivate deeply at the start; flat cultivation is preferable. For destroying beetles, apply Paris green and lime with a spray pump. Varieties for late planting are Empire State, Summit, Thorburn, Rural New Yorker. Early varieties—Early Puritan, Burpee's Extra Early.

MANURES.

Manure is a term applied to anything which we put back upon the soil to increase its fertility. Every farmer should keep stock enough to consume all the fodder and coarse grains grown upon his farm, as the manure thus produced is the great source of fertility. The quality of the manure depends upon the food fed to the stock. If the feed be poor, the manure is also poor. When all the animals are fed a grain ration every day, the quality of the manure is much improved. If there is not too much snow and the land is level and fairly well drained, the best results are obtained by drawing directly to the field and spreading evenly on the land. If the manure is left in the barnyard, it should be spread evenly over a given area removed from the drippings of the roofs, and the manure from the pig sty, the horse stable, and the cattle barns should be mixed in the one pile. This should be well tramped and made as solid as possible, in order to prevent fermentation. Keeping the manure in a covered shed is an advantage. Manure should be applied as near the surface as possible, and be thoroughly mixed with the soil.

MUNGO MCNABB.

Mr. W. G. Pettit, of Freeman, Ont., the well-known breeder, in our "Gossip" Department states that he has had gratifying experience in feeding rape to his Shropshires, and says that so long as he keeps sheep he will never be without it again.