

cool of the morning or evening, and stable them at night and during the heat of the day. The quantity to be given depends upon many circumstances which you must investigate for yourself. It does not pay to give some cows grass, let alone bran or meal. If the cows have a good deal of traveling to do in procuring grass or water, they will eat more, and if they are large and in a healthy condition, drinking only pure water, they will eat still more. Most cows will be benefited by all they will eat up clean, while others are apt to gorge and injure themselves. If they masticate their food well, you will experience little danger from overfeeding, providing they are in good health, and produce a good flow of milk. With these facts before your eyes, give 8 to 12 pounds per day of grain or mixture of grain with bran, making the bran about one-third of the mixture. Under favorable circumstances, this practice would be preferable to exclusive soiling or exclusive pasturing. 2. Sour apples, by their superfluous acidity, may weaken the constitution of the cow, and to this extent affect the yield of milk. There is a great difference between sour apples and sour ensilage, the former being desirable and natural when given in suitable quantities, but the latter is purely artificial, even in the minutest quantities. There are four stages of fermentation: (1) The *saccharine*, evolving sugar from the starchy portion of the food; (2) *vinous*, evolving alcohol from the sugar; (3) *acetous*, evolving vinegar from the alcohol; (4) *putrefaction*, or rottenness, evolving ammonia. The ensilage may be good or bad, according to the stage it has reached, but if fermentation takes place at all, it cannot be so good as the original grass. The saccharine stage may not be regarded as objectionable, but the cow is provided with saliva for the purpose of changing starch into sugar, so that there is no sense in the artificial method. In the intermediate stages, the ensilage acts as a stimulant, which usually produces injurious results if persisted in for any considerable length of time.]

Building a Milk Cellar.—I would feel much obliged if you would give in your paper a few hints as to building a milk cellar, say for 8 or 10 cows; the building to be detached and the floor either sunk a foot or two, or level with the surface. No doubt it would need ventilation and perhaps a double wall. —P. T. Brantford, Ont.

[For many reasons the house cellar is best for milk if the drainage is good; for in keeping it clean, cool and well ventilated, you benefit the milk as well as the health of your family. It can be more efficiently ventilated than a separate cellar, for a pipe can be made to extend from the cellar into the chimney, where a good draft can be obtained. However, as you want to build a separate cellar, you should select a spot, if possible, where the air is pure and free from stable odor, the brow of a hill being best, and where pure water is easily obtainable. The main benefit of a hillside is that the drainage can easily be made complete. It should be made for milk and butter alone; make no departments for vegetables or anything that decomposes and produces odors. Of course, eggs or anything of that sort, will do no harm. If your object is to make first-class butter, not grumbling at a little extra expense, you may make a double wall of brick or stone, filling the space with *dry* sawdust or cut hay or straw. You may make a double roof in the same way, using planks instead of brick or stone. So long as the drainage is complete, you may sink the cellar into the ground as far as you like. As to ventilation, the air should enter at the bottom, and if the floor is below the level of the ground, you may use pipes connecting the outside air with the ventilators which should be placed just above the level of the floor, and should contain slides by which the air can be closed out when necessary. A ventilator with a slide should also go through the roof, and the top of the windows should be as high as possible and made to open at the top, which will also act as ventilators. Keep the ventilators open when the air is purest and coolest outside.]

Growing Several Crops Together—Feeding Value of Chess.—1. What advantage is there in sowing peas and oats as a mixed crop for grain? 2. What is the feeding value of chess compared with oats? —W. H. W., Lakelet, Ont.

[1. Any two or more crops may be sown together for feed grain, providing they ripen together, are easily harvested and threshed, and the land can be got into suitable condition for them. 2. We have

never seen an analysis of chess, or feeding experiments made with it. If, according to most practical farmers, wheat turns to chess, there would likely not be much difference in their feeding values; but if, according to the evidence of botanists, it belongs to a different species, it may have a widely different feeding value from wheat or oats. The comparative feeding values of wheat and oats and other grains have recently been published in the *ADVOCATE*.]

Cure for Spotted Apples.—Fruit Growing in Nova Scotia.—I would like to ask if lime would tend to produce even-shaped, smooth fruit. Some varieties of my apples grow one-sided and spotted, especially the Yellow Bellflower and Spitzenburg. For some years the fruit on them has almost been an entire failure. Apple orcharding is being largely extended in the valley of Annapolis and Kings, and many other parts of the Province. Small fruits are also coming to the front, among which cranberry culture is occupying considerable attention. Though our fruit growing and farming is small compared with the more extended parts of the upper Provinces, yet if we keep on extending our fruit culture and farming in general for a few years to come, as in the past, we will, at no distant day, occupy no mean position among the farmers of the Dominion. The standard of the *ADVOCATE* is high for us as to farming, but we can use judgment and approach as near to it as we may think fit.—I. J. S., Berwick, N. S.

[Spotted apples have been discussed by our fruit growers, and a leading member of the Fruit Growers' Association, who has tried sulphate of copper (copperas), speaks highly of it as a remedy. Sprinkle from one-half to one pound (according to the size of the tree) about the roots of each tree, and let the rain wash it in on the ground. Probably you don't manure your orchard enough, or perhaps you use too much of a one-sided fertilizer. We hope your anticipations about fruit culture in N. S. will be fully realized.]

Oyster Shells and Bones as Fertilizers.—1. Will you kindly inform me through the columns of the *ADVOCATE* whether oyster shells are better burnt or spread on the land whole, and what is their value burnt. 2. Are bones partly burnt and then ground as good as dry ground bones without burning, and what are their different values? 3. Will sulphuric acid dissolve whole bones, and how strong will it have to be? How many pounds acid per 100 lbs. bone?—H. B., Fort Lawrence, N. S.

[1. Oyster shells are mainly carbonate of lime, and so are of little more value than limestone, which is not of much use for most soils. They should be burnt or pulverized, of course. 2. When bones are burnt the nitrogen is lost, but as the percentage of nitrogen is usually small, little loss is sustained. Bones pulverized but not burnt are more valuable. The respective values can not be ascertained without knowing the percentage of nitrogen, which is greatest in fresh bones. 3. Sulphuric acid will dissolve whole bones very slowly; it will pay to break them. The acid as procured from the drug store should be diluted with an equal volume of water, and as much put on as will reduce the bones to a pulp. Mix the pulp with l-ached ashes before you apply it.]

Ration for Cows—Cisterns for Liquid Manure.—1. I have been feeding the cows until lately on uncut hay at night; morning and noon, cut straw one bushel, with four lbs. pea meal and 1 lb. bran, each meal; also a peck of turnips twice a day. Then I discontinued the meal and gave 6 lbs. bran per meal, but I find neither of these rations pays for the food consumed. It seems to take at least 18 quarts of milk to make 1 lb. of butter. Do you consider straw suitable for milk cows? If so, what would give better results fed with it? Would corn or oats, and how much should a cow 800-900 lbs., get? The cows are common natives and give fair results on grass. The milk is set deep in water. 2. We lately dug a cistern for liquid manure. One neighbor says it will not give good results unless mixed with straw. Another last winter who got his stable drain frozen, found it killed his strawberries, although it was very much diluted with snow water. The soil is clay.—BEGINNER, Waterdown, Ont.

[1. There are two sides to this question; (1) something may be wrong with the ration; (2) something may be wrong with the cows, and two wrongs never make a right. Straw, when fed for milk or beef, must be used cautiously, and should be of first-class quality. Being very bulky, it must be fed with the most concentrated foods, such as oil-cake, bran and peas. Try hay instead of straw, or add some oil-cake to the meal and bran, and if the ration does not then pay, the fault lies in the cows, and you must look to your manure heap for the profit. You must have observed that some cows can utilize bulkier food than others. Corn or oats can only be fed with good hay. From 9 to 12 pounds per day of a mixture of cake, bran and peas should be fed with straw. 2. As a rule, we do not approve of cisterns for liquid manure. We can see no sense in mixing it with straw. Barnyard manure, solid or liquid, is just as apt to produce injurious results as any other kind, if improperly applied. Likely your neighbor's strawberry patch was badly drained.]

Colonial Exhibition.

The Colonial Exhibition to be held in London, England, this year, should be, if properly managed, of great benefit to Canada. It is our intention to attend, and we expect to meet many of our Canadian, Australian, New Zealand, India and British friends there. We have not as yet heard who are intending to exhibit from other parts, but this city we think will be fairly well represented. Mr. W. Saunders, Canada's great entomologist, chemist and pomologist, is appointed to superintend the pomological department, and is preparing the exhibit. Mr. White has one agricultural engine ready for shipment, and is working on a new one which appears to us the most complete agricultural traction engine we have seen, but he fears he will not have it ready in time for the first shipment. Perhaps the Government may allow two shipments of agricultural implements, as it will for horticultural products. John Elliott & Son will exhibit two harvesters. Stevens, Turner & Burns one threshing machine and one agricultural engine. The North American Co. will exhibit one thresher and one mower. Wortman & Ward, churns and hay forks. D. Darvill is talking of sending a pile driving machine. McClary & Co. will make a large exhibit of stoves and tinware. Mr. Thompson, carriages. Mr. Leonard & Sons, and Jno. Campbell, are as yet undecided.

As Others See Us.

SIR.—The *ADVOCATE* is the best paper in Canada.—LYMAN B. SMITH, Warrington.

SIR.—The *ADVOCATE* is to the farmer as the compass is to the sailor.—R. S. McGill, Hagersville.

SIR.—I have taken various agricultural journals, but am best satisfied with the *FARMER'S ADVOCATE*.—J. W. BURNS, Rockwood.

SIR.—I cannot do without the *ADVOCATE*, hard as times are. Wishing you greater success.—FRANCIS MIDDLETON, Chandos.

SIR.—I would not think of doing without the *ADVOCATE*, for I believe I receive ten times its cost every year.—E. W. BROOKS, Glen Ross.

SIR.—After reading some of the articles that appeared in last issue, I made up my mind that I could not do without the *ADVOCATE*. Stick up for what is right for the agricultural class, and all right-thinking people will stick to you and be your friend.—THOS. WHITE, Branchton, Ont.

SIR.—Enclosed please find \$1, being my subscription for the coming year. This is my fourth year, and I certainly have less inclination to give it up than ever. I like the *ADVOCATE* for the fearless way it criticises things it conscientiously believes to be wrong.—GEORGE H. HEALEY, Virden, Man.

SIR.—Although I have rented my farm for a time, I still take an interest in farming and everything connected with it, and do not intend to give up your old and valuable journal. I have been a subscriber, I believe, ever since it started, and have got a great many useful hints in its columns. Wishing you every success.—JAS. ANDERSON, Guelph.

SIR.—I enclose you one dollar to pay for the *ADVOCATE* for 1886.—It is twenty-one years next February since our Township Clerk presented each of the Councilmen with a copy of your *ADVOCATE*. The remarks that were made about the little sheet were, it would not last long and would soon die a natural death. But each of us subscribed for it, and I have taken it ever since, and to-day it is a credit to the country; also the publisher to send forth such a sheet, for it fearlessly advocates what is right and denounces what is wrong. Hoping it may continue long in the true cause.—JACOB SOVIEREEN, Delhi, Ont.