

able on some farms. The choice of permanent pasture will depend on soil, drainage, altitude and rainfall, and also very largely on the previous mode of cultivation on the farm. The value of grass is best illustrated by reference to primitive condition, such as we may find in the far northern counties of Ontario and Quebec, and also in the North-west. After feeding to stock, and obtaining the value of the manurial residue, we still have something of greater relative value than either, and that is the accumulated store of soluble plant food which generations of nitrification have stored up for the pioneer farmer. The comprehension of this great fact has induced both Manitoba and Dakota to raise live stock hand in hand with grain farming, and thus to preserve this great heritage of fertility as the true basis of modern economical husbandry. The permanent fertility of soils depends primarily on the grass as the best crop for controlling evaporation and retaining the moisture and heat necessary to feed and nourish the plants, and to elaborate for successive crops food for their growth and maturity. This clothing of the earth's surface with the great variety of plant life found upon it provides the first and cheapest condition of plant food, and therefore the best and strongest guarantee of nutrition for the succession of crops which may follow in a rational rotation. The rotation of crops is based on the necessity of plant food supplies for succeeding crops, varying in structure, form, root and leaf systems, and their general habits of feeding. The adaptability of a soil and the climate, together with its previous crops and general treatment will determine the succession. The whole practice of agriculture implies food, feeding and nutrition, and to fail in food is failure to nourish the farm crops. Such a condition in plants, as in animals, lays the foundation for disease; indeed when nutrition is arrested disease is a natural consequence. According to every law of biology disease is malnutrition, and hence if we are to avoid disease it is only by complete nutrition, which is the product of rational feeding of plants and animals. It naturally follows that every thought and every act of the husbandman must be bent to this end, because the more food he can provide, the larger will be his crops. Chemistry teaches us that matter is indestructible, and that we can create nothing, but only transform, sometimes cheaply, but often very dearly. The great lesson agriculture teaches is to place ourselves in harmony with nature, and to learn her chief laws carefully and well, that we may reap bountifully what she provides, a provision which we so often labor to dissipate and fritter away.

(TO BE CONTINUED.)

#### What the Members of the Ontario Creameries Association say of Ensilage.

MR. JNO. SPRAGUE,

of Ameliasburg, when opening the discussion said, first, that in past discussions our attention has been largely occupied with the best methods of getting cream, of making butter, best breeds of cattle for the dairy, etc. Those subjects, although of great importance, are not the foundation of success in our branch of industry. Without cheap, good feed, and plenty of it, we cannot expect to receive a profitable return from our labor. Ensilage for feeding has now passed the experimental stage, and has been adopted by so many farmers, that it may now be considered an established fact. The rapid growth of this system, and my own experience proves, to me at least, most conclusively that the silo is destined soon to replace the old unsatisfactory method of feeding. The growth of this system in England and America has been marked with rapid development. In 1880, ten silos were in use in these two countries. In 1885, the number had increased to 3,190, and I now estimate from the

best information attainable that the number has increased to 10,000 in practical use. There is one fact I desire to keep before the minds of my readers, that is, the future success of our industry in this country more largely depends on a good, cheap and abundant food supply than any other subject under our consideration. By the use of properly constructed, properly filled silos, it is no longer necessary that our cattle should be allowed to lose in condition during the winter, to come out so thin and emaciated in the spring that one half of the following summer is required to get them in condition again. To my own mind, ensilage is sure to revolutionize dairying and become a necessity to the farmers of this country, and here I strongly urge your careful consideration and early adoption of this and other improved systems of feeding. My observations lead me to believe that we, in the older counties of Ontario, are on the eve of a mighty change. That change will be in the ownership of our farms, or in a rapid change in our method of farming. The West, with its new virgin soil and easy tillage, has now driven us far from growing grain at a profit. To the business man the day of wooden ships and stage coaches has passed; we too, as practical farmers, should be quick to abandon that which has not been a paying system in the past and be ready to adopt something better. That something better is, in my opinion, corn feed and the silo, aided by permanent pasture. By the use of this system of storing and feeding ensilage, the capacity of our farms can be largely increased. We can make our best butter and beef in the winter when both are in best demand and bring the highest price. I suppose the most of you have given this subject more or less attention; in a word, you have the theory. After carefully studying the method, I decided last spring to grow corn and construct silos. We selected a field of thirteen acres near our barn building, for growing the corn; planted three acres of this field to field-corn as usually planted; also planted ten acres with southern red cob sweet, or silo corn. Planted the latter with two-horse drill, in rows  $3\frac{1}{2}$  feet apart; used on  $3\frac{1}{2}$  acres  $1\frac{1}{2}$  bushels to an acre; on  $3\frac{1}{2}$  acres, 1 bushel to an acre; on  $2\frac{1}{2}$  acres,  $\frac{3}{4}$  bushel to an acre. Planted 1st June; as soon as the corn was nicely up I cultivated once, and in ten days cultivated again. Used a two-horse cultivator; time used in planting and cultivating (man and team), three days—one day planting and two days cultivating. We harvested about the 15th of September; cut the corn with a Royce reaper, doing one row at a time. We estimate the yield from the thirteen acres at 130 tons green feed. We fed our stock from the field as needed, the balance was put in silos. We found, after the siloed feed had cured and settled, we had, by actual measurement, 81 tons, allowing 45 feet to the ton. Last winter we fed it to ten milch cows, fourteen young cattle and two colts. We were more than pleased with it; our cows gave a good flow of milk, and the other stock did well. We valued this feed as worth to us \$7 per ton. To construct a silo for convenience and cheapness we used the ground or hay-mow of barn, excavated five feet below floor, built up with stone wall fifteen feet high, and plastered inside and bottom with water-lime. The inside measure of our silo is 13 feet and 4 inches by 14 feet, 15 feet deep, with doors to enter at a level with barn floor. We find our silo convenient to fill, also convenient for feeding. There has been much said about construction, filling and weighting the silo. I need not comment on the different constructions or the best kinds of silo; I will only say, that in my opinion, good

silos can be made with any kind of building material; can be built above ground, underground or partly both. The main point in construction is the exclusion of air and frost. The feed used to fill silos, if grass, Indian corn or clover, should be well matured—at extremity of growth when cut.

MR. V. E. FULLER,

of Hamilton, said Mr. Sprague must have had a very unfortunate year, or else he could not have had the ground that produces the best results, otherwise, I don't think, he would have estimated the return at ten tons to the acre, and if he will put it at twenty tons to the acre he will be more in accord with our experience. We carry at our place 250 head of stock, outside of sheep or horses. I speak of cows and calves, and if we had not had ensilage to depend on, the cost of maintenance would have exceeded the production of these animals at the pail and in the churn. It would take at least a ton or a ton and a half of hay per day to keep our stock, yet the product of forty-five acres last year kept our entire cattle stock from the frosts until the pastures in the spring. I must correct Mr. Sprague in his estimate that two tons of ensilage are worth a ton of hay. The experience of most people is against that, but I have heard it so, that three tons of ensilage are worth two tons of hay. It is certainly a most economical food when you consider that it increases the flow of milk and gives it a better color. I have heard it contended that it will give a taste to the cream and butter, but I don't believe there is any justification for that statement, and it is against our experience. It is true we don't cut our ensilage just previous to the time of feeding, but earlier in the day, and we never found any difficulty from this source. Our practice is, in place of planting corn in rows thirty-six inches apart, we plant it at eighteen, and even then we are taking off two crops a year; rye in the fall; pastured that down with cattle; cut it early in the spring, early enough to be put away for use during the period of dry weather in August and September; manured the land in the winter; manured it again in the spring, and have planted that same ground with ensilage corn, and taken off a crop in the fall. Last summer we took off a large quantity of rye, intending that as food during the drought. Finding that the drought continued during the whole year, we retained it and are using it to-day with good results. We have also had some experience in using clover, and have found it very satisfactory. It is unnecessary to go to the great expense, which is advocated by some, in the building of silos. In one we built we went to a lot of unnecessary expense—stone wall, concreted the bottom floor, and, as usual, when fancy farmers undertake anything of that kind, spent piles of money we need not have spent. It is necessary that spaces should be left to be filled with sawdust or earth. It is also necessary to exclude water. At one time it used to be very heavily weighted by placing upon it planks ranged crossways, and putting over them heavy weights. The idea was to keep out the air, because air causes putrefaction. Now in place of that we have found that if we merely spread the planks over the top and cover it over with earth, it is just as beneficial as heavy weighting. Now I can only add to what Mr. Sprague has said, that I also believe that ensilage is bound to become an important factor in the economic production of milk throughout this Province at no distant day. We must recognize and remember the value of fodder corn as fodder.

MR. D. DERBYSHIRE,

of Brockville, the President, said there is no doubt that the "B and W" is the kind you should sow. Now, for the benefit of any farmers who think it is going to be a terrible expense to build a silo, I will give you a little history of how to build one cheaply. Commence by selecting a site somewhere convenient to your other buildings. Make your foundation. The proper shape is about twelve by thirty-six feet, that is the most economical size, the easiest handled and the best. Build a stone wall two feet deep all the way around, a solid mortar wall just as if you were going to build a house on it. Put on the slide and have it dropped right down level with the wall. Commence and dig clay and fill in one