

lived and had enough to eat, their highest ambition was realized. But as human wants increased, and the race found the need of a religion, from whose altars ascended, morning and evening, the smoke of the burnt offering, men would be compelled by a priesthood that exacted the best of everything to aim at higher results than merely keeping life in the animal, and as men were observant then just as they are to-day, it would not be long before some shrewd cattlemen would notice that quality as well as quantity had something to do with desired results, and that by pursuing a certain course of feeding these results were more speedily and profitably attained. Still there would be much mystery in the business, and for long years cattlemen would require a lifetime in finding out what chemistry has revealed of the *why* and *wherefore* of those mysterious properties contained in the every day food of our fields and farm yards.

The present century has been rich in discovery and scientific research, in every department of human industry, but in none of the busy activities of this bustling world has more been done than in that of agriculture. We live in a remarkable age of the world, at a time when "many run to and fro and knowledge has increased." We need not live the years of a patriarch to know even the wonders of nature or the developments of science that our children can learn from the text books that our common school educational system puts into their hands. It would indeed be an interesting study and an appropriate one too, for a Farmers' Institute to take a retrospective view of the mysteries brought to light during the present century, but my paper confines me for the present to bran, and my purpose is to look at the light that science and experience have thrown of late upon this much undervalued cattle food. Many of us yet remember the time when the grist came back from the mill, we knew what to do with the flour, and we had a place for the shorts, but the bran—we would leave that anywhere out doors. Those days, gentlemen, have gone, bran is taking its place in the front, and we are indebted to our wives and daughters for the discovery, that when "bossy" was given a teed of bran the tops of the milk pails were yellower and the cream thicker and the churning had to be oftener done. Our cattlemen, too, can tell us something about bran, and it speaks well of the article to find bran as a mixture entering into all profitable cattle rations, whether for growth, beef or milk.

As both theory and practice in cattle feeding have proved that a mixture of foods will produce better results than feeding those foods separately, it will always be understood that the food value of wheat bran is best obtained when fed as a mixture.

I would like to guard farmers present against a mistake into which not a few were inclined to run a few years ago, namely, that with the new roller process of making flour, the bran being freed from all flour, is of much less value than in the olden times when there was more or less flour mixed with it, that the inferior machinery of the day was unable to take out, but the fact is that as a substitute for clover hay and a mixture to be fed with timothy, there is nothing equal to wheat bran, and the closer it is ground and the more closely the flour is taken out of it, the more valuable it is, ton for ton. The reason of this seems to be that in reducing wheat to flour by the roller process, the germ or embryo of the wheat is left to a greater extent in the bran, and as this is the richest part of the kernel (rich in nitrogen), a ton of roller bran is of more value for feeding purposes than the same weight of stone ground bran. Before closing my paper I will give a table shewing the comparative value of the two brans, but in the meantime will pass on to notice that in feeding cattle there are three things to be considered and three distinct objects to be aimed at: First, to make bone; second, to make muscle or flesh; and third, fat. Although these three points are dependent upon one another, and all needed in the make up of an animal, they are very different in their composition. Bone is not flesh, neither is flesh fat; yet without bone we cannot have flesh, and without flesh we cannot have fat. Experience has shown and science has given the reason that certain foods are better adapted to the animal while it is making bone and muscle, that is, when it is young and growing; while other foods are better suited when the animal is to be fited for the shambles. Now what is called science in cattle feeding is just putting the farmer in possession of the knowledge of those foods which are best adapted to the particular stage the animal may be in, so that he may save his fat-forming

foods till the animal has attained its growth, after which he can cease feeding the bone and flesh-forming foods. Hence science in feeding is simply economy in feeding, for it may be put down as a rule that "the closer the food approaches in its chemical constituency to the matter it is required to form, the sooner will the end be attained."

Cattle feed of all kinds is divided into two classes; those that form flesh and those that form fat. I presume every farmer present takes an agricultural paper. In that paper, whether it is the STOCK JOURNAL, or some other, or the agricultural column of his weekly newspaper, he will find these two classes of food referred to, but very likely under more scientific names than I have given them. But the farmer of the present day must not be afraid of science or scientific terms in connection with his calling. These high sounding and scholastic terms are necessary in speaking intelligently and correctly of the common things in farm life, and a knowledge of their meaning is a necessity in understanding the farm literature that comes into our houses. One of the functions of Farmers' Clubs and Farmers' Institutes is of an educational nature, where, as in a school room, we become acquainted with the principles of our profession and the terms used in connection therewith. The flesh forming foods are called nitrogenous, protien or albumenoids; and the fat-forming foods, non nitrogenous, or carbohydrates. They may aid in understanding and remembering those terms if you allow me to explain them a little. The flesh forming foods being rich in nitrogen, some writers choose to call them nitrogenous foods; other writers prefer the word protein, a word signifying "first," because they are the first foods the animal requires as the casein of milk, the fibrine of flesh, gluten of flour; whilst a third class of writers use the word albumenoids, because albumen, a substance resembling the white of an egg, enters largely into all the flesh forming foods. The carbohydrates, I would not undertake to explain further than that they are rich in carbon, which is both a fat and a heat-producer, and are represented by starch, sugar, gum, etc.

In all agricultural periodicals that aim at progressive farming, the results of the laboratory are given in tables from which we can learn at a glance the chemical and comparative value of all foods raised on a farm.

(Concluded in next issue.)

### The Clydesdale Horse.

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(Seventh Paper.)

THE HURON CLYDES.

The county of Huron has for many years been well to the front with its draught horses, as far forward, probably, as any other county of western Ontario. Many of the early settlers in the "Huron Tract" were men from sections of the old land where good horses were known and appreciated. When the stumps of the clearings gave place to fields where a straight furrow could be drawn with the plough, these men very naturally looked out for a good bit of horse flesh to draw the furrow. Years ago, when ploughing matches were better attended and more talked about than they are now, some very creditable teams turned out to the work in Huron matches, some of them with evident traces of good blood and good care. Since then the standard has been much improved, and the number of good breeding mares much increased. The best have not always been kept, for here, as elsewhere, American dollars too often took away the best of the better bred ones—the ones that should have been kept for future breeding—and would have paid better at home than did their price. There are now, notwithstanding this, a good number of breeding mares of good Clydesdale character, and the number is steadily increasing. It is true that in some parts there is too much cross-breeding—or perhaps mixed breeding would be a better term to describe the habit of breeding to a recorded Clyde one season, to an animal without a pedigree the next, and again to an animal of mixed Shire and Clyde breeding, a select animal, or something of that sort. No steady, definite plan, but instead,

breeding to any animal that may for the season take the fancy. As a very natural consequence there are a good many animals of mixed breeding—good some of them may be, but by no means well-bred. There are still some who boldly advocate this system of breeding, but generally it results from no definite plan of breeding having been adopted; and when these latter look carefully into the matter the disadvantages are easily seen. It is different with other animals. In breeding sheep or cattle for feeding only, cross breeding has long been considered profitable. It frequently gives to the produce larger size and earlier maturity than either of the parents possessed. This is very desirable when the animal goes straight to the butcher; but breeding from these has always been considered very unsatisfactory; a good hit may be made, but this is very rare. And coming back to horses, those of mixed and cross breeding, especially the first cross, may be extra good in body and bowel, and may even stand well in the show-ring, but their produce are likely to be irregular in form and uncertain in quality. They have never held out as well as animals pure-bred; and this is the experience of both Scotch and American breeders. There have been a few exceptions to this. Now and then an animal of cross-breeding appears able to reproduce the form and style of one of his ancestors, but these are so rare, they only go to prove more clearly the general rule and cast by contrast a deeper shade on the great bulk of cross-bred animals that have been such miserable failures.

The first volume of the Clydesdale Stud Book of Canada contains the names of 26 breeders and owners from the county of Huron who have pure-bred animals there recorded. The late Hugh Love, sr., of Hillsgreen, is one of the foremost here named. He imported the black mare Bonnie Jean [131] (816), foaled 1872, and bred by Wm. Love Beith, Ayrshire, sire Farmer (285), dam by Young Garibaldi (973); the dark bay stallion Wellington [36] (1801), foaled 1871, and bred by Col. McDowell, Stranraer, sire Grand Duke (366), a horse bred by the late Lawrence Drew, Merryton, and the light bay Glenlee [106] (1669), foaled 1871. This horse had dark legs, black mane and tail, and was sired by Glenlee (363). Of younger animals he imported the dark brown horse Wellington [69] (903), foaled 1874; bred by Alex. Love, Kilmalcolm, sire Crown Prince (206). Emigrant [4] (1648), another dark brown horse bred by Routledge Bros., Old Mill, Port William, Wigtonshire; sire Warrior (908), and the young Lord Lyon (994), colt Heather [53], out of an Old Times (579) mare. A grand old horse was Old Times, and he left good stock.

Mr. John McMillan, M. P., Constance, imported in 1882 Rothschild [21], dark brown, bred by David Cross, Knockdon, Maybole, Ayrshire, sired by the very celebrated Darnley (222) whose death last year was regretted by Clydesdale breeders everywhere; dam Rosie by Old Times (579). From D. Frederick, Stranraer, he got Puzzler [22], another dark brown colt from an Old Times (579) mare, and sired by Ploughboy (590).

Mr. C. E. Mason, Brucefield, has had a number of good horses, amongst others the old grey horse Glenelg [32], sire Glenelg (356). The brown horse Honest Sandy alias Young Bergamie [67] (387), bred by Jas. Fleming, Falkirk; sire Vanquisher (889), dam by Sir William Wallace (804). One of the best bred of the Huron horses was one imported by Peter McGregor, Brucefield, called Count Careless [41] (1421), foaled in 1878, and from the celebrated stud of the Marquis of Londonderry, Seaham Harbor, Sunderland, England; sire What Care I (912), a horse that cost £1,500, and that has proved himself cheap at the