

ever saw. On the newly-cleared, rich lands of this Province it did remarkably well for a number of years. Gradually it worked its way westward, and on the rich virgin soil of the Western prairies of Minnesota and the Dakotas it seemed to find congenial conditions for perfect development. The City of Minneapolis is called the Flour City, and to the traveller, the chief interest is in its immense milling industry, for it has the largest mill and largest milling capacity of any city in the world; its reputation for high grades of flour is world-wide. And if the traveller asks for a reason for all this, he might truthfully be told that it consisted of two things—the great water-power and the hard Fife wheat.

And in our own great West, with the great mills of the Ogilvies, Lake of the Woods, and other companies, and the long line of big elevators stretching along the railways and looming up huge and massive in all our lake ports, the Fife wheat has had more to do with all this development than most people have any idea of.

The ability to grow this wheat is one of the most valuable assets of our Northwest to-day. I remember a time, back in the eighties, when the Northwest was in a fair way to lose its reputation. There had been frequent damage from frost, and it was thought the Fife wheat was too slow in maturing; also that there were other kinds that would not only mature earlier, and thus escape the frost, but at the same time give a larger yield, and so they began to sow other varieties. The result of this would have been disastrous, and would soon have ruined the reputation of our Canadian West as a producer of high-standard milling wheat. But two large corporate interests came to the rescue and saved the situation, because their own interests were going to suffer if they did not—the C. P. R. and the millers. The C. P. R., with the shrewdness and foresight so characteristic of that company, carried seed of the pure Fife wheat free of charge, and the millers, especially the Ogilvies, furnished pure Fife wheat for seed at a low price—below actual cost, I think. And so, between the two, a propaganda was begun in favor of the growing of the famous hard wheat; and that action has had a far-reaching effect in re-establishing the supremacy of the Fife.

Dr. Saunders, about this time, introduced a new wheat from Russia, the Ladoga. It was thought this would be a substitute for the Fife, and would ripen earlier. Analysis of this wheat showed it to contain as high a percentage of gluten as Fife. But that did not make it its equal, as there is a vast difference in the quality of the gluten of different wheats, and we never hear now of the Ladoga wheat; it had to take a back seat.

Back in the seventies the Fife wheat was still being grown in Simcoe County, and was still doing fairly well on rich clay soils, but was showing signs of failing in yield. About 1874 or 1875 a new wheat was introduced that was intended to replace the Fife. It was called the "Farrow" wheat. It gave a large yield, and in color and appearance closely resembled the Fife, though it was a little darker in color. But there the resemblance ceased, for when the flour of it reached the baker it was condemned. The millers who stocked their mills with this wheat found that they had a white elephant on their hands. It gave a poor, weak, starchy, gray-colored flour that nobody wanted at any price. However, the White Fife, for a number of years after its introduction, did very well; and on rich clay loam, where the land is rolling, and on high table land, it still continues to do fairly well. It is the best substitute for Red Fife ever tried here. I do not know the origin or history of the White Fife, but it is no doubt a sport of the Red Fife, different in color, not quite so thin in the bran, but giving a strong, rich flour.

Speaking of varieties, Mr. Motherwell says, on page 60: "As to varieties sown, the Red Fife stands head and shoulders above all competitors." I have always contended that the Fife wheat grown here 35 years ago was as hard and as good in every particular as any ever grown in the West. In proof of this, Mr. Saunders, on page 65, speaks of an old sample of Red Fife, grown at Ottawa in 1902, and used in the baking tests, which earned 104½ marks, the standard of comparison being that 100 marks signified a very strong flour, and 75 a very weak one. Mr. Saunders attributes this largely to the age of the sample used. But that is not the whole reason. In my own opinion, it goes to show that if we could find the conditions necessary in order to get this wheat to grow and yield in Ontario as it did 35 years ago, and furnish these conditions, there need be no fear as to its hardness.

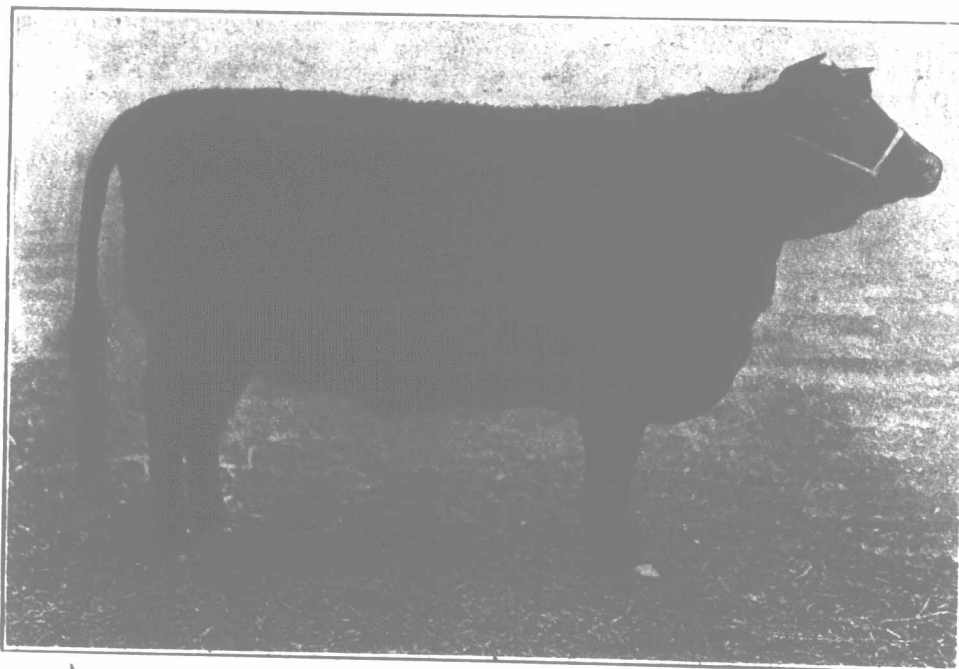
On the same page Mr. Saunders speaks of a variety of Club wheat grown in Manitoba, and has this to say of it: "It gives fairly hard kernels, of a deeper red color than red Fife, and commands a high price on the mistaken idea that depth of color always indicates strength." But he goes on to say that this wheat gives flour of a dark color, low in gluten and very deficient in strength, and should be condemned; and, further, he suggests that the Seed-growers' Association

refuse to receive for registration any variety of wheat from districts where wheat is grown chiefly for export, if the variety is known to be of poor quality.

All this goes to show that the propaganda in favor of good seed, improving the quality by selection, has not been started any too soon. And just here I would refer to a remarkable statement made by Mr. T. G. Raynor at the Winter Fair, viz., that he knew a man in Renfrew County who, by selecting for a series of years, had produced a crop of Red Fife wheat that yielded 30 bushels per acre.

But selection is not the only means of improving our seed grain. We may get, and no doubt have already, some valuable new hybrids by cross fertilization. Dr. Saunders began work along this line several years ago, and now has several promising hybrids in cultivation, nearly always, I think, using the Red Fife as one of the parents. And if Dr. Saunders succeeds in originating a wheat such as David Fife's great protégée has proved itself, it will be worth vastly more to the country than the total cost of all the experimental farms. It is pleasing to note that this work has lately been taken up also at Guelph, with some very interesting results.

So much for the spring wheats. And now a word about the fall wheats, which now constitute the bulk of wheat grown in Ontario. In the early seventies the old Soules and Dhil, or Delhi, were the varieties grown in this county. Then a little later the Treadwell was introduced. At first it was not in favor by the millers. It had a very thick bran and gave a small yield of flour. But in a few years it improved considerably in this respect, and it always gave a good flour. This wheat or the Soules, mixed with a third of Red Fife, and ground in the old way—in the old stone grist mill—gave us flour that was a delight. It had that moist, sweet, nutty flavor that we cannot get nowadays with our modern systems.



First-prize Shorthorn Heifer.

And reserve for championship for best Shorthorn at the Smithfield Club Show, 1906. Bred and owned by His Majesty the King.

These fall wheats after a time began to degenerate in yield, and new varieties were introduced. But up to the present we have never had a variety in any way comparable with those old varieties mentioned. One of the best yielding of the varieties introduced since then was probably the Dawson. It was a very vigorous grower, a healthy, strong plant, but the flour from it was a disappointment. It was so dry and starchy, so low in gluten, that when baked the loaves cracked open. This was a subject of general complaint, and was only avoided by mixing it liberally with spring wheat for gristing purposes. It is claimed that the new variety from Kansas, Turkey Red, has high milling qualities; but, with that exception, we have not had a good milling fall wheat since the days of the old Soules and Treadwell.

The history of our wheat-growing is, briefly, this: The wheats we grew 30 or 40 years ago were all, or nearly all, good milling wheats. When the yield began to fail, new varieties were introduced, giving a larger yield on the same land, but poor in milling quality. There has been quite a long list of varieties grown since the days of the old Soules and Treadwell, but nearly all giving poor, starchy flour, of poor breadmaking quality. Of course, a certain amount of this flour is always used in pastry and the making of all kinds of biscuits. But for the wholesome, spongy, moist, sweet bread which is so desirable, and which everybody wants and everybody relishes, we must have the hard wheat, of the best milling quality, rich in gluten and giving a strong

flour, rich in all that goes to make a high-class article of bread.

The miller does not always know a good milling wheat when he sees it, as witness the reception given the Red Fife by them when first introduced. The deciding test is with the baker. It is the breadmaking quality that counts.

Most valuable work is being done at the Dominion Experimental Farms in the breeding and testing of wheats. In the report of 1901, 117 varieties of spring wheat were under test, and the Fife wheats stood well to the front. It is pleasing to note that 54 of the varieties tested were cross-bred sorts, and that in a select list of 48 varieties of the best spring wheats, the Fife wheats and their crosses stood well to the top, with average yields at all the farms of from 32 to 35 bushels per acre. Dr. Saunders was on the right track when, in looking for a wheat that might be a worthy successor to the Fife, in case that variety should deteriorate and fail, he looked to the country from which the Fife wheat came; and, although the Ladoga proved a failure itself as a substitute (I note that it comes next to the bottom of the select list), yet, by crossing it with the Red Fife, he has produced a wheat—The Preston—that bids fair to rival the old stand-by itself. In the report of 1904, at the Brandon Farm, Red Fife stood next to the top, with a yield of 36 bushels and 40 pounds per acre, and at Indian Head it stood eighth in a list of 36; but on the same Farm, in a field test with eight varieties, in plots of from two to ten acres (the eight varieties were nearly all the Fife wheats and their crosses), the yield was from 31 to 42 bushels per acre, and the Red Fife on the 10-acre plot gave a yield of 40 bushels and 57 pounds per acre. This was on land which had been summer-fallowed. In view of all this, is there any reason why Canada should not retain her supremacy as a producer of the best hard wheats in the world?

Should the Fife wheat fail or deteriorate, or, in common phrase, "run out," there seems to be evidence that we will have some varieties of its progeny worthy to take its place. The deterioration or running out of a variety may be deferred for a long time if the propaganda of the Seed-growers' Association is successfully prosecuted. Of this we have abundant evidence. In the West they have the soil and climate for hard wheat; the rest depends upon the skill of man. In the experiments being carried on at the Dominion Farms and at Guelph in cross-breeding and testing varieties, and in the work of the Seed-growers' Association, we have two strong factors in the problem. But there is another most important one—the soil. To get good seed of any kind, the soil must be right, and here I would refer to Prof. Harcourt's address, on page 56 of the report—one of the best I have read on the subject of soil conditions. I would refer to one quotation. On page 56 he says: "An insufficient supply of phosphoric acid is always followed by the production of poor yields of shrunken grain." Nitrogen forces the leaf and stem growth, and the presence of phosphoric acid is needed to hasten maturity. So strong is the action of phosphorus in this direction, that at maturity three-quarters of the constituent taken up by the plant is found in the seed. He further shows the function of potassium, which, he says, aids in the formation of all organic matter; and of lime, which seems to aid in the construction of the cell wall. Each of these constituents has its own particular work to do, and the absence or deficiency of any one of them will cause the death or the incomplete development of the plant.

It is plain from all this that we must have the aid of the Agricultural Chemist in the solution of the problems presented; and one of these is, Why cannot we produce fair yields of good hard spring wheat in Ontario, as we did 35 years ago? Why is it that, almost invariably, when we get a wheat, either spring or fall, that would give a larger yield per acre, it just as surely deteriorates in breadmaking quality? There must be a reason. Can we not find it out?

The idea of installing a miniature mill and bakery at the Experimental Farm is a capital one. It is money wisely and well spent, for the