

perennial grass, Awnless Brome, is among the best known. Chess, however, is not a perennial, but, like fall wheat, is a biennial plant, or rather what is now called a "winter annual." The seeds germinate in the autumn of one year, and the grain ripens during the following summer. Chess is known to be more hardy than wheat, and frequently, when wheat is killed out, the chess remains uninjured; for this reason, having more room, it stools out and forms vigorous plants where, had the wheat plants lived, it would have been crowded and only a few weak stems would have developed, which might then have been easily overlooked. I have in my collection of dried plants just such crowded chess plants, only 2 or 3 inches high, bearing mature seeds, and, on the other hand, in good soil, with plenty of room to develop, chess plants will frequently grow 3 feet high, with fifteen or twenty stems, bearing large panicles with many seeds.

It is sometimes stated that chess and wheat have been found growing on the same head, and specimens have frequently been submitted to botanists for examination. In every instance it has been shown that a spikelet of chess had merely been caught between the chaff scales of the wheat head, and with care could be separated without breaking. Three such specimens have been sent to me here during the last twelve years, and some years ago a similar specimen was sent to the FARMER'S ADVOCATE, of which a figure was published. The slender stalks of the spikelets of chess render this accidental occurrence very easy, as anyone will find upon trying it when the two plants are in a green condition. Again, it is said that chess and wheat have been found growing from the same root. It will be easily understood that where wheat containing chess seed is sown with a drill, the plants grow up so closely together that they intertwine their roots, and at first sight have the appearance of having grown from the same seed. That this is not the case may be easily proved by anyone who will carefully wash out from the roots all the earth, when not only will the two plants be easily separable, but in most cases the old seeds, of entirely different appearance, from which the chess and wheat grew, will be found attached beneath the center of each plant. The grain of wheat will be shrunken, but easily recognizable; the chess seed, owing to the husk which remains attached, will have changed but little in appearance. I draw special attention to this because anyone finding chess growing in fall wheat next summer can prove for himself what will certainly be the case, that *every plant of chess he can find grew from a chess seed and not from a grain of wheat.* As frequently the rootlets of plants will penetrate any hollow object lying in the ground, some care may be necessary that mistakes are not made from this cause. The position of the exhausted seed from which a plant has grown may be easily studied from young plants of corn, wheat or barley. These seeds are firmly attached beneath the center of each plant. Old seeds lying in the ground will be found to separate easily from the rootlets and, as a rule, to be some distance from the base of the stem. The following are some of the causes which are given for the alleged degeneration of fall wheat into chess:

- (1) Sowing shrunken seed.
- (2) Sowing in a certain time of the moon.
- (3) Injury by Hessian fly.
- (4) Eating off of the plants by stock or by fowls.
- (5) Trampling by animals or injury by passing vehicles.
- (6) Drowning out by water lying on the ground in spring.
- (7) Freezing out in winter or heaving by frost in spring, so as to "cut off the taproot."

None of these causes, however, can have the slightest effect in bringing about the change of one of these plants, which are distinct species, into the other, as I have proved by experiments here at Ottawa, which have been carried on year after year and have been watched by hundreds of farmers who knew of the experiments and have come periodically to examine them. In the first place, plump, shrunken and even broken seeds of fall wheat have been sown and never produced anything but wheat. Seeds have been sown (for experiment's sake) at all times of the month. Plants injured by Hessian fly, but not killed, have been marked and watched carefully. One hundred grains each of chess and fall wheat have been sown in September and each grain marked with a label. In the spring, twenty-five plants were trampled into the ground; twenty-five were twice cut down with a pair of scissors, in imitation of stock eating them off. Part of these plants had the snow shovelled off them during the winter two or three times, and a small plot was sown on a bed where it was known that water would lie for two or three weeks in the spring. In this last case, many of the plants were always killed out. These experiments, as stated above, have been repeated every year for nine years, and are still going on. The results may be summed up by saying that in no instance has the least change been discernible. Chess seed produced chess, and fall wheat, whatever treatment it might have received, produced fall wheat and nothing else.

In reply to the contention that chess cannot be grown from its own seed, I will merely state that the chess I am now growing has been cultivated year after year from the same stock with which this experiment was begun nine years ago, and

further, that chess is one of the recognized fodder grasses in France and Germany, of which the seed is regularly advertised for sale. On this continent chess is largely grown for fodder in the State of Oregon. Correspondence with Prof. Moses Craig, of the Oregon State Agricultural College, is printed in my annual report for 1892, from which the following may be quoted: "In reply to your letter, regarding the use of chess as a fodder plant, I would say that in this county it grows well and is considered by most farmers to be as good as timothy, selling readily at \$12 a ton. This applies mainly to the hill regions, as in the valleys other grasses can be profitably grown. It endures the dry, dusty summer much better than timothy, and is often sown in freshly-cleared land, where it makes a good stand. In the ranches of the Cascades, when mixed with wild oats, it forms the entire food of cattle. I think that chess grows much better on alkaline land than do timothy and other tame grasses." As stated above, chess is a winter annual, like fall wheat; therefore, if seed is sown in the spring, few if any of the plants will flower that year, but if sown in September, all the plants will flower the following summer. There is only one remedy for chess—to sow clean wheat in clean land. If this be done, there will be no trouble with chess; but clean seed wheat is a much rarer thing than most farmers think, unless it has been hand-picked, grain by grain. It must not be forgotten also that seeds of chess will remain in the ground for several years.

In conclusion, let me quote the following from Prof. Scribner, the head of the Division of Grass and Fodder Plants of the United States Department of Agriculture, and the highest authority on the subject in America: "The idea that chess is degenerated wheat has no foundation whatever in fact. Only chess seed will produce chess. Chess and wheat are only remotely related, and they belong to quite different tribes in the grass family. Wheat is less likely to change into chess in a single generation than into the more nearly-allied oats, or than wheat is to change into barley, with which it is very closely related."

And now, sir, I do not hope in the least to convince anyone by what I have written that chess does not originate from fall wheat, but I do hope that I may have indicated lines of investigation by which every one can prove it for himself, and from which, if carried out, no other possible result can follow. Chess can no more grow from fall-wheat seed than a rose or any other plant can grow from an onion seed. If any of your correspondents would like to test for himself whether chess seed will grow and produce chess, I shall be glad to send a sample of seed to all who apply, as long as my supply lasts.

[EDITOR'S NOTE.—Since asking Dr. Fletcher to write on this subject, we have received a number of well-written letters, discussing the question pro and con, most of the writers being very confident of the soundness of their conclusions. As their publication would take more space than the overcrowded state of our columns and the importance of the subject would appear to justify, we append, as an acknowledgment, the names of the writers, and trust that Dr. Fletcher's article may be accepted as authority. Our correspondents on this question are: Messrs. George Sexsmith, A. Potts, Thomas Dunlop, S. K. Ruddell, J. W. L., D. R. Marr, J. J. Wilson, J. H. Mitchell, T. Collins, R. Bullock, and J. Bobier.]

Nova Scotia Farmers' Association.

The Nova Scotia Farmers' Association convened at Kentville, for its fifth annual meeting, on Jan. 30th, the last session closing Friday evening, Feb. 1st. It had been expected that Hon. Sidney Fisher and Mr. F. W. Hodson, Dominion Live Stock Commissioner, would be present, but owing to the death of Her Gracious Majesty Queen Victoria, they were unable to attend, and the Association was thrown largely upon its own resources, and the success of the meeting showed the ability of Nova Scotia farmers in such an emergency.

President Wm. Corning, in his opening address, said in part: "The agriculturists of our Province have had a fairly prosperous year. The western section has been blessed with one of the finest seasons ever known. Crops were good, and owing to the very large number of tourists visiting the country, prices were firm, and every production of the farm was in good demand, especially poultry and the products of the dairy. . . . Through the courtesy of Mr. F. W. Hodson, I, with other delegates from the Maritime Provinces, had the pleasure of visiting the Ontario Fat Stock Show at Guelph, the Agricultural College, and the Experimental Farms. The object of this delegation was, I think, to more thoroughly unite the agricultural classes of the Dominion. The difference in the agricultural standing of Ontario and the Maritime Provinces is not, in my judgment, so much in natural advantages as in education. If this be correct, then it would seem wise for us to largely bend our energies in this direction. This should naturally increase our interest in our own agricultural and horticultural schools and in every other line of work that has for its end the better educa-

tion of the farmers. I should like to call your attention to one other point that impressed itself upon my mind more than any other thing while in Ontario, and that was the class of men who represent the farmers in the Governments of the country and are leaders of public opinion, and have been very large factors in placing the agriculturists of Ontario in the high and important position they occupy to-day. I refer to such practical farmers as the Hon. Sidney Fisher, now Minister of Agriculture; Hon. John Dryden, Dr. Mills, Prof. G. E. Day, and others. In this part of the Dominion, while we are fortunate in having a few such representative men as our Hon. Mr. Black, and others, yet it appears to me that our profession has not that standing and influence which the magnitude of its interests requires and has a right to demand."

A paper by Mr. F. W. Hodson, on the "Organization of Farmers' Institutes and Live Stock Associations," was read by Mr. R. Robertson and discussed at length. Mr. Macoun spoke in support of the system as it obtains in Ontario, and all who are acquainted with its work there gave it great credit for what it has accomplished. Yet it was thought by the Association that definite action could not well be taken on the matter at this time, and further, that, with our present system of bonusing agricultural societies, the Ontario system would need to be considerably modified before being adopted here.

A paper on "How Best to Maintain the Fertility of Our Orchards and Farms," by Mr. John Donaldson, of Port Williams, was most practical and interesting. Mr. Donaldson believes that commercial fertilizers at fifty dollars per ton are too expensive for most farmers, and he advocates a larger use of mill feeds for stock, and the consequent increase in the amount and value of the manure produced. He gave figures to show that he is carrying out his ideas on his own farm, and his well-known success in farming gave emphasis and weight to what he said.

The Provincial Exhibition received a large share of attention. Mr. J. R. Wyman presented the report of the exhibition commission, speaking of the success of the Exhibition as an agricultural and live-stock show. The transportation service had been greatly improved, as well as the grounds, and he urged that every member of the Association give his hearty support to the enterprise. Mr. Logan, the other representative of the Farmers' Association on the exhibition commission, spoke briefly in further discussion of the report. He said that exhibitions were not run to make money, but to educate the people, and he insisted that the financial result of the exhibition compared favorably with that of any other held in the Dominion. President Corning said that some persons were agitating for a biennial exhibition, but he thought if the question were studied carefully it would be found that exhibitions are largely a failure unless held annually. What was needed was more united action among the farmers in support of the exhibition. It was felt that the freight rates on exhibits carried by the Dominion Atlantic R. R. were not as liberal as they should be, and a committee was appointed to interview Mr. Giffins on the subject. After waiting upon him and discussing the matter, they reported that he was willing to make this further concession; that upon all live stock carried by his road to the exhibition at Halifax and receiving no prize or prizes, he would refund the amount which had been paid for the carriage of such live stock; but that upon live stock which secured prizes there should be no refund of the freight paid, namely, one fare for the round trip.

In discussing the prize list, it was felt by some that the standard breeds of cattle, as Shorthorns and Ayrshires, should receive larger prizes in the different classes than those herds which are of little importance in the Province, as the Devons and Galloways. A resolution was introduced urging the commission to take action in accordance with this idea, but the matter was finally dropped without a vote being taken.

On the last evening of the meeting a memorial service was held in memory of Her Gracious Majesty the late Queen Victoria, during which a large number of members paid sincere and heartfelt tribute to her many virtues.

The election of officers resulted in the choice of the following: Pres., G. C. Lawrence, Port Hastings; 1st Vice-Pres., John Donaldson, Port Williams; 2nd Vice-Pres., S. J. Moore, Shubenacadie; Sec.-Treas., Chas. R. B. Bryan, Durham.

Sewer Pipe to Exclude Surface Water from Wells.

To the Editor FARMER'S ADVOCATE:

SIR,—I see an inquiry in Jan. 15th ADVOCATE re excluding surface water from well. A number of wells in this locality have been lined with sewer pipe: some with 18-inch and some smaller. I do not see why they would not answer in L. G. Troup's case. He would need to fill the collars at the joints with cement, and also cement around bottom of first pipe where it joins the rock, else the surface water might work through the joints.

I have been taking the ADVOCATE for over 20 years—in fact, was brought up on it, and have not yet learned to do without it.

Ontario Co., Ont. F. R.