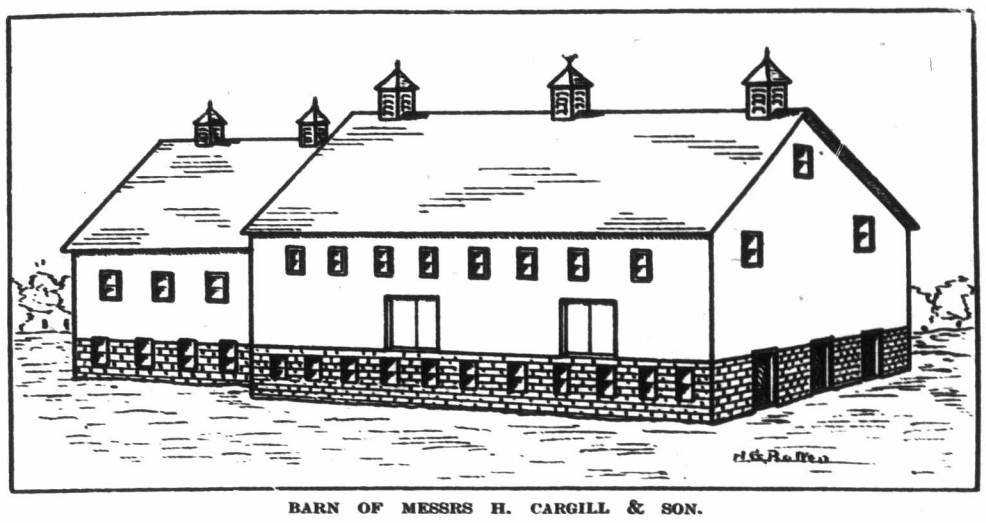
A Highly Satisfactory Stock Barn.

The following is a plan and description of one of Messrs. H. Cargill & Son's stables at Cargill, Ont., importers and breeders of Shorthorn cattle. The size of this barn is 72 x 100 feet. The silo, mixing room, and the manure room are separated from the stable proper by a wall, having doors in convenient places, as shown by plan. They feed their stock feed from feed room, it being passed down through chutes from floor above, and the ensilage is conveyed from silo in car or truck built with two wide-tire wheels behind and one swivel wheel in front, so that it can be moved or turned easily in any direction.



BARN OF MESSRS H. CARGILL & SON.

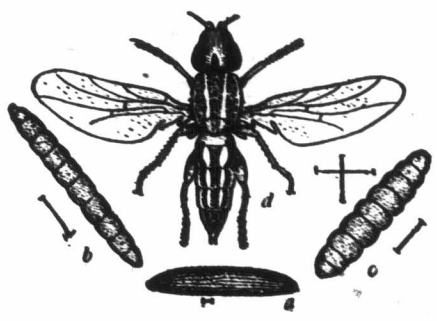
Regarding further details, Messrs. Cargill write: "Distance from floor to floor is 12 feet, ventilated with 6-inch tile through top of wall between the joists, about six feet apart. Water is supplied by a windmill and pumped into a large round tank, 8 x 8, which sets in implement house just over the wall between manure shed and root house; is piped from this tank to small supply tanks, marked S, which maintain water at proper level in water basins. The pipes from these small tanks for box stalls run along the floor, buried sufficiently in the cement to make surface level. Pipes to supply stall basins run along top of plank, which is the front of mangers, and where it crosses passage in center of stable is dropped low enough to cover with cement same as pipes in boxes. The cement used was from Battle's Cement Works at Thorold, Ont., and is very satisfactory. Manure is removed with wheelbarrow. Mangers are 16 in. wide, with bottom raised 2 in. higher than floor with cement. They are not wide enough for cattle with a little extra horn. Partition between stalls is 4 ft. at back and is 4 ft. 6 in. at head, and in front of cattle is 4 ft. 10 in. high. Partitions in front of boxes are 6 ft., and between 5 ft., except for bulls, which run nearly 6 ft. also. Mangers in boxes are 8 ft. deep and 14 in. wide and about 18 in. up from floor. Motor sets on a platform suspended from joists, driving a main shaft from which we run pulper, straw cutter, etc. Pulper can be moved from one end of root house to the other, keeping close to the roots, as pulley on main shaft is easily moved. Pipes from large tank to smaller ones are kept up at ceiling and run straight down into small tanks. Where water is taken off for supply to horse stable, etc., we have a Globe valve and connection to which we attach hose to supply thresher engine when threshing."

Injurious Insects --- "Dead Heads" in Manitoba Wheat.

BY DR. J. FLETCHER, DOMINION ENTOMOLOGIST, OTTAWA.

A subject which has attracted a good deal of attention and given rise to much discussion among farmers in Manitoba during the last two or three years is the cause of the so-called "dead heads" in wheat. While it is possible, I believe, that these may be due to two or three different causes, I feel convinced that much of it at any rate is due to the attacks of the maggot of the fly which in Ontario and other parts of Canada injures wheat and barley in a precisely similar way to that which in Manitoban wheat is known as "dead heads." The wheat-stem maggot, which, owing to its attack at the roots of wheat plants, is also called wheat-bulb worm, occurs all through Eastern Canada, and, although the adult flies are enormously abundant in meadows and prairies all the way from Northern Quebec, through the Lake Superior region, Manitoba, and the Northwest Territories, its attacks in grain fields have not been complained of under its own name until last season, when it was discovered by Mr. Geo. Greig, the Manitoba editor of the FARMER'S ADVOCATE, to be the cause of, at any rate, some of the injury. In company with Mr. Greig I was able to confirm his observation at several points in the Province of Manitoba during the past summer. The wheat-stem maggot, however, cannot be claimed to be the only cause of this characteristic effect, for we found near Deloraine, in Southern Manitoba, that many "dead heads" in the corner of one field were due to bruises by hailstones which had struck the stems after the ears had speared. It is probable also that "dead heads" are produced in wheat in the same way that they are in various grasses, by having the juices of the stems sucked out by various plant bugs. Prof. Otto Lugger, the State Entomologist of Minnesota, has also found that "dead heads" are caused by the attacks of the maggots of another small fly, a frit fly (*Oscinis soror*, Macq.), the maggot of which he described as boring inside the lower portion of the culm. It has been supposed by some Manitoban farmers that "dead heads" were due to the attacks of the larvæ of the wheat-stem sawfly (*Cephus pygmæus*). This, however, I feel sure is a mistake. Although the stems are sometimes seriously injured by the burrowing inside them of the larvæ of the sawfly, it is seldom or ever that the whole stems are destroyed and the ear turns white. Another cause to which this loss has been attributed very generally is an obscure fungous disease. With regard to this last suggestion, all I can say is that having searched for it I have failed to find any trace of such a disease.

The presence of the wheat-stem maggot in a crop of wheat is very easily detected in the summer time when ears of injured stems turn white before the rest of the crop ripens. If the stems be examined carefully it will be found that the base of the topmost joint has been gnawed away by a slender, glassy, green maggot, a quarter of an inch long. It is this injury to the growing part of the stem that causes the death of the heads before the grain ripens. The injury is known in various parts of Canada under the different names of "white heads," "bald heads," and "silver top." There is another attack on the wheat crop by the same insect which is harder to detect. This occurs in the root shoots close to the ground, not only in wheat and barley, but also, and perhaps much more generally, in various kinds of grasses. The severity of the summer attack in the top joints seems to vary very much in different years according to the season. Occasionally the injured stems will constitute as much as 25 per cent. of the whole crop. This was the case three years ago near Rounthwaite, in Manitoba, and in Ontario is recored as having been as much as five per cent. When full-grown, the maggot of the brood which causes the "dead heads" works its way up to the upper portion of the sheath and turns to a slightly-flattened and very transparent green puparium, from which the fly emerges at the end of July and during August.



THE WHEAT-STEM MAGGOT
(*Meromyza Americana*, Fitch).

There are three distinct broods of the perfect insect. These appear during June, at the end of July, and at the end of September. They are active, elongated, greenish-yellow flies, one fifth of an inch in length, with shining green eyes, and three dark stripes down the back. The legs are short, the hind thighs thickened, and when the fly is at rest the fore part of the body is raised. Very soon after emerging the sexes pair, and the eggs for the next brood are laid on the upper surface of the leaves of grasses and wheat. These are snow-white, spindle-shaped, as shown at A, and beautifully marked in narrow lines.

Remedies.—Should the attack of the wheat-stem maggot increase seriously, which from past experience it may be confidently hoped will not be the case, as soon as its presence is shown by "dead heads" much may be done in reducing the numbers of the next brood by sowing a drill or two of wheat or barley in close proximity to infested fields. This should be sown as soon as the injury is detected, so that the young plants may be got above the ground in time to attract the females for egg laying. After the middle of August these strips should be fed off by sheep or plowed down. All stubbles should be harrowed as soon as the crop is carried, so as to start a volunteer crop which can be plowed down early in September, when all of the eggs laid upon it will be destroyed. The late sowing of fall wheat where this crop is grown could not profitably be delayed long enough to escape the egg-laying period of the last brood.

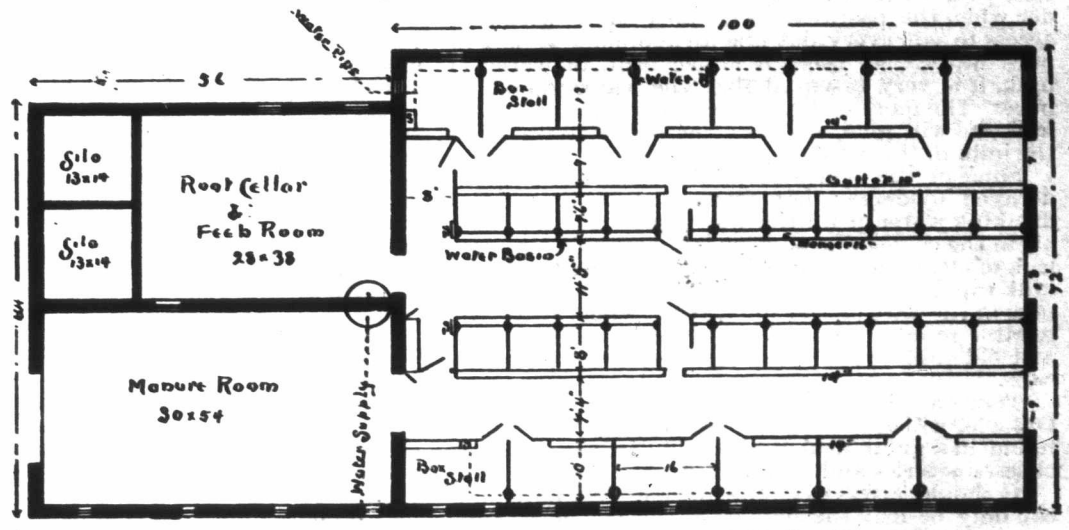
(2.) The application of special fertilizers as a top dressing when young wheat is known to be attacked will help injured plants to throw out new stools and overcome to some measure the effects of the attack. I am hopeful that the wheat-stem maggot may not be a constant source of loss to the wheat-growers of the West. The insect feeds naturally in the grasses of the prairie, to which, under ordinary circumstances, it will chiefly resort, and I believe that its attacks upon wheat, occurring so occasionally, are due to climatic conditions, which are not likely to occur every year. Another hopeful feature is the invariable abundance of a special parasitic fly (*Cœlinius meromyzæ*, Forbes) which destroys large numbers of this enemy. Wheat-growers, however, will be wise to learn as soon as possible to recognize this enemy and detect its presence, for Prof. Lugger, who has studied it in Minnesota, says that in 1895, 1896, and 1897 it was common from the Red River Valley to the central part of East Minnesota. In some parts of the States, late sown fall rye, which had made but little growth during the autum, and which grew slowly in spring, was greatly damaged, in some cases to the extent of one-tenth of the crop. Wheat did not entirely escape, and infested plants showed the presence of the insect by their small size and weakly appearance.

A Strong Argument for Sowing Mixed Grains --- How to Still Grow Peas.

To the Editor FARMER'S ADVOCATE:

SIR,—About six years ago, having noticed in the report of the Guelph experimentalist that crops of mixed grains yielded more per acre than the same grains grown separately, I began to sow for a grain crop oats and peas mixed. I have been so pleased with the returns that I have had a crop of such mixed grain every year since. I sow with a drill on spring-plowed sod, well harrowed, as peas do best on sod and sown rather deeply. While it is well known that early-sown peas are worse with bugs, yet I sow as early as possible, because if they are more buggy than if sown later the yield is generally greater, and certainly early-sown oats yield the best. On the whole, there would be more lost than gained by late sowing of such a mixed crop. I prefer the large-grained varieties of peas because there is a smaller percentage of loss in each bug-infested pea. The hole that a bug eats is regulated by his own size, not the size of the pea. The Mummy variety is the one I have generally grown, and it is hard to beat. Last year, however, I had some Canadian Beauty, which is a fine large pea, yielding well, and which seemed to stand dry weather at the ripening season exceedingly well. I aim to sow, mixed together, 1½ bushels of oats and 1½ bushels of peas per acre. I would rather sow less than more. The advantages of this mixed crop over either sown alone: 1st. Greater yield. 2nd. Surer crop. One year, owing to a wet spring, peas were a complete failure; where sown mixed with oats a fair crop of oats was harvested. Another season, in a part of the field where Cutworms destroyed nearly all the oats but left the peas untouched, peas were a full crop. 3rd. The crop can be cut with an ordinary mower. I seldom, if ever, get less than 34 bushels of mixed grain (weighing 45 pounds to the bushel) per acre, and I sometimes reach 46 bushels of almost as heavy grain. I have noticed that periodically the bugs almost disappear, so that we need not fear a complete and permanent failure of the pea crop. Where farmers have become discouraged in trying to grow peas alone, I would strongly recommend a trial of growing them mixed with oats, as I have already outlined.

Middlesex Co., Ont. T. BATY.



GROUND PLAN OF BARN OF MESSRS H. CARGILL & SON.