

fouling of the food, the troughs are guarded by a frame of small laths.

A little above the two troughs are the nests or laying places, *n, n, n*, five or six in number (see figs. 4 and 5), into which the hens get through fairly large openings.

It is not necessary to enter the compartment to collect the eggs; all that is needed is to raise a board, *m, v*, fig. 5, which closes all the nests by the side of the passage, and keeps them dark enough.

Above the nests stretches the floor, *t*, 5½ feet wide, and about 8 inches above it are the perches, *c, c*. While the fowls are at roost, their dung falls on the floor, and is taken away daily without any one going into the compartment, for it can be raked up with a hoe, or any other suitable tool, by raising the plank *o* (fig. 5.)

The door *p*, by the side of the nests and perches, and extending the whole height of the house (fig. 2, 3, 4), gives entrance to the compartment; by this door, all the sweepings of the litter &c., are withdrawn, and the poultry attended to if anything goes wrong.

The compartments are separated from one another by close partitions (of boards) from the bottom upward, two or three feet high, and thence to the ceiling by a lattice-work of laths and wire, as in fig. 1; thus, there is a free circulation of air in every part.

In front, i. e., on the side of the passage (*v*, fig. 3 and 4), the doors opening into the compartments, as well as the rest of the partition, are also of laths or wire.

Each division receives light directly from a large window (fig. 1 and 2). Level with the ground is a large opening, closed in winter and only open in summer, by which the fowls can go and take their pleasure in the open air in their summer yards.

Still more light is given to the house by several windows opening on the large passage.

POULTRY DUNG.

M. Dubord gets a great quantity of rich manure from his 225 hens so well fed as they are. What falls from them, when at roost, on to the boarded floor is free from all admixture with foreign matters, and is carefully kept in barrels. The litter contains the rest of the droppings. M. Dubord uses a great deal of it on his large garden, and sells the rest at a good price. His last onion-crop gave a yield of 600 bushels an acre, some of them weighing nearly 1½ lb. a piece. Seven of his pumpkins went over 100 lbs. each!

BONE-MANURE.

We said that M. Dubord's poultry receive a large feed of bone-meal daily, it is one of the best food to make hens lay in winter; and we wish to draw the attention of farmers to the value of this system of feeding:

The raw crushed bones are by the digestive powers of the fowl converted into a phosphatic, nitrogenous manure, assimilable by plants, and, from that point of view, the stomach of the fowl constitutes itself into a most economical laboratory for the preparation of bone-phosphate of the best quality.

Let us, then, keep as many laying hens on our farms as we can manage to get together, and give them all the bones we can collect; we shall, to begin with, get plenty of winter eggs, which always sell well, and our hens will manufacture for our use an incomparable phosphatic, nitrogenous manure.

(From the French).

IT IS GOOD FOR CATTLE.

The Question of Brewers' Grains as Fodder Discussed by Learned Men. (1)

The statement of Dr. Laberge in the *Herald* to the effect that the feeding of brewers' grain was injurious to cattle caused the following letter to be sent to Dr. McEachran.

Montreal, February 15th, 1896.

Dear Sir,—We, the undersigned brewers of Montreal, beg to call your attention to the enclosed extracts which have appeared in the Montreal newspapers during the past few days, regarding the unwholesomeness of brewers' grains as food for cattle. Would you kindly give us your opinion as Chief Government Inspector of Stock for the Dominion of Canada on this matter.

Signed, Wm. Dow & Co.
John H. R. Molson & Bros.
Dawes & Co.
H. A. Ekers.

To DUNCAN McEACHRAN, Esq.,
D. V. S., F. R. C. S.
Chief Inspector of Stock for Canada.

THE REPLY

Dr. McEachran replied as follows:
Dominion of Canada, Dept. of Agriculture, Office of the Chief Inspector of Stock

Montreal, Feb. 15th, 1896.

Messrs. Dow & Co.
John H. R. Molson & Bros.
Dawes & Co.
H. A. Ekers.

Gentlemen,—In reply to yours of this morning inclosing newspaper cuttings, on the subject of feeding brewers' grains to dairy cattle and asking me to express my opinion, in writing, to you on the subject, I beg to say that there is nothing deleterious in the draff as sold by brewers to the cattle feeders. In the process of brewing grain of the best quality only is used; it is deprived of some of its starch and probably to a certain extent of its albuminoids, thereby lessening its nutritive value, but the residue is in no way rendered unfit for food and can in no manner produce injurious results on the health of the animal eating it or on the milk produced by them, other than would result from any food deficient in certain nutritive elements, nay, I would further state that the boiling to which it is subjected would effectually destroy any injurious germs, such as fungi or smuts, which occasionally are found in raw grains.

So far, therefore, as the functions of the Board of Health are concerned in interfering with the sale of this valuable bye product of the breweries, it does not appear to me to be justified on the ground of preventing disease; on the contrary it would be an unwarranted interference with two important commercial industries, brewing and dairying. Nor would such action be local in its effects, for there are no less than 10,000 head of beef cattle fed in the distillery byres of Canada every year on grains which, unlike brewery grains, have undergone the process of fermentation, and consequently would be much more likely to contain various products of fermentation, yet we do not find that they prove injurious to the health of the cattle. (2) The Board of

(1) From the Montreal Daily Newspapers.
(2) Our own experience at the Kingston Distillery (Morton's) agrees with this.—Ed.

Health are to be commended on the signs of awakening interest in the milk question; it has a very important bearing on public health, and in this they may rely not only on the sympathy but the active co-operation of the public and professional men of the city.

Yours truly,
Signed, D. McEACHRAN.
Chief Inspector of Stock.

DR. GIRDWOOD'S OPINION.

In reply to a letter sent to Dr. Girdwood on this important question the following was received.

Chemical Laboratory,
Faculty of Medicine,
McGill College.

February 15th, 1896.

To Messrs. Dow & Co.
J. H. R. Molson & Bros.
Dawes & Co.
H. A. Ekers.

Gentlemen.—In reply to your letter calling my attention to the paragraphs which have been in the daily papers stating that the Health Department are investigating the milk supply and having it analyzed for Bichromate of Potassium, and that steps have been taken to stop the use of brewers' grains for feeding cows.

Bichromate of Potash is such an active poison that it should not be allowed to enter into articles of food, and the milkmen, if such there be who use it, should be punished. The use of brewers' grains is quite a different matter. I can see no objections whatever. The brewer obtains the best grain on the market; by the process they are put through in brewing all germs that might possibly be present are destroyed.

Brewers' grains are not like distillers' grains which have undergone fermentation, and may thus contain all kinds of germs, good, bad and indifferent. Brewer's grains, in respect of ferments, are better, coming as they do direct from the hot mash tun, than the ensilage now so much extolled and used for feeding cattle, and which is stacked in close piles and does undergo a kind of fermentation, and which if examined would be found to give ferments of different kinds in abundance.

Yours truly,
Signed, G. P. GIRDWOOD.

Brewers' Grains. (By the Editor).—We have had as much experience in the use of brewers' grains for milch-cows, horses, swine and ewes as most people. Our family's private brew-house, in Kent, England, was what a brewer would call an eight-quarter one, i. e., we mashed 64 bushels each brewing. The whole of the grains—exhausted malt—was given to the stock on the home-farm. The same was done with them at Sir Percival Hart Dyke's private brew-house, of about the same calibre, at Lullingston Castle, Kent, and Mr. Jenner, of Wenroo Castle, Glamorganshire, S. Wales, pursued the same plan. These are instances of the use of grains that came under my own personal observation in England, and in no one instance did we ever hear the slightest insinuation that the effect of grains as a food was injurious to cattle.

Every London milkman, in my day, used at least 150 bushels of grains per annum per head of his cows, and we never heard of any harm arising to the cow or to the customers of the milkman from such food being used.

At Burton-on-Trent, to day, hundreds of thousands of bushels of grains, of

which there is generally an over-plus in the winter, are bought by farmers in the neighbourhood and trodden-down firmly in silos or tanks for later consumption.

A more modern plan is now being pursued in some of the great London breweries: the grains are desiccated, i. e., deprived of most of the water they contain, and sold in that form.

In Canada, we ourselves had a brewery, for some eight years, at Chambly. It is no exaggeration to say that the farmers of the neighbourhood were crazy after the grains, and crowded up the office on brewing-days to a most inconvenient extent. We never heard the slightest hint of any injury arising from their use by cows, or to the human consumer of the milk produced.

What are the processes by which barley is converted into grains? Briefly, they are these:

The barley, always carefully selected, (1) is steeped in water for from 50 to 70 hours. It is then put into *couch*, allowed to germinate on the floors, in beds gradually thinner and thinner, being turned at regular intervals to encourage the growth of the *acrosipire* or plumule up the back of the grain, and when that is sufficiently advanced, the barley is put on the *kiln*, dried, deprived of its rootlets or cummins, and after crushing, is ready for the *mash-tub*.

In the *mash-tub* the crushed malt is mixed with water at a temperature of, say, 170° F., and, after standing some two or three hours, the extract or wort is let off into the boiling-back. Then more water is sparged, or sprinkled over the malt, which water permeates the mass, and rejoins its predecessor in the boiling back, or copper, and, under the name of *wort* goes through the usual cooking with hops and the fermentation with yeast, until it becomes beer. The whole process of making *grains*, from the first mixing with hot water to the end of the running off of the last sparge, does not occupy more than from 5 to 5½ hours. At what part of this process does the change take place that renders the wholesome grain, barley, become the highly deleterious feeding material *grains*? It would puzzle any one to tell.

The changes that take place, in the brewer's *mash-tub* are as follows: About 15 minutes after the hot water and the malt come in contact, the marvellous principle called *diastase* begins to do its work of converting part of the starch of the malt into gum and sugar. The brewer would be very glad if the greater part of the albuminoids of the barley could be got rid of, as he does not care to have too much fermentative matter in his worts, and in *malting* about ⅓ of the albuminoids of the barley are lost.

AVERAGE COMPOSITION OF BARLEY AND OF GRAINS. (Wolff.)

Barley.						
Water.	Ash.	Albuminoids.	Fibre.	Other Carbohydrates.	Fat.	Value per 100 lbs.
14.3	2.2	10.0	7.1	63.9	2.5	\$0.95
Brewer's grains.						
75.2	0.3	5.9	3.9	13.2	1.5	0.36

(1) Best malting barley from the Saale, and from Moravia, is now worth, in England, 4½ shillings a quarter of 8 bushels, heavy grinding barley, 21 shillings.—Ed.