been trying to bring about for more than thirty years in this country. Ed.)

FARM-YARD MANURE is a mixture of the dung and urine of farm animals with the straw and other matters used as litter. It is regarded as the typical manure, both because it is a "general" manure, and on account of its influence on the texture and general character of the soil to which it is applied. Still it is not a perfect manure. It contains, no doubt, all the elements of plant-growth; but these are not always present in the best proportions. To prevent a deficiency of one element, it has to be employed in such large quantities as to furnish other elements more or less in excess of what is actually required by the crop. Its great bulk also makes it extremely expensive to handle. It is, moreover, exceptionally liable to waste, and it yields its results very slowly.

In a ton of ordinary farm-yard manure there is contained about 13 lbs. of nitrogen, 10½ lbs. of phosphoric acid, and 10½ lbs. of potash. The percentages are, of course, variable. Mr. Warington, in the "Chemistry of the farm," puts the amount at 9 to 15 lbs. of nitrogen, 9 to 15 lbs. of potash, and 4 to 9 lbs. of phosphoric acid. The conditions affecting the composition and quality of the manure are (1) the kind and condition of animal producing it; (2) the food of the animal; (3) the kind and quantity of litter used; and (4) the care bestowed upon its after-management.

An adult animal takes comparatively little of the nitrogenous and ash elements from the food, because what it chiefly requires is the carbonaceous matter to keep up respiration and to form fat. (Quite right. Ed.)

Oil-cakes yield the richest manure; then come beans, peas, malt-dust, bran, clover hay, cereal grain, meadow hay, roots, and straw, in the order named.

The litter is an important part of farm-yard manure, not only on account of the manure matters contained in it, which are considerable, but also as affecting the texture and consequent fermentation of the manure. The quantity of litter should be sufficient to absorb and retain the greater part of the liquid manure and the surplus, if any, should be pumped up at intervals and distributed over the manure so as to keep the whole in a proper state of moisture. If the litter is deficient, the dung becomes too moist, and the most valuable part drains off, unless means are taken to collect it in liquid tanks. Whether the manure is too moist or too dry, fermentation is equally checked; in the former case by the exclusion of air, and, in the latter case, by the want of moisture.

MANAGEMENT OF FARM MANURE.—Air and moisture are both essential to the proper fermentation of manure. If it is too dry, it burns, gets "fire-fanged," white, and mildewed; and the high temperature of the manure promotes the formation of carbonate of ammonia, which is volatile and easily escapes into the air. This occurs when the temperature exceeds 80o F. But when the manure is kept moist and the temperature low, fermentation stops with the formation of organic acids which take up ammonia. The salts thus formed are present in the black decomposed dung, and the ammonia in them is in a soluble form, but not volatile. A strong smell arising from the manure makes it evident that a wasteful fermentation is going on.

# Bees.

## MICHIGAN STATE CONVENTION.

The Michigan bee-keepers' held their annual convention Jan. 1st, and 2nd, at Mt. Pleasant. There is probably no part of Michigan better adapted to bee-keeping. That grandest of all honey plants, the basswood, is fast passing away in that locality, but this loss is more than compensated by the "Epilobium angustifolium," or the great willow herb, as it is usually called. This plant springs up after the ground has been burned over in the newer, northern portions of the State. It commences blooming in July and continues to bloom until the frost kills it. It furnishes large quantities of the whitest and clearest of nectar. Naturally, bee-keeping is in a flourishing condition around Mt. Pleasant, many apiarists reporting a yield of more than 100 pounds of comb honey per colony. Had not the weather been unfavorable (rainy) and the roads bad, there would have been a large crowd of local bee-keepers present; as it was, the attendance was the largest that the Michigan convention has enjoyed in several years.

Wintering.—President Aspinwall of Jackson read a paper on this subject. He said that hive construction, including thickness of walls—packing—ventilation and entrance protection against drafts of cold air, also quantity and arrangement of the food supply, and strength of colony, are requisites tending towards one end—successful wintering. To exclude any one of these requisites will detract from uniformly successful results. With hives of the proper construction, containing sufficient stores, bees may be wintered in the most exposed situations, and it matters not whether the hives face the north, south, east, or west.

The unrestricted flight secured by out-door wintering has no compensation with in-door methods, even when the winters are very severe. With out-door wintering there is complaint of the excess of moisture, and upward ventilation is recommended as a means of carrying off the moisture. This current of air carries off not only the moisture but the heat. With single-wall hives this ventilation is necessary, as the moisture condenses the moment it comes in contact with a cold surface, but with thick walls of chaff or sawdust or some non-conducting material, there is no condensation, the moisture being held in suspension. If there is sufficient honey in all of the combs there is no necessity for winter passages through the combs, or above them. No colony should have less than 30 or 35 pounds of honey. When breeding is over for the season, the central combs are often deficient in stores, and feeding should be resorted to. Thick syrup should be used. There is nothing gained by causing the bees to evaporate a large quantity of water. One quart of water to 14 pounds of confectioner's A. sugar will make a syrup so thick that no harm will result if it is not sealed over.

"L. F. Bingham."—Why have so much honey for winter?

"L. A. Aspinwall."—The bees often eat out the stores from the central combs and long-continued cold keeps them from reaching honey in other combs. There should be sufficient in all of the combs to last the bees that are clustered between them. Then in the spring the bees breed up much faster if they have an abundance of stores.

"T. F. Bingham."—If 20 pounds will bring a colony through the winter, why put in more honey for the bees to keep warm?

"L. A. Aspinwall."—I don't know that they do keep it all warm.

"T. F. Bingham."—I am putting up my bees for winter with only 20 pounds to the colony. I have an idea that putting too much honey in a hive for winter is objectionable.

"T. J. Fordyce."—I winter my bees with the hives packed in planer shavings. I put on the shavings 18 inches thick on top. The hives with a large entrance give the best results.

"H. S. Wheeler."—My experience is the same.

"T. F. Bingham."—The entrance to my hive small, but I put a rim 7-8 of an inch deep under each of my hives, and this prevents all clogging of the entrances and allows me to use a small entrance.

INFERIOR EXTRACTED HONEY.—Mr. Bingham called attention to the advice given by Dr. C. C. Miller, in a recent meeting of the Illinois bee-keepers, to the effect that, by pouring off the thin, watery honey that had arisen on the top of candied honey, a very superior article might be secured by melting the solid portion that remained. Mr. Bingham thought that giving the impression that thin, watery honey "usually" arose upon the top of candied honey was mischievous. Only honey that had been extracted before fully ripened, or that had been improperly treated after it was extracted, would thus have a lot of water rise to the top when it had candied. Well-ripened honey never exhibited any such symptoms.—"Country Gentleman."

# The Flock

## FEEDING LAMBS FOR MARKET.

### SHEEP-FEEDING (continued).

In feeding sheep for market the important consideration is the profit, and that depends on many circumstances. The feeding value of different foods, their cost, and the time occupied in fattening and marketing the sheep, are perhaps the most influential. It will be advisable to consider (1) the feeding of lambs that are to be sold to an early market some time during the interval from birth to weaning, (2) lambs intended for the fall market, and (3) those fed until they reach the period of their fullest development, which is usually when they are about 1 year old.

### FATTENING LAMBS FOR THE EARLY MARKETS.

In preparing lambs for the early markets the best gain, to my knowledge, is that made by 3 lambs at the New York Cornell Station, which made a weekly gain per head of 5.36 pounds, extending over a period of nine weeks. Another lot of 3 made an average weekly gain of 4.47 pounds per head, extending over a period of twelve weeks. In neither case, however, is the composition of the ration or the amount of grain reported. The best gain in the writer's experience at the Wisconsin Station has been made by 4 lambs that were fed a mixture by weight of 4 parts of bran, 4 parts of corn meal, 1 part of linseed meal. When the experiment started, the lambs were about 3 weeks old, and they were fed for ten weeks on this grain ration, receiving in addition the milk of their mothers. The average weight of each lamb at the beginning of the experiment was 18.6 pounds, and at the end, 62.5 pounds, an average weekly gain per head of 4.48 pounds. They each ate 26.6 pounds of the grain mixture during the ten weeks, costing 18 cents per head.

The results that come next to these in profit were obtained from feeding a grain mixture consisting of 2 parts of ground wheat and 1 part of ground corn by weight. The lambs were about four and one-half weeks old when the experiment started, and averaged 26.1 pounds in weight. When the experiment ended, fourteen weeks later, they averaged 77 pounds in weight, having made an average weekly gain per head of 3.63 pounds. They each ate 40.5 pounds of the grain mixture in the fourteen weeks, costing 33.3 cents.

Another lot of 5 lambs, about six weeks old at the beginning, fed a mixture of equal parts of bran and linseed meal before weaning, made an average gain of 40.0 pounds in twelve weeks, or a weekly gain of 3.4 pounds, per head. They ate 50 pounds of the grain mixture per head, which cost 37 cents.

In another trial with 14 lambs a mixture of bran, corn meal, and linseed meal gave an average weekly gain of 3.1 pounds, extending over a period of twelve weeks. During the three weeks the mixture was 3 parts of bran and 1 part of linseed meal, and during the remaining nine weeks it was 2 parts of bran, 1 part of corn meal, and 1 part of linseed meal. The lambs each ate 42.7 pounds of the mixture during the twelve weeks, which cost 34 cents.

Considering these results, it is clear that corn meal is the leading food to feed young lambs for quick and profitable fattening. Bran probably ranks next, and with these linseed meal may usually be fed in small quantities to advantage.

### FATTENING LAMBS FOR THE FALL MARKETS.

Under some conditions it may not be profitable to put the lambs on the market early or to carry them over winter, but it may be better to sell them in Novembre, before housing is required. The best weights that we have obtained at the Wisconsin Station with lambs fed until November have been made by the lambs previously mentioned as receiving bran, corn meal, and linseed meal before weaning. After weaning they were fed 2 parts of ground corn and 1 part of linseed meal by weight. On November 19 each lamb averaged 102.7 pounds in live weight, and in the nineteen weeks that elapsed since weaning they had made an average weekly gain of 2.66 pounds per head. They each ate 183 pounds of the grain mixture, in addition to pasturage, at a cost of $1.47 per head for the grain.

(Linseed meal and cotton-seed meal).—In a comparison of these, in addition to corn meal for fattening lambs after weaning, a weekly gain of 3.3 pounds per head was obtained from the mixture of 2 parts of corn meal and 1 part of cotton-seed meal, with pasturage. In the ten weeks' feeding the 5 lambs on the linseed-meal mixture had eaten 432.5 pounds of grain, while those receiving the cotton-seed-meal ration ate 346.5 pounds of grain. In the last five weeks there were only 4 lambs in the latter lot. The cost of gain, exclusive of pasture, would be at the rate of $2.00 per 100 pounds for the linseed-meal ration and $2.25 for the cotton-seed-meal ration.