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*Nec aranearum sane textus ideo melior, quia ex se filigunt, nec noster vilior quia ex alienis libamus ut apes.*

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## Agricultural Journal.

From the Dublin Farmer's Gazette.  
**FARM YARD MANURES.**

By C. W. Johnson, Esq. F. R. S.

There is hardly a single operation in the management of a farm, which can compare in importance with the preparation of Farm Yard Manure. And yet it is an operation which is very commonly left to chance rather than systematically carried on with anything like scientific precision. A few facts, which have been collected with much laborious accuracy, will perhaps therefore assist the young farmer in arranging his operations. The manure commonly collected in the farm yard, as I have in another place had occasion to remark, is compounded of a mixture of animal and vegetable substances, chiefly of the straw of various descriptions of grain, mixed with the fæces and urine of cattle, horses, and swine. The mixture of these different substances does not form any new substance, neither by the putrefaction which ensues, is anything added to the bulk of the dung; on the contrary, it causes a considerable loss of weight. Neither is the manure produced equal to the amount of food the stock consume. "If," says Dr. Sprengel, "we weigh the dry food given to the cattle to eat, and also dry and weigh the resulting excrements, we shall find the weight of the latter considerably less than that of the former." Block, who has lately made a great number of experiments on this circumstance, found that 100 lbs. of rye straw yielded only 43 lbs. of dried excrement (liquid and solid) while 100 lbs. of hay gave 44 lbs. Food which contains many watery parts, furnished, as may be naturally supposed, a still smaller proportion. Thus, to give one or two instances, 100 lbs. of potatoes gave only 14 lbs; 100 lbs. of mangel wurzel 6 lbs; and 100 lbs. of green clover 6½ lbs of excrement.—*Journal Royal Agricultural Society.*

The dry straw of wheat is composed chiefly of carbon, hydrogen, and water, and about five parts of saline and earthy matters. 100 parts of these solid matters usually contain:

Various salts, principally carbonate & sulphate of potash	22½
Phosphate of Lime	6 1-35
Chalk (carbonate of lime)	1
Silica (flint)	61½
Metallic oxide (prin. iron)	1
Foss	7 4-5

The urine of the cow contains various salts, such as phosphate of lime, the muriates of potash and magnesia, sulphate and carbonate of potash, carbonate of ammonia, and urea, but by far the largest portion is water, of which it contains about 65 per cent. That part of the horse, however, contains a still larger proportion of water; a specimen analyzed by M. M. Fourcroy and Vauquelin, yielded 94 per cent; that of the pig contains 92 per cent; and that of the sheep kept at grass 96 per cent; and human urine affords nearly as much, some that was examined by M. Berzelius, the great Swedish chemist, yielded 93 per cent of water.

The fæces of cattle also contain a

large aqueous proportion. That of black cattle fed on turnips was found by M. Einhof, to contain about 72 per cent of water.

By good management, and under ordinary circumstances, one ton of dry straw will produce three tons of manure; so that at the common weight of straw per acre is about one ton and a half, the straw grown upon that extent of land should yield about four tons and a half of compost.

The proportion of manure produced by stock, however, necessarily varies with the quantity and quality of the food upon which the animals are fed. In an experiment made at the Cavalry depot at Maidstone, a horse consumed in a week—of oats 70lbs, hay 84 lbs, straw 56lbs—210lbs. He drank within this time 27 gallons of water. The weight of the dung and litter produced was 327½lbs. In another experiment on a large sized Yorkshire milch cow, she consumed in 24 hours—of brewer's grains 81lbs, raw potatoes 30lbs, meadow hay 15lbs—125 lbs, and during that period she drank two pailfuls of water. The urine was allowed to escape, and she had no litter of any kind. The weight of the solid dung she produced was 45lbs. When fed on another day with raw potatoes 170lbs, hay 28lbs—198lbs, she produced under the same circumstances 73lbs solid manure.)—*British Husbandry.* Taking, therefore, the average produce to be equal to 60lbs per day, it follows that a cow will make about 9 tons of solid manure in the course of the year.

Few operations appear at first sight so simple as the manufacture and collection of farm yard manure, and yet there are several errors into which the cultivator is very likely to fall without he is ever vigilant to avoid them. Mr Francis Blakie, in his valuable tract upon the management of farm yard manure, alludes to several of these: he highly disapproves of the practice 'of keeping the dung arising from different descriptions of animals, in separate heaps or departments, and applying them to the land without intermixture. It is customary,' he observes, 'to keep the fattening neat cattle in yards by themselves, and the manure thus procured is of good quality, because the excrement of such cattle is richer than that of lean ones. Fattening cattle are fed with oil cake corn, Swedish turnips, and other rich food, and the refuse and waste of such food thrown about the yard, increases the value of the manure; it also attracts pigs to the yard. These root the straw and dung about in search of grains of corn, bits of Swedish turnip and other food, by which means the manure in the yard becomes more intimately mixed, and is proportionably increased in value. The feeding troughs and cribs in the yard should for obvious reasons be shifted frequently.' The stable manure should be spread about the yard. 'The horse dung,' continues Blakie, 'is usually thrown out at the stable doors, and there accumulates in large heaps. It is sometimes spread a little about, but more generally not at all, unless when necessary for the convenience of ingress and egress, or perhaps to allow the water to drain away from the sta-

ble door. Horse-dung lying in such heaps, very soon ferments and heats to an excess, and the centre of the heap is charred or burned to a dry white substance. Dung in this state loses from 50 to 75 per cent of its value. The diligent and attentive farmer will guard against such profligate waste of property, by never allowing the dung to accumulate in any considerable quantity at the stable doors. The dung from the fattening hog sties, should also be carted and spread about the store cattle yard in the same manner as the horse dung.'—*Blakie on Farm Yard Dung.*

'Some theorists,' he adds in another place, 'recommend the yards to be so concave as almost to amount to a well shape, giving as a reason in support of their opinion, that the virtues of dung can only be preserved by being saturated in urine, or some other moisture.' Others, again, assert that dung yards should be formed convex, and assign as their reason that farm yard dung should be kept dry. Practical experience points out that a medium between these two extremes is the best; and a yard a little hollowed is the most common shape.

When the dung is sufficiently prepared to be ready to be carted to the compost heap, considerable attention is necessary in its removal and mixture. These observations had not escaped Blakie: he tells us, in his subsequent page of his essay, 'When it is found necessary to empty the dung yards early in the season, I recommend that preparation should be made in the usual way for the reception of the dung heaps in the intended turnip fields, by collecting large heaps of clay, marl, or such other materials.—The bottoms of the heaps should not, however, be laid above six or eight inches thick, with the earthy material, and a good quantity of it should be placed in rows, on each side of the bottoms, marked out. The dung should then be drawn out of the yards, and placed upon the bottoms, but not in the usual way of throwing it up loosely, to cause fermentation; on the contrary, by drawing the carts with their loads upon the heaps, for the purpose of compressing the dung, and thereby retarding fermentation. One or two men should remain constantly at the heaps while the teams are at work, on purpose to spread and level the dung regularly, so as to render the ascent easy for the succeeding teams as they come with their loads. If the dung has not been previously mixed in the yards, it should be so in drawing to the heaps, by taking up a few loads from one yard, and then a few from another alternately—and even from the same yard the loads of dung should be taken from different parts alternately—for the dung is not of equal quality, nor made with the same regularity, in all parts of the yard.

The coal ashes, road scrapings, and all other collections of manure about the farm house, should be also carried to these dung heaps; and when the heaps are raised as high as convenient for the horses to draw up, several loads should be shot up at the end of the heaps, for the purpose of making them up to the square of the centre; the whole heap should then be complete-

ly covered with the marl and clay, or the soil previously collected in rows by the side of the heaps, so as effectually to enclose the dung heaps in crusts; and they are thenceforth denominated *pies*. In these the dung will be preserved in a very perfect state, with little or no fermentation, and without loss by exhalation or evaporation.

The pies, within ten days or a fortnight of the time the compost is wanted for the turnip land, should be carefully turned over, and the crust, top, bottom and sides, intimately mixed up with the dung. When the turning is completed, again coat the heaps over with the natural soil around the heaps; the pies will then undergo a gentle fermentation; the earth intermixed with, and covering the dung, will absorb the juices and gaseous matters produced, and the compost comes out in a fine state of preparation for using on the turnip lands.

When the dung is taken out of the yards late in the spring, or only a short time before it is required for the turnip ground, the preparation should be somewhat different, because of the compost heaps having less time to incorporate. Thus the dung should not be carted upon the heaps to compress them, and prevent fermentation as in winter; on the contrary, the dung should be thrown up lightly with the fork upon the bottoms, and the side heaps of earth mixed intimately along with the dung. Turf turned up for a year preceding on wastes, by the side roads, makes excellent pie meat. *Farmer's Encyclopaedia.*

There is no doubt of the advantages of the plan of forming layers under, and of covering compost heaps with earth in the way described by Mr. Blakie; for this mode, not only is the fermentation of the dung retarded, but the earth itself is enriched, all the grub and other insects are destroyed, and the seeds of weeds, which commonly abound in the soil, are stimulated into life and destroyed. This result is produced chiefly by the effect of the gases of putrefaction and the carbonate of ammonia, which, generated in the dung, is volatized by the heat.—To prevent the escape of this, it is a good plan to mix the earth with gypsum (sulphate of lime) in powder, for, by this means, if any carbonate of ammonia is escaping through the soil, it is decomposed by the sulphate of lime, and sulphate of ammonia is formed; this latter salt, not being volatized by heat, remains in the soil, and when afterwards spread over the fields, it is decomposed, and its constituents become the food of the growing crop.

It is very desirable that the farmer should have some ready means of ascertaining when the dung hill is fermenting to an injurious extent, and it fortunately happens that there are one or two easy experiments by which this can be easily determined. If a thermometer, when placed in a dung hill, does not rise above 100 deg. there is little danger of too much gaseous matter being evolved; if a thermometer is not in the farmer's possession, a piece of rag wetted with spirit of salt [muriatic acid] and held over the dunghill, will pretty accurate-