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MANURES.

THE CAUSES WHICH MAKE URINE BETTER OR WORSE, MORE OR LESS, AND THE MODES OF PRESERVING IT.

There can be no doubt, that the same causes which we have pointed out as affecting the value of dung, affect also the urine.

We have already alluded to the four chief circumstances to be regarded in urine. And first, of its composition. It may be affected by the age, sex, food, and difference of animal. The process of forming urine is the same in man and animals. Now if we reason here, as we surely may, from analogy, then the effect of age and sex upon the quantity of the essence of urine or urea, will appear from the result of one hundred and twenty analyses of urine.

In 24 hours there are discharged by men,	432	grains of urea.
By women,	293	" "
By old men, from 76 to 80 years of age,	122	" "
By children, 8 years of age,	208	" "
By children, 4 years of age,	70	" "

It will be recollected that each grain of urea is equal to a grain of carbonate of ammonia of the shops, so that a healthy man discharges daily about an ounce of this salt. If, then, other animals are affected by age and sex, as in the human species, then we may say that bulls and oxen give a better urine than cows, steers better than calves, and a venerable old cow gives as much of the essence of urine as two calves.

Food affects the quantity of water, and that acting merely to dilute the urine, renders it weaker in salts for a given amount, though perhaps not the daily amount of salts. Supposing the animal well fed, as to keep up the wear and tear of his blood and flesh, then as the urine derives its chief value from the worn out materials of the body, the amount of urea daily discharged may be the same, though the amount of urine may vary considerably. We may increase the amount of salts and acid by particular food, but this can never be continued long enough to change materially the character of urine as a manure. Difference of animal has a great effect on the quality of urine. The more active, the greater wear and tear, the better the urine in working animals. Where the animal is stall-fed, there no doubt the urine is still richer, and urine of fattening animals is still more valuable. Hence of all animals, commend me to swine, as manufacturers of ammonia. Cast your eye on the table (page 140) of the amount of urea or ammonia furnished by various animals. No one exceeds the hog. He seems specially formed by nature for this office. He eats everything. His habits require very little of that class of food which forms flesh and blood. He is a fat-former, a magazine of lard, a real oil-butt, and demands, therefore, the food essential to form fat and keep up his heat. He returns of course, having little lean meat to form, (nobody would praise him for that,) having little flesh to form to increase his size, he returns quickly the waste his body suffers as urea, which becomes ammonia. But it is only the still, and quiet, and penned animal, which gives this valuable product. If we would cause him simply to produce the greatest amount of his manufactory, without taking into account his labour in shovelling over the compost heap, perhaps no better rule can be given, than the Shaker practice of feeding with lettuce leaves. Having little brains to replenish or build up, and not quick in his nerves, (for be it known to you, reader, the opium of lettuce leaves is supposed to contribute mainly to the formation of brain and nerves,) the opium-eating hog will return a vast amount of the nitrogen of his lettuce, in the shape of ammonia. If now you add to the facts, common to the nourishment of swine, the action of ammonia on mould, as it has been explained, you will see that he who neglects to fill his yard with mould, and swine to convert it, overlooks one of the cheapest, most effectual, and certain modes of manure, which practice and theory unite in pronouncing the surest element of the farmer's success. Not only is the quality of urine affected by age, sex, food, difference of animal, but the season also exerts an influence upon this liquid. The urine of cattle often contains ammonia ready formed in summer, but never in winter. In cold weather the amount of ammonia, or rather the principle affording it, is less; often it is not one half in winter what it is in summer. This certainly is a misfortune to the farmer, who generally keeps his cattle up only in winter; but then it is an argument also for the practice of summer soiling.

Secondly, with respect to the circumstances necessary to change urea to ammonia; or, in short words, to fully ripen urine, or to make it a fit manure. These also depend upon the season, in part. It is to be remembered, reader, that this rotting of urine is only fermentation. It takes place because there is a principle in urine which brings on fermentation, just as it does in new cider. Now, if it is by fermentation that urine rots, it will take place, as all fermentation does, best at a moderate temperature. The cold of winter will prevent it. Hence, your winter manure must be allowed time, as the heat of spring comes on, to ferment, that the urine may be changed to ammonia; and every means must be taken to prevent the heat rising beyond, in the manure heap, or falling below a moderate temperate warmth. These are the circumstances which chiefly promote the change from urea to ammonia.

Thirdly, in regard to the time in which this change will take place, it will require at least one month; and six weeks are better. If urine be allowed to rot for a month, it fully doubles its quantity of ammonia. In fact, it would have contained more than double the ammonia of fresh urine, had not a portion escaped.

This brings us to our fourth point, the best mode of preventing the flying off of the ammonia when this change has taken place. Much has been said about tanks, and vats, and urine pits, and many plans devised for preventing the escape of volatile ammonia. But when once the action of ammonia upon mould is understood, as we have already pointed it out, I am persuaded, reader, that these tanks, and vats, and urine carts, will appear to you not only expensive and cumbersome, but useless. Your first point is, to save your ammonia, your second is never to use urine in its caustic or burning state. If you do, you will as assuredly burn your crop, as the puddle formed by a cow burns the grass upon which she empties her watering-pot. Here the urine, forming caustic ammonia, acts as would caustic potash, or a lump of stone lime, left to slake upon the grass. You want to change this burning or caustic ammonia into mild ammonia, or to combine it with some substance which has not only that effect, but also keeps it from flying away. Unless you understand, then, the principles of these actions, and apply them too, your labour is all vanity, when you attempt to save your own or your cattle's urine.

These principles are in number, two. First, the principle which changes caustic to mild ammonia, is carbonic-acid, derived from air or decomposing mould. Second, the principles which render ammonia less volatile, or wholly fixed, are certain acids formed in mould, as sour mould, or certain salts which give up their acids to the ammonia. Plaster of Paris does this, by changing its lime for ammonia. Now let us go into the reason of this a little, and see if we can understand it. Very slowly, and supposing moisture present, the oil of vitriol of the plaster quits its lime, and unites to the ammonia, and so changes a volatile into a fixed salt. Now this is a change which has been of late much insisted on, and the practice recommended of strewing the stable and barn cellars, and even the privies, with plaster, to save the ammonia, which escapes in these places. But it is doubtful whether the saving is as great as is usually supposed, for the ammonia arising from the urine is caustic, it flies off as caustic ammonia, that has no effect upon plaster. To produce this mutual effect of ammonia and plaster the caustic ammonia must previously have been made mild. However, this plan is only applicable on a small scale. Copperas, alum, common salt, potashes, and wood ashes, all act to fix the volatile ammonia, and have all been recommended for this purpose. But it is easily seen, that, in employing some of these substances, it is to buy ammonia almost at apothecary's price. These practices will be followed, therefore, only by those who place the crop and its value upon ammonia. This is a limited and narrow view. The true, and farmer-like, as well as the most scientific and natural mode of preserving the ammonia of urine is to fill your yards and barn cellars with plenty of mould: by which I mean truly decayed and decaying vegetable matter, as well as loam. There is no mode more effectual, no mode more economical. Consider now for a moment, how mould formed and forming, and ammonia act. Have I not said, again and again, that ammonia hastens decay? that it makes mould more easily dissolved, and cooks the food of plants! That action having occurred during its progress acids were formed. The ammonia unites with them, loses its burning properties, and becomes fixed. The acids having been satisfied, the ammonia is actually imbibed and retained by mould.

It does not drink it in like a sponge, but the mould forms a peculiar chemical compound with the ammonia. This peculiar compound, while it does not render the mould an easily dissolved matter, yet holds ammonia by so feeble a force, that it easily yields to the power of growing plants. It gives up the stored ammonia at the place where, and the time when, it is most wanted. If you remember these actions of mould and ammonia, it will be as plain as day, that what we have said of the inexpediency and expense of vats, and tanks, and urine-carts, must not only be true, but is confirmed by the experience of a host of hard-working, thinking, practical men. In connection with urine, the dung of birds for instance, domestic fowls of all kinds, and pigeons may be here mentioned. These animals discharge their solids, and what we may term their liquids, together. Their urea comes out combined with, or forming part of their dung. Now, reflecting a moment on the nature of their food, strongly nitrogenous, being seeds, grain, &c., or animals, bugs, grasshoppers, &c., we can understand why their droppings are peculiarly rich in ammonia and salts. The strongest of all manures is found in the droppings of the poultry-yard.

But since these form but a small portion of the farmer's stock, and are never regarded as a principal source of manure, their further consideration may be omitted. It may perhaps be here added that as from their nature bird droppings run quickly into fermentation, with warmth and moisture, so they act quickly and are quickly done. They are more allied to sheep dung than to other manures. Their mould not being great, droppings of poultry require to be mixed with decayed vegetable matter or loam. To this class belongs the manure brought from the Pacific Ocean, under the name of Guano, a Spanish word for excrement. New England farmers can find cheaper sources of salts, to which the main value of guano is owing, and therefore, reader, we shall detain you no longer on this point.

FARM WORK FOR OCTOBER.

October is generally a busy month with the farmer. A variety of duties now require his attention, and which he cannot conveniently do at any other time. As soon as the potato and corn crops are harvested, and his thrashing out of the way, he will do well to see that the stones on his stubble grounds are picked up, and so placed as to facilitate their removal by sledding. Stones of a large size should be blasted, and raised from their beds, in order that they may be conveyed to the lines on a drag with the first fall of snow. In this manner a vastly larger amount of labour may be performed, with the same expense, than in the usual way.

CELLARS,—As soon as your potatoes are in, the windows and doors of the cellar should be carefully secured, and the contents protected as thoroughly as possible from the action of the frost. It is bad policy and poor economy to defer the performance of this duty till the advent of cold weather, as is the practice with some farmers. When the position of the cellar renders "banking" necessary, choose the lightest materials, such as straw, chip-dung, rotten wood, and leaves from the woodland, in preference to those that are of a more compact and solid texture. Not only will they operate much more efficiently in securing the cellar during the extreme cold of fall and winter, but they possess a decided value as materials for manure in the spring. In placing your bankings, all treading and stamping should be avoided; solid and compact masses, or those in which there are comparatively but few insterstices or pores, being good conductors, and consequently more liable to freeze than those of a more light and permeable material. This fact is pointedly illustrated by the soil's freezing much more compactly, and to a greater depth, in roads which are hardly trodden, than in fields where it is less compressed.

SHRUBS AND PLANTS.—Those shrubs and plants which are of a tender and fragile nature, and which are consequently liable to injury from cold, should now be removed to the cellar or some other place which will insure their protection from the effects of frost.

SHEEP should now be provided with comfortable quarters, and supplied regularly with water, food, and salt. Much of the debility and many of the diseases, often incurable, which afflict these valuable animals during their long confine-