

for door-cleanings, litter which may accumulate about the barn, and every other kind of vegetable or animal refuse. These additional matters may occasionally be protected, by adding a new layer of peat or soil to the top. The pit for liquid manure should be roofed over. A method much followed in Britain and the continent of Europe, is to collect the urine in a tank, and add sulphuric acid to prevent waste of ammonia. When used, the liquid is diluted with water, and distributed to the crop by a watering cart. This is too expensive for most of our farmers; but when it can be followed, it will be found to give an astonishing stimulus to the crops, especially in the dry weather of spring. Gypsum may be put into the tank, instead of sulphuric acid."

"In a prize essay on manures, by Prof. Way, published by the Royal Agricultural Society of England, the following analysis is given of the drainings of a dung-heap, composed of the mixed manure of horses, cattle, and sheep, and in a well rotted condition. The fluid examined was that washed out with rain water, and was of a deep brown colour. It contained in each imperial gallon 764.64 grains of solid matter, of which 395.66 were volatile and combustible, and 368.98 incombustible or ashes. Its composition was as follows:—

I. COMBUSTIBLE PART.

Ammonia, in a soluble state.....	36.25
do in fixed salts.....	3.11
Ulmic and humic acids.....	125.50
Carbonic acid.....	88.20
Other organic matters (containing 3.59 of Nitrogen).....	142.60
	<hr/> 395.66

II. COMBUSTIBLE PART.

Soluble silica.....	1.50
Phosphate of lime, with a little phosphate of iron.....	15.81
Carbonate of lime.....	34.91
Carbonate of magnesia.....	25.96
Sulphate of lime.....	4.36
Chloride of sodium.....	45.70
Chloride of potassium.....	70.50
Carbonate of potash.....	170.54
	<hr/> 368.98

Total per gallon..... 761.64

"It will be observed that the combustible part contains a large amount of ammoniacal matter, and the rest is principally the richest humus or vegetable mould; while the incombustible part contains all the ingredients in the ashes of cultivated plants, and these in a soluble state, ready to be absorbed by the soil and taken up by the roots. This table, in short, affords the most conclusive evidence of the immense loss sustained by the farmer who allows his stable manures to be weathered, and their soluble part washed away by the rains. No economy in other respects, and scarcely even the most costly additions of artificial manures, can compensate this waste. This subject is, in all its details, deserving of the careful study of every practical farmer."

Culture and Feeding Properties of Kohl-Rabi.

KOHL-RABI is deserving of a prominent place among the farm crops of Canada. It resists the extremes of heat and cold to which our root crops are frequently subjected; and on heavy lands, where the turnip, too generally, proves a failure, kohl-rabi may be grown with success. Among the more advanced "old country" agriculturists, this valuable specimen of the brassica tribe, is popularly known as "the bulb of dry summers." As compared with the turnip, it may be said to be free from disease and the depredations of insects; while in feeding properties, it is superior either to swedes or mangolds. Horses and all kinds of farm stock are particularly fond of it; and, as a food for milch cows, it is especially valuable as it not only causes an increased yield of richer milk, but both the milk and butter are free from any such unpleasant taste as is produced by turnips. The leaves of the kohl-rabi are nearly, if not quite, equal in feeding value to the bulb. They both contain about twice as much albuminous compounds as the best swedes. The following analyses of the bulbs and leaves are given, by Dr. Anderson, the able Chemist of the Highland and Agricultural Society of Scotland:—

Water.....	86.74	Leaves.....	86.68
Albuminous Compounds....	2.75		2.37
Respiratory principles....	8.62		8.29
Fibre.....	0.77		1.21
Ash.....	1.12		1.45
	<hr/> 100.00		<hr/> 100.00
Nitrogen.....	0.44		0.38

Speaking of this crop, the distinguished agricultural writer, Mr. Henry Stephens, says:—"As kohl-rabi holds the same position as a crop as the turnip, its culture is very similar; but while turnips affect the lighter soils, kohl-rabi thrives on the stronger, so that it may be raised where turnips cannot be. Specimens of kohl-rabi have been raised in Scotland weighing from 5 to 7½ lbs., in Ireland individual bulbs have attained the weight of 14 lbs., and in England they commonly reach 8 to 10 lbs. The advantages which kohl-rabi is said to possess over Swedish turnips, by those who have cultivated it in England and Ireland, are these:—cattle, and especially horses, are fonder of it; the leaves are better food; it bears transplanting better than any other root; insects do not injure it; drought does not prevent its growth; it stores quite as well or better; it stands the winter better; and it affords food later in the winter, even in June."

A paper on the kohl-rabi by P. Lawson & Son—the eminent seedsmen—appeared in the *Journal of the Royal Agricultural Society of England*. (1859) We make the following extracts respecting the special features of the plant, and the various points of its cultivation, &c.:

"All soils are suited to its cultivation, but it prefers heavy lands, even those approaching to stiff clays, and it can be grown where turnips cannot. Soil should be in fine tilth, well worked, and farmyard manure ploughed-in in the autumn. In the spring it should be grubbed and thoroughly pulverized. It requires heavy manuring: phosphatic manures, with common salt added, are most suitable for it. Peruvian guano and other nitrogenous manures should be avoided. Seed should be sown in drills 12 inches apart. A bed 5 yards square will afford sufficient plants for one acre of land, and 8 oz. of seed will be necessary for the seed-bed. Drills should be 27 inches in width, and plants should be singled to 18 inches. While growing, the horse-hoe must be kept in continual requisition, until the spreading of the leaves prevents the operation being performed. The average weight per acre is in England from 26 to 40 tons; and in Ireland from 30 to 35 tons. Every description of stock will eat the kohl-rabi with avidity. In consuming the crop, sheep may be folded on the ground; but, if given in the yards to cattle, the bulbs should be sliced or pulped. For pigs they should be steamed or boiled. For cattle and horses it affords true nourishment when boiled with grain. For milch cows it is invaluable, giving to milk or butter none of that disagreeable flavour which results when they are fed on turnips. For ewes and lambs it is as fine food as they can have in March and April; and when the ewes are lambing, it is found greatly to increase the supply of milk. Kohl-rabi is, so far as at present known, subject to no diseases except "clubbing" and "anbury." If hares or rabbits exist in the neighbourhood of the crop, they are sure to prove very destructive unless means of precaution are taken. The leaves are of equal value with the bulbs in nutritive properties. The plant for feeding purposes is twice as valuable as ordinary turnips, and materially surpasses the best swedes in point of composition and feeding value. It bears transplanting better than any other crop, and is invaluable, therefore, for filling up blanks in turnips, swedes, or potatoes. The kohl-rabi can withstand any amount of drought, if the operation of transplanting has been successful. The most intense frost does not affect it; it stands the winter well, and affords good feed even to the end of spring."

Domestic Poudrette.

PURY pits where they exist are but rarely watertight, and permit the greater part of the urine and other fluid contents to leak away, thus causing the loss of a good deal of the most valuable matter, such as the potash salts and the soluble phosphates. The following statement will show the great value of the excrements of man. In the fortress of Rastadt and in the soldiers' barracks in Baden generally, the

privies are so constructed that the seats open, through wide funnels, into casks fixed upon carts. By this means, the whole of the excrements, both fluid and solid, are collected without the least loss. When the casks are full, they are replaced by empty ones.

The peasants about Rastadt and the other garrison towns, having found out at last by experience, the powerful fertilizing effect of these excrements upon their fields, now pay for every full cask a certain sum (still rising in price every year), which not only has long since repaid the original outlay, besides covering the annual cost of maintenance, repairs, &c., but actually leaves a handsome profit to the department.

The results brought about in these districts are highly satisfactory. Sandy wastes, more particularly in the vicinity of Rastadt and Carlsruhe, have been turned into smiling corn fields of great fertility. Assuming, for the sake of illustration, that the peasants had to furnish the whole corn produced by means of this manure, to the military administrations of the several garrison towns, there would thus be established a perfect circulation of these conditions of life, which would provide 8,000 men with bread, year after year, without in the least reducing the productiveness of the fields on which the corn is grown, because the conditions required for the production of corn being always returned to the soil, would continue to circulate and yet always remain the same.

What is said here about the corn—constituents applies, of course, equally to the constituents of meat and vegetables, which, returned to the field, will reproduce as much meat and vegetable matter as has been consumed. The same relation that exists between the inhabitants of the barracks in Baden and the fields supplying them with bread, exists equally between the inhabitants of towns and the country around. If it were practicable to collect, without the least loss, all the solid and fluid excrements of all the inhabitants of towns, and to return to each farmer the portion arising from the produce originally supplied by him to the town, the productiveness of his land might be maintained almost unimpaired for ages to come, and the existing store of mineral elements in every fertile field would be amply sufficient for the wants of the increasing populations. At any rate that store is, at present, still sufficient to do so, although the number of farmers who take care to cover by an adequate supply of suitable manures the loss of mineral matters sustained by the land, in the crops grown on it, is but small, in proportion to the whole agricultural population. However, sooner or later, the time will come when the deficiency in the store of these mineral matters will be important enough in the eyes of those who are at present so void of sense, as to believe that the great natural law of restoration does not apply to their own fields; and the sins of the fathers, in this respect, will also be visited upon their posterity. In matters of this kind, inveterate evil habits are but too apt to obscure our better judgment. Even the most ignorant peasant is quite aware that the rain falling upon his dung-heap washes away a great many silver dollars, and that it would be much more profitable to him to have on his fields what now poisons the air of his house and the streets of his village; but he looks on unconcerned, and leaves matters to take their course, because they have always gone on in the same way.

BARON JUSTIS VON LEDIG.

CHEMICAL EFFECT OF UNDER DRAINAGE.—Every one must have observed how our cultivated plants, our crops and trees, dislike stagnant water; and how their roots travel along its surface under-ground, directly they reach it. The existence of stagnant water implies the absence of air, which is as essential to the development of vegetable growth in the soil as it is to our existence above the surface, and therefore we can readily understand how essential it is to render the depth of the soil which our plants require for their perfect development, percolative or permeable free or active. This is not only required because roots will not penetrate a bed of stagnant water, and will prosper in a deeper feeding ground, but because there are in soils organic and inorganic ingredients, which require alterations only to be effected by the absorption of gases from the atmosphere. By drainage you not only afford to plants the deeper bed to sustain them, at the rate of 100 tons per acre for every inch of depth gained, but you correct the influence of injurious constituents of the soil; and, what is more, you carry into the deepened bed those fertilizing ingredients which are constantly associated with fresh air and moving water.—F. Bailey Denton.