from the use of the commercial fertilizer as would be supposed from the data given by chemists, will be, I think, obvious to any intelligent (and disinterested) cultivator. To get a proper idea of the comparative merits of guano and farm-yard manure, experiments as commonly conducted, would also be difficult, and almost impossible, from the fact that guano is of quick action, whereas that of common yard manure is slower and long continued. Hence the dearth of any reliable data bearing upon the subject of their comparative values. The *Country Gentleman* says guano promotes the growth of all crops benefitted by common manure; but its influence is not permanent."

Your correspondent loses sight of the fact that common yard manure, aside from the purely fertilizing effects attending its use, has other advantages not common to the artificial fertilizer. The benefits resulting to a crop of fall wheat from top-dressing it with common manure simply regarded as a mulch, protecting the plants and their roots from the frosts of winter, in this climate where at best from this cause wheat growing is but precarious, must be great, and should not be overlooked. So also ploughing in farm-yard manure improves the texture of most soils.

Apropos to the subject, the author of "The Farm" gives it as his opinion that "the urine of three cows for one year is worth more than one ton of guano, which would cost from 50 to 60 dollars. Will you continue to waste urine and buy guano?" He further says: "Think of this, ye American farmers, who are accustomed to allow so much richness to run to waste." It would be well and evidently more profitable for the farmers of Canada to carefully husband and make the most of the many sources of manurial wealth at present upon their farms, than to fly to others that they know not of, and whose value and effects are at best, with any soil and circumstance, unreliable and not always the same.

I do not agree with "Cultivator" that "no farmer can produce natural manure sufficient for his purposes, and as large quantities have invariably to be procured elsewhere," &c. A system of agriculture which is not self-supporting, one that cannot keep up the natural fertility of the farm without resorting to foreign sources, is imperfect and bad. I reiterate, after all the many sources of supply connected with every farm are exhausted, then will be the proper period for resorting to artificial fertilizers, but then it will undoubtedly be found that their agency will not be required; after every manurial resource of the farm is brought into requisition, it will be found, that with a sound system of husbandry, its natural state of fertility will be kept up and improved, without the necessary application of any foreign fertilizer.

If "Cultivator" attempts to argue in favour of the advantages resulting from the substitution of guano for farm use in the place of farm-yard manure, for any but special and peculiar circumstances, the question is really an issue between that gentleman and all authorities. Of the value of guano as a manure there is no doubt; but circumstances must determine whether in any given case it can be profitably purchased and applied at the prices at which it is held.

J. F. C.

L'Original, C. W., Nov. 10th, 1866.

Note by Ed. C. F.—We cheerfully insert the above letter, not to provoke or prolong controversy, but to encourage discussion on subjects of practical interest to the farmer. Both "Cultivator" and "J. F. C." are right in our view. The latter in the above letter somewhat shifts the issue, and discusses the question of permanent effects as an element of value. It is an important consideration to be taken into the account. We do not suppose "Cultivator" wishes to see guano resorted to as a substitute for farm-yard manure, and the more both are used the better.

Effect of Sewage Irrigation.—The *Gardener's Chronicle* of Oct 27, says:—"We have this week cut plots of Italian Ryegrass sown 11 or 12 weeks ago, which have since been watered (part of 30 or 40 acres similarly laid down) with 400 or 500 tons per acre of North London sewage. They yielded at the rate of 10 tons per acre of first rate succulent cow food. Unless we should have a very severe November, we cannot doubt that they will yield another 10 tons per acre before the winter after another similar dressing. At Worthing we hear of a single cut of 20 tons having been obtained from Ryegrass similarly treated. Near Barking they have cut in places 20 tons per acre at a single cutting; and from the surface of sheer sea-sand, dressed with the water from the North London outfall, they have cut 10 to 12 tons per acre of Grass at a single mowing, as the result of four or five weeks' growth."

The Cattle Melon.

In several parts of England, where the Turnip has been extensively cultivated for many years in what is termed a fourth or fifth year's course, that invaluable root has of late shown symptoms of weakness and decay; arising, it is thought, from the too frequent repetition of the crop on the same ground. Accordingly we find that kohl rabi, mangel wurzel, and what is called the *Cattle Melon*, have of late been brought into greater prominence, with a view of meeting the deficiency occasioned by the frequent failure of the turnip. What species this so called Cattle Melon now cultivated in the fields of England belongs to, we have at present no means of knowing, but presume that it is a hardy kind of pumpkin or squash, so commonly cultivated among Indian corn on this side of the Atlantic. Perhaps such of our readers as have recently visited England may be able to throw some light on the subject. In the last annual report of Professor Voelcker, chemist to the Royal Agricultural Society of England, we find an analysis of the Cattle Melon, which enables us to judge of its value as a food for stock.

COMPOSITION OF CATTLE MELON.

Water	91 66
*Albuminous compounds (flesh forming matters	1.63
Sugar, mucilage and digestible fibre	5 74
Woody fibre (cellulose)	1 17
Mineral matters (ash)	.77
	100.00
*Containing nitrogen	.265

It will be seen from the above that this new vegetable occupies a lower rank, as a good food for cattle than either Swedes or mangolds, and, we may add, potatoes. The proportion of water in all succulent vegetable productions, varies considerably according to the soil and season, and methods of cultivation. The Cattle Melon seems to have a larger amount of water than either swedes or mangolds, and to approach in that respect more nearly to the ordinary varieties of white turnips. We subjoin a carefully conducted analysis, made by Dr. Voelcker, of specimens of cattle melons and yellow Globe Mangolds, grown on the same soil and cultivated exactly alike.

COMPOSITION OF A SPECIMEN OF CATTLE MELON AND OF YELLOW GLOBE MANGOLD WURZEL.

1 *General Composition.*

	Cattle Melon.	Yellow Mangold.
Water	92.030	88.450
Organic matters	7.350	10.524
Mineral matter (ash)	.620	1.026
	100.000	100.000

2 *Detailed Composition.*

Water	92.030	88.450
*Soluble albuminous compounds	.619	.887
†Insoluble albuminous compounds	.156	.104
Sugar and mucilage	4.661	7.538
Woody fibre (crude)	1.914	1.995
Soluble mineral matters	.540	.932
Insoluble mineral matters	.080	.074
	100.000	100.000
*Containing nitrogen	.099	.142
†Containing nitrogen	.025	.017
Total nitrogen	.124	.159
Equal to albuminous compounds (flesh forming matters)	.775	.991

New Process for Dissolving Bones used as a Fertilizer.

The importance of phosphates, such as common bones, as fertilizers, especially in grain culture, could hardly be extolled, and it would be presuming upon the intelligence of our farmers to say more than to recommend its practical application. There exist, however, some obstacles which yet prevent waste bones, nearly always cheap and within easy reach, from being generally used. The great distances in the far west, and other inconveniences, render their purchase in powder form expensive, and for grinding them at home or dissolving them in acid, there is still less chance.

Professor Hienhof, in Russia, has however, lately discovered a method for dissolving them, which must prove highly economical and suitable in unsettled countries, where, owing to the great abundance of forests, wood ashes are cheaply secured, indeed are almost always ready at hand. This new process of treating bones consists of mixing them with wood ashes and slaked caustic lime, and keeping the mixture constantly moist. As in the preparation of lye, for manufacturing soap, the alkaline carbonates in the ashes, such as carbonate of potassa, are, by the action of caustic lime, converted into free, caustic potassa, attacking and quickly dissolving the bones.

The following practical example will illustrate the necessary proceeding:

Suppose the wood ashes to contain about 10 per cent. carbonate of potassa, and that 4,000 pounds of bones are to be worked up; then we take 4,000 pounds of ashes, 600 pounds of caustic lime, and 4,500 pounds of water; a ditch some two feet deep, of such width and length as to hold 6,000 pounds of the mixture, is dug, and near it a second ditch, being some 25 per cent. larger, and both lined with boards. The lime is then slaked, and, when crumbled to a powder, mingled with the wood ashes, and 2,000 pounds of bones piled up in layers and covered up with the mass in the smaller ditch, 3,000 pounds of water added, and the whole left to itself. From time to time small quantities of water are added to keep the mass moist. As soon as it is found that the bones are so far decomposed that when pressed between the fingers they are soft and crumble, the second portion, *i. e.*, the other 2,000 pounds of bones, is brought into the larger ditch and covered in layers with the first mass, and left to decompose.

After the whole mass has undergone decomposition, it is suffered to dry by removing it, and, lastly, to facilitate its reduction to powder, mixed with 4,000 pounds of dry turf, or some other dry vegetable earth. The mixture is repeatedly stirred about with a shovel, and may at once be brought upon the fields. Manure prepared thus will contain about 12 per cent. of tribasic phosphate of lime, (3 CaO, PO_5,) 2 per cent. of nitrogenous matter.

This manure must, from its composition, produce an admirable effect upon grape vines.

Liebig, in generally recommending this new fertilizer, thinks an addition of gypsum an improvement for many kinds of fruits.—*U. S. Ag'l. Report for Sep.*

Value of Clover.

ANALYSES OF CLOVER.

If evidence is wanted of the nutritious qualities of clover hay, let us examine its chemical indications. Prof. Johnson analyzed a first crop of clover from an acre of land, and found it to contain the following ingredients:—

Albumen, gluten and casein	430 lbs.
Fat oil, &c	143 lbs.
Starch, sugar, gum and dextrine	1,825 lbs.
Fibre and husk	1,156 lbs.
	3,554 lbs.

According to Boussingault, the elements of a first and second crop of clover from an acre of land are:

Carbon	2,757 lbs.
Hydrogen	188 lbs.
Oxygen	2,211 lbs.
Nitrogen	118 lbs.
	5,374 lbs.

The clover plant leaves a large per cent. of ash on burning, the whole being 11.18 per cent.; the leaves give 10.69, and the stems 8.62 per cent. The value of the ashes may be estimated by the following per centage of its several elements:—

Potash	12.164 per cent.
Sodium	1.414 "
Soda	30.757 "
Lime	16.556 "
Magnesia	6.262 "
Phosphate of iron	.506 "
Chlorine	2.159 "
Phosphoric acid	2.937 "
Sulphuric acid	.801 "
Silica	1.963 "
Carbonic acid	22.93) "
Sand and coal	1.244 "
	99.718 "

CLOVER AS A FERTILIZER.

These analyses show the value of clover as well in its character as a fertilizer as in its qualities for feeding. Opinion varies very much as to certain practical points in the application of the crop as a fertilizer, but especially as to the propriety of plowing it under, or leaving it to perish on the surface of the ground. It will be remarked that the percentage of carbonic acid is very large, exceeding the sum of all the other acids. When green clover is first turned under, heat is evolved by the action of carbon, and fermentation begins; carbonic acid gas is formed, and, passing off, forms a chemical combination with the mineral or inorganic elements of the soil, rendering them fit to be assimilated and appropriated by the succeeding crop.

Some think that positive injury is done by ploughing under a full grown crop of clover, arguing that