



Vol. III. No. 16.

TORONTO, UPPER CANADA, AUGUST 15, 1866.

POSTAGE FREE.

The Field.

Familiar Talks on Agricultural Principles.

BONE MANURES.

ABOUT the year 1740, the value of bones as a fertilizer was discovered by accident. The cutlers of Sheffield, who use bones largely in the manufacture of handles for knives and forks, threw their bone refuse into heaps, which remained undisturbed for some time until they became putrified. One of these heaps was carted away as rubbish, and somehow or other came to be spread upon grass-land. The effect of it was most remarkable, so much so, that it could hardly be believed that it was owing to the bone refuse. People thought there must be some wonderful fertilizer beneath the surface, and they dug to find it. Not succeeding, they came to the conclusion that it was the cutlers' rubbish after all. Subsequent trials confirmed this view of things, and though at first this new manurial agent was not extensively used, it has now come to be regarded as one of the most valuable substances that can be applied to the soil. It was not until the year 1814 that machinery came to be set up for crushing bones. A Mr. Legard, of Ganton, on the Yorkshire Wolds, is reputed to have been the first manufacturer of bone manure, and from imperfect beginnings, bone-crushing machinery has been improved and steam power applied, until the preparation of this fertilizer is now an extensive, profitable, and established trade.

The chief value of bones arises from their furnishing that scarce and useful substance, phosphate of lime. They also supply a rich animal matter. The following analysis of the bones of an ox may be taken as an exhibit of their average constituents:—

Cartilage.....	33.3 per cent.
Phosphate of Lime	55.35
Fluate of Lime	3.0
Carbonate of Lime.....	3.85
Phosphate of Magnesia.....	3.05
Soda and a small portion of common salt	2.45

Thus it will be seen that bones consist wholly of material that is useful for plant food; while they are especially valuable on account of their containing so large a proportion of animal matter and phosphate of lime.

Bones are prepared for use by boiling, crushing or dissolving. The boiling process extracts the gelatine and fatty matter, which while it lessens their fertilizing qualities, makes them yield more quickly to the action of air and moisture, so that their influence is at once brought to bear on the growing crop. The breaking or crushing process makes bones more soluble in water, and hence the finer they are ground the more speedily and perceptibly they act. But from the fact that crushed bone requires time to be thoroughly incorporated with the soil, its effects are very durable,

and a field well dressed with this manure shows the effect of the application for years. The dissolving process is usually accomplished by the use of sulphuric acid. This destroys the mechanical structure of the bones, and renders them so thoroughly soluble, that they become at once available for plant-food. Sulphuric acid is itself a valuable fertilizer, and enters largely into the composition of certain plants. It also acts on other fertilizing substances in the soil, so as to make them available for the nourishment of the growing crop. Superphosphate of lime, as it is called, is a preparation of bone manure by the addition of sulphuric acid. This fertilizer, when made upon honour, is of great value, and well worthy the attention of the farmer. He should know, however, that there is a great chance for adulteration in making it, and that superphosphate differs very considerably in their value. In England, some humiliating exposures have been made of frauds committed from time to time, in the manufacture and sale of this material. An agricultural writer in that country observes that makers and vendors of this article "take advantage of that patent weakness of all farmers for cheap bargains," and consequently do not hesitate to use all manner of rubbish in the manufacture of superphosphate, so as to undersell their more conscientious rivals. Gypsum is largely used in the adulteration of superphosphate. Bone-dust is also liable to be adulterated, so that it is of great importance to have some guarantee of its genuineness, either in the character of the manufacturer, or the application of some test for the detection of worthless admixtures. It is not difficult to analyze bone-dust, and an ordinary farmer may soon learn how to do it.

But the cheapest method of providing bone manure, and the surest way of having it genuine, is to prepare it yourself. There is no great difficulty or occult art about this. Various processes have been prescribed, most of them of a very simple character. One was given in our issue of June 1, 1866, under the heading of "Turnip Cultivation," by means of which, at a cost merely nominal, any farmer may annually supply himself with such a quantity of bone as would, in the course of a few years, raise the character of an ordinarily-sized farm to a respectable point of productiveness. Another very practicable method is to break a quantity of bones with a hammer, and mix them with sulphuric acid diluted with three or four times its bulk of water. This is to be thoroughly mixed and left a day or two at rest. It should then be stirred daily until it is reduced to paste, when it may either be diluted with water, and applied to the land in a liquid state, or mixed with a large quantity of earth, soot, sawdust, or powdered charcoal. If diluted with water, one barrel of the pasty mass may be mixed with one hundred barrels of water, and sprinkled on the land from a water-cart or by scoops. An English work on "Scientific Farming" suggests the following methods: "Let us suppose a farmer

to require bones for his turnip crop in the spring; let him lay in his stock of bone-dust, say 2 cwt. per acre, in the December previous. Let him mix these in a shed or any covered place, with the same weight of salt, and to this add 20 bushels of finely-sifted coal ashes, and water them with gas-liquor, or liquid manure from his tank, if he have one, and turn them over every week or ten days. The quantity of liquor to use should be as much as they will absorb. This process, repeated for three months, will reduce them to a proper state, and, by the time they are required for use, he will have, at least so far as bones are concerned, a sufficient supply to procure him an excellent crop." Another mode is the following: "In a large square tub, say 5 feet wide by 2 feet 6 inches broad, and 2 feet deep (lined with lead), the bones should be spread evenly, and upon them should be poured half their weight of water, if hot all the better; after steeping for 24 hours, then pour on the same quantity of acid, viz., half the weight of the bones. These should now remain 36 hours at least, and be stirred at intervals during the time, when they should be taken out and mixed with ashes to such an extent as will make them sufficiently dry for drilling. The more they are stirred while under acid the better, and the more thoroughly they are mixed with the ashes the better also; as by so doing, the whole mass becomes more thoroughly incorporated." We do not see why a barrel will not do as well as the expensive lead-lined box spoken of above. In all the foregoing processes that include sulphuric acid, it is well to remember that this chemical substance requires to be "handled with care." Bones broken with a hammer, and mixed with an equal quantity of earth or ashes, will heat and decompose so as to be in a state fit for use in turnip drills. We imagine that most Canadian farmers who can be persuaded to use bones at all, will do so in that way which requires least trouble, and either by purchasing crushed bones, or resorting to some simple method like that last named, will avoid slower processes that require time, patience and labour. Everyone who has a piece of land under cultivation should see to it that it has from time to time a dosing of bones, in one form or another.

Noxious Weeds.

The old adage, that "What is everybody's business is nobody's business," has lately been constantly recurring to our mind, as we witnessed with pain and sorrow the luxuriant crops of Canada thistles rapidly coming to maturity in various parts of the Province. As everybody knows very well, an Act was passed in the Legislature last year for the prevention of the spread of Canada Thistles, and all landholders are bound in various pains and penalties to cut down and destroy any of these vile weeds which may chance to encumber their property; the