

is richly deserved—two new books for the winter's school. He tells his father how the other boys of his class are to have them, how he shall fall behind them without this assistance—how he will study, and work harder next summer if he can have them, and that they will only cost one dollar. But his imploring looks and earnest language avail nothing with the father. He says not an encouraging word, but simply mutters—"I didn't have books—I am too poor to buy them; you must wait another year."

An agent for the *Anglo-American*, seeing the forlorn appearance of the premises, and thinking ignorance must have caused such bad management, presents the work, asking for his name and fifteen shillings. "O, it's no use," exclaims the farmer, "I don't believe in books; I am too poor; you must wait another year."

So year after year the poverty-stricken and procrastinating farmer drags on, lamenting the fortune which his own negligence renders inevitable, making his family equally miserable with himself, by denying them the means of improvement—too ignorant and too poor to grow wiser and richer. Almost as easily may the leopard change its spots or the Ethiopian his skin, as a man be induced to change his course of life, and we have reason to believe that this unfortunate man will, to his dying day, consider himself the victim of untoward circumstances, the son of misfortune, and the sport of destiny, instead of seeking in his own providence the cause of his bad luck.

#### SCIENCE AND EXPERIMENTS.

We are glad to observe a determination with some farmers to settle disputed points by a resort to actual experiments, in connection with the suggestions of science. Performing experiments without the guiding light of science, is like trying to make money without keeping any accounts—the man may sometimes get considerable sums, but he cannot for the life of him tell by what operation he has made it, nor how he is likely to be successful again. So, in a random experiment, the farmer may succeed finely, but he cannot guess which of the dozen operating causes has had the most influence; which is essential, and which useless, nor why he has succeeded. It is true, he may find out after repeated trials, like the blind man who goes over a piece of ground, till he becomes familiar with all its parts, which the light of vision would have revealed to him at a glance. On the other hand, science not corroborated by experiment, is but little better, being not unlike that of the ancient philosophers, who preferred to shut themselves up in the closet, and by profound abstract reasoning for a life time, found out what they could at once ascertain by a few minutes of manipulation. Both are as needful and as useful as the two rails of a railroad—we should make rather sorry work in trying to run the train upon one alone. It is true, we know more at present through the teachings of experiment than of science; but this is because we have the practice of many thousand people through many centuries, which quite overbalances the scientific investigations of the few who have labored in the present day. Wait till we have as

much labor expended under the light of science, as has been done in the dark, and the balance may fall on the other side of the account.

#### BONE MANURE.

##### UNIVERSITY OF TORONTO.

We, the undersigned, learn with much pleasure that Mr. Peter R. Lamb, of this city has been the first that has had sufficient enterprize to erect the necessary machinery for grinding bones for manure, at an expense of about £250.

It has been known for a number of years, by experienced agriculturists, as well as by chemists, that bones contain several fertilizing substances, more or less required by all cultivated crops, and that by the mere mechanical operation of crushing or grinding, they can readily be made available to the wants of vegetation, and thus constitute one of the richest and most permanent kinds of manure.

The rapid strides made in British Agriculture during the last quarter of a century, have been materially assisted by the application of bones as a fertilizer; and it is not too much to say that without the ready and effectual means which they supply of preparing poor, light, and elevated lands, for a course of alternate cropping, turnip husbandry could not have been carried to anything like its present extent, and consequently those distinguished improvements which have of late years been effected both in the breeding and fattening of stock, and the cultivation of root and grain crops, must have been greatly impeded. In England, so high is the repute of this manure, that bones are carefully collected, not only in the larger towns, but also in villages and farm houses, and such is the present demand for them, notwithstanding the heavy importations of guano, and the large manufacture of different kinds of artificial manures, that some thirty or forty thousand tons, amounting in value to upwards of £200,000 sterling, are annually imported, chiefly from the countries of northern Europe.

Although bones vary considerably in their composition, according to the age and character of the animal, they may all, however, be considered as consisting of two essentially distinct parts; the mineral or earthly and the organic. The former, amounting to about 60 per cent, consists chiefly of the phosphate of lime, together with small quantities of the phosphate of magnesia, fluoride of calcium, carbonate of lime, and common salt. The organic portion amounting to about 40 per cent, is made up of cartilage and fatty matters. Cartilage by being boiled in water is converted into glue or jelly, and is a substance rich in nitrogen, forming by decomposition much ammonia, together with carbonic acid and a small quantity of sulphur compound. Hence it is obvious that bones contain the most important materials for producing the living structure of plants.

As bones in their natural state are very slow in decomposing, it becomes necessary to break them up in minute fragments, or what is better, when immediate effect on vegetation is desired, to grind them into powder. In this state they can be most effectually applied to the soil, where by the action of rain water, which always contains