

be ascribed the slowness of its action, no effect being perceptible until warm weather made its appearance, when its effects became nearly as striking as in the previous experiment. The plants acquired a dark healthy green colour, and were upon the whole nearly as tall and luxuriant as those treated with nitrate of soda; but here again the produce was less than expected, the weight of straw being 264 lbs.; of grain 215 lbs., measuring 4 bushels and three gallons, which is at the rate of 42.3-4 bushels per acre. In so far, therefore, as we may judge from the result of these two experiments, it would seem that neither nitrate nor sulphate of soda were adapted for using on thin, light soils. It is perfectly true that they act in some way as a stimulant to the growing plants, as shown by the places where they have been used, being of a dark healthy green.

3. *Guano*.—The conflicting statements which have appeared from time to time respecting the proper quantity which ought to be applied of this manure, and the failures that have occurred from using it too bountifully, induced me to use a much smaller proportion of it than is now recommended, but notwithstanding this, its effects were truly remarkable; for, although only 16 1-2 lbs. were sown dry over this allotment, which is at the rate of about 1 1-2 cwt. per acre, it could readily be distinguished during the growing season from any other part of the field. The corn tilted well, and appeared thicker than in Nos. 1 and 2, and although somewhat shorter, it was in other respects equally strong and healthy, and of a rich deep green. It deserves to be noticed that, at the time of binding up the grain, the workmen remarked what appeared to them to be a difference in the weight of the sheaves, compared with those in the first and second plots, which they had previously bound up, and the result showed an increase over the nitrate of soda, of no less than 81 lbs. of straw, and 84 lbs. of grain; the weight of the straw being 280 lbs., of grain, 252 lbs., equal to 5 bushels, or 50 bushels per acre. Besides this experiment, I have made several others with guano in a liquid state, on vegetables in the kitchen garden, all of which have satisfied me that this manure, when unadulterated, is one of the most powerful that can possibly be employed. Its effects are visible in the course of eight or ten days after the application. For onions, celery and the cabbage tribe, it surpasses all manures. I had portions of each of those vegetables watered with guano, without being made aware of the particular spots so treated, and at the end of a week I had no difficulty in pointing out every spot where the guano had been used.

4. *Sulphate of Ammonia*.—A small quantity of this salt was sent me from Bristol, with the following directions: "The quantity usually applied is about 2 cwt. per acre. Upon grass lands or growing crops, it may be sown broadcast; or in preparing the land for seed, it may be harrowed lightly in the ground; or it may be mixed up in any proportion with soil or any decayed vegetable matter that may be most easily procured." In the present case, the quantity used was 22 1-2 lbs., which after being reduced and made tolerably fine, was sown by hand unmixed with any other substance. A fortnight after the application, I remarked a trifling difference in the color of the young plants, which seemed to be of a paler green, than those adjoining; but this soon changed, and was succeeded by a fine healthy green, which they retained during the rest of the season. The crop was about the same thickness as where the guano was used, and of an average height. The produce gave of straw, 269 lbs.; of grain, 232 lbs.; equal to 47 1-2 bushels per acre. Between this and guano, there is a difference in favor of the latter of 18 lbs. in grain; while the difference in the cost of sulphate of ammonia is nearly double that of guano.

Drainings from the Farm-yard.—The value of liquid manure is well known; the trial which was made of it in this instance, was highly satisfactory, and confirms the opinion I have long entertained, that more attention ought to be paid to the proper formation of dung heaps, as well as to the making and preserving of liquid manure in tanks, &c., than is the general practice. Were this the case, I am persuaded it would be far more advantageous to the farmer, than spending his money for foreign substances, not more powerful than those which may be obtained, at much

less cost, from other agents within reach, if the means are only adopted to secure them. Here we have the fact of the common drainage of the farm-yard giving a return equal to that obtained from the finest manure of which we have any knowledge. The quantity used was 100 gallons, or 1000 gallons per acre, not in the strong, brown colored state it appears when running from the stables or cattle houses, but diluted with water until it resembles what is commonly used for gardening purposes. It is difficult to make the general reader understand this; but I should think one gallon of the dark colored liquid, in two gallons of water, would be near the right proportions. The appearance of the grain was remarkably strong and healthy. The weight of straw was 300 lbs.; of grain, 256 lbs., or 52 1-2 bushels per acre.

If the effects of guano and some of the other manures were such as to excite surprise, I think the results of this experiment will appear no less remarkable, as it supplies us with evidence in proof of the great value of liquid manure, which, I regret to say, is either little attended to or permitted to run to waste. In this particular, I believe it will be generally admitted there is a great room for improvement; and it is to be hoped the time is not far distant when the facts derived from these and similar experiments, will be the means of causing a better system of management to be introduced.

A portion of equal extent to those allotted for each experiment was set apart for comparison, and found to produce, without manure, in straw 233 lbs.; in grain, 200 lbs., or at the rate of 40 bushels per acre.

The subjoined table will more readily show the results of the several experiments:

Kind of Manure.	Produce per acre.
Nothing,	40 bush.
1. Nitrate of soda,	37 1-2 "
2. Sulphate of Soda,	43 3-4 "
3. Guano,	50 "
4. Sulph. of ammonia,	47 1-2 "
5. Drainings of farm-yards,	52 1-2 "

W. B. BOOTH.

Leaves are the lungs of plants; they take oxygen from the air and emit carbonic acid, which is composed of oxygen and carbon. While the former goes off, the latter remains and converts the sap into a kind of pulp, a part of which consists of carbon. The pulp passes from the upper to the under side of the leaf. The cells where the pulp lodges being yellow, and the carbon of a dark blue, they form together the green color of the leaves and young bark.—*Selected.*

NIAGARA FALLS.

The stupendous magnitude in which the physical powers of moving waters are displayed in the unparalleled scenery of this cataract, leaves the mind of every beholder impressed with a sense and feeling "unfelt before;" and renders it an object not unworthy of a prominent motive inducement to a European for crossing the Atlantic. But as long and as often as this scenery has been viewed by all classes of people, no attempts, that we are aware of, worthy of note or reliance, have ever been made to estimate the force, or more properly the amount of power exerted by the descending water at the great precipice, until it was undertaken in '841 at the suggestion and under the direction of Z. Allen, Esq., of Providence, a gentleman whose well known scientific skill renders his estimates worthy of great confidence. In the practical measurements he associated with him E. R. Clarkwell, a most skillful and accurate Engineer, of Black Rock. An exact measurement of the depth and velocity of the river at Black Rock harbor was taken at three different points or sections, 660 feet apart,—and thus was it carefully ascertained that about 22,440,000 cubic feet, or 167,862,420 gallons, weighing 701,250 tons, or 1,402,500,000 pounds of water flow out of Lake Erie every minute. Estimating the perpendicular descent of the grand cataract to be 160 feet, and taking the usual and best sanctioned estimates of the loss of power in the application of water to water-wheels, and also regarding the power of a horse to be