

dissent to be recorded in the minutes. He contended that this date was too early for Northern Ontario, as the farmers were then in the midst of their harvest, and it would also clash with the Industrial Exhibition. He was in favor of the fourth week of September.

After some discussion it was agreed that the consideration of the question be postponed till the March meeting of the Board.

A communication was read from the London City Council, asking the Board if it would accept a monetary consideration in lieu of the \$4,000 which it held on the present London fair grounds, or if it preferred to transfer the lien to the contemplated new grounds. There being a wide difference of opinion amongst the members of the Board, the question was postponed for the consideration of the new Board.

The Dominion Government having decided to send a Canadian Commissioner to the Antwerp International Exhibition, the Board offered to petition the Minister of Agriculture to appoint Mr. Joshua Legge as such commissioner.

A motion, moved by Mr. Drury and seconded by Mr. Snell, was carried to the effect that the Commissioner of Agriculture be requested to appoint Mr. Henry Wade, Secretary of the Agricultural and Arts Association, to represent Ontario at the coming New Orleans Exposition, the Government to pay no extra salary, but merely the expenses of the mission. Mr. Morgan offered to accompany and assist Mr. Wade, and pay his own expenses. This generous offer was applauded by the Board.

The thanks of the Council having been tendered to its President, Mr. Joshua Legge, for the able and courteous manner in which he discharged his duties, the meeting adjourned.

How to Save the Manure.

No. V.

As a supplement to our articles on farm-yard manures, we purpose treating briefly on concentrated fertilizers. But it may be asked, What has this to do with "How to Save the Manure?" Much every way, as we shall shortly see. Many names have been attached to these fertilizers, which have little or no application. "Artificial" is very inapplicable, for most of them are natural products, and require less manufacturing than farmyard manure, both before and after they enter the soil. "Commercial" is a poor distinguishing term, for in some countries farm manure is also an article of commerce; and in many of the neighboring States it is extensively shipped from one State to another. In our own country it will soon become an extensive article of commerce also, if farmers do not early begin to save their manure. "Chemical" is a misleading name; for there is just as much chemistry involved in farmyard manure—except when a host of analysts has to be employed by governments to detect adulterations. "Special" is a word of bad repute. Is it "special" for certain soils or certain crops? Unfortunately there are over 50 "special fertilizers" sold for different kinds of crops, and this humbug has brought more disgrace upon the fertilizers than all other abuses combined. Every farm crop contains the same constituents, and while it is true that some plants require more of some of these constituents than others, and may assimilate them in a slightly different form, yet these

circumstances are insignificant compared with the constituents that may be lacking in soil. "Special," however, is legitimately used to distinguish them from "general" manures. A "special" manure contains only some of the constituents of plant food; a "general" manure contains them all. "Direct" is a term usually confined to green manuring. "Mineral" is an inapplicable word applied to fertilizers, for all fertilizers contain minerals, and farmyard manure is not the only kind that contains the organic constituents of plants. We shall employ the term "concentrated" as being the most applicable; for, when pure, these fertilizers usually contain no constituents that are not needed by the plant, whereas farmyard and other organic manures contain elements that are useless in the soil for plant food, and may therefore be regarded as "bulky."

Of the dozen or more elements that are usually found in the composition of farm crops, all of which must be in the soil, one would think it a difficult problem to ascertain which ones are deficient, and which exist in excess, before the deficiency can be supplied; but the task is greatly simplified when it is known that hardly any soil is ever lacking in any of the constituents of plant food except one or more of these three, viz., nitrogen, phosphoric acid, and potash. Of those potash is usually the least important, it being present in sufficient quantities in a large majority of soils.

How then is the farmer to know which of these fertilizers is most deficient in his soil? By no other available means than by conducting experiments for himself—just as he does in testing the different varieties of grains, vegetables, etc. There is this difference, however, that a few grain tests conducted by one farmer may be of use to the whole neighborhood, while fertilizers must be more repeatedly tested, not only on every farm, as a rule, but frequently on different fields of the same farm. We have always advocated that every farmer should save his farmyard manure in preference to purchasing concentrated fertilizers; but as soon as his home-made manure begins to run short, he must commence supplementing it with purchased manures. It is too late to begin after the fields cease to yield profitable crops. Just as the thoughtful farmer commences to lay out plans for his buildings, drains, etc., many years before he undertakes the work, so it is with fertilizer experiments; he cannot begin too soon. Just as sure as he will need buildings and other improvements, so sure will he have to restore the lost fertility of his land. After several years experimenting, he will be able to ascertain what fertilizers should be added to his farmyard manure so as to make it cover two or three times the area to which he now applies it.

1. *The Supply of Nitrogen.*—A soil may be ever so rich in all the other constituents of the plant, but if deficient in nitrogen the crops will be small. The same truth applies to all other lacking constituents. There is little difficulty in ascertaining when nitrogen is wanting. The natural source of this element is the decay of vegetable matter, also called organic matter, humus, or vegetable mold. Decaying farmyard manure and the remains of worms, insects and animals are also fruitful sources. Soils that are rich in organic matter are therefore

rich in nitrogen; but this nitrogen is not always available for the crop. It must first undergo a process of nitrification or change to nitric acid, which is brought about by living organisms (bacteria) in the soil, aided by a warm temperature, moisture, and a free circulation of air. Tillage is therefore necessary to keep the soil porous; but not so porous as to prevent moisture rising from beneath in dry weather. Unless these conditions exist the soil will be poor in nitrogen supplies.

There are many kinds of fertilizers which supply nitrogen to the soil. We shall merely mention the names of blood, wool or woollen rags, soot, hair, meat scraps, leaves, and leather scraps, many of which are articles of commerce. We do not, of course, recommend farmers to purchase these wastes, but we mention them to show that they are rich in nitrogen, so that the farmer will take the hint that many a valuable little compost heap can be made by saving the "scraps" about the farm. These forms of nitrogen are in the organic state; and, like humus, they must be nitrified before they become available for the crop.

The other forms of which we shall speak, and are readily procurable in our markets, are nitrate of soda and sulphate of ammonia. Being soluble, nitrate of soda is readily assimilated by the plant, and contains about 16 per cent. of nitrogen. It acts more quickly than any other nitrogenous manure, and is therefore good to give the crop an early start, or it may be applied as a late dressing. If there is only a small quantity of organic matter in the soil, it usually furnishes sufficient nitrogen during the warm season. Sulphate of ammonia is prepared from the ammoniacal products of gas works, and contains about 20 per cent. of nitrogen; but as the ammonia must first be oxidized to nitric acid, it is not quite so active as the last named fertilizer. Vegetation is destroyed by the application of large quantities of these fertilizers, and they are easily washed out of the soil by heavy rains, if there is not a sufficiency of clay in the subsoil to retain them; the same may be said with regard to the nitrogen of the humus after nitrification has taken place. Humus, being black, is a good absorber of heat, and it has the property of retaining more moisture than other soils.

A little reflection will now show the causes of the loss of nitrogen. Summer-fallowing in a wet season and in a light soil is a fruitful cause; but the greatest source of loss is the amount of nitrogen wasted under the existing system of treating the farmyard manure. It will therefore be seen that enormous quantities of farmyard manure must be spread on the field in order to supply a sufficiency of nitrogen to produce a good yield, so that more phosphoric acid and potash are applied than the soil requires. The addition of nitrate of soda or sulphate of ammonia to a smaller supply of farmyard manure now explains one of the mysteries of how to save the manure by the use of concentrated fertilizers.

(TO BE CONTINUED.)

R. Gray, Seaforth, says: "Many farmers round here take the ADVOCATE, and all seem well pleased with it. Our house is flooded with papers, and I must dismiss some of them, but I will hold on to the ADVOCATE as our best friend."