

Middlesex Agricultural Council.

The regular monthly meeting of this council was held on Saturday the 19 ult., in the office of the FARMER'S ADVOCATE, the President, Mr. D. Leitch, in the chair.

The President read over the constitution and by-laws as published in the August issue of the ADVOCATE, and after a sharp discussion on some of the clauses, it was moved by W. A. MacDonald, and seconded by John Kennedy, that the constitution and by-laws be adopted without change. Carried.

Moved by John Kennedy and seconded by Joseph Johnson, that John Wheaton, George Douglas, and John Weld be elected as members of the Board of Control. Carried.

After a lengthy discussion on the question as to how the Council should dispose of the \$100, or any part thereof, granted annually by Mr. Weld, for the benefit of agriculture, it was moved by Mr. Wheaton, seconded by John Kennedy, that a committee of seven be appointed to visit the Model Farm, and make a separate and impartial report to the Council, with the object of ascertaining what real practical benefits that institution was doing for the farmers of the Province, that the Secretary be instructed to acquaint Prof. Brown as to the time and object of such a visit, and that the expenses of the committee be paid out of the special fund of the Council. Carried.

It was decided, after some deliberation, that the committee should leave London for Guelph on Wednesday, Oct. 7th, on the 7.30 a. m. train.

The President then nominated the following members to act on the committee: Messrs. Leitch, Kennedy, Anderson, Wheaton, Johnson, Douglas and Pearce.

The newly appointed Board of Control proposed to retire for the purpose of deciding upon a program for the next meeting, but the Board and Council unanimously agreed that a discussion on the reports of the committee appointed to visit the Model Farm be the program.

The Council then adjourned.

To Farmers' Sons.

We want active agents in every township to canvass for the FARMER'S ADVOCATE AND HOME MAGAZINE. Liberal commission will be given. Send for terms, sample copies and outfit.

On account of the number of high-priced cows that have lately been fed and milked to death for the purpose of producing "records," the New York Tribune suggests that the matter should be taken up in a decisive manner by humane societies. It is certainly a form of cruelty not less heinous than others which meet condign punishment. We would add that feeding for fat stock shows be included in the same category, the form of cruelty in the latter case being even more appalling than in the "record" outrage. In feeding for fat the cruelty continues for two or three years, while in feeding for large yields of milk it only lasts for several days as a rule. If the one produces untimely death what must be said concerning the other? Why doesn't some ambitious investigator test how long it would take to stuff a Christmas beef steer to death?

The Farm.**Farm Drainage.**

NO. II.

Having described the different conditions of water with regard to the soil, and having pointed out that plants live on the moisture and nourishment obtained from the water found within the soil particles, and not from that found between them, it is now in place to consider:

1. *The Effects of Surface Washing.* It being well known that most waters contain appreciable quantities of plant food, it is important that the water be so regulated that the soil, or rather the plants, obtain the greatest possible benefit therefrom. Now if the surplus water produced from excessive rains be allowed to wash over the surface of the field, not only will the plant food in the water itself be lost, but the finer particles of soil and the soluble plant food in the surface soil will also be washed away. These particles, called silt when found in running streams, consist mostly of clay with decayed vegetable matter, and are the most valuable portions of the soil; sand, which is coarser and less valuable, remains behind. This silt contains valuable fertilizing matter in solution. The silt-carrying capacity of water depends upon the depth and the rapidity of the flow. It is now plain that if silt-water overflows your field, and is allowed to percolate through the soil, the land will be of inexhaustible fertility, for most of the fertilizing matter will be retained in the soil, the drainage water containing very little of its original plant food. It will now also be seen that if this drainage water, or in fact any water that has once soaked through the soil, overflows your land, it will contain very little fertilizing matter, and so should be got rid of in the most effectual manner and with all possible speed; it is only useful in supplying moisture in a dry season, and has little or no value from a fertilizing point of view. The other source of water, namely, from the rain, is intermediate in its character; it contains appreciable quantities of plant food before it soaks through the soil, and if it forms silt water it becomes specially valuable as a fertilizer. Few farmers, however, are concerned in being enriched by silt water at the expense of their neighbors, or in being impoverished by a surplus of water from underlying springs, so that the question is practically limited to the disposal of water from rains, and we have shown that the surplus should not be allowed to wash over the surface of the field.

2. *The Effects of Water Percolating through the Soil.* The advantages of drainage depend largely upon the value of percolation, and we shall therefore be somewhat detailed in our observations. We cannot obtain a true estimate of its value without knowing the causes of fertility and exhaustion. We must also know how to distinguish between soluble and insoluble plant food, as well as the sources thereof, and be able to take account of the gains and losses that are constantly taking place.

The broad question is that all fertility derived from rains and dews has primarily ascended from the earth, for none comes down to us from other planets. In our articles on manures, our statements to the effect that plants

contained a large number of elements and compounds, will be remembered, but we only treated specially of three, viz., nitrogen, phosphoric acid and potash, for all the others were rarely deficient in any soil. We shall now be equally circumscribed, confining our remarks mainly to the effects of drainage on these constituents.

When exposed to decay, all animal and vegetable substances gradually revert to the original elements or constituents of which they were composed. It is a process of slow combustion. The constituents of the plant which came from the air return to the air, and those which came from the soil return to the soil; dust to dust, and air to air—part remaining in the earth as a solid or a liquid, and part escaping by volatilization in the form of gas. The re-union of these constituents produces vegetation, and there is a constant interchange of fertility between the soil and the atmosphere. The carbon, which forms about 50 per cent. of the plant, escapes united with oxygen, forming carbonic acid gas, and returns to build succeeding vegetation through the leaves, never through the roots. All the other constituents of the plant nourish it through the roots, although much of this sort of plant food is washed into the soil from the atmosphere by means of rain. We shall here say nothing about the disputed question as to whether much, little, or no nitrogen be taken into the plant through the leaves, merely mentioning that all soils deficient in this element are greatly benefited by the application of nitrogenous fertilizers, which proves that large quantities are absorbed by the roots. This is the practical view of the question, and we shall not indulge in speculation.

It is now important to know in what forms nitrogen exists, both in the soil and in the atmosphere, and the affinity which different soils have for fertilizing compounds. The decay of animal and vegetable matters is the source of nitrogen. When this element unites with hydrogen it forms a gas called ammonia, and afterwards, when oxygen is added, it forms nitric acid; this is a liquid, but it readily unites with lime, potash and other bases to form nitrates. If there is much decaying vegetable matter (humus) in the soil, the ammonia is retained; if not, this gas escapes into the air, and will perhaps come down on your neighbor's farm. Bear now in mind that nitrogen in the form of ammonia can scarcely ever be washed out of the soil into the drainage water, while if left to the action of heat and moisture till it is converted into nitric acid, it is then washed into the drain in large quantities, unless there is a growing crop on the field to absorb it. This nitric acid does not escape alone, but carries with it large quantities of lime from the soil, the loss being largely in the form of nitrate of lime. Small quantities of mostly all fertilizing matters may sometimes be lost in drainage water, but no appreciable waste can occur except in the case of nitric acid. This loss can be prevented by skillful management.

The supply of nitrogen from the atmosphere now remains to be considered. Atmospheric nitrogen also exists in the forms of ammonia and nitric acid. These descend with rains and dews, but ammonia is also absorbed from the air by the soil during warm, dry weather. Carbonic acid also descends with the rain, and al-