The Agricultural Gazette

The Official Bulletin of the Dominion Cattle, Sheep, and Swine Breeders' Associations, and of the Farmers' Institute System of the Province of Ontario.

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THE DOMINION CATTLE, SHEEP, AND SWINE BREEDERS' ASSOCIATIONS.

Annual Membership Fees:—Cattle Breeders' $1; Sheep Breeders', $1; Swine Breeders', 1.

BENEFITS OF MEMBERSHIP.

Each member receives a free copy of each publication issued by the Association to which he belongs, during the year in which he is a member. In the case of the Swine Breeders' Association this includes a copy of the Swine Record.

A member of the Swine Breeders' Association is allowed to register pigs at 50c. per head; non-members are charged $1.00 per head.

A member of the Sheep Breeders Associations allowed to register sheep at 50c. per head, while non-members are charged $1.00.

The name and address of each member, and the stock he has for sale, are published once a month. Over 10,000 copies of this directory are mailed monthly. Copies are sent to each Agricultural College and each Experiment Station in Canada and the United States, also to prominent breeders and probable buyers resident in Canada, the United States and elsewhere.

A member of an Association will only be allowed to advertise stock corresponding to the Association to which he belongs; that is, to advertise cattle he must be a member of the Dominion Cattle Breeders' Association, to advertise sheep he must be a member of the Dominion Sheep Breeders' Association, and to advertise swine he must be a member of the Dominion Swine Breeders' Association.

The list of cattle, sheep, and swine for sale will be published in the third issue of each month. Members having stock for sale, in order that they may be included in the Gazette, are required to notify the undersigned by letter on or before the 9th of each month, of the number, breed, age, and sex of the animals. Should a member fail to do this his name will not appear in that issue. The data will be published in the most condensed form

F. W. HODSON, Secretary.
Parliament Buildings, Toronto, Ont.

The Stock List.

The following is a copy of a circular which has been sent to the members of the Dominion Cattle, Sheep and Swine Breeders' Associations:

TORONTO, July 21st, 1899.

Dear Sir,—The Exhibition number of FARMING in which is published the *Ontario Agricultural Gazette*, will be issued on August 31st. We intend to publish a complete list of the stock for sale in this issue and wish to make it as large as possible. In order to do this it will be necessary that we receive your list of stock for sale not later than Aug. 21st. By giving this matter your attention you will oblige,

Yours very truly,
F. W. HODSON.

An Abridged Report of English and European Experiments Which are of Value to Canadian Farmers.

BARNYARD MANURE.

It is well known that barnyard manure, if neglected, rapidly loses the greater part of its fertilizing value and becomes practically worthless, except to improve the mechanical and physical properties of the soil. It is also well understood by practical men that it is not economical to carry out some of the elaborate methods of preservation which have been suggested. To be economical the method of management must be simple and involve as little labor and expense as possible. Scientific men have been directing their energies for some time in the line of simplifying methods of management and preservation of farm manures, a summary of which is given in *Farmer's Bulletin*, 56, of the U. S. Department of Agriculture.

Inasmuch as the direct fertilizing value of manure depends so largely upon the nitrogen which it contains, the investigations have been mainly, into the availability, changes, and causes a prevention of loss of this substance. There is a wide difference between the fertilizing value of the nitrogen of the solid and liquid parts of the manure. The effectiveness of the former has been found in experiments to be only 10 per cent. of that of nitrate of soda, while that of the latter was over 90 per cent., being very nearly equal to that of sulphate of ammonia. The nitrogen of the solid excrement becomes available very slowly in the soil or in the heap, while that of the urine is in a soluble form, rapidly converted into ammonia which may escape into the air. It was found that the effectiveness of the nitrogen of the solid excrement is not materially increased by mixing it with the liquid part, the nitrogen of such a mixture being decidedly less available than that of either nitrate of soda, sulphate of ammonia or green manures The conversion of the nitrogen of the urine into ammonia, moreover, is apparently hastened by the admixture of solid excrement and straw.

CHANGES IN MANURE THE RESULT OF ORGANISMS.

The changes which manure undergoes, which it brings about in the soil, and which so largely determine its fertilizing value, are merely the work of microorganisms, which, though insignificant individually, multiply with astonishing rapidity and are thus able to accomplish startling results. These microorganisms begin their work as soon as the manure is voided; in fact, it is believed that many of them come from the stomach of the animal along with the manure. At any rate, the air and litter of the stable swarm with them, and the odor of ammonia, which can be detected very soon after the excrement is voided, shows that they commence their work without delay.

These organisms are of various kinds. Some require air (or oxygen) in order to grow; others flourish only when oxygen is absent. Most of them affect the quality of the manure injuriously, but some may be made beneficial. The management of manure thus becomes largely a question of controlling these minute organisms.

CHECKING THE ACTION OF THE ORGANISMS.

The most effective means of checking the action of the organisms which require oxygen for their growth is to exclude the air. During experiments it was found that they were capable of completely converting the nitrogen of urine into ammonia, which escaped into the air, in twenty-four hours when air was freely admitted, but that the escape of ammonia was almost entirely prevented by excluding the air, although the nitrogen was still largely converted into ammonia. The same changes occur in the solid excrement, but much more slowly. In one experiment mixtures of dung and litter which were exposed to the action of the air were found to lose as high as 17 per cent. of the nitrogen which they contained in about seven months. In other experiments in which a current of air was drawn through the manure the loss was over 40 per cent.

It is due to the beneficial effect of excluding the air that deep stall manure has been found so much more effective than manure stored in an ordinary pile. Maercker, an eminent German investigator, has recently found in experiments with oats that the nitrogen of deep-stall manure compared favorably with that of sulphate of ammonia and nitrate of soda, while ordinary barnyard manure was either without effect or lowered the yield.

The unsatisfactory results with the latter are accounted for, not only by the fact that the manure had probably lost a large part of its fertilizing value by careless treatment, but also because the manure as well as the litter mixed with it contained peculiar microorganisms, known as denitrifying organisms, which are capable of converting available nitrogen into forms which are of little or no use to the plant when the manure is applied to the soil. In these experiments, moreover, the manure was applied in much larger amounts than is usual in practice, and the denitrifying organisms were thus distributed in the soil in sufficient numbers to work injury. Other experiments indicate that when manure is applied in the usual amount this is not likely to happen.

Careful attention to the construction of the manure pile so that air will be as completely excluded as possible, keeping the heap moist, and avoiding alternate wetting and drying have been suggested as means of preventing loss of valuable fertilizing constituents and of promoting a decomposition which will largely reduce the power of the manure to convert available nitrogen into less valuable or useless forms in the soil. Here we have an explanation of the effectiveness of well-rotted manure; not only is the availability of its own nitrogen increased, but its power to injuriously affect available nitrogen from other sources is reduced.

One point which has been clearly brought out by recent investigations is that the addition of straw may very