- NEWSY NOTES -

By J. A. Clark, D.Sc.

Fertilizer Development

In prehistoric times, the use of the excrement of animals to increase the yield of plants, would appear, according to tradition, to have been a general practice. The English word "manure" had its origin in the same root as manoeuvre, and it meant work by hand, but later it acquired a further meaning of a process or material used to improve the fertility of the soil. The Roman poet Virgil, and agricultural writers of his time, in their record of agricultural practices, mention the value of manure, the virtues of marl when used on the land, and even the beneficial effect of growing crops of vetches or lupins, upon the succeeding wheat crop.

The overthrow of the Roman Empire by the barbarians, destroyed their records and most of their practices of husbandry, and little is known except from old traditions, which were handed down from one generation to another by the workers in the fields, concerning the growing of corn, the production of wine, etc. During the dark ages there seems to be a blank concerning the production and development of crops, except a chance record in English tenures, such as, that tenants were obliged to fold their flocks at night on the lord's land; the securing of manure in this way was one of his most valued privileges.'

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With the Renaissance came writings such as those of Bernard Palissy, the potter (1563), who recommended marl, lime and ashes, and showed that the value of barnyard manure lay in the portion soluble in water. At the beginning of the eighteenth century, such materials as marl, chalk, lime, etc., were described as manures. The cultivation of the land was then called tillage or husbandry. A little later, barnyard manure was classed as "typical manure," and marl and chalk as artificial manures, because in themselves they were not plant food. Van Helmont, in the Low countries, described an experiment that convinced him that a tree was made of water alone. A sturdy Englishman, Jethro Tull, believed that hoeing and stirring the soil would provide all that plants needed to produce full crops.

Chemistry and Agriculture

It was not until the science of chemistry was developed, however, that any idea was formed as to how a plant came to grow. Agricultural chemistry may be said to have had its beginning with the information concerning the nutrition of plants, and the discovery of the composition of air. Priestly, who discovered oxygen, found that plants purified air fouled by the respiration of animals. Bonnet showed that oxygen was emitted from the leaves of plants. Ingenhausz demonstrated that light was essential during the process, and Sennebier proved that the oxygen came from the breaking down of the carbonic gas absorbed by the leaves. DeSaussure found that the gain in weight of the plants was nearly represented by the carbon; which combined with the elements of water produced such carbohydrates as sugar and starch. His ideas as to the source and value of the elements of the ashes of plants have been confirmed.

The great early German chemist Liebig thought that plants could take nitrogen in the form of ammonia direct from the air through their leaves, and that the ashes of plants indicated the proper fertilizer that should be applied for their development. Liebig, though he did not contribute very much in developing the theory of nutrition, made use of the findings of the men mentioned above, and from him and his great scientific reputation came the chief impulse which developed agricultural chemistry. Perhaps his erroneous theory regarding the way in which plants secured nitrogen direct from the air, which was not accepted by Lawes and Gilbert, started a controversy which led to the founding of practical experiments and scientific research in agriculture.

Field Tests

Boussingault in Alsace, in 1834, started practical field experiments, and systematically weighed crops and manures. He concluded that plants got their nitrogen from the soil, but found that certain rotations produced more nitrogen than he could account for. It was not until 1886 that Hellriegel and Wilforth cleared up this difficulty by showing that leguminous plants do fix nitrogen from the air by the help of certain symbotic bacteria on their roots.

An English landlord, afterwards Sir John Bennet Lawes, with the aid of Dr. Joseph Henry Gilbert, a chemist who had worked with Liebig, started a number of field trials in 1839 to prove that these theories, presented by Liebig to the British Association, were not correct. These trials were made at Rothamsted, St. Albans, near London, and were the beginning of the first Experimental Station. There Lawes and Gilbert demonstrated that ordinary plants could not use free nitrogen from the air. They established the value of nitrogenous manures for plants, and in a practical way showed that it was phosphoric acid and potash in ashes that were the ingredients most necessary to plants.

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The three essential fertilizers of today: Nitrogen, phosphoric acid and potash, were first obtained commercially as follows: Nitrogen from nitrate of soda, found and taken to England from Chile about 1838. These wonderful Chilean nitre beds, away up in the high Andes, supplied for years, most of the nitrate of soda of commerce; phosphoric acid was obtained from old bones and natural rock phosphate treated with sulphuric acid; potash was secured from certain salt deposits near Strassfurt, Germany, about 1860, and these mines are still a source of commercial potash. The science of agriculture owes a great deal to fertilizers, for it was from the profits secured from the manufacture of superphosates by Sir John Lawes that the great Rothamsted Experimental Station was organized.

The Dominion Bureau of Statistics has published the following data: "Production of fertilizers during the year ending June 30, 1950 amounted to 999,993 tons of materials and 699,292 tons of mixtures. Imports of fertilizers amounted to 803,638 tons. The larger items in the list of imports were natural phosphate rock, 493,014 tons; superphosphate, 152,429 tons; muriate of potash 114,253 tons; sulphate of potash, 10,180 tons; and nitrogen solution, 17,725 tons. Exports were made up of 578,997 tons of materials and 20,053 tons of mixtures. The principal materials exported were ammonium sulphate, ammonium phosphate, ammonium nitrate, and cyanamide."

STERLING W. I.

Mrs. Blois McEwen entertained the members of Sterling W. I. at her home for the October meeting. There were nineteen members and ten visitors present. The President, Mrs. Elmer Fyfe, presided.

The meeting opened with the "Institute Ode" followed by the "Creed" in unison. The roll call was responded to by the members paying a penny for each letter in their Christian name after which the minutes of the last meeting were read and approved.

Two members reported on library meeting held in Hunter River and it was decided that more information was needed before a decision could be reached.

The correspondence was read and discussed. Two thank-you cards and a letter of thanks were received.

The visiting committee reported three visits made and treats taken. Two ladies personally expressed thanks for a treat and a gift received. It was moved and seconded that twenty-five dollars be given to the Sanatorium Radio Fund.

The following new committees were appointed: School — Mrs. Cranford McKay and Mrs. F. S Bell. Visiting — Mrs. Albert Fletcher and Mrs. Blois McEwen. Program — Mrs. McGuigan and Mrs. D. B. Reid. Lunch — Mrs. Earle Henry, Mrs. J. E. Fleming, Mrs. F. S. Bell, Mrs. Gordon Fyfe and Mrs. Elmer Fyfe.

Mrs. H. S. McEwen invited the members to her home for the next meeting when roll call will be answered by members paying their fees.

The President then welcomed and introduced Mrs. Wilfred Pickering, who had been invited to demonstrate the dyeing and shading of hooking yarn. She supplemented her talk by showing samples of different shades and how she blends them together. This demonstration was much appreciated by those present.

Mrs. H. S. McEwen and Mrs. Lorne McEwen entertained with amusing and interesting contests. The first being won by Miss Vivien Woodside and Mrs. Carl Woolner and the latter by Mrs. W. I. Green and Mrs. Wilfred Pickering. Collection was $2.80.

The meeting closed with "The King," after which lunch was served by the hostess and committee in charge.

FINE JEWELS

Rubies, sapphires and jade found in Burma are considered among the finest in the world.

JAPANESE ISLANDS

The four main islands of Japan have a total area of 147,690 square miles.