THE GLEANER:

AND NORTHUMBERLAND, KENT, GLOUCESTER AND RESTIGOUCHE

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Agricultural Journal.

From the British American Cultivator.

THE APPLICATION OF SCIENCE TO AGRICULTURE.

We can now understand why it is in humid tropical climates, in soils abounding in vegetable matter, plants attain such rapid gigantic growth—surrounded by an atmosphere most injurious to the health of man. In such situations more carbonic acid is evolved by heat and moisture acting on organic matter in the soil than can be taken up by the most vigorous vegetation such a soil can support; hence the surrounding air contains a disproportionate quantity of a gas unfriendly to the health of animals. It is also found that plants have a much greater power of absorbing carbon during the day, than the night. When light is excluded they exhale a portion of carbon which, uniting with the oxygen of the atmosphere, forms carbonic acid gas. Hence the injurious effects of growing plants in close bed-rooms. We now see the reason of the rapid growth of plants in the artic regions—no darkness of night, during the brief summer, weakens the absorbing power of the leaf and stem in imbibing the carbonic acid of the atmosphere; hence vegetation, springing at once from the frozen soil, under the influence of solar action, rushes forward without interruption to an early maturity.

Again, what a beautiful adaption does science disclose, between the animal and vegetable worlds! What a mutual dependence! Look at the expanded leaf; study the physiology of the living plant, and with a mind under correct moral discipline, you cannot fail to trace and adore the inimitable perfections of the Creator. The air contains only one gallon of carbonic acid in 2500, and this proportion has been adjusted to the health and comfort of animals to whom this gas is hurtful. But to each this minute quantity, the tree hangs out thousands of square feet of leaf in perpetual motion, through an ever moving air; and thus, by the conjoined labours of millions of pores, the substance of whole forests of solid wood is slowly extracted from the flirtling winds.

Another view is opened up by vegetable physiology, of great moment to the farmer. Plants obtain, as we have already shewn the greatest portion of their carbon from the atmosphere, but the other materials which they get from the soil by means of their roots. The extremities of the roots are furnished with what are termed spongioles, from their resemblance to small sponges, these contain a large number of exceedingly minute pores, so small indeed, that nothing in a solid form can possibly enter them.

It thus becomes evident, that the food of plants can be taken up only in a liquid or gaseous state. Hence in applying manures, so as to secure their full benefit to the crop, the desirableness of the practical farmer making himself acquainted with the laws that govern vegetable nutrition. It is only a waste of labor and money to apply solid manures to plants, under conditions which will prevent their becoming soluable, the only state in which they can become active, or of any use.

There is a great difference in this respect in the nature of the various substances employed as manures; some being more really decomposed, and rendered soluble than others. Woollen rags, bones, and rough farm yard dung, require considerable time and moisture to reduce them into a proper state to enter into the circulation of plants; while the nitrates of potash and soda, which are very deliquesent salts, are brought quickly into action by the slight agency of a common dew. We have seen the action of these manures on wheat and other crops, in the course of forty-eight hours, when a warm shower has immediately followed their application. There is no mistaking their action; the yellow feeble leaves of the plant speedily become changed to a swarthy green, indicating the assimilation of the nitrogen of the manures. The coating of flint or silica, which gives smoothness and strength to the stems of wheat and other cereals, of previously existed in the soil in a state fluidity. And every one must have observed the striking effects of a thundre shower, on the growing crops of manured land in dry weather. The moisture and heat acting upon materials that had lain dormant in the soil, thus become changed in their condition, and are brought within the range of the chemical affinities and vital forces of the plant.

And here again we may just notice, the connection and mutual dependence which are found to obtain throughout all nature, both organic and inorganic. The soil, composed as it is, of various minerals and salts, combined with a varying proportion of the remains of animals and vegetables, is a dead inert mass. No animal can support its existence directly from these earthy materials. The plant intervenes, and forms the grand connecting link, between the mineral and animal kingdoms. Thus by a beautiful law of nature, we percieve an extensive system of harmonious connection and mutual dependence, man while occupying the highest position of all creatures, in this wide and all embracing system of creative wisdom and providential care, cannot fail to be deeply impressed with the truth that for his material organization he is dependant upon, and intimately connected with the earth; out of whose dust he was originally formed, and to whose bosom he must ultimately return.

Our space compels us to close these introductory remarks. In our next we shall consider the claims of chemistry on the attention of agriculturists; and in future papers, we hope to shew the application of the facts and laws of that most useful and attractive science, to the art of culture, and the phenomena of daily life.

From the London Farmer's Magazine.

AMMONIA AS A MANURE.

Colonel Challoner called the attention of the Council to an interesting set of experiments in progress at the Horticultural Society's gardens at Chiswick, in which, among other artificial manures, the effects of the Muriate, Sulphate, and Phosphate of Ammonia were ascertained on Spring Talavera Wheat. The most remarkable circumstance was, that each of these ammonical salts appeared to possess an equal fertilizing power. It therefore became a question of economy, which of the three could be obtained most abundantly and at the cheapest rate.—Prof. Way stated that the cheapest of these salts would probably be the sulphate, and the most costly the phosphate. He believed that it was generally understood that the efficacy of ammonical salts consisted not so much in the particular acid which entered into their composition as in the base, namely ammonia, common to them all. It was to the element nitrogen contained in this volatile alkali that their powers as manures were due, and the respective acids had perhaps no influence on the fertilizing action in question. He would observe, that it was to the final result at harvest that he would for the respective value of these artificial manures; for they were all apt to produce too great a luxuriance of straw, and accordingly to diminish the amount of grain.—Mr. Blake had often remarked that luxuriant green crops do not always prove the best grain crops; indeed he was inclined to think that he was the best farmer who grew grain crops with the smallest quantity of manure, if with any at all.—Mr. Tweed had grown more oats on well drained land without manure than with it, in consequence of the manure having produced too great a luxuriance of straw to be beneficial.—Mr. Fisher Hobbs thought the mode and time for the application of manure for corn crops required much consideration. Both his own and the late Lord Western's experience had shown him that it was frequently advisable not to apply the manure close to such crops, but the young clover crop of the preceding year. By this arrangement, the mildew arising from the rankness of immediate manuring was obviated and abundant crops produced chalk gravel.—Col. Challooner had been fully impressed with the value of this earlier application of manure for a grain crop, in consequence of a statement he had read in a Synopis of Practical Husbandry, published about the commencement of the present century, in which the advantages of that plan in referance to Norfolk farming are clearly pointed out.—The Chairman cited the different modes pursued in the plan of manuring in the neighborhood of Holkham.—Mr. Mechi explained the mode in which the Earl of Lonsdale had succeeded in raising oats by improved tillage, and without manure at Barns, in Westmoreland; and he promised, at the request of the Chairman to obtain from Lord Lonsdale's bailiff the particulars of his management on this point.

SALTS AS MANURE.

Mr. Mechi informed the Council that he had found the application of common salt have a very beneficial effect in strengthing the straw of his wheat crops which were always strong and erect. He had this spring applied eight bushals of it per acre, broad-cast, on 40 acres of wheat, with great success; and the barley, oats, and flax following the swede crop drawn off, were all looking very healthy. He had also applied it broadcast with a shovel, to his root crops, on both light and heavy land, mixed with twice its bulk of lime, namely, 15 bushels of common salt with 30 bushels of quicklime, to the acre; these substances, before application, being well mixed together, and either exposed to rain or otherwise moistened by water. His land of course had been well drained.

A REMEDY FOR WIRE-WORM.

Sir,—In reply to a "Yorkshire Correspondent," in your last number, allow me to recommend salt, as I think it the only remedy for the attacks of the wire-worm. The quantity to be applied per acre should be regulated by the texture of the soil. The lighter the soil the more salt may be used with safety and advantage. From 5 to 10 cwt. per acre is a medium quantity, and if his soil is sandy, your correspondent might probably venture on the latter quantity. I should, however, observe that the salt will not destroy the wire-worm effectually in a dry state. It should therefore be applied in showery weather or before rain.

A highly intelligent agriculturist in Warwickshire informs me that he has in his occupation a sandy soil, on which he experienced much difficulty in getting a plant of wheat, owing to wire-worms and other worms, that he salting his land at the rate of 8 cwt. per acre, and that since doing so over upwards of 400 acres he has not had in any one field a yard of ground without a good plant of wheat.

I am, sir, your's very respectfully.

A READER.

A REMEDY FOR SMUT IN WHEAT.

Mr. Tucker—To ascertain the most effective remedy for smut in wheat, we tried the following experiments in 1841.

Ten square rods of sandy loam land we divided into six equal beds. Upon each we sowed three fourths of a quart of wheat.

No. 1. Sown with smutty grain. Yield, two and a half quarts. One smut ball to 19 grains.

No. 2. Sown with smutty grain, or rather, a very few balls of smut, the grain being quite clean. Yield, 5½ quarts clean grain, and a pint of screenings. One smut ball to one hundred and sixty eight grains.

No. 3 Smutty grain washed in lime water and brine. Yield, 4 and a half quarts, one pint screening. One smut ball to 176 grains.

No. 4. Smutty grain washed in lime water and bring and plastered. Yield, 4 quarts clean grain. One smut ball to 74 grains.