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The Essay of which the following is a part, received the prize offered by the Massachusetts Society. The writer S. L. Dana is well known in the United States as an Agriculturist, and ranks among the first both for practical and scientific knowledge. His writings are numerous and of the very highest order. This little Essay was intended to be plain and practical, and to lay down those well-proved principles which ought to be understood by all who have to do with the cultivation of the soil. The farmer who is anxious to add to his stock of knowledge and have more clear and intelligible notions of the very first principles of his business may by giving the essay of Dr. Dana (which we shall publish) and the Agricultural Chemistry of Professor Johnson, (part of which has already appeared in our Columns) a careful perusal, be greatly pleased as well as greatly benefited. It is the want of such knowledge that makes farming a yearly experiment. Why is not more effort made by all interested parties to diminish its accidents and uncertainties, by making it a science?

CLEARING AND BREAKING, UP AND MAKING COMPOST.

THERE is one thing settled in farming; stable manure never fails. It always tells. There are no two ways about it. There is here neither theory, nor speculation, nor doubt, nor misgiving. "Muck it well, master and it will come right," is an old proverb. It is considered a fact so well established, that nobody thinks of disputing it. There is advantage in asking why barn-yard manure never fails. The answer is easy It contains all that plants need for their growth. If we know then what plants contain, we can easily tell what is in manure The whole doctrine of manures, then, falls into two plain principles, on which hang all the law and the "*profits*" of agriculture.

1. Plants contain and need certain substances which are essential to their growth.

2. Manure contains all those substances which plants want. If, then, we would find out what it is which manure contains, that makes plants grow, we must first find out what a grown plant contains. This cannot be done without some little, a very little knowledge of chemistry. Do not be startled, reader I suppose that you may know nothing of chemistry, no, not even its terms. As a very sensible man, who wrote letters on Botany to a young lady, said, to encourage his pupil, it was possible to become a very good agricultural chemist, without knowing little more then the chemical names of a very few substances. You know nothing of chemistry it may be, and as little of law; yet you will go to law and learn some of its terms by a dear-bought experience. The law terms are harder to learn them the chemical terms. Now I fear that some persons, who have followed me thus far, will shut up the book. It is, say they, all stuff, book-farming, and beyond us. If one may not understand what manure is without learning, we may as well begin where our fathers ended, and that was where our forefathers begun ages ago. By a little law, however, picked up as a juryman, or witness, selectman, townclerk, justice of the peace, yea, perhaps, hearing an indictment read, men do come to understand what a lawyer means when he talks. So, too, by a little chemical talk, a man may learn what a chemist means when he talks of oxygen, hydrogen nitrgen, chlorine, and carbon; potash, soda, lime, (and these are old friends, the very names make us feel at home again,) alumina, magnesia, iron, manganese and silex, sulphur, and phosphorus. Here is a long list. Long as it is, perhaps it will be thought worth learning, when you are told, that these are the name of all the substances found in plants, every substance which they want. Out of these is made every plant. Every part of every plant, from the hyssop on the wall to the mountain ceder, contains some of all of those Be not disheartened· Look over, read, the list again carefully, see how many are old names of things which you know. Of the fifteen, you know nearly one half by name and by nature These are potash, soda, lime, magnesia iron, sulphur. Perhaps you will add,, that you know carbon is coal, or rather coal carbon. You have heard from our travelling lecturer at your town Lyceum, that oxygen and hydrogen together form water. That oxygen and nitrogen form the air you breathe; that nirogen and hydrogen form ammonia, or salvolatile, which gives the sharp smell to the smelling bottle. Besides, the thing has been said to so often, that you must have heard it that chlorine the substance which bleaches in bleaching salts, united to soda, makes common salt; or if chlorine is is united to ammonia, sal ammoniac is formed. Now changes and combinations among these fifteen things, nature makes everything we find in plants. Many of these are invisible as is the air. The substance called chorine, perhaps you have never seen, but if you ever smelt it you would never forget it. It is often smelt in a pice of bleached cotton, when opened in the shop. It gives smell to bleached powder used to disinfect the air, during cholera and other diseases. If you could see it, it would appear merely a faint yellowish green air. It is all-powerful on vegetation. As it forms a part of common salt, say half of its weight, we may dimiss the further consideration of it, by saying, that, in some shape or or other, chlorine is universally diffused in soil and plants.

The list above may be divided as follows: First, the airy or volatile; secondly, the earth and metals; thirdly, the alkalies; fourthly, the inflammables. Only the third and fourth divisions requite to be explained or defined. The substances called potash and soda are termed alkalies. They are said to have alkaline properties. Touch your tongue with a bit of quicklime, it has a hot burning, bitter taste. These are called alkaline properties. Besides these they have the power of combining with and taking the sour liquids or acids, that is, the acid and the alkali neutralize each other. This word alkali is of Arabic origin; its very name shows one of the properties of alkalies. "Kali" is the Arabic word for better, and "al," is like our word super, we say fine and superfine; so kali, is bitter, or truly alkali means, the "dregs of bitterness." I wish, reader, for your own sake, as well as my own, that you should fix your mind what I have said about alkali and alkline properties. Alkali is a general term. It includes all those substances which have an action like the ley of wood ashes, which you use for soap making. If this ley is boiled down dry, you know it forms potash. Now lime, fresh slacked, has the alkaline properties of potash, but weaker, and so has the calcined magnesia of the shops, but in less degrees than lime. Here we have two substances, earthly in their look, having alkaline properties. They are called, therefore, alkaline earth. But what we understand chiefly by the term alkalies, means potash, soda, and ammonia· Potash is the alkali of land plants; soda is the alkali of sea plant: and ammonia is the alkalia of animal substances. Potash and soda are fixed, that is, not easily raised in vapor by fire. Ammonia always exists as vapor unless fixed by something else. Hence we have a distinction among alkalies which is easily remembered. This distinction is founded on the source from which they are procured, and upon their nature when heated. Potash is vegetable alkali, derived from land plants; soda is marine alkali derived from sea plants; ammonia is animal alkali derived from animal substances. Potash and soda are fixed alkalies; ammonia is a volatile alkali. Potash makes soft soap, with grease, and soda forms hard soap. Ammonia forms neither hard nor soft; it makes, with oil, a kind of ointment, used to rub a sore throat with, under the name of volatile liniment. But though there be these three alkalies, and two alkaline earths, I want you to fix in your mind, reader, that they all have common properties, called alkaline and which will enable you to understand their action, without more ado about their chemistry. The inflammables, or our fourth division, are sulpher and phosphorus; both used in making friction matches. The phosphorus; first takes fire, by rubbing, and this sets the sulpher burning. Now the smoke arising from these is only the sulphur and phosphorus united to the vital part of the common. This compound of vital air, or oxygen, as it is called, and inflameables, forms acids, called sulphuric and phosphoric acids. So if you burn coal, or carbon, it is well known you form fixed air, or carbonic acid. That is by burning, the coal or carbon unites with oxygen or vital part of common air, and forms carbonic acid. The heavy, deadly air, which arises from burning charcoal, has all the properties of an acid. And now let us see what these properties are. All acids unite or combine with the alkalies, alkaline earths, and the metals. When acids and alkalies do thus unite, they each lose their distinguished properties. They form a new substance, called a salt. It is very important you should fix well in your mind this definition of a salt to common salt. That is a capital example of the whole class. It is soda, an alkali, united to an acid, or chlorine, or, to speak in terms the most intelligible, to muriatic acid. So saltpetere is a salt. It is potash united to aqua-fortis. Yet in saltpetre you perceive neither potash nor aqua fortis. These have united, their characters are neutralized by each other. They have formed a neutral salt. Our list of substances found in plants is this reduced from things which you did not know, to things which you do know; and so we have saved the troubles of learning more of their chemistry.

We have reduced the airy or volatile into water, formed of oxygen and hydrogen; or volatile alkali, formed of nitrogen and hydrogen; or into acids, as the carbonic, formed of oxygen and carbon—as the sulphuric, formed of oxygen and sulphur—as the phosphoric, formed of oxygen and phosphorus; and having thus got water and acids, these unite with all the alkaline, earthy, and metallic bodies, and form salts. To give you new examples of these, I may mention Glauber's salts and Epsom salts. Glauber's salts is formed of soda and sulphuric acid; Epsom salts, of magnesia and sulphuric acid; alum, of alumina, or clay and sulphuric acid; green vitriol, of iron and sulphuric acid; white vitriol of zince and sulphuric acid; plaster of paris, of limean sulphuric acid; bones, of lime and phosphoric acid; chalk and limestone, of lime carbonic acid. These are all examples of salts; that is an acid, or substance acting the part of an acid, united to an alkali metal, or earth.

To be Continued.

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THE CROPS IN EUROPE.

ENGLAND.—The accounts throughout all parts of the kingdom are most favourable and encouraging. The seasonable change which has taken place in the weather has given to vegetation a new vigor, and forced forward the growing crops with an astonishing rapidity. In Lancashire the wheat crop is expected to start into ear in the coming week; the spring corn is much improved by the late rain, and the potato crop looks most luxuriant.—From Suffolk, the want of rain had put a check to vegetaion; notwithstanding, wheat looked well, and the potato never had a better appearance. The crops in every part of Cambridge are in most promising condition.—Favourable accounts have been received from Somersetshire; the crops in general had a healthy and promising appearance.—In Nottinghamshire the crops of all descriptions are described as looking very luxuriant.—In every direction in Wiltshire the grain crops have a favourable appearance, and an early harvest is anticipated. The contrariety of opinions with regard to the existence of disease in the potato is amply sufficent to induce a a proper degree of circumspection in receiving them; it is quite evident, however, that in some localities the disease has put on so positive an appearance that a denial is as absolutely impossible. In the majority of instances, where reports have been made up to the present time, the balance of testimony is of a cheering nature. In the neighbourhood of Devizes the crop never looked more healthy.—From Cumberland we learn that the harvest is anticipated three weeks earlier than last year. The wheat crops in the neighbourhood of Ravenglass, Bootle, Millom, and Broughton, are remarkably promising. Potatoes were scarcely ever known to wear so luxuriant an appearance. and without the least symptoms of the late disese.—Around Cockermouth they present a most luxuriant and healthy appearance, and. It is stated that around Dalton, in the early gardens, disease has appeared.—Wheat looks well in Kent, and with fine weather there is every appearance of an early and abundant harvest. In Dorsetshire the wheat; barley and oats, were never seen in finer condition. The potatoes are still healthy, except in a very few instances.—In Lincoln the crops are also described as having never been in a more flourishing condition: the prospects of an abundant harvest are of the most cheering description.—In Worcester the wheat is ready to burst into ear; turnips and potatoes are looking well, and there is as yet no indication of disease in the potato.—The rich verdure of the crops in Cornwall is truly wonderful. Around Penzance potatoes are very healthy in appearance.—From Yorkshire the accounts are very favourable. A correspondent from Doncaster writes:—"The wheat lands are making extraordinary progress; and there never was known a season in which with regard to this discription of grain, a richer luxuriance presented itself. The same remark applies to other descriptions of grain; and the whole is not only remarkably healthy and vigorous, but promises, provided fine weather continues to prevail, an early harvest." In Bedfordshire for the last ten years the potatoes have not looked so vigorous; all