

the expense of the seed; but as soon as it reaches the air, it lives at the expense of the air. All plants require three substances, or rather four—oxygen, hydrogen, nitrogen, and carbon. These substances are only known in the form of gases. After explaining the nature and properties of those gases, he proceeded to say that the plant derived from the air a large portion of carbonic acid; and to obtain that supply, it spread out its leaves in every direction, thus sucking in the carbon from the atmosphere. As there was comparatively only a small portion of carbonic acid in the atmosphere, it might be supposed that the vegetable kingdom would extract the whole; but by a wise adaptation of Providence which connected together the animal and vegetable kingdoms, it was provided that the same gas which was so greedily inhaled by plants was that which was thrown off as noxious by animals. A full grown healthy man threw off at every breath he took 25 ounces of carbon; a horse and a cow each would throw off about 4 pounds; so that in this way a constant equilibrium was maintained. Another ingredient in the composition of plants was nitrogen, which existed in large portions in the atmosphere; but the plants did not derive their nitrogen from the air, but rather from the manures applied to them. The knowledge of this fact was of the utmost importance in regard to the application of manures to the soil. Well, the plant had now got above the surface of the ground, and had thrown out its leaves.

At this stage it was usual in many parts of the country—he believed not very common in this district—to apply to what was called a top-dressing. When a crop of oats, beans, or turnips, came up of a sickly character, the farmer sprinkled over it a quantity of common salt, or gypsum, or nitrate of soda, or mixtures of these; and in the course of a single day, the plant would appear to be altogether renovated. What was the precise chemical effect produced in this case, they had not yet been able clearly to make out; but they could trace it to some extent. He then mentioned the estates of Mr. Alexander of Southbar, and Mr. Fleming, Barrocham, Renfrewshire, as places where a great effect had been produced by the application of these top-dressings. He then came to the turnip. It was necessary for the safety of the turnips, that they should rush up as it were, and throw out their leaves quickly. Now this was a condition of things totally new; and it was only by knowing all the plant required that they could obtain this rapid rushing up of the turnip crop. In connection with this subject, he might mention a curious fact. A farmer could tell by the odour that was exhaled whether the turnips were coming up healthy or not. He (Professor J.) had often endeavoured to detect this odour; but he could not—it required a long experience in practical farming to enable a man to do so. But upon the cause of this odour, so delicate to the sense, chemists threw a beautiful light. All plants in growing throw off certain substances, which were unnecessary for them at that particular stage. It is that exhalation of substances which causes the odours in question; and it is the same principle that causes the odours to delight us so much in the sweet smelling flowers in the garden or the green house. Let them observe what a beautiful arrangement it was, that while Nature, or rather the Lord and Governor of Nature, caused the plant to throw off those substances which were unnecessary or even unwholesome to itself, it threw them off in a manner which was agreeable and delightful to man; thus, even in the most trifling and minute circumstances, providing for our comfort and gratification. Nothing could be more beautiful than the exhibition of the wisdom and beneficence of the Deity, as exhibited in this arrangement. Then, with regard to the proper time for cutting down the crop when ripe, that could only be ascertained by an examination of the straw and other parts. He then referred to the failure of the potatoe crop, and stated it to be the result of very extended observation, that potatoes, when full ripe, contained more starch than albumen, or saline matter, of which three substances, potatoes which contained the largest quantity of starch were those which were most likely to fail; while those containing greater quantities of albumen and saline matter were more likely to succeed. They would farther observe, that if they top-dressed a portion of a field of potatoes with a saline substance, and left the other portion of the field undressed, the latter might prove a failure, while the former would prove an enormous crop. It has been still farther ascertained that if they planted seeds next year taken from the top-dressed potatoes, they would find their produce much greater than those raised from the undressed portion of the potatoes. It was in this manner they were proceeding; and when they had worked out their operations, he had no fear but they would be able to find a remedy to the failure of the

potatoe crop. But it opened up a field which applied to various crops, and would lead them to obtain such a control over it that they could not only increase the quantity, but improve the quality of the produce. He then referred to the ashes of the plants, which remained when their substance was burnt. After giving a history of various chemical opinions which had been held at various times regarding the origin of the matter which composed these ashes, and of their use in the plant, he stated that it had now been ascertained that these ashes contained no fewer than eleven distinct substances—potash, soda, lime, magnesia, &c.—that they existed in different plants, and that all the substances thus presented in the plant must also be presented in the soil, as it was from the soil that the plant derived its supply of this earthy matter. This threw a beautiful light upon the causes why plants would not grow in certain situations; for if a plant required a large proportion of lime, for instance, and there was little or none in the soil, it was clear that the plant would either refuse to grow, or that it would be stunted in appearance, and would soon exhaust the land. To remedy this it was necessary to supply the deficiencies of the land, so to speak, and to supply lime if lime was wanted. On the other hand, if lime was not wanted, as he believed it was not in this district and in the neighbourhood of Edinburgh, then it was unnecessary, and injurious to the land, to apply lime. He concluded by urging upon farmers to economise their manures, and compensate to the land as much as possible for what was annually carried away by the produce.—*Canadian Agricultural Journal.*

## NEWS.

In England, they have had a most extraordinary winter—only one day's frost during the whole of December and January. In fact the weather has been like spring, mild, and plenty of sunshine, so that flowers, many of them, have continued to bloom all winter.

The Lords of the Admiralty have ordered six iron steamers to be built for Her Majesty's navy.

The number of lives lost in consequence of the late eruption of Mt. Etna, is stated at 143. Most of the victims were foreigners, (including many Englishmen,) who were attracted to the spot by curiosity, to witness this phenomenon of nature. The damage done to the fields, vineyards, and cattle is estimated at a million and a half of ducats.

There has been a great fire at Canton, by which 1200 to 1500 houses have been destroyed, including some of the Foreign Hong's. The loss of property is very great.

CHAPEL FOR THE DEAF AND DUMB.—This chapel, which is in Fetter Lane, Fleet Street, was opened yesterday, and the service was conducted in a manner understood by the deaf and dumb, as well as by the hearing portion of the congregation.

A NEW INSANE ASYLUM.—The extraordinary success attending the establishment of the State Asylum for the insane at Utica, has induced the citizens of Rochester to move in favour of establishing another in their city. The institution at Utica is crowded to its utmost capacity, while the number of insane persons unprovided for in Western New York, is said to be very great.—*N. Y. Evangelist.*

[When will Canada move in this matter?—Ed.]

The Governor of Mississippi, in his late annual address to the Legislature, states that only one out of fifteen of the white population of that State, can read. This is the repudiating State.—*Id.*

The schooner *Amistad* case is revived, and a claim by the Spanish Minister for \$40,000, for slaves and cargo, is now before the Congress Committee on Foreign Affairs.—*Id.*

The German population is increasing with wonderful rapidity in the United States. It is estimated that there are three millions in this country, and not less than fifty newspapers are published in the German language.—*Id.*

Business in the United States is generally admitted to be in a very healthy and flourishing state. The revenue is fast increasing, and the value of property, especially in cities, is again rapidly advancing.

After a very long, and frequently adjourned, debate in Congress, on the rule excluding abolition petitions, it has once more been retained.

A boisterous debate upon the Oregon question has recently agitated Congress, in which the fiercer speakers are for declining all negotiations with Britain on the subject, and taking military possession at once, and this at the precise time when a special