the farmer commences a work that is only concluded when he harvests the crop of the ensuing year, so that one subdivision of it cannot be examined apart from the rest, as regards the excretory products of plants, and the specific function of the soil under all the circumstances of the case. The success of "Tull's horse-hoe husbandry," of the modern systems of draining, subsoiling, scarifying, and of spade-husbandry, as also of the rotation of crops; have all been pointing in the direction of an affirmative answer being one day given to the question under consideration. A common doctrine has thus been pratically taught, that a chemical relation exists between earth, air, and water of a utilitarian character, like all Nature's works, that is not yet practically understood in all its details. With the extra produce grown, the agriculturist has long been familiar, and also with the general mechanical means by which such results are obtained; but when we come to the chemical data in the laboratory of the soil, the further prosecution of the subject must be left for discovery to pursue. All manurial topics are highly interesting, and the one to which we have drawn attention is doubly so, inasmuch as the supply is unlimited, and the gratuitous gift of Nature.

Since the above was written, a notice has appeared in the leading columns of the *Gardener's Chronicle*, stating that Schonbein has discovered a natural process whereby nitrate of ammonia is formed during the evaporation of water, thus experimentally solving our problem—a process which cannot fail to lead to farther discoveries in the same direction.—*Farmers' Magazine.*

AGRICULTURAL IMPORTANCE OF DEW.

Whilst the rain-cloud supplies the earth with its greatest amount of moisture, there are other means that Nature possesses for feeding vegetation with this necessary element. There are parts of the earth where rain never falls, and where a cloud is hardly ever seen; yet in such regions Nature displays in some instances all the luxuriance of more favoured localities. Moreover, during some portion of the year, in our own country, no raindrops fall; yet Nature does not fail, nor vegetation cease to thrive. The other source lies in the dews and fogs that rise into the atmosphere during the heat of the day, and at night get deposited on the leaves of plants and on the ground.

Let us for a moment look into the philosophy of the thing, and see how the beneficial results are brought about. The principles on which the formation of dew depends are, the radiation of heat and the condensation of the invisible vapour contained in the atmosphere by cold. Formerly it was thougnt that the cold observed on the formation of dew was *effected* by the dew, and not, as is really the case, the *cause* of the deposition itself; *before* dew can be formed, the body on which it becomes apparent must be colder than the surrounding air.

In considering, therefore, the beautiful phenomena of dew, we shall find that the laws of heat are intimately connected with it.

All bodies, whether existing in the form of primitive rocks and earths of creation, or of the green dress that a later age has thrown around the globe, or the compound materials that the industry of man has made for his comfort and use, has the property of radiating, or giving off into space, its heat; but all bodies do not possess this faculty in the same degree: hence the variety of the phenomena which the subject of dew presents for our consideration

Let us observe how these effects are produced in nature. On clear nights the ground—let us suppose it to be covered with herbage—becomes colder than the atmosphere; every blade of grass is continually giving off its heat into space, and receiving none in return from the sun, as is the case during the day. That this is the fact may be observed by placing a thermometer with its bulb on the grass, and another raised a moderate distance from it; the former will be found to indicate a lower temperature by several degrees than the latter.

When radiation has proceeded to such an extent as to produce the required degree of cold to precipitate the vapour existing in the air at the time, dew is the result: giving that beautiful appearance that we see in the early autumn mornings, when each blade of grass seems edged with shining diamonds, that reflect the rays of the morning sun in all directions. But its value does not consist merely of the pleasing effect on the eye: during many days in the summer and autumn, drops of vapour so supplied are the only ones that vegetation receives.

As we have said, different substances have different radiating powers, and consequently different aptitudes for exhibition of dew; even on some leaves more dew will be found than on others of another kind which radiate heat less readily. A sheet of polished metal and one of glass, if exposed to the sky during the night, will exhibit the phenomena in different degrees. The texture of substances also determines their capacity for radiation. Those that are loose, such as fine raw-silk, masses of unwrought cotton, wool, hair, and other similar materials, possess the power of radiating heat in a very eminent degree; whilst closer and more compact bodies do not show the same readiness in parting with their heat. This is why we often see the delicate fibres of the gossamer, which covers our hedges at some periods, covered with dew, when but little or none is observed on the surrounding foliage. Substances of the kind above enumerated are sometimes as much as from 5 to 15 degrees colder than the air, as is shown by the difference between a thermometer whose bulb is placed on such substances and one whose bulb is freely suspended in the atmosphere. In cold climates the difference is still more marked.

There is another circumstance that modifies the extent of radiation at different times, and that is the state of the sky with regard to the amount of cloud. When the sky is perfectly cloudless, radiation goes on with great rapidity, but is checked by the slightest covering even