This substance, a product of the decomposition of organic matter, always exists in small quantities in the air, whence it is brought down by dew, rain and snow to the earth, where it is retained for the use of the plant. Although nitrogen exists so abundantly in the air, and forms so large a portion of plants, yet they cannot use it in its pure form; it must be supplied to them in the form of ammonia, or of nitric acid, as some say. Their leaves imbibe and exhale, but use it not. The experiments to support the contrary idea are inconclusive, as all their results can be explained without coming to the conclusion that nitrogen, as such, is supplied directly to plants from the air.

I have now given the most marked properties of the four elementary organic substances which form the air we breathe, the waters of the earth, a large part of the earth itself, and of the animal and vegetable tribes which inhabit it. The names and properties may not be familiar to some; very many may be entirely ignorant of them; but what can be more appropriate subjects for study and investigation, than the air which supports our lives from its first moments, the water which is to us daily food, or the composition of that food, which by the curse of labor we are obliged to earn—a curse, however, changed by mercy into a blessing, when the intellect is used to lighten the toil of the body? Is a knowledge of these substances useless? then the knowledge of those things nearest to us, and with which we hold constant relation, is useless; and if these are, those which are more remote must of consequence be more so, and all knowledge is vain; and if knowledge be nothing, then men are on a level with brutes—they are below them.

The most noted properties of these substances can be easily understood, and as easily learned as the multiplication table, and will enable the tiller of the ground to understand many facts of great use to him which are now incomprehensible, and give him, as the fruits of labor, pleasure as well as profit.

The substances which I have mentioned above, namely, carbon, oxygen, hydrogen and nitrogen, are combined with each other, and form many substances, of which it is not my province here to speak. I will mention some whose constitution it is proper to know.

Carbon and oxygen form carbonic acid, whose uses and properties I have spoken of above. Hydrogen and oxygen form water, which serves either as such, or by its elements, to produce a large part of the mass of vegetable matter; it moreover is the vehicle for the transportation of food to the plant, and causes matter, by dissolving it, to assume a form, giving to it the properties of food.

Though the above substances are of such vast importance in vegetable life, and form nearly all of the woody fibre, leaves, stem,