ces. I have oceans and mountains, and I support myriads of immortal beings on my bosom; and when I have done this, I send my bright beams down to earth, and the sailor takes hold of the helm, and fixes his eye on me, and finds his home across the ocean Of all the countless hosts of my sister stars who walk forth in the great space of creation, not one, not one lives or shines for herself!"

And thus God has written upon the flower that sweetens the air, upon the breeze that rocks that flower on its stem, upon the rain-drops which swell the mighty river, upon the dew-drop that refreshes the smallest sprig of moss that rears its head in the desert, upon the ocean that rocks every swimmer in its chambers, upon every penciled shell that sleeps in the caverns of the deep, as well as upon the mighty sun which warms and cheers the millions of creatures that live in his light,—upon *all* has he written, "None of us liveth to himself."

And if you will read this lesson in characters still more distinct and striking, you will go to the garden of Gethsemane, and hear the Redeemer in prayer, while the angel of God strengthens him, You will read it on the hill of Calvary, where a voice that might be the consecrated voice of the whole universe of God, proclaims that the highest, noblest deed which the Infinite can do, is to do good to others,—to live not to himself! Rev. J. Todd.

Ammonia, a compound of nitrogen and hydrogen, seems the compound which nature chiefly makes use of to furnish nitrogen to plants.

Ammonia is contained in the air, and every shower which descends brings with it a portion of this valuable substance, for the use of the vegetable world. There can be no doubt that all wild plants obtain their ammonia from this source. But though even with cultivated plants more ammonia may thus be conveyed to the soil in a year than they take out in a year, yet it may not be conveyed at a time when the plants most require it. An artificial source of ammonia in the soil is, with proper regulation, doubtless of great benefit. Guano, rags, horn shavings, &c., are all capable of supplying ammonia to the soil. But great care should be taken in the use of these manures. If a farmer should manure his soil with these alone, without a proper amount of mineral matter, he would undoubtedly deteriorate his soil; they should, therefore, always be mixed with manures containing much mineral matter—such as wood or peat ashes, used as an adjunct to farm yard dung, or alternated year by year with other manures, containing the necessary amount of inorganic matter.

The decomposition or putrefaction of all vegetable or animal matters containing nitrogen always furnishes ammonia. Thus urine after some time has a strong ammoniacal smell. A badly ventilated stable always smells strongly of ammonia in the morning, from the decomposition of the animal excrements. Formerly sal ammoniac used to be made from camel's dung. It is now a product of the decomposition of coal (vegetable matter), by heat in the making of gas.

The dung-mixens in fermenting give out ammonia in a volatile form, and unless some means be taken to stop its escape, it will serve to manure the whole neighbourhood instead of the farmer's own land. It may be prevented from escaping by the addition to the midden or dung-heap of a quantity of finely powdered gypsum. In making the mixen, a layer of dung twelve or fourteen inches deep ought first to be placed on a proper bottom, then a few pounds of gypsum strewed over, then another layer of dung, then gypsum, &c. The whole ought to be covered with a layer of mould, four or five inches thick. It is very improper to mix lime with manures of any kind. The consequence is, the immediate liberation in a volatile form of all the ammonia, to the great detriment of the farmer. As an illustration I will add to this sample of Peruvian guano, which is almost without smell, a quantity of quick lime. A powerful odour of ammonia is immediately produced. (Experiment performed)

We now have in this course of lectures mentioned the principal properties of OXYGEN, HYDROGEN, NITROGEN, and CARBON, the four elements which constitute the organic parts of vegetables and animals. It is wonderful to observe how the wisdom of the Almighty is displayed in every portion of his vast dominions. We have seen that vegetables derive their supplies of oxygen, hydrogen, carbon, and nitrogen, from *water*, *carbonic acid* and *ammonia*. How wonderful, therefore, is it that the decomposition and putrefaction of vegetable and animal matters should result in the reproduction of water, carbonic acid and ammonia; the destruction and death of one generation is thus by the wisdom of God made to provide for the sustenance and life of another.

No sooner does an animal cease to exist, or a vegetable begin to decay, than the sources of new life are afforded, with all that is essential to keep up a ceaseless round of living and sentient beings.

UNIVERSAL DIFFUSION OF LIFE.—Since the time when in an earlier work, I attempted to describe the universal diffusion of organic life on the surface of the globe, and its distribution in height and in depth, our knowledge has been wonderfully augmented by Ehrenberg's brilliant discoveries, which rest not on ingenious combinations and inferences, but on direct and exact observations. By these discoveries the sphere of animated existence—we may say, the horizon of life—has expanded before our view. Not only is there no interruption of minute microscopic forms of animal life in the vicinity of either pole, where larger animals cannot maintain themselves, but we find among the microscopic animals of the south polar Seas, collected in the Antarctic expedition of Captain James Ross, a remarkable abundance of new forms, which are often of great elegance. Even in the residuum obtained from melted ice, which floats in round fragments in latitude 78 deg. 10 min. S., there have been found above fifty species of siliceous-shelled polygastrica, and even coscinodiscæ with green ovaries which were therefore living, and able to resist the extreme severity of the cold. It is not only so in particular localities, in inland waters, or in the vicinity of coasts, thus thickly peopled with atoms invisible to the naked eye. Samples of water taken up by Schayer in 57 deg. S. latitude on his return from Van Dieman's Island, as well as those taken between the tropics in the middle of the Atlantic show that the ocean water, in its ordinary condition, without any appearance of discolouration, contains innumerable microscopic organisms, quite distinct from the siliceous filaments of genus chætoceros, floating in a fragmentary state like the oscilatoria of our fresh water. Some polygastrica which have been found mixed with sand and excrements of penguin in the Cockburn Island appear to be generally distributed over the globe; other species belong to the Arctic and Antarctic Polar regions. Thus we see that animal life reign in the perpetual night of the depths of the ocean; while on continents, vegetable life, stimulated by the periodical action of the solar rays, chiefly predominates. Not only are earth, air, and water, filled with life, and that at most different temperatures, but also the interior of the various parts of animal bodies; there are animalcula in the blood of frogs and of salmon; according to Nordman, the fluids of the eyes of fishes are often filled with a worm which lives by suction (diplostomum); and the same naturalist has even discovered in the gills of the beak an extraordinary double animal (diploson paradoxon) having two heads and two caudal extremities disposed in rectangular directions.—*Humbolt's Cosmos.*