

from the atmosphere, must be supplied artificially by what are called, and are then manures.

Although the ten last named elements form but a very small percentage of living bodies, yet they are absolutely essential in their existence; for without phosphate of lime and magnesia, which is a compound of phosphorus, calcium and oxygen, neither the bones of animals nor the seeds of grass nor of grains would be formed. Without sulphur no nutritive food capable of yielding blood or brain matter could be produced. Without silicate of potash and soda no stem of wheat, no blade of grass nor stalk of corn could exist.

It may be interesting here to state the various parts and secretions of the body in which the different mineral constituents occur.

Phosphate of Lime occurs most largely of all the mineral constituents of the human body. It is found in the bones, blood, milk, urine, fæces, &c.

Carbonate of Lime forms the principal part of the skeleton in the invertebrata, (animals who have no spine,) such as crabs, oysters, &c. It also occurs in the bones of higher animals and man, in egg shells and the urine of those animals which feed on grass.

Phosphate of Magnesia is very frequently associated with phosphate of lime. It occurs in bone, blood, milk, egg shells, urine, &c.

Fluoride of Calcium sometimes occurs in very small quantity in bones. It is abundant in fossil bones.

Hydrochloric Acid exists in the digestive fluid of man and all animals that give milk to their young.

Chloride of Sodium (common salt) exists in the blood, gastric juice, urine, bone, cartilage, (gristle,) &c.

Carbonate of Soda is found in various animal substances, especially in the urine of animals that feed on grass.

Phosphate of Soda occurs in the lymph, bile, chyle, milk and urine.

Chloride of Calcium is found in the gastric juice and saliva.

Chloride of Iron is found in the gastric juice.

Alkaline Sulphates are found in blood, sweat, urine, &c.

Iron is found in considerable quantities in the coloring matter of blood, in chyle, black pigment of the eye, hair, &c.

Chloride of Potassium is found in almost all of the animal fluids.

Silica has been found in the enamel of teeth, in bone, hair and saliva.*

The above compounds contain all of the substances which I have before named as necessary to constitute a fertile soil, viz: