The ability of plants to create inorganic substances: results of experiments by A. von Herzeele

Nature has neither core nor shell
In both as a oneness does she dwell

Goethe

To obtain a thorough insight into the transmutation of one element into another is something held by many to be an undertaking doomed to failure from the start. Although I worked for many years to find the solution of this phenomenon, I cannot say that I came closer to my goal despite the fact that some favorable results were forthcoming.

Still, one feels a certain urgency in attempting to find an answer to the question of the transmutation of elements especially because of the broader attitude of science today. On the one hand it seems natural not to be able to find a solution, but on the other hand a solution if found, can easily be unacceptable in view of its apparent unlawfulness.

As a starting point in the setting up of my experiments with growing plants I would like to step away from the currently accepted views and present the following thoughts. In my opinion there is no such thing as the inorganic. Nature does not create soil first and then the plants, soil and plant come into existence at the same time. Soil consists of elements that are created in plants and the plant will continue to produce these elements. This must be proven by experiment.

If plants are grown in aqueous solutions, or on sand, or pumice etc. the seeds and roots will loose organic and inorganic substance especially in the latter case. For this reason I did the experiments, for the greater part, directly on porcelain plates. The roots form a thick texture which is easily kept moist, especially when they are covered with glass tops, bell jars etc. Distilled water was used. In this manner the previous problem did not occur. According to the usual supposition the seedlings must have the same quantity of inorganic substances as the seeds.

Four times a quantity of four beans, of the family of *Vicia faba*, weighing on average 2.063 g was analyzed with the average result:

0.050	ash
0.006	sulfate of lime (as oxalic acid precipitated, as sulfuric acid weighed)
0.0106	phosphate of magnesia

The average result of four seedlings grown on distilled water from four beans of the same kind (weighing in average 2.294 g) was after four experiments:

0.064	ash
0.13	sulfate of lime
0.014	phosphate of magnesia

Three analyses of 6 g quantities of *Trifolium pratense* had the average result:

0.030 sulfate of lime
0.043 phosphate of magnesia

The seedlings of a quantity of 6 g seeds each had in four experiments the average:

0.043 sulfate of lime
0.064 phosphate of magnesia

With the same kind of seeds an analysis was done four times, each with 6 g of seeds, with the result in average:

0.017 sulfate of barite (barium sulphate) equivalent to 0.006 sulfuric acid

The seedlings of a quantity of 6 gr. seeds each had through four experiments the average:

0.034 sulfate of barite (barium sulphate) equivalent to 0.012 sulfuric acid

---

White beans, average weight 2.930 g average of three analyses:

0.011 sulfate of lime

Seedlings of a quantity of 2.940 g beans each, had after three experiments:

0.018 sulfate of lime

Dwarf beans, average weight 2.500g, average of three analysis:

0.006 sulfate of lime

Seedlings of the same seeds with the same weight, average of three experiments:

0.015 sulfate of lime

None of these kind of beans showed an increase of phosphate of magnesia.

Four times a quantity of 6 g of seeds of *Brassica oleracea* had in four analyses an average of:

0.071 phosphate of magnesia

The seedlings of 6 g Brassica produced as an average of four experiments:

0.090 phosphate of magnesia

The increase in lime was insignificant, for sulfates there was none.

The increase of phosphate of magnesia in the seedlings of turnips was:

0.012 in relation to 0.074

for 6 g of seeds.

The increase of sulfate of lime and phosphate of magnesia in the seedlings of barley was respectively:

0.004 and 0.012 (seeds)

0.008 and 0.018(seedlings).

How difficult it may be to accept something which is contradictory to our accustomed preconceptions, one must admit that the proven increase of inorganic substances in the seedlings have to do with the growing processes of the plant. There is no lime, magnesia and sulfuric acid in the vessels, nor in the distilled water. These substances must have come about just as the so-called organic bases and acids are formed through the densifying and formative effect of light and warmth. The change of the substances in the cotyledons, the growth of the plants and their development into new forms (even if we don't consider assimilation) is not possible without the simultaneous change and increase of inorganic substances. Lime, magnesia etc. did not come out of its own into existence before the plants did, they grew together. Lime and magnesia cannot come about without a living organism. The fact that a dead substance originates from another dead substance is impossible. What lives dies, but what is dead is not created as such.

Cellulose, chlorophyll etc. are influenced by the earth and the atmosphere, whilst lime, magnesia etc., once they are there, stay unchanged and form the soil. So the soil creates not the plant, but the plant the soil. Nature does not fix first the parts together into a whole. She does not produce first potassium and then phosphoric-acid, as in a laboratory. She has command over the organism of the plants and the animals and those produce the substances in the process of creation and growth. The creation of elements is an everyday process.

Because the soil is a product of the plant, the plant can take up substances out of the soil. Only through such a conception can one explain this aspect of growing processes in plants. If the soil was not the product of the plant, the plants would not grow on it. Experiments to be done later will show which elements are brought about through the organisms of animals, but a sharp dividing line is not to be expected. As to those elements we do *not* find in living organisms it is possible that the sun did not always shine like today and that in an earlier time plants and animals in their primitive forms, produced - in a much brighter atmosphere with different light and temperature - elements we do not find anymore in living organisms because they cannot be created by the cosmic conditions of today.

It is not my intention to elaborate on further conclusions. With this publication I want to encourage other people to repeat my experiments and this in modified ways: e.g. experiments on a larger scale, with seeds, bulbs and tubers, in darkness, with different colors of light and different temperatures and measured quantities of air. It would also be important to determine whether leaves and roots differ in the production of elements. As nearly nothing is known about the coming into existence of elements this request seems to me to be justified.

I will report later on the behavior of substances like manganese, iron, silica, alumina, potassium, sodium, chlorine, which I did not mention here.

Freienwalde a.d. Oder, November 1875.

A.von Herzeele