Secrets of the Soil

Peter Tompkins & Christopher Bird | Chapter 17 – Savory Soil

WHAT IF BILLIONS of tonnes of Schindele's rock dust were readily available in America, as effective on crops, trees, and even humans as his Gesteinsmehl? In a narrow valley south of Salt Lake City, blessed with a profusion of pink hills, cobalt lakes, and azure skies, a geological prospector, Rollin Anderson, has discovered just such a treasure.

In a hundred-year-old adobe farmhouse on a hill, surrounded by centenary Lombardy poplars, we found Rollin though already in his nineties, acting like a "crusty young fellow". Like Schindele, he has been swallowing down a spoonful of his native Utah soil with every meal. Not just ordinary soil, but a special montmorillonite clay.

"Some scientists", said Rollin, "think my rock stores up energies of sun, earth and water, only releasing them as needed for the growth of plants". He spread his hands as if accepting bounty. "And Robert Ripley claimed that Sun, Earth and Water are represented by the Hindu sound of AUM; so I thought of calling my ore Anderson's Utah Mining; but I refrained. Instead I called it AZOMITE: or A to Z Of Minerals, Including Trace Elements. And they're the secret to its great success".

One sunny day in August, as we breakfasted on scrambled eggs and Azomite, Rollin told us how he came to discover his precious substance, and how he came to eat it. Half a century ago, as a contracting engineer in his forties, he had become fed up with city life in San Francisco, convinced that what was wrong with America was its food, and therefore the soil from which it derived. Sick soil, said Anderson, means sick people. And somewhere there had to be a remedy. Told that gypsum might help neutralize alkaline soils, and that if mixed with fertilizers it could help grow better crops, Rollin packed up and moved to his native Utah to exploit a gypsum mine owned by his father. But, before he could obtain the necessary equipment, World War II broke out, to scotch his every effort.

Roving the river district of Sanpete County, he came upon a range of terraced hills with a pink sheen, twenty-one of them to be exact, rising two hundred to five hundred feet from the arid desert plain, all with a pinkish ore. Intrigued, he took samples to Salt Lake City to his friend Dr. Charles Head, ranking scientific expert and chief microscopist at the U.S. Bureau of Mines. Head placed in a piece of ore beneath the lens of his microscope and let out a long, low whistle. "How much of this stuff do you think is out there"?, he asked. In no way attempting to disguise his excitement.

"Several billion tonnes", replied Anderson. "That's what I reckon".

Head's excitement, it developed, was not because the sample contained nitrates, considered valuable as fertilizers, which it didn't, but because it was a colloidal clay containing quantities of minerals very similar to the caliche of Chile and Peru from which the world's nitrates have long been mined. Between 1990 and 1995, Head had been seconded by the U.S. government to study Chilean and Peruvian nitrates in South America. There he developed the conviction that the benefit plants were deriving from South American nitrates was not from the nitrates themselves but from minute quantities of trace elements, which served as catalysts-a word coined by the great Swedish chemist Berzelius to describe substances that speed up chemical reactions but come through these reactions without themselves changing.

In the “gay” twenties few men in the scientific field, especially in agriculture, new much about trace minerals; and ever since, because of the obscurantism of official bureaucracy, Head was obliged to be careful what he said, lest he lose his job. The prevailing opinion considered trace elements impurities that would contaminate food. The notion gave birth to so-called refined foods, from which these “contaminants” were deliberately removed for a supposed improvement in nutritive qualities.

Now, at last Head had a chance to check his own theory. Would Anderson please grind up some of his montmorillonite ore, put it on his plants and see what happened. Anderson, like everyone else in those days had a war time Victory Garden, and was happy to oblige by pouring powdered montmorillonite onto the ground around his vegetables, leaving several rows as controlled to see what difference might develop.

Jutting his bulldog chin with evident pride, Rollin told of his early successes. “The first tomatoes we planted with the dust came up fine and healthy, whereas the controls were attacked by hideous long green worms. We picked off the worms where ever we found them, but they ate a lot of leaves. On the Azomite plot, not a worm. The plants were stronger, held fruit well, and had great flavour. Once you’ve tasted a vegetable grown with Azomite you are spoiled for life. The beets in the control plot were juiceless and woody. The ones with Azomite dripped with juice and were tender at all ages of their growth. By fall, one measured seven inches across, just as tasty as the young ones. The same with tomatoes, cabbages, and peppers; and everything kept better when canned or frozen. We couldn’t help feeling that Dr. Head’s theory about minerals, trace elements, and catalysts was definitely improved. Here was a substance that gave results that you could see without the aid of any microscope”.

Ushering us into a living room lined with some eighteen hundred volumes, covered subjects from Agriculture to Zionism, many of them dealing with the occult and the esoteric, Rollin seemed happy to have someone with whom to share the story of his early discovery, and the remarkable results that had ensued.

“None of the local geologists or mineralogists seemed to know what we’d found in those hills: some called it brecciated rhyolite, a glassy volcanic rock similar in composition to granite. Others called it diatomite, a mineral made from the calciferous bodies of tiny marine algae. Others called it a diatomaceous earth. But to Head it was good old montmorillonite, aluminum silicate clay admixed with a various minerals, rare in the United States, and even in the world, but greatly prized by medicine men of Indian tribes. On Head’s instructions, I obtained samples of rhyolite from most of the known deposits in Utah, as well as from the surrounding states; but none were similar to our ore, though all were similar to each other. Ours was definitely first-class montmorillonite clay. Now geologists consider it to be an ancient oceanic deposit brought to the surface by volcanic action, a form of heavy sedimentation on the sea floor, a mixture of mineral elements and marine life such as seaweed, shrimp, and algae. The clay contains all the essential mineral trace elements in a balanced ratio, as laid down by nature. In this form the minerals are naturally chelated, as in plants and animals, in an organic, easily assimilable form.” Rollin poured a teaspoon of the pinkish-gray Azomite into the palm of his hand to show that it was as fine as a lady’s face powder.

“The problem, he explained, was how to get the stuff out of the ground and refine it in a wartime emergency, which preempted obtaining machinery of any sort. Only when the colonel in charge of a U.S. Ordnance Depot in Tooele, Utah, had the good sense to order several tonnes for an experiment were we able acquire a small hammer mill and an ancient Fordson tractor. With this rudimentary equipment we set about mining the ore from the pink hills, grinding it to various sizes”.

He looked up with satisfaction. “We now know that Azomite aids the soil in fortifying the natural mineral balance. It helps satisfy the ‘hidden hunger’ in soil caused by mineral depletion or

deficiency from continued use over long periods of time. Soil without humus is half alive, and without bacterial action humus is dead. The reason the bacteria in the soil fail to function properly is because of the lack of natural trace elements and catalysts“.

A gust of wind drove down the valley, turning poplar leaves from green to pewter, bending large red poppy blossoms almost to the ground.

“I learned the power of Azomite said Rollin, experimenting with earthworms. I didn’t know, until I tried it out, that earthworms can be kept alive in a metal container, filled with just the soils the worms are found in, from early spring until late fall, and all year round where winter is not a problem, by the simple addition of a small amount of Azomite, and, of course, moisture. The worms will be lively and healthy, with firm body tissues thanks to all the elements. They not only grow but multiply. Any boy who has been fishing knows that after a few hours worms in a container will bunch up, become slimy, thin, and sort of transparent, then die, unless you keep replenishing the container with fresh soil or mulch and moisture. Well, I have kept as many as two hundred worms in a twelve-quart pail filled with the soil they were dug in, from early June until the middle of November, with nothing added but a heaped teaspoon of Azomite mixed with the soil at the time the worms were dug up. The worms were as fresh and active at the end as when I first took from the garden. Just try it?” Rollin looked to his wife, Elsie, as if for confirmation, then hurried on, as if his time were running out.

“We further learned that applying Azomite directly in contact with the seed or root structure one could get much quicker action. We tried it on the lawn, but people complained they had to cut the lawn too often. On pasture and perennial crops the best results were obtained by applying about fifteen hundred pounds to the acre. Results were even more noticeable after the second or third year”.

He waved toward the valley, where fruit trees grew in an orchard. “Trees seem to respond to Azomite about as readily as any vegetation, especially fruit trees. In one orchard where leaf curl, sluggish growth, poor- quality fruit and many pests were the problem, Azomite corrected the conditions within a year. By the end of the third year, none of the conditions existed”. Azomite, Rollin explained, should be applied to tree in the fall, just after harvest, starting about eighteen inches from the trunk and spreading as far as the drip line, then disked in, anything from two hundred to three hundred pounds.

“But the real payoff,” he said, smiling broadly, “came when he fed it cows through silage. Animals showed a definite preference for pasture grown with Azomite. Cows, horses, sheep, goats, rabbits, turkeys, all preferred Azomite-treated hay. I’ve had animals walk right through belly-deep lush-looking pasture not treated with Azomite to get to that which was, and then eat off it until you’d swear there was nothing left to chew on. Failing to get an adequate supply of any one trace element, animals have difficulty breeding, calves are small, and litters of pigs are weak. Beef cattle fail to make the best use of their feed. Dairy cows produce less milk; sheep have thinner fleece”. Elsie, tall and slim, got up and headed for the kitchen. “Tell them about the chickens”, she said. “It was amazing”.

Rollin drew breath, his satisfaction evident. “We got started with poultry quite by accident. It was difficult to get all the Azomite ground to a fine powder. There were a lot of pea-sized nodules left over. So I had the bright idea of feeding the chunk-sized Azomite to poultry as a grinding agent. When a neighbor placed some Azomite in the pen where culled hens were housed, by morning it was gone. None of the hens died; all started laying eggs again. Baby chicks would take Azomite from the very first day, if was ground fine enough; it seemed to stimulate their appetite. They developed more evenly, feathered out sooner, and later gave a greater percentage of fertilized eggs. Pullets were laying a week before they were supposed to, and their shells, which had been fragile, were now much harder. Did you know that it costs the U.S. poultry industry $60 to $70 million annually for broken eggshells”?

Rollin paused for us to appreciate the importance of the remark, then hurried on. “With turkeys we had even greater success. Azomite gave them earlier maturity, greater weight, stronger legs, and a greater number of prime-grade quality. Then we found that it was just as good for cattle. A farmer’s cow got loose in the barn, where she found a bucket of Azomite and licked it up as if it were lush feed. So we spread the word and cattle ranchers started mixing it in with feed. One rancher wrote that since he’d included Azomite the average gain per head per day was more than four pounds. Prior to feeding, Azomite the cost per head in the feedlot for three months had been $140 a head. Since Azomite, it was down to $95, and the quality of the beef was greatly improved. Another farmer wrote that seven Holsteins, which had been bred four times artificially failed to settle until 5 percent, Azomite was mixed into their daily feed. On the fifth breeding, all the cows settled. So we fed it to hogs, and by the market time the runts had caught up to the others. With goats we managed to breed culled ewes past lambing with a ram that was supposed to be infertile; and we got plenty of kids, plus 50 to 60 percent more wool from the sheep”. To make his point, Rollin waved a small booklet: The Story of Trace Minerals by Dr. Melchior Dikker’s. Already in 1931, Dr. Dikker’s, as Professor of Biochemistry and Organic Chemistry at Loyola University, was so struck by the properties of montmorillonite clay- claiming it to be one of the most amazing and unusual materials he had ever been fortunate enough to come in contact with-he launched an extended research program Years of intensive study convinced him that trace elements were the key to all living organisms, essential to the structure of certain complex chemical compounds that influence the course of metabolism, a vital factor in the health of every living being.

Metabolism-the sum total of all chemical reactions that proceed in ever single cell of the body twenty-four hours of each day-is what keeps us all alive. Some thirty trillion cells are at work, constantly, in each and every human body, twenty million in the human brain alone. In each cell, the process by which foodstuffs are synthesized into complex elements, is carried out by enzymes — large proteins which themselves synthesized by the cells. And it became clear to Dr. Dikker’s that trace elements were essential to the creation of these enzymes, to act as catalysts to bring about chemical changes by their mere presence, with-out themselves undergoing change. It is a phenomenon for which science has no real explanation, but which clearly cannot occur without both the enzymes and the elements taking in and radiating energy to achieve specific effects. Combinations of trace elements have been found, under certain conditions, to acquire entirely new properties, very different from those of individual elements acting singly. There is a noted interaction among trace elements, such as iron and copper, both of which are concerned with blood formation.

Without chlorophyll there would be no life on earth, the very first green plants being the understood link between energy from the sun and life on the planet. Only green plants and certain microorganisms are able to absorb the sun’s energy, store it, transform it, and then transfer it to man in the form of wheat, corn, vegetables, and fruit. Uncooked and unprocessed food will supply enzymes directly to the blood. Some two thousand different enzymes, every one a protein, are synthesizes by every cell from amino acids furnished by the blood, obtained from ingested food, best eaten raw.

Any heat over 119 degrees Fahrenheit destroys enzymes, as does pasteurizing. Many chemical substances-fluorine, chlorine, lead, barbiturates, Benzedrine, amphetamines, nicotine, carbon monoxide, nitrates, sulfur dioxide, DDT, and the most other pesticides, herbicides, and chemical fertilizers-inhabit enzyme activities, as do water and air pollutants.

The activities of enzymes are extremely susceptible to foods. The mere presence of chemical additives in food may cause some trace elements to become unavailable. The same applies to chemical fertilizers in the soil. They can cause trace elements to become unavailable to plants. Enzyme reactions are influenced by a deficiency of any functional nutrient.

Dr. Rudolph Abderhalden, Director of the Laboratory for Endocrinological and Enzymatic diagnosis in Basel, Switzerland, and Professor of Biochemistry and Halle University in Germany, believes the majority of all diseases maybe enzymatic in origin. He asserts that metabolism is synonymous with enzyme activity, and that disease is a disturbance in the harmonious pattern of enzyme activity, an activity dependent on the presence of trace elements. Breakdown of the

enzyme system results in disease or death of the cell. Many nutritionists and physicians now agree that there is really only one disease: malnutrition; that all the other ills derive from it. "We now know," said Rollin, "that the synthesis of all known natural mineral elements is the secret of the harmonious synergetic function that forms the basis of healthy living matter. Azomite is a complex compound of natural colloidal silicate minerals and trace elements. Some thirty-two trace elements-iron, cobalt, magnesium, zinc, copper, etc.-occur in such minute quantity they must be measured in parts per million, yet they appear to be basic in the complex chemical and electrical mechanism that makes up the human body. The form in which the major part of the natural inorganic nutrients are assimilated by animal and vegetable consists of material in the colloidal state.

"In plants, rootlets and root hairs are generally in intimate contact with colloidal sources of the soil nutrients they feed from. Plant nutrients are thought to pass from the soil solids to the plant without leaving the sphere of colloidal influence."

Rollin laid down Dikker's book to make the basic point about his precious Azomite. "Trace elements need to be ingested in a balanced manner, because they interact. A little too much of one can produce a critical deficiency of another that is present in barely sufficient amounts. Trace elements function as activators, as catalysts, within the living cell, be it plant, animal, or human: and they are the root of all living processes, with an influence out of all proportion to there size. While the quantity of any one element maybe small and effective compared to another, no element functions alone, but only in conjunction with others, equally important." We were back to the colloidal glacial sediment in Hunza water, full of the same trace elements, electrically charged, which proved to be the source of its vitality. Could Flanagan, we wondered, put an extra charge into Rollin's Azomite by subjecting it to his vertical method? Rollin was immediately receptive.

"Colloidal," he emphasized, "is a condition, not a mineral. Fine dust-like mineral particles pass into the colloidal state of fineness upon reaching a critical size when there activity prevents them settling out as molecules of there particular inorganic element. Particles larger than one micron are generally in an available condition ready for immediate use by plant, animal, or human." To physicists, a piece of material can be subdivided into smaller pieces only so far before these cannot be seen with the most powerful microscope. At a further stage a limit is postulated beyond which particles cannot undergo subdivision without losing their chemical character: This they call the molecule. The smallest particle visible in the microscope is still about one thousand times larger than the largest molecule. In this twilight zone of matter are found the peculiar forms first called "colloidal" by Thomas Graham in 1862.

"By colloidal", said Rollin, "Graham meant those materials which readily crystallize and have the vital function of diffusing readily through animal membranes, as apposed to amorphous masses, which do not diffuse readily or at all through animal membranes, and cannot therefore be assimilated."

And here, we realized, may lie the explanation for the extraordinary vitality of colloids, as well as for the surprising facts of homeopathy, in which the smaller the dose, the more powerful the effect. Copper is said to be effective in plant life when present in a concentration as low as one part per ten million (dry matter); molybdenum is effective when presenting one part per two hundred million, and cobalt is effective when present in one part per billion.

By the laws of physics, the smaller an element is divided, the larger is the area of surface exposed by all the pieces. A one-inch cube has a surface area of six square inches; the same cube divided into eight cubelets will together have exactly twice that surface area. By the time the cubelets or particles become microscopic, their cumulative surface is enormously increased. And the larger the surface exposed, the larger the particle's potential to be charged with energy. In colloids, the ratio of exposed surface area to volume of material becomes extreme.

As electrical charge tend to repel particles from each other, colloidal particles are kept separate, in suspension, retaining their vitality. But if the charge decreases (reduced by light, heat, electrical fields, etc.) the particles tend to snap together and coagulate. With coagulation the system loses its colloidal behavior and becomes "dead," in both organic and inorganic systems.

All of life is found in the colloidal form and has many characteristics also in inorganic colloids, which lead German Noble laureate in physics Wolf Gang Pauli to conclude that colloids provide the most important known link between the inorganic and organic, a clue to the very source of life.

One of the keenest supporters of Rollin's Azomite is a Veterinary Doctor, C.S. Hansen, who attributes the extraordinary powers of trace elements to the microwaves they radiate. He maintains that insects have an innate intelligence that respects a vigorous growing plant, capable of producing seed for reproduction, and will somehow have the sense to avoid it. He said that when the natural trace-element material, such as Azomite, with the proper microwaves present, is supplied to a growing plant he has failed to find any insects present. Insects avoid such treated plants. But when a plant is not of vigorous growth, and capable of carrying on as a perfect species, nature gives insects the job of cleaning it up.

"Anything that becomes inferior in quality," says Dr. Hansen, "Becomes food for insects, so that only the healthy plants capable of developing seed for reproduction are left to mature. Imperfection in life has a way of being destroyed if left to the devices of nature. Food products from a deficient soil should never be used for human or animal consumption, and they should never be used for reproduction again as feed".

To demonstrate to effectiveness of the microwaves radiated by trace elements, Dr. Hansen took a bag of Azomite and spread it on the ground around an orange tree with mature fruit ready to be plucked. "The tree", he explained, "was full of heavy metals: zinc, lead, mercury, and insecticides. Within four minutes after the Azomite was spread, there was not an orange or leaf on that tree that wasn't free of the harmful effects of the heavy metals, DDT, and other chemicals".

So amazed was he by these results he repeated the experiment several times. His explanation is as simple as it is amazing: "Microwaves from the trace elements in the Azomite catalyze the heavy metals into harmless compounds, which the plant or tree can then use or automatically return to the soil".

Hansen says the effects of different forms of radiant energy on colloids and protoplasm are being extensively studied, and that it is known that different wavelengths and frequencies may produce structural effects on colloids and organisms: ultraviolet rays can slow down or stop the streaming of protoplasm, causing increased viscosity or coagulation.

Rollin sat back and sighed, partly pleased about getting his points across, and partly in despair about the world. "We have ganged up on nature by taking the attitude that insects are invading our fields and destroying our crops. So we kill the bugs, thinking it correct. Instead we are killing ourselves. But the bugs are only destroying our crops because we are not feeding the crops their proper food. We are not giving the plants the natural trace elements which give them the access to the benefit of the microwaves of creation".

What he meant by the microwaves of creation was not to become clear to us until we met later with a brilliant ornithologist turned entomologist. But first we had to deal with an eminent biologist.