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Policies Regarding Agricultural Chemicals

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In this Statement to the Governor's Special Committee on Agricultural Chemicals, Sacramento, California, November 15, 1960, Doctor Albrecht showed convincingly how we have gone astray by ignoring the Laws of Ecology, and what we must do to correct our errors.

UNDER PRESENT AND prevailing marketing arrangements, the farmer's operations require his liquidation of his creative assets (namely, the fertility elements and organic matter of his soil) every time he makes a sale. Those are items thrown into the bargain with every sale. Yet according to views of economics and principles of taxation, that liquidation is classified as "taking a profit." Thereby, our soils are gradually being left as acres, claimed for taxation according to deeds to the land as geographical areas, but are undergoing a declining productivity.

Price of Exploitation

Exploitation of the fertility of the soil for economic gain only has pushed all living matter more and more to its ecological fringes of survival. This is being told to us by increasing diseases, ravages by pests and lowered quality as food and feed values (even to the degree of being poisons both natural and introduced).

There has been no evil intent on the farmer's part to offer products of lowered food quality (much less of added poisonous contents) resulting from poorer soils for which he cannot afford fertility maintenance by not charging for it in what he sells. Even under domestication and assumed management by man, the microbes, the plants, the insects and our supposedly well-bred livestock do not submit to control for the wholly economic advantage, according to man's desires. All those life forms in the entire biotic pyramid behave according to laws of Nature, of which we know so little. What a threat to survival, as man within his modified environment relentlessly transplants life forms from anywhere to everywhere, with utter disregard of the soil fertility required to perpetuate healthy species!

Falsity of Economic Manipulations

Emphasis on the economics of agriculture and the false hope that economic manipulations can correct what

is basically a biological matter of nature—according to man's modification of environment—have blinded us to the simple fact that agriculture is first and foremost a case of Nature at work in creating living things. Those are perishable. They must be nourished and protected from pests and diseases. They must be cared for according to laws which are not matters of economics, but laws of life which transcend all economics. They are controlled by Nature, not by man. Therefore agriculture is not an industry, or business. It is not a matter of merely the buying and selling of stable commodities.

Consequently the food values in agricultural products as harvested and slaughtered to go into commercial transactions may well vary widely even to the point of containing what are natural poisons to warm-blooded bodies. Rich, green spots of grass in the pasture grow tall because the animals refuse to eat that vegetation given unbalanced fertility by the cow's droppings. The excessive nitrogen applied in them is responsible. This tells us that food values (including poisons) of a crop may vary acccording to (1) the species of plant, and (2) the amount and balance of essentials in the inorganic and organic fertility of the soils.

As illustrations of plant species which may or may not be dangerous feed or food via poisons according to soil and plant growth conditions, a few may be cited:

(1) PASTURE PLANTS may accumulate excesses of some poisonous element like selenium in the legume plant, astragalus on certain shaley soils, or like molybdenum by several plant species on certain semi-arid soils.

(2) NON - LEGUME PLANTS may bring on sickness of animals from deficiencies of copper and cobalt when but a few clover plants growing on the same soil with the non-legumes as feed mixture may take those trace elements from the same soil sufficiently to remedy that chemical deficiency.

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(3) SORPHUMS may, or may not, give cyanide poisoning, a variation in the plant's physiology in synthesizing nitrogen into a poison rather than into a protein food.

(4) NITRATE POISONING has come into prominence with more generous and casual use of nitrogen fertilizers. This occurred prominently in Missouri during the drought of 1954. Thirty years ago we called it "cornstalk poisoning," only to discover during the last decade a *cause and effect* relationship due to the nitrate and nitrite poison concentrations in the soil, along with climactic conditions. This has also been the direct cause of poisoning and sometimes death of babies in Kansas, due to nitrates from soil seeping into shallow wells from which water was used in babies formulae.

(5) SOME LEGUMES synthesize hormones, like the sex hormone of clover (*subterranean*) which produces disturbances of the sex organs in much the same order as those by stilbestrol (the artificial female hormone of complex carbon ring structure).

(6) SODIUM BENZOATE is natural to cranberries as it was learned by finding this chemical in the commercial offerings and then examining the berries from the field.

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(7) AMINOTRIAZOLE, the compound of carcinogenic potential that produced the recent cranberry episode about chemicals in food, has recently been reported as produced by plants.

(8) TREES excrete into their bark several poisons, including tannin and many carbon ring compounds. These are not broken down by microbes. They, as aromatic compounds, like the longer chain hydrocarbon (or aliphatic compounds) are not broken down by digestion either. They persist during the ages while wood is being converted into coal. They are recovered from coal-tar distillates when coal is distilled in making coke. Yet some ring-carbon compounds are used by the warm-blooded bodies as powerful chemical agents, like sex hormones, plant hormones, growth stimulators and others. But they occur in very small amounts. Plants and animals contain many compounds which in larger amounts are poisons; but in smaller amounts they are part of the body functions, and possibly only in conjunction with other chemicals still unknown. Consequently, our administration of the single, separate and known chemical may be disastrous because of the ignorance of the accompanying chemical through which it functions in natural conditions. It is this ignorance of the combinations that sponsors the danger rather than the use of the chemical.

Use Determines Effects

Coal-tar substances have always been common in plants as supposedly by-products of plant functions within which some services were rendered to the plant life by these chemical compounds. But when used in chlorinated or sulfonated hydrocarbons as pesticides, fungicides, etc., those chemicals are powerful poisons. Separated out of the natural conditions, as combinations with other bio-chemical compounds, they are dangerous. We may catalogue the list of substances, but how their functions are integrated is not revealed by that listing.

Relative to the inorganic elements required for growing things, we do not have all of those listed yet. Boron has recently suggested itself essential for warm-blooded bodies when for the past years it was considered non-essential. Even though as students of agriculture, we start with inorganic chemistry, we are not well enough acquainted with what some more knowl-

edge of even that could do for our understanding of all the functions which the inorganic elements of rock or mineral origin render in growing healthy plants and nourishing healthy animals. We are, therefore, in danger of misusing the trace elements in fertilizing the soil, lest we grow poisonous crops by that means.

We are slowly realizing that salt treatments are upsetting plant compositions very seriously in terms of vegetable matter as food for man and animals.

Major Weakness in Management

Perhaps the major weakness in managing soils to grow crops is our lack of knowledge of the services rendered by the organic fertility of the soil. Because of our ignorance of that, there are those among us who ridicule those who believe the soil requires organic fertilizers. We observe that Nature's climax crops (a) of pure stands, (b) of freedom from pests and diseases and (c) of excellent reproduction and regular survival have been found only after the same crop has grown in the same place year after year and has built up an accumulation of organic matter of its own creation. Man's failure to maintain the organic matter of his soils under cultivation is slowly coming to be granted as a serious factor in the decline of crop quality as nutritional value, though by inorganic salt fertilizers the yields of some crops have been maintained up-to-date over a few years.

Hybrid corn with large yields per acre, has fallen as low as 5.15% crude protein in the grain when 10.30 (just twice as much) was the standard forty years ago. Protein in Kansas wheat has also been on the decline.

Organic Functions Acknowledged

Only recently has there been acknowledgement of more functions by organic matter in plant growth when it was discovered that what is called "chelation" by chemists is a case of the organic compounds of the soil taking the inorganic elements into the plants for more efficient crop production. That these organic compounds coming from digestion and excreted in dung of animals may be in a cycle of re-use, as the inorganic elements are, was demonstrated by the experiments by Dr. Francis Pottenger, Jr., Monrovia, California. Feeding cats on cooked milk grew dwarf bean plants on their dung mixed in sand when seeds were planted from a crop of dwarf bean plants. But those same dwarf bean seeds planted on sand with dung from cats fed raw milk,

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Man's failure to maintain organic matter in his soils is slowly becoming a recognized factor in the decline of crop quality.

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shifted the dwarf beans into pole beans. The seeds from the dwarf bean plants grown on dung from cooked milk gave off a cat dung odor to suggest indole in the seed. Those plants grown on dung from raw milk did not have the indole odor given off by the seed.

In the cooked milk case, there is the suggestion that even that much heat served to change the functions of the indole ring compound and its chemical side chains so that the plant took it up and located it in the plant's seed crop. Since indole is a remnant of protein digestion, it was apparently stored with the other proteins which the plant put into the seed for reproduction but did not put it into protein form. Rather it left it in the excreted indole form of pronounced fecal odor.

Indole Synthesized

In the raw milk case, there is the suggestion that the indole was synthesized into the plant hormone, indole-acetic acid (which is known to stimulate lengthening of internodes), and changed the dwarf bean to a pole bean—the plant-breeder's contention notwithstanding.

With our limited knowledge of the soil's organic compounds as plant

nutrition, it would seem a dangerous stroke to offer organic poisons within the soil to be taken up by plants to be assumed poisons for insects attacking or eating the crop.

Better Quality Needed

Organic matter in the soil by Nature serves in ways nearly unknown to tell us that we need to look to better quality of vegetation as food, by restoration of the soil organic matter —a wiser way of fertilization rather than by increasing the use of salt fertilizers now depleting the organic matter so rapidly. Nature built powdered rock into soil by adding to the mineral soil all of the organic matter grown in place. By that food for the soil microbes, their activities have probably been more significant than we realize in putting the inorganic fertility into combinations with the organic compounds so that they both

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enter the plant roots for growth of crops in ways we do not yet comprehend in soil or plant sciences. Crop quality has been declining rapidly with the neglect of organic fertilizers and increased use of those which are inorganic.

All life forms are struggling to find enough proteins, which are the only compounds that carry life. Proteins are synthesized more by plants according to (a) different plant species, with legumes most rich in proteins, and (b) any plant species according to its balanced fertility of the soil suggested by Nature where the particular virgin crop was at a climax, or was growing (a) to the exclusion of all other crops, including weeds, (b) with no pests or diseases of significance and (c) with excellent annual growth and regular reproduction. Such crops were a case of that plant species in its proper ecological setting, or the crop where Nature put it as a result of the crop's nutrition to make it more fit for survival there than any other crop.

Synthetic Environment

Man has been putting any crop anywhere according to his desires to sell seed, rather than fitting the crops to the soils in Nature's soil pattern so the plants are most effectively nourished by the soil's dynamic process under the climatic forces. Man's emphasis on economics, his assumption of control of natural life forms as management of them instead of studying the plant's (or animal's) requirements, have depleted and destroyed soils to bring a synthetic environment for what we grow, including our own bodies. That disruption of living things in their place for healthy survival by self-preservation is the basis of man's fighting other forms of life; his monocultures which upset natural balances of predators and pests; his present degenerations (called diseases); and the seeming revenges which Nature is visiting on man and all he tries to grow. We need to see health from the positive approach on the soil as the starting point of nutrition for survival. Instead, we are given to emphasis on cures for granted ill-health and to working from post-mortems and graves backward rather than from preconception and parturition forward according to basic laws of survival of the fit via proper nourishment.

Chemicalization everywhere is the symptom of our attempts to manage Nature's work according to our economic desires rather than by starting with natural laws and by following them having healthy microbes, healthy plants, healthy animals, and healthy people.

Some cases of irregularities of production of agricultural products without fitting into the soil pattern under ecology may well be cited. The health patterns are according to the fertility pattern for production of proteins

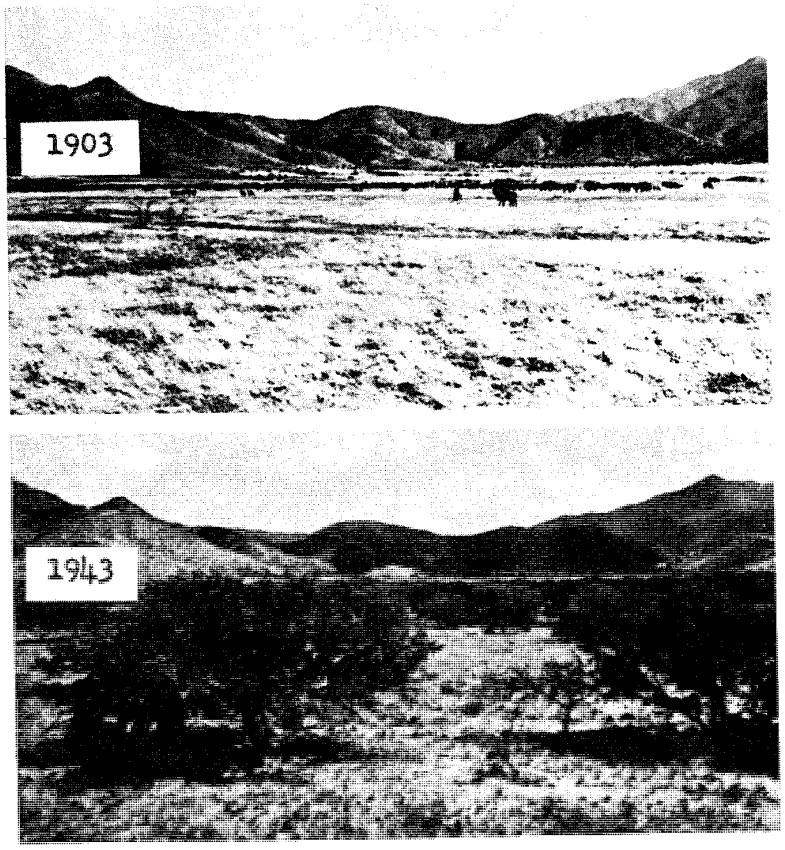
complete in their array of amino acids required for each specific form.

Results of Straying from Ecology

Failing to fit ourselves, our domestic animals and our crops according to the ecological pattern of Nature determined by the soil as nutritional support, our lifelines from yonder to here are becoming entangled and even cut off. Our technologies and economics have given us a synthetic rather than natural environment, including the soil as the basic starting point of Nature's creation. We have gone so far that Nature is destroying many life forms through degeneration so puzzling when we think of disease and enemies to our health. Enemies call us to fight; hence pesticides, herbicides, fungicides, bactericides, etc., have been employed until we are simply destroying our own capacity to survive, which true capacity is good health by growing it (not throwing it) within our bodies.

The policy regarding agricultural chemicals merely calls for a new reformation that goes back to the study of how Nature works in agricultural production. Then by following natural laws, undisturbed by desires to collect a living, but with readiness to earn a living in terms of elements, compounds and Natural substances of nutrition for health rather than monetary accumulations, the chemicals will not be so necessary. We shall then be living with prevention in place of dying with our own creations as cures.

WE NEED TO SEE AGRICULTURE as our first concern, since it is the foundation of health of all life forms. ●



The Indian Ponders White Man's Conflict With Nature.

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