SEA ENERGY AGRICULTURE
BY MAYNARD MURRAY (1910-1983)

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http://www.oceangrown.co.uk/documents/TheRemineralisingImperative-GrahamSait.pdf

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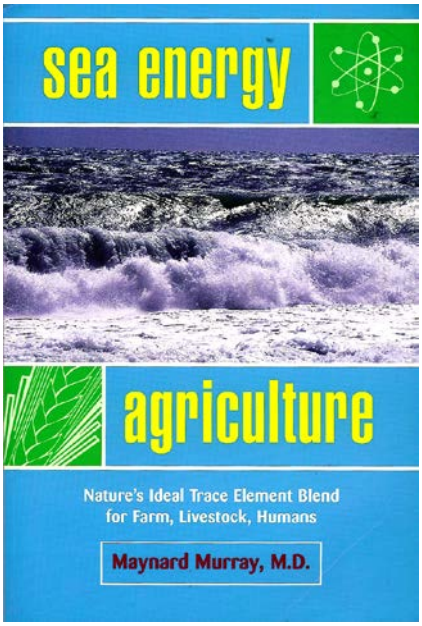

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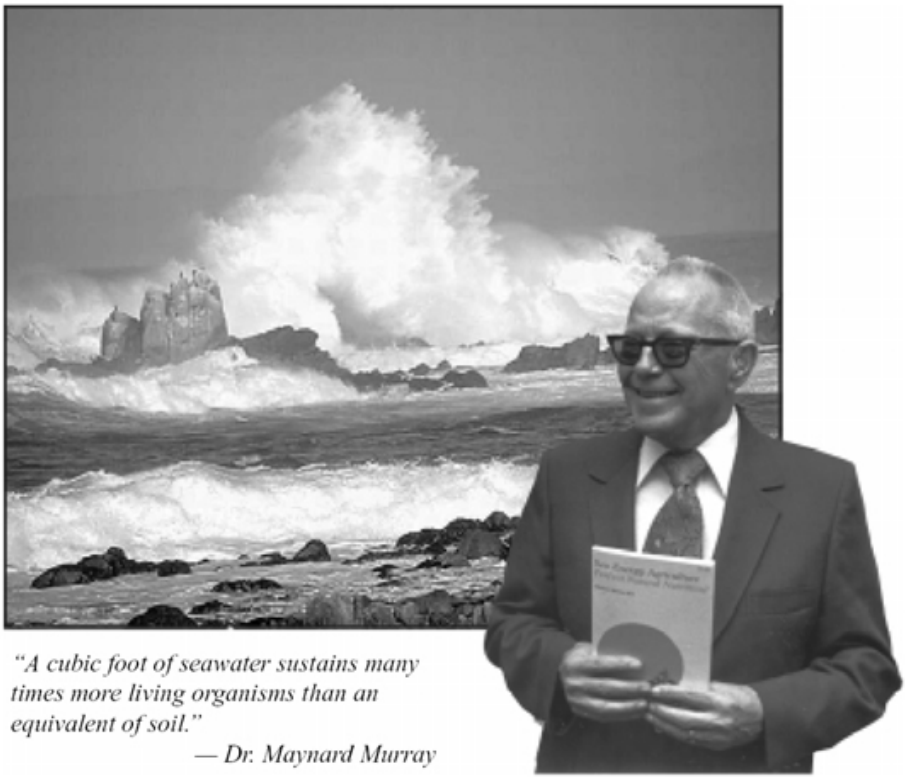
Integral Nutrition: "Health Begins in the Soil"

Conventional: Mine the Soil to Depletion

Terms: **Seaponics**

SEA ENERGY AGRICULTURE (SELECTIONS)

Source: *Sea Energy Agriculture* by Maynard Murray, M.D.



Maynard Murray was a medical doctor who researched the crucial importance of minerals—especially trace elements—to plants and animals. Beginning in 1938 and continuing through the 1950s, Dr. Murray used sea solids—mineral salts remaining after water is evaporated from ocean water—as fertilizer on a variety of vegetables, fruits, and grains. His extensive experiments demonstrated repeatedly and conclusively that plants fertilized with sea solids and animals fed sea-solid-fertilized feeds grow stronger and more resistant to disease.

***Sea Energy Agriculture* recounts Murray's experiments and presents his astounding conclusions. The work of the eco-ag pioneer was largely ignored during his lifetime, and his book became a lost classic—out of print for more than 25 years. Now this rare volume is once again available, with a new foreword and afterword by the founder of *Acres U.S.A.,* Charles Walters.**

Dr. Maynard Murray was a pioneer in biology, health and agriculture. His lifelong quest taught him the key to health is a secret in soil, whose source is the sea. A medical scientist, he recognized evidence of an all-encompassing unity for life on Earth. His inspiration came from his study of the ocean.

Along his 45 year journey, Murray was actively engaged with farmers to learn agriculture. Later, he operated a successful hydroponic vegetable farm. His research led him to a key to the cause, treatment and prevention of cancer.

Murray got his B.S. in 1934, an M.D. from University of Cincinnati College of Medicine in 1936. Two postgraduate years in internal medicine, then three-and-a-half in ear, nose and throat surgery. From 1937 to 1947, he taught physiology and directed experiments at Cincinnati College of Medicine, studied law at night school and learned in medical hypnosis.

In 1947, Murray moved to Chicago to begin a 25-year medical career in ear, nose and throat. Experiences with patients aroused his concern for the quality of life. While Americans lived longer, medical practice revealed they weren't living better. Chronic illness and degenerative disease slowly steadily increased.

"A large portion of our lifetime and resources is spent to combat illness and withstand aging," Murray wrote. "Paradoxical that despite the great variety of foods developed to nourish our bodies, we still suffer degenerative diseases, and fall prey to aging long before optimum lifespan is reached."

Pointedly, he wrote, "Americans hold the dubious distinction of being among the sickest of populations in modern society."

Astutely, he added, "A nation with a drug industry flourishing as well as ours certainly cannot claim good health!"

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Acknowledgements

This book contains a report of many years of research on sea salt agricultural technology conducted by the author. The opinions, assumptions and conclusions stated within the context of this work represent results of preliminary research conducted to date. Therefore, the material in this book is not intended to be accepted as conclusive in regard to methodology or results achieved and in no way should be construed to make a claim for better health or concrete advances in disease prevention

and/or treatment. This report is presented in the interest of science to stimulate further research which will one day render conclusive results, hopefully for the benefit of all mankind.

A NOTE FROM ACRES U.S.A.

"Life is electrical." With that statement Maynard Murray, M.D., opened his lecture at the 1976 Acres U.S.A. Conference in Kansas City. His many years of research then were ready to be put on the table. "There can be no life without a transfer of electrical energy."

This was a profound statement for an audience that had come to hear about organiculture and hadn't considered the business of conductivity and electricity, especially as it related to crop production. It didn't take Murray long to explain that the center of life's gravity was the ocean, the repository of minerals from the land, dissolved and carried to nature's settling basin via streams, both above and below ground. The solution, he said, was ripe for life if only the right key was used to unlock nutrient-rich accumulations of trace minerals, all of which surely figure in the life process.

Each cell is a little battery. It puts out a current. Deprived of this function because of nutrient shortfall or marked imbalance, the cell dies and deprives living tissue of its service. Murray's remarks were stage setting for those who would read Tom Valentine's book on sea energy agriculture, and they serve us now to preface a body of knowledge that ought not be allowed to die.

The late Ted Whitmer of Glendive, Montana first called my attention to sea solids as a potential plant produc6on fertilizer. He had explored the commercial prospects at considerable expense, and before he passed away in 1996 he counseled *Acres U.S.A.* to add the lessons contained herein to the body of knowledge rescued from oblivion over the decades since the publication was founded. In the final analysis, Maynard Murray was his own best spokesman, the following extract and abstract clearly ratifies.

Listen to this man as he works substance to baffle and teach.

> *Anything living alters its environment for its benefit in order' that it may live and reproduce. Life is contained in the cell. Cells vary in size. The largest cell on Earth is an ostrich egg. The smallest is a small bacteria. In the warm-blooded animal, the reproductive cells are the largest and the smallest, the sperm cell being the smallest, the egg being the largest. These cells are able to carryon the process of life.*

Cells need only food from the outside. They can break down complex compounds and synthesize their own body tissues.

A virus, which is smaller than the smallest bacteria, has to live within the cell. Living tissue has to get its food by either concentrating or diluting its environment in order to make its environment a part of its tissue.

All of life is parasitic, exceptions being few. Plants are the exception. Plant life contains chlorophyll or a substitute pigment. Science has identified these pigments by which plant cells can synthesize their own tissue out of simple inorganic elements, the plane of observation defining the locus of organic and inorganic in the life process. Chlorophyll is the pigment in the green algae. The pigment in the

retina of the human eye-contained by certain cells-can synthesize proteins, etc., out of angstrom-sized inorganic materials.

Green plants will not use organic materials of the micron size. The plant is not fed organic materials. The soil is the container, and it in turn feeds the plant. It is the supreme function of the soil and its life forms to prepare for plants a suitably sized diet composed of life's diversity minerals, which explains why and how some plants draw nutrients from the air as well as the soil and solutions.

Just as plants require a diet that chemists might style organic-taking the transport mechanism into consideration-animals turn to the mineral box only when desperate, leaving it to microorganisms in the gut to refine and make available nutrient values contained therein.

All this prefaces the introduction of sea solids into agriculture. Sea solids are known as sea salts, and salt is considered more toxic than many mild fungicides used in apple groves. Yet sodium and chloride tied up in many vegetables is perfectly tolerated even by patients on a low salt diet. It has been said that all absolutes are false-including this one. Often this is true with minerals, as is the case with iodine, plant iodine stepping up metabolism, potassium iodine stepping it down.

Nevertheless, Murray does not rely on disclaimers to support his case for sea solids. Pictures presented here tell one part of the story. The rest is supported by experiments and case reports.

Murray is quick to point out that life started in the sea. Human blood is about 25% sea water. Fully 85 percent of life on Earth is in the sea. Two elements will not stay in solution: phosphorus and iron. Scientists now consider phosphorus is leaving the land at a tremendous rate. The only return from the sea is via bird droppings, one to three percent going to the sea. In the sea phosphorus hugs the bottom, insoluble, unavailable.

Murray's quest has been to use sea solids, all of them-92 elements included-on acres, orchards, pastures and gardens. Some of the details have become part of the scientific literature. Others are still to be discerned by innovative researchers and farmers. Of special interest is the new hydroponic application discussed here, an application of nutrients that repairs most of the shortfalls of the simplistic hydroponic salt fertilization.

Sea solid fertilization does not excuse farmers from supplying major nutrients, not only the phosphorus (P) discussed above, but the nitrogen (N) and potassium (K) as well. All are best accomplished when the natural nitrogen cycle is working and when the natural carbon cycle is working. Needless to say, the sea fixes nitrogen. The food supply fertilizer is sea water.

Murray reports total success using sea solids on every crop ever tried. His record invites scrutiny, emulation and reiteration. Go to chapter one, then follow the storyline through photographic evidence.

Drama requires backgrounding. This Tom Valentine does by detailing the character of the human health profile and the reason for being of sea solids research in the first place.

"We, indeed, can build up immunity to staph infections, viral and fungal infections in plants," was Murray's parting shot when he came to that Acres U.S.A. conference. "When we grow corn, wheat, oats, etc., and feed them to animals, we see changes." Using animal research with a species bred to get

cancer, and feeding them with food grown with sea solids, the first generation cut debilitation from 97 to 55 percent, a significant drop. Through each generation sea-solids food installed resistance to cancer, that is one kind of cancer in mice. Ditto for leukosis in chickens, arthritis in rats, that is, rats bred to get arthritis can be excused from the disease with the foods produced from sea solids.

Farming has to be the beginning of preventive medicine.

That is the Maynard Murray, M.D. conclusion, and the start of *Sea Energy Agriculture*.

--Charles Walters

PREFACE

> **Sometimes one has to say difficult things, but one has to say them as simply as possible.**
> ***A Mathematician's Apology* - G.P. Hardy**

Life in the sea, both animal and vegetable, is far healthier than similar life on land. Why? Some people believe that the buoyancy of a water environment ameliorates much of the stress and trauma experienced by creatures constantly combating the forces of gravity.

Although buoyancy may be a partial factor, it cannot explain why the same species of trout lives twice as long in the saline ocean water as it does in fresh water. This curious health phenomenon indicates that the sea provides its creatures a totally balanced and adequate physiological and chemical diet, while fresh water and rain-washed land masses do not.

Questions posed by the radical health differences between sea life and our landlocked environment have occupied my research efforts, as a practicing physician and physiologist, for the past fortyfive years. This report is the result of my lifelong search to open doors to a provocative new arena of science and technology called sea energy agriculture; and it is quite possible that this new field of endeavor could lead to the end of disease and famine.

Such a prospect is most encouraging, since our world is now on the verge of a terrible crisis in agriculture and food production. Of course, there is much more to be learned, but my efforts have tried to establish a firm foundation for future research. Life is far too short for one person to guard selfishly any new facts he may discover. Therefore, 1 am revealing all I have learned even though some of the data are not yet complete. Many minds are better than one, and it is my hope that from this beginning, enthusiasm will be generated which will bring active, probing minds into the field. The results of my initial research must be amplified and technologically developed in order to best serve mankind.

A large portion of our aggregate lifetime and total resources is spent combating illness and trying to withstand the ravages of aging. It is paradoxical that despite the great variety of foods that we have developed to nourish our bodies, we still suffer degenerative diseases and fall prey to the aging process long before the optimum lifespan for humans is reached.

It has been said time and again that we are what we eat. This truism complements the simple fact that although we, Americans, have greater abundance, and perhaps a more balanced diet, than most of our primitive forbears, our intake of vital, life-sustaining elements is woefully inadequate. The people of the United States are the best fed, chemically starved people in the world.

It is difficult to keep accurate statistics in a nation as large as ours, but in recent years statistical studies of disease have improved considerably -- and the data revealed are frightening. There is a tremendous increase in the frequency of chronic and metabolic ailments. My research clearly indicates the reason Americans generally lack a complete physiological chemistry is that the balanced, essential elements of the soil have eroded to the sea; consequently, crops are nutritionally poor, and the animals eating these plants are, therefore, nutritionally poor. Our scientific efforts to isolate and synthesize what has been learned about the essential properties of soils and fertilizers are impressive; but man's methods apparently have not satisfactorily duplicated nature's methods. Something is obviously lacking.

As a scientist, I have great respect for what our technology has accomplished, but it is imperative that we accept a junior partnership with nature. If we do, she may allow us to survive. If we do not, she undoubtedly will eliminate us just as surely as she exterminated the brontosaurus, the woolly mammoth and all the other creatures who once also "ruled the earth." To join this junior partnership we tnust alter the way we grow our food, the way we protect our plants from pests and disease, and the way we process our food.

Many prevailing beliefs about soil and plant growth are erroneous and must be discarded. My experiments have proven that an adequate supply of food can be developed if man recycles the sea. Since 1936, 1 have been experimenting to determine what elements in the sea harbor the secret of healthy plant life, which elements, in turn, contribute to the health of the animals who eat this plant life. I became interested in hydroponics, the art of growing crops in liquid solution without soil, as a means of discovering and controlling the elements that should be present in the nutrients available to the plants in my experiments. I tried solutions made from evaporated sea water, or sea solids, to determine what means of balance were available in the natural sea water and the effect on plants. Sodium chloride, the major component of sea water, is normally toxic to plants. However, my method prevents the salinity from affecting the root structure of the plants.

From the start, my sea solids experiments produced excellent results, and it has now been conclusively proven that the proportions of the trace minerals and elements present in sea water are optimum for the growth and health of both land and sea life. In 1954, controlled crop experiments were conducted. Corn, oats and soybeans, three staple feeds, were used. Ten acres treated with sea solids and ten control acres of corn, ten acres treated with sea solids and ten control acres of oats, and six acres treated with sea solids and six control acres of soybeans were grown.

Subsequently, the produce was fed to animals and under controlled conditions-four parts corn, two parts oats, and one part soybeans. Not only were the experimental crops superior to the control crops, but the effects upon the physiology and pathology of the animals fed the sea solids produce were delightfully amazing. For example, chickens, pigs and cattle fed sea solids produce reached maturity much sooner than control animals, and all resisted diseases common to their species better than control animals. Experimentally fed pigs carried over the benefits into a second generation; and there were no runts in the litters, which is something that "always happens" in a litter of pigs and is a sign of malnutrition.

My background includes a B.S. degree in 1934, and an M.D. from the University of Cincinnati College of Medicine in 1936. Two additional years of postgraduate study in internal medicine followed, with three-and-a-half years in ear, nose and throat surgery. While in Cincinnati between 1937 and 1947, I taught physiology and directed a number of experiments at the College of Medicine. I studied law at night school and was trained in medical hypnosis. My membership in professional societies includes the Association of Medical Hypnotism, the New York Academy of Sciences, the American Association for the Advancement of Science, the American Medical Association, Chicago Medical Society and the Illinois State Medical Society.

In 19471 moved to Chicago, where for the next twenty-five years I practiced otolaryngology. At the same time I carried on extensive experimentation with sea solids fertilization, which led to my patented sea solids technology developed on the land, and hydroponically as seaponics, as well as numerous articles published in national and international scientific journals. My present residence is in Fort Myers, Florida, where I am continuing my research.

I do not relish being critical of current practice and theory; and certainly I do not wish to be accused of self-righteousness. My criticism is meant to be constructive; and if the results of my lifelong work eventually lead to less suffering and illness for mankind, all debate and difficulties will have been worthwhile.

CHAPTER 2: PLANNED FOOD POLLUTION

> **We cannot impose our wills on nature unless we first ascertain what her will is. Working without regard to law brings nothing but failure; working with law enables us to do what seemed at first impossible. --Ralph Tyler Flewelling**

The waters of the oceans hold the perfect balance of those essential elements required as food for the complex cell groups that make up our bodies. This is my thesis-now for the proofs.

When I was a student at the University of Cincinnati in 1932, 1 at tempted to induce cancer into a toad, but was astonished to note that the amphibian seemed to have a natural immunity. This laboratory incident precipitated the beginning of a lifelong search for an explanation. Some decades ago I fed crops grown with recycled seawater to various farm animals and obtained remarkable health and growth results which confirmed my theories.

A cubic foot of ocean water sustains many more times the number of living organisms, plants and animals than does the equivalent amount of soil. Seawater is literally alive, especially where the temperature of the water is warm.

Of special interest is the fact that the aging process does not appear to occur in the sea. A comparison between the cells of a huge, adult whale and cells taken from a newly born whale will show no evidence of the chemical changes observed when comparing cells of adult and newborn land mammals. There are some denizens of the sea that apparently never cease growing. One need only compare the size of land turtles with sea turtles to realize the tremendous difference.

I am convinced the difference in size and longevity is due to the complete, balanced chemistry provided by the sea. There are no chronic diseases found among fish and animal life in the sea that can compare to those on land.

In man, most cells are replaced within about eighteen months. If the requirements for certain elements are not supplied by food ingested as cell division occurs, dilution becomes apparent until critical elements are nonexistent in the organism. This shortage of essential elements does not occur in the sea. Why aren't these vital elements in our food?

When our cells must compensate for the dilution, or lack of elements, then they lose their resistance to disease. Remember that our bodies are host to an enormous number of microbes that eagerly pounce when the slightest breakdown in cell function occurs. Our frightening increase in chronic disease and the sorrowful process of aging can be attributed to the absence of a complete, balanced physiological chemistry.

If the necessary elements are not found in our food, where are they? Certainly nature provided them. The answer is they have departed from our soils due to continuous taking of crops and the process of erosion. Most crops require an average of forty elements from the soil. In no case do fertilizers add more than twelve, and most commercial fertilizers add a maximum of six elements.

The single most devastating source of depletion of soil is water leaching. Even on relatively level land tremendous leaching occurs and has been taking place for thousands and thousands of years. Ultimately, the various leached elements, because they are in water solution, flow down to the sea.

For countless centuries the vital elements have been eroded into the sea. What state are they in while mixed with our vast oceans? Analysis of seawater shows a constant proportional balance of all the water-soluble elements. Three and one-half percent, by weight, of seawater is composed of sea salts, or sea solids. Chemical analysis shows that all the elements in the Atomic Table are present, with the possible exception of some of the gases.

I used these sea solids as plant food in experiments to prove that these elements in perfect balance will grow chemically perfect plants. I did not try to synthesize anything, but merely took what nature already offered.

My first experiments were in 1938. Since then I've carried out literally hundreds of experiments involving feeding plants nothing except sea solids mixed with tap water and a minor but fertilizing amount of a water-soluble nitrogen, such as ammonium nitrate, sodium nitrate, potassium nitrate, calcium nitrate and the like. Invariably the result has been the same-healthier, more productive crops.

Early in the experimental game I learned that hydroponics-which is feeding nutrients to plants without soil-gave me better control over the plant diet. Dried, natural sea solids were dissolved in plain water, using approximately 112 pounds of sea solids to 10,000 gallons of water-a damn economical mix. The only nutrition my experimental crops received was sea solids in solution, which bathed their roots a few times each day. The plants flourished as no plants have flourished in this modern day of fertilized soil. The contrast in the experimental crops with the control crops grown by normal commercial methods was truly exciting. The taste difference was very significant, especially in tomatoes and carrots. The production rate was considerably higher and the resistance to disease was apparent.

The second line of experimentation was to put these evaporated sea solids directly on the soil as fertilizer. We actually used as much as 3000 pounds per acre-and I know eyebrows are being raised now!

But in the presence of the other elements found in seawater, sodium and chlorine are not toxic to plants. Actually, salt may be necessary for the absorption of the heavier elements. It is known that a saline solution will pick up a greater quantity and variety of elements than ordinary water solution.

We planted fields side by side so that one experimental plot used sea solids mixed into the soil as fertilizer and one control plot used the best commercial methods available. The results were similar to those with hydroponics. Sea solids-fertilized crops grew faster, were healthier and produced a far greater yield. Colors of the plants also differed and a taste difference was obvious. Animals, both wild and domestic, had no trouble determining which was better for them to eat; and a walk through a field of oats showed us a glimpse of animal heaven. Rabbits and mice scurried everywhere, yet the minute we stepped into the control area where standard fertilizers had been used, it was almost lifeless so far as the animals were concerned.

We put tape around some green stalks of field corn to identify them as having come from our experimental field. We mixed the experimental with control stalks and placed them in the feed lot for cattle and sheep. We watched as the animals munched away. It was immediately apparent which stalks they preferred, because after once sampling an experimental stalk, the animals would nuzzle and burrow in the pile to find another stalk, ignoring the control stalks until they had no other choice.

To prove further that animal instinct knows best, we treated a section of clover field covering about 100 square feet with sea solids. When the clover grew to about six inches, sheep were let out to graze. They walked and grazed until they came to the treated spot, then ate until the clover within the treated area was nubbed to the ground.

Feeding experiments with steers showed they had greater weight gain while eating less of the experimental feed. Farmers ought to appreciate that!

We used 306 freshly hatched chicks and designated 153 control and 153 experimental. The experimental group was fed a commercial concentrate and oats along with corn and soybeans grown on sea solids-treated soil. Control chicks were fed the same diet with the exception that all feed was grown on non-treated soil. At the end of six months, the experimental roosters weighed a full 1.5 pounds more than controls. Experimental hens laid eggs for the first time one month earlier than controls, and exhibited a phenomenon amazing to anyone familiar with laying hens-not a single experimental hen laid a pullet size or small egg! All the experimental eggs were of firm shell and large size. During one complete year of careful observation, experimental chickens exhibited perfect health, free from disease, and remained calm when approached by men. The controls were nervous when approached by the flock tender, exhibited disease such as slipped tendons and worms; and several died of unknown causes. None of the experimental chickens died.

Similar advantages of 40 foods grown with sea solids were seen in experiments with laboratory rats. Control rats showed less weight gain per pound of food and sustained definite eye disease. Experimental rats, on the other hand, exhibited sleek coats, were apparently immune to eye disease that afflicted the others, and showed a markedly uniform weight gain on less food. We then conducted

a similar experiment with mice bred to develop breast cancer, and the experimental mice failed to develop cancer and lived significantly longer.

Wow! You might exclaim. Why not sprinkle sea solids on our food and get healthy? It simply doesn't work that way. Anyone with a cursory knowledge of biology knows that humans and other animals cannot obtain any benefits from the elements unless they are hooked up with carbon atom by green plants. This is the explicit role of plant life on earth: to convert inorganic elements to organic compounds that can be utilized by animal life. Table salt is the only food we eat that is inorganic and, frankly, it isn't very good for us.

Sea energy agriculture-growing foods with sea solids as fertilizer-provides a means for improving our chemical intake without sacrificing our eating habits. Our meats, vegetables, fruits and cereals would all be adequately balanced with the essential elements simply by growing all crops with sea solids technology.

It has been shown by agronomists that soil may contain a large amount of one particular combination of elements that the plants cannot absorb. The presence or absence of a trace element can be the deciding factor in determining whether a necessary element is absorbed into the plant's root system. The balance of elements must be right in the soil for plants to synthesize their complete chemistry.

Tomatoes serve as an example of the need for this balance. Tomato growers know that potassium is an element with a major function in the plant's growth. Potassium is added to the soil in quantity by tomato growers. Yet the tomato itself has only a minor amount of potassium. My hydroponic experiments proved conclusively that only a small amount of potassium, as found in its proper balance in seawater, is needed to grow outstanding crops of unusually healthy tomatoes. It is unnecessary to fertilize heavily with one element or another if an adequate balance of elements is available for the plant's use.

Growing staple crops hydroponically in seawater solution has tremendous implications, especially for the starving millions in our world. One super advantage is that plants grown hydroponically require only about one-tenth the water that the same plants growing in soil require. The cost of hydroponic facilities becomes negligible when the exceptional productivity is considered.

Technical journals stress that the "long-term solution to the food crisis is development of new, productive crop hybrids and the spread of modern agricultural technology throughout the developing world," I shudder. Established experts harp or things like "pest control," better management of "fragile soils" and novel ideas for "storing water", but they turn a deaf ear toward sea solids technology, which provides all of these things naturally.

Aside from economic and productivity reasons, what are the implications for man if we are able to restore the chemical balance to our food? We can eliminate illness as we experience it today. I know that to many of you this sounds like a grandiose, unproved claim, but one must remember that we are only beginning to investigate this new agricultural technology.

During World War I (circa 1918) with high military standards for physical and mental fitness, 31 percent of all the young Americans called for induction into the armed forces were rejected as unfit. For World War II (circa 1943) the rejection rate was over 50 percent, so the standards were lowered to a point

below that of 1918. This lowering of standards lowered the rejection rate to 41 percent. During the period between 1948 and 1955, which included the Korean War, the physical and mental standards were lowered even more, yet the rejection rate of young men between ages eighteen and twenty-five climbed to 52 percent. More than half the young men of our nation who were called for military duty were rejected. How can we call ourselves "healthy"?

Any nation with a drug industry flourishing as well as ours certainly cannot claim good health!

CHAPTER 8: IN CONCLUSION

> "Every creative act involves . . . a new innocence of perception, liberated from the cataract of accepted belief." ***The Sleepwalkers* - Arthur Koestler**

Life on earth is divided into three major categories: plant, animal, and protista (organisms that display a combination of plant and animal characteristics). Of the roughly 1,250,000 life species almost three-fourths are animal with the remaining one-fourth made up of plants and protista. The sea, which covers 71% of the earth's surface, probably contains 90% of all life. This is true because of the extent of the sea surface and the fact that the sea averages two and one-fourth miles in depth, with some places measuring seven miles deep. Forms of life can be found throughout the ocean including the lowest regions, whereas life forms on land are generally found in the upper foot or so of soil. Even land birds and other flying animals must trace their food and life cycles to the soil.

When looking at ocean life, one is immediately impressed by the fact that in this 71%, of the earth's surface there is no cancer, hardening of the arteries, or arthritis. A whale carries around tons of fat and lives in an environment of salt solution, which makes one wonder if the medical advice of low salt and low fat diet is, indeed, justifiable. Ocean trout do not develop cancer, while a large percentage of fresh water trout over five years of age have cancer of the liver. It should be noted, however, that a few years ago an ocean trout was found with cancer of the liver. Its habitat was the mouth of the Columbia River where a quantity of carcinogenic chemicals had been poured. The fact remains that it is very difficult to find any species on land that does not have cancer, while animals living in the ocean are without cancer. Some animals, of course, are more resistant than others, but the reason for this is unknown. The guinea pig is one of the rodents most highly resistant to cancer. The toad is more resistant than the frog. The guinea pig and the toad keep their thymus gland throughout life, but whether or not this is the reason for their resistance is unproven.

As a university student, I became interested in these mysteries and decided that I would seek a reasonable explanation for the presence of malignant disease in fresh water and land animals as opposed to ocean animals. Much time and money were spent traveling, studying, and dissecting sea life. The study ranged from South America to the Pribilof Islands, and included whales and seals. In dissecting many of these animals, no malignant disease could be found; in fact, no tissue suspected of malignant disease was seen.

At this time it occurred to me that if there were some way to nourish land animals on food that contained all the essential elements, it should make a difference in their resistance to disease. Diet must be the secret. Ocean water contains a complete spectrum of elements, whereas soil and fresh water do not. Plants in the ocean can select any and all the elements they need to grow. In turn, ocean

animals feeding on these plants easily obtain their element requirements and thus better disease resistance. If ocean animals can establish their resistance through diet, I feel that land animals can also obtain this resistance if the food which they consume has been grown with all the necessary elements available.

To accomplish this end in the early days, seawater was trucked into the Midwest and applied to soil considered adequate for growing cereal grains. This, of course, was an expensive method of securing the complete range of elements from the sea, so we immediately began to look worldwide for natural locations, where the seawater becomes landlocked and total evaporation takes place. The largest deposits were found in Mexico, with others in countries of South America and some in Africa. This complete spectrum of elements from the sea we have designated sea solids, and when used hydroponically our method is labeled Seaponics.

We began using these complete sea solids in growing large quantities of cereal grains for feeding animals. Sea solids were applied at the rate of 1000 to 2,200 pounds per acre to half of the fields, while the control half received only the customary fertilizer. At harvest time corn smut, rust, and other cereal diseases were significantly reduced in the experimental fields. Disease resistance had been fixed in the plants by the use of this complete elemental diet. The next step was to see if the resistance could be transferred from plants to animals.

A first animal experiment was carried out on C3H mice which get spontaneous cancer of the breast. These cancers are most probably due to the so-called Bittner virus. We hoped that by using sea solids-grown food we could build resistance to the virus or cancer: The C3H mice were divided into two groups. The control group was fed on regular cereal grain, while the experimental group was fed cereal grain raised on sea solids-treated soil. The results showed that instead of getting spontaneous cancer in 90% of the animals as the control group did, the experimental animal figure dropped to 55%. The second generation born to parents fed on sea solids food produced cancer in only 2% of the population!

We also tried the special feed on transplanted malignancies (sarcoma) in rats. The sea solids-fed rats showed high resistance to the transplanted sarcoma. A transplant would die off most of the time, but occasionally it would take. After growing for a while it, too, would die off. This success occurred in over 90% of the animals treated with the sea solids-grown food.

Rous sarcoma was tested in chickens using the two kinds of food but we were unable to discover any difference in the death rate between those fed treated and untreated foods. This sarcoma kills in a hurry, sometimes within four days; and we felt that probably the physiology of the chickens was not changed enough in this short period of time to show any difference in this experiment.

Other animals were fed sea solids-grown food and did well. Dairy cattle were raised in this manner, but no statistics were kept as to production or quality of milk. However, it is interesting to note that if a bundle of corn stalks containing a mixture of sea solids-grown corn and untreated corn was offered to the cows, they would nuzzle through the bundle and always eat the sea solids-grown corn first.

These experiments were continued for three to five years. It was found that the bony structure of cattle and horses fed on sea solids grain was better. This was also true of chickens. Eggs of experimental chickens would be larger than those chickens fed on controlled food. The difference was evident from

four to six months of age. These experiments show that changes can be transferred from plants to animals.

In studying those human populations where malignancy is rare, it was found that the soil in which the food was grown contained all the essential elements for optimum growth. In other words, the soil appeared almost like a spectrum of sea solids. In these areas, for the most part, there is very little egress of water to the sea and the elements are usually washed down from the mountains and highlands into the valleys by rain or melting snow. These elements are not carried away by water, erosion, or by man. They remain to be utilized again and again.

We are not so fortunate in the United States and in most of the world. Daily we are losing elements due to loss of soil through erosion and population growth. It has been stated by good authority that a 120-acre farm passes the city of St. Louis every twelve hours. This, of course, is dissolved in the waters of the Mississippi River. When one thinks of the large rivers on earth, such as the Amazon or Euphrates, one realizes that the amount washed into the ocean is, indeed, impressive. To try to reclaim this material from the ocean must be a priority, and as time goes on, it will be even more imperative.

The encroachment of cities on agricultural land is also an important factor to consider when thinking of the land available for the production of food for humanity. This invasion of arable land multiplies the need for some sort of reclamation procedure to obtain more land for food production and more food from that land.

There are several avenues available to us to reclaim and improve our soil and food production. Each choice is dependent upon the amount and condition of the soil and the need and availability of food.

The first avenue is to use sea solids on the remaining agricultural land. Sea solids return to the soil elements lost through over-cropping and generally poor cropping techniques. Past experiments indicate that the amount of food produced with the sea solids is generally increased. The plant can grow at its full potential, and production is not reduced due to disease. More importantly, the food produced is a better quality. Double-blind taste tests show that foods raised with sea solids were rated better tasting than foods raised without sea solids. Past experiments also indicate that sea solids can improve disease resistance in plants and that these plants can in turn increase disease resistance in the animals that consume the plants.

The second way is to substitute hydroponics for land where the soil is completely incapable of food production. One can produce ten to fifty times the amount of food per surface area in hydroponics than can be grown on soil. This is especially important in areas that have little or no arable land and large populations to feed. Since nature uses 71% of the earth's surface for hydroponic growth, it does not seem too farfetched to consider growing much of our edible food in this manner. In hydroponic culture, one adds nitrogen and phosphorus to complete sea solids. In soil culture, this does not have to be done, because the application of sea solids promotes the growth of azotobacter (or nitrogen-fixing bacteria), and there is enough potassium and enough phosphorus in the ocean water if one gets the complete sea solids. There is more nitrogen fixation in the ocean than in any place on land, and, of course, this is due to the fact that the ocean elements are ideal media for azotobacter nitrogen-fixing bacteria.

The third avenue is to rebuild soil that is incapable of production. Just adding sea solids to sand will not make the sand more productive. There is nothing in the sand to prevent the sea solids from being

washed away when water is added. Some soils are too hard for plant roots to grow in, and still other soils hold too much moisture and smother a plant. In all the examples, it is the condition of the soil that affects its productivity. To return the soil to its proper physical condition, organic farming has to be reintroduced, or in many cases introduced.

Today, the organic farmer is more concerned with what is in the fertilizer bag than what is absent. Commercial fertilizers generally contain nitrogen, phosphorus, and potassium, plus a few microelements. Many elements needed by a plant are not returned to the soil by chemical fertilizers. On the other hand, in organic farming, many elements are replaced if the unused portion of the plant is returned and allowed to decompose to its inorganic elements. In addition, the organic farmer is also concerned with the undisclosed content of the commercial fertilizer. A bag of 10-10-10 commercial fertilizer by volume contains 70% of some unknown material. This material may contain substances that can build up in the soil and eventually make it useless.

Today's organic farmer knows his chemistry and realizes that plant fertilizer must be broken down into its inorganic elements before it can be utilized by plants. The organic farmer realizes that the giant commercial farmer, specializing in one type of crop and using only commercial fertilizer, is destroying the soil's ability to produce food. If this process continues, the soil itself will be ruined and lost through erosion. To prevent this and reclaim soil already destroyed, organic farming methods must be utilized.

It should be noted that the three avenues can be employed in combination. Sea solids can be used in the soil and in hydroponics. Hydroponics can be used in areas with poor soil conditions, and the unused portion of plants produced hydroponically can then be returned to the exhausted soil to help build it up again. Soil structure can definitely be rebuilt through the application of organic farming methods.

At one time the soil and the oceans were probably very similar in elemental content. Through the centuries, increased populations have put a strain on agriculture to keep up with the demand. This has led to a farming technology that tries to increase production on the reduced amount of available soil, with an inferior product as a result. Plant diseases are more prevalent than ever before and modern agriculture's answer is to manipulate a plant genetically to produce more and to be resistant to disease.

But in this process, it appears we are losing something. Food quality and taste have declined. Diseases not seen earlier in humans are developing, while others long known to man continue to increase. Some diseases thought to be controlled or extinct are reappearing. Yet the oceans don't seem to have these problems. Even on land different people in different areas of the earth have lived longer and are healthier than the rest of us. Why? The answer would appear to be diet. Not what we eat so much as what elements are in what we eat.

In order for man to continue to live on earth, he must make some fundamental changes. He must look to the oceans of the world as a source of needed elements. These elements must be returned to the soil so that better quality and more healthful foods can be produced. Man must stop the destruction of the soil. This will require basic changes in our agricultural system. The large commercial farms will probably have to be broken up and smaller regional farms using organic methods will take their place. Most importantly, the population growth of the world that has pressured our agricultural system to its present state must be controlled. The population of the earth must be stabilized or all our efforts will

be for naught. As the agricultural system changes, hydroponics can help take up the slack so as to prevent mass food shortages and starvation.

We have the means and ability to make these changes. We need now only the desire.