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Down to Earth

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ABOUT THE AUTHOR

Dr. John I. Mosher, was raised on a 200 acre diversified farm in central New York State and also worked as a ranch hand in Colorado. Before entering active duty with the United States Navy he completed a Bachelor of Arts Degree at Hobart College, Geneva, New York. Later he went on to complete a Master's Degree from Western State College of Colorado, Gunnison and the Ph.D. from Utah State University. He is a member of the biology faculty at State University of New York, Brockport and has been lecturer and senior research fellow at University of Manchester, England. He has studied the environment formally and informally all of his life. He lives with his wife Constance and four children in rural upstate New York.
DOWN TO EARTH

by

John I. Mosher

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PREFACE

This book is intended to provide some basic information and viewpoints which will help individuals grow in awareness.

Some years ago it occurred to me as an ecologist, that I should translate the basics of what I had learned from my research and formal theoretical scientific education in ecology as well as my more casual environmental education, into language and examples to which most everyone could relate. This thought became a desire which manifested itself in a basic "applied" ecology course called Ecological Life Styles. From the experience gained in teaching this course for several years, mainly to non-science oriented students, this book arose.

The real importance of this effort is not only translating and solving some of the semantic problems but to encourage people to change their life style to one more consistent with ecological principles.

I see the basic principles of ecology as tools not to be kept hidden from use, but to educate with and to help dispel ignorance. I also see these same principles of life being taught by the great masters. In most cases the semantics are different from modern scientific ecological jargon but that is only a matter of language, not truth. Truth is useful only if it can be understood, related to, and applied. As language barriers evaporate and consciousness raises it is obvious that scientist, sage and religion are all saying the same. It is hoped that those reading this book will transcend a limited view of themselves, life and environment, to a holistic, orderly view of life. Realization of the unity which underlies the diversity of life will aid each individual in realizing that he or she is an integral part of the natural scheme.

The essays, examples, and information which I share with you are, admittedly, for the most part very simplistic, general and limited by space and time. However, I believe it important to share with you at least a portion of what scientists, philosophers, sages and farm boys have discovered about life, something that you can use as a start in the adventure of gaining greater awareness of yourself and the world with which you are one.

Life is to enjoy! It is in the full sunshine of knowledge of one's self that one understands life. Not to know one's self is not to know one's place in Creation. It is in this darkness of ignorance that hate, fear, disease and all negativity arise to keep one from enjoying the love which is expressed throughout Creation. It is only through ignorance of one's true nature that disharmony and negativity arise and keep us from enjoying the beauty, abundance, and happiness which abounds throughout all of Creation.

It is my hope that this little book will bring the dawn of understanding so that all will BEGIN TO SEE!

Love-Learn-Enjoy!
CONTENTS

World Peace
From peaceful individuals 1

The Inner Life of Humans
Growth toward the good life 2

An Ecological Perspective
Interrelatedness of all 3

Message from the Eagles
What happens to animals happens to man 4

Those Who Have Eyes Let Them See
Learning from nature 5

An Unnecessary Evil
Safe energy 6

A Simple View
Evolution and the support of nature 6

Ignorance Can Be Dangerous
Understanding the cycle of life 7

A Drawing of A Simple Ecosystem 8

Soil: The Wealth of a Nation
Soil is a direct factor in health 9

Reading the Signs
Understanding causes of soil problems 11

Ecology, Religion and Science
Living ecology 12

Mother's Classroom in the Woods
Pollution as a blockage of energy-nutrient flow 13

A Lesson Not to be Forgotten
Ecological succession 14

Fire, Deer and Blueberries
Order not chaos, eco-succession 16

You Can Fool Yourself, But Not Mother Nature
Cooperating with nature, not fighting it 17

Lawn Garden or Climax
A perspective on property maintenance 18

To Rake or Not to Rake
The benefits of leaves 18

Behavior, Ecology and Populations
Predator-prey relations 18

Energy Again 20

Wolf's Vindication
A look at predation 20
"If a man has not order within him, he cannot spread order about him." - Confucius (551-479 B.C.)

World peace depends upon the peace within the individual. A peaceful family is one made up of peaceful individuals or individuals at peace with themselves. Peaceful communities are comprised of peaceful families. Peaceful states and provinces are populated with peaceful communities. Peaceful nations are made up of states or provinces at peace, and, a peaceful world is one whose nations are at peace.

Happy, healthy, enlightened people do not make war! At the present time peace may seem "...a distant goal sought by experts at international conferences; it is also a simple state achieved by ordinary people out on a picnic." World peace depends on respecting one's self. With self respect comes the realization that you have as much right to be on this planet as trees, flowers, animals and other humans. "I am the only person that fools me into believing I am less of a person than I am," stated J.R. Walt. If one does not believe in one's own personal worth, one is easily caught up in the competition for status, money, and prestige. History has shown us that being caught in such competition, because of our ignorance, our unenlightened view of ourselves and our life, leads to disrespect for other peoples and cultures and, is at the base of all human woes.

"...We have blinded ourselves to the endlessly renewable plenty all around us while devouring the subterranean resources of the land. Our behavior has resembled the panic of a drowning man who might float quite safely if he weren't convinced that he must struggle in order to survive... A society that is harmonious and stable because it is founded on the self-renewing balance of the universe is based not on ignorance which produces greed and fear, but on justice and love...

"...The more self-reliant we are, the more we feel the creative energy that flows between heaven and earth flowing through us, and the more we are moved to share that love with others. Peace is not unity imposed on top of essentially conflicting desires, but the recognition of one origin behind our diversity, like sunlight in a field of flowers. World peace is built every day, as more of us refuse to depend on either experts or servants, but bend to scrub our own floors, say our own prayers, and shine our shoes, setting them down neatly, side by side, as an example for our children and our children's children." 2

What is the formula for becoming a peaceful person at peace within one's self? Some say that being peaceful is largely due to heredity, early childhood environment, nutrition, local climate and innumerable other conditions. However, most of these factors are outside factors which seem largely out of our individual control. So there is the temptation to throw up one's hands in despair and say it's all chance. Some people are lucky and are born into the "right environment" to the "right" parents and they have peace and are peaceful. I would not agree with this fatalistic attitude. I believe there is a pattern in the life-style of peaceful people which is not based on factors entirely out of an individual's personal control.

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1 Sherman Goldman, editor of East West Journal, 233 Harvard St., Brookline, Massachusetts 02146

2 Ibid.
Some of the most peaceful people I have observed are those who work on the land, be they farmer or home gardener. In working on the land one must comply with the ancient cycles of nature. Great patience is required and competition is not encouraged. Cooperation, not competition is the guiding philosophy of those enlightened in the ways of nature. Other peaceful people I have observed are those interested in natural living. These people avoid foods, drinks and practices which are potentially harmful to their health. They emphasize nutrition and clean living and usually seek natural healing methods if they become ill. However, the most universal group of peaceful people I have noted are those sincerely seeking union with God. Some call this self-realization or working toward bringing one's self into harmony with God. When such a union is achieved there is no difference between the will of God and the will of the individual. When this level of consciousness is reached there is the "great silence", the great peace within. This all pervading inner peace shines out and the person is not only completely peaceful, but radiates order, peace and harmony. So, if I were asked to suggest a formula for becoming peaceful within and without, based upon my personal observations and experience, I would simply repeat the words of Jesus, "Seek ye first the kingdom of heaven and all else will be added unto you."

There are many approaches or techniques that a seeker of peace can learn to help find the "kingdom within". Some techniques require the seeker to spend long arduous years of self-denial and discipline. Other techniques fit in very well with the busy life many lead in our society. What is most important is to seek out a method in which you feel comfortable, which produces results and, consistently improves your health, inner peace and happiness. The technique I have found most satisfying to me in all ways is the Transcendental Meditation (T.M.) technique as taught by Maharishi Mahesh Yogi and described in Dr. Harold Bloomfield's book Happiness: Peace be with you!

**THE INNER LIFE OF HUMANS**

To add daily to one's mental and emotional equipment—that is living the good life.
To be in touch with that which nourishes the spirit—poetry, music, literature, religion. To become daily more wise, more poised, more proficient, more patient, better natured, better adjusted, better able to stand aside and see oneself go by—that is the good life. author unknown

Ideally all religions and/or techniques for inner growth should produce the "good life" as outlined in the preceding quotation. "In God we trust" is stamped on American coinage. Freedom of religion is guaranteed us by our Constitution, and many Americans attend religious functions regularly. This fact to me seems incongruous with the high crime rate, poor health and polluted environment which we also have here in America today. Apparently there is something missing in our understanding and living of our spiritual teachings. If this were not so, more Americans would be living the "good life" and this growth toward higher awareness would be reflected in our external environment.

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Harold H. Bloomfield, M.D., & Robert B. Kory, Happiness
The Supreme Being, The Creator, The Infinite Spirit, are all terms used in referring to the Omnipotent, Omnipresent, Omniscient Energy we may refer to as God. Many believe God to be distant from them, as some kind of super parent or authority there to reward or punish. This attitude can only serve to produce fear and obscure God's revelation through natural cosmic law. Our neighbors, the plants and animals, should also be seen as manifesting the infinite love and intelligence of God and treated with the love and respect due a handiwork of our Creator.

We should always remember the essence of that so well stated by Meher Baba:

1. God does not exist for one form or one religion. ...All forms and religions exist for God. It is not correct to look upon the one reality as being intended solely for any one manifestation of itself. It is more accurate to look upon each and every manifestation as being intended for the one reality.

The inner life of a person is reflected in their outer life. Therefore to change the outer life, it is necessary to change the inner life. Many from various faiths and religions and those from no faith nor religion have found the T.M. technique the key to improving their inner life, therefore improving their outer life.

What lies behind us and what lies before us are tiny matters compared to what lies within us. Emerson

AN ECOLOGICAL PERSPECTIVE

The sun was shining but there was still a little coolness in the spring air. I enjoyed the smell of wet forest soil and the scent of lodgepole pines here in the high country of Utah. As I sat there on a large boulder enjoying the vibrant life around me, my thoughts drifted to the life of the famous naturalist of the 1890's, John Muir. John Muir once made the statement, "When we try to pick out anything by itself, we find it hitched to everything else in the Universe." This statement has stayed with me even into the wilds of the college lecture hall and has been a guide to me in realizing the larger aspects of ecological studies.

Present day environmental researchers are continuously compiling data which supports that which was obvious to John Muir, Aldo Leopold, and the pre-colonial native Americans. Everything is interrelated and what affects one part of the environment eventually affects the whole.

Dr. Eugene Odum, a well known ecologist, has presented in his text book examples in which research has shed light on some startling environmental subtleties revealing unsuspected interrelationships. One which I find particularly interesting is that which occurred at Great South Bay, Long Island, New York. Large duck farms were established along the tributaries leading into the bay. The duck manure caused fertilization of these waters

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and subsequently there was an enormous increase of the phytoplankton. A little known phytoplankton organism (of the genera Nannochloris and Stichococcus) population increased immensely. The oysters of that area, which had been thriving for years on a diet of normal phytoplankton, were unable to utilize the new phytoplankton organism as food. Oysters were found starving to death with a full stomach of undigested "new" phytoplankton. Therefore, the oyster population in that area decreased dramatically. When first observations were made that the oyster population of Great South Bay, Long Island, was decreasing, it was not associated with the increase and establishment of duck farms. What do duck farms have to do with oyster populations?

What do alligator pocketbooks and shoes have to do with the bird and game fish populations in the Florida Everglades? Another ecological detective story indicates that such items made from alligator hides have a great deal to do with the Everglades ecology. The alligator digs holes which store water during droughts and thus provide a sanctuary for the survival of birds and other animals during the drought. The alligator also keeps waterways open and preserves game fish by eating large numbers of predator fish such as the gar. A reduction in the number of alligators, by hunting them for their hides, directly affects the survival of birds and animals which are also vital to the Everglades ecosystem, which in turn is vital to the ecological balance in Florida.

These are but two examples of the numerous subtle relationships which have been discovered by extensive ecological research. But when all is said and done and the years of arduous research by ecologists have been compiled, it adds up to the simple statement made by John Muir those many years ago, about the interrelatedness of all. We all must keep in mind that our actions do count and may have far reaching, profound influences throughout the universe. What you do does matter! How you live does make a difference!

MESSAGE FROM THE EAGLES

AH! OOOEEE!—YEAH! I could hear the rustle of the dancers outside the building before they burst through the door of the Longhouse. It was a cold winter evening on the Ho-de-no-so-ne (Iroquois) reservation in New York State. The dancers, dressed in bear skins with false faces and carrying turtle rattles, were a colorful reminder to me at that New Year's ceremony of the culture of the precolonial native Americans. Their daily way of life, their religion, their entire culture reflected their awareness of the interrelatedness of all life. Their ceremonies such as this New Year's celebration especially focused on the commencement of a new cycle of life. Life is a gift of the Creator, and all life is to be respected. In the poetic words of Chief Seattle (a chief of the Dzamish Tribe of the Pacific Northwest, circa 1850), "We are part of the earth and it is part of us. ... What ever befalls the earth, befalls the sons of the earth. ... Whatever happens to the beasts soon happens to man." We all know this but act as if we did not know it. Medical researchers use animals extensively because they believe what they do to animals will give them information on what will happen to humans under the same drug or conditions. Miners have recognized this for ages. It is this recognition that encouraged them to take caged canaries down into the mines with them. They knew that if the bird, more sensitive to poisonous mine gasses than they, became ill or unconscious, then the same would happen to.
the miners unless they left the mine. Recent day studies of
birds of prey has indicated a rather disturbing decline in their
numbers. Upon further investigation, it was discovered that the
egg shell of these birds was so thin it could not withstand incubation. The setting parent would unavoidably break the
egg shell and the embryo within would die. It was discovered that the pollutants in the environment, especially pesticides
taken in by animals upon which the birds preyed, were stored in
the bird's body and affected egg shell formation. Some researchers believed that it was through studying the decline of birds of
prey such as eagles and peregrine falcons, that possible long
term effects of environmental contaminants on humans was first
realized. Again the wisdom of Chief Seattle's words, "What happens
to the animals will happen to the human". Humans cannot live
without animals. Yet, the list of endangered species and those
becoming extinct, lengths every year. We are not like the
miner. We cannot simply leave the mine when the birds die, we
must change our behavior so the environment will again be safe
for man and beast. We must develop an environmental consciousness
and treat the environment as it is a part of us. Our life depends
upon it! We must change from exploiters to stewards, and take
care of this beautiful rich land on which we depend and live.

THOSE WHO HAVE EYES LET THEM SEE

The breeze sighing through the pines had lulled me into a
quiet transcendent state. Suddenly I was aroused by the loud
"chickadee-dee-dee" call of the black-capped chickadee. I was
in the woods doing a study on the behavior and ecology of chickadee
flocks. As I made my observations, a quotation I had read by
Johann Christoph Friedrich von Schiller, an eighteenth century
German poet and dramatist, came to my mind, "Never does nature
say one thing and wisdom another." The whole woods in which I
was doing my study shouted this to me. As long as man did not
interfere, the cycles of life following natural law continued
as in ages past. Schiller's statement focuses our attention
again to take a look at nature because nature expresses natural
law. What happens in nature is a guide to the functioning of
natural law. Looking toward nature for advice in using our
technology might be illustrated in the case of generating elec­
tricity. Most any school student knows that electricity can be
generated by using the force of moving water or wind. Either of
these two methods of electric generation are not going to ex­
tensively pollute, poison or disrupt the environment. The wind
blows naturally and the water flows down rivers and streams whether
we intervene with a generator or not. Thus we are simply using
to our advantage, natural occurrences. We are not making an
intrusion on nature. We are not adding a poison to the cycles
of life. However, if we use a substance as an energy source
which puts something into the natural ecosystem which cannot
readily be broken down, assimilated and reused by the life in
that system, but indeed may even cause parts or all of the natural
system of recycling to be destroyed, then we are not working within
the natural frame work which has evolved in that locality.

1 Cornell University Ornithological Research Station, Ithaca, N.Y.
It seems unthinkable to a true ecologist or any rational person that any group of humans could even consider using a source of energy that potentially could kill ecosystems, including their human components, and retain such a vile ability for the next 240,000 years. This of course is what waste products from nuclear power plants could do. There are numerous safe ways to solve any energy problems we have, some of which are referred to in this book. The first step is energy conservation and environmental education.

According to the Science Council of Canada, improving the efficiency of present energy use by two per cent can save more energy between now and the year 2000 than nuclear sources can produce in the same period, without any major shift in lifestyles. Science Council releases indicate that “produces energy at one tenth the dollar cost of large scale development schemes such as nuclear.” Along with energy conservation full scale development of non-nuclear sources for generating electricity should be given first priority. Decentralized generating plants should take advantage of local conditions, e.g. tides, rivers, streams, wind, hydrogen production, thermal, photovoltaic, etc. and establish generating plants utilizing these natural resources of that particular locale. The criteria for such generating plants would be they do not pollute nor disrupt local ecosystems. However, they should take advantage of the local environment’s capability for naturally generating electricity. Whether in sunny deserts or windy plains, natural elements can be harnessed to generate electricity safely without long term hazards. Such methods do work and have been used by individuals for years. But, it is well known that power companies do not look with favor upon any plan which might compete with them or cause them to lose some of their control. Special interest groups who would not quickly profit by ecologically sound methods of generating electricity are probably one of the major factors holding back the rapid development and extensive use of alternatives to fossil fuels and nuclear power. Any technology or deviation from that which has evolved without human technical intervention should be given the test as to whether it can or cannot fit into the existing cycles of life without destroying them. Oftentimes, as we’ve seen in the past, an unharmonious approach to producing energy or using some new technological development is employed because of expediency in profit making. Does the proposed development fit into existing ecosystems causing no energy blockages in the system or doesn’t it? This should always be of highest priority in considering the use of any new technology, land use, dam building, etc.

A SIMPLE VIEW

The sun streamed through my friend’s window as I watched him tack up a quotation by the Indian Sage Maharishi Mahesh Yogi. Printed there on the newly displayed poster were these thought provoking words, “All that is true and real is always simple, natural and life supporting.” All of nature seems to reflect the wisdom of this quotation. Although ecosystems seem very complex, they can be understood in terms of their simplicity. As I learn more and grow in my own consciousness, I appreciate more and more the

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wisdom of this simple, yet profound statement. It seems that as
more is learned about Creation, complex theories are exchanged for
basically simpler ones. Even now geologists such as Stephen Jay
Gould are questioning Darwin's ideas that evolution happened gradu­
ally, and giving argument that evolution occurred more as an "ex­
losion, not ascent." This view seems to me to be more in line with
the mythological and religious view of Creation. Even present theo­
ries concerning Creation of our solar system show very uncomplex
beginnings. The term "vacuum state", as used in theoretical physics,
is roughly defined as a state of least excitability. In this state
there is all potential, unmanifested. Apparently from the void or
vacuum state of outer space our solar system manifested by the evol­
ution of helium and hydrogen atoms. What could be more simple than
this. This new creation coming about as an impulse of nature and
manifesting and evolving into the planets and myriad of life forms
which we find here on earth. Only that which is supported by
natural law has remained. Extinction does occur as a normal part
of natural selection, which is the foundation of evolution. It
is the nature of life to progress, evolve and grow but always in a
way consistent with natural law. In a sense we do not have to
concern ourselves with anything we do, because the laws of nature
will operate and support only that which is consistent with those
laws. If humans violate the laws to the extent that our continua­
tion of this violation is not life supporting over the long run, then
we will become extinct. It is instructive to think about the fact
that we need plants and animals, but they do not need us. I
cannot think of one naturally occurring ecosystem in which the human
component is an absolute necessity. On the other hand, the human
does not exist without the support of nature nor without a pro­
perly functioning ecosystem, at least not for very long. Again
Maharishi's quotation emphasizes the need to evaluate our activity,
style of living, value system and indeed culture in the light
of natural order.

Jesus told us basically the same thing when he stated
"by their fruits shall ye know them." What are the fruits of our
actions? If there is any question at all, then re-examination and
a comparison with what nature is saying is necessary.

IGNORANCE CAN BE DANGEROUS

Environmental education at all levels is one of the keys to
moving a culture toward that which is harmonious with nature, thus
avoiding extinction. If every citizen was truly aware of the essence
of the following quotations and understood the basic principles
illustrated in figure one, "A Drawing of a Simple Ecosystem", and
applied this awareness to his lifestyle, our environmental problems
would commence to evaporate. Such understanding and application
would be a very big step in preserving our environment and ourselves.

"This science of relationships is called ecology,
but what we call it matters nothing. The question
is, does the educated citizen know he is only a cog
in an ecological mechanism? That if he will work
with that mechanism his mental wealth and his material
wealth can expand indefinitely? But that if he
refuses to work with it, it will ultimately grind
him to dust? If education does not teach us these 2
things, then what is education for?" Aldo Leopold

1 S.J. Gould is professor of geology at Harvard University, and
author of the book Ever Since Darwin.
2 Aldo Leopold, A Sand County Almanac, Sierra Club/Ballantine
A DRAWING OF A SIMPLE ECOSYSTEM

VEGETARIAN
Direct use of plants for human food instead of eating animals. Therefore avoiding the energy lost by eating meat. Less expensive eating closer to the sun.

PLANTS
Using the energy of the sun to make food.

HERBIVORE
Animals eating plants

released nutrients for use by growing plants.

SCAVENgers & DECOMPOSERS
Micro & macro organisms breaking down dead plant & animal material returning it to the soil releasing it for use by plant roots as nutrients. Encourage these creatures and use them in waste management e.g. composting

Meat Eating
Expensive protein source.

CARNIVORE
Animal eating animals. Protect predators to maintain population balance in the wild.
Nature provides no written text on her laws. She only smiles or frowns faintly on her subjects, and whispers softly in approval or disapproval of their conduct. Her disciplines seem very mild, even to the most careful observer, but in the long run, continued obedience to her laws leads slowly to great abundance and continued violation of her laws ends in desolation. (Author unknown)

Figure one illustrates a very simple food chain. If one looks to nature one finds that basic recycling occurs as illustrated in this oversimplified diagram. But in actuality it is not so simple. There is a complexity of interrelationships in every environment which, if sorted out and drawn on paper, would end in an illustration of lines going in all directions, hopelessly obscuring the paper and the information it was intended to convey. However, this drawing may be quite useful in providing the layperson with a basic idea of energy sources, how energy flows and where the cheapest energy is. As one can see upon examination of the drawing, the cheapest energy is that closest to the sun. With each step that energy must flow through there is a loss and therefore not as much available to the next level. Green plants are most efficient because they stay in one place, take energy directly from the sun and use this energy to make food for their own growth, reproduction and storage. Animals and people who eat plants are next most efficient because they do not have to chase the plant, they simply use their energy to move from one plant food source to the next, the energy they gain from the plants (or second-hand sun energy) is used for growth, movement, all metabolic processes, and reproduction. The animals and people that eat other animals are farthest from the original source and have the least amount of energy available to them. This is reflected by the fact that their populations are smaller than plant eaters upon which they feed. The meat eaters also must expend more energy to capture their food. We can see the costliness of meat eating among humans. To buy meat requires more money (representing energy) than to buy or grow plants for food. The book, Diet for a Small Planet, by F. M. Lappe, does an excellent job of providing information about the environmental impact of our eating habits.

What was the human designed to eat? Close examination of the human, especially the digestive tract, reveals that the human anatomy and physiology most closely resembles that of the great apes. It is well known that the great apes are primarily fruit and tender leaf eaters. It is clear to see, by such a comparison that evolution has stamped the human primarily a vegetarian with limited omnivorous ability at best. Therefore, not only is it better for the environment for humans to eat closer to the sun, as Ms. Lappe suggests, but better for the human as mother nature suggests.

SOIL: THE WEALTH OF A NATION

Rape is a word I have heard applied by some to what is happening to our land as a result of the petro-chemical farming practices now most prevalent. Rather than getting caught up in emotionally laden words, let's try to apply some basic ecological thought to agriculture. Using substances in agriculture and home gardening which will inhibit or destroy the natural processes carried on in soil ecosystems can be looked upon as polluting and should not be done.
In some cases chemical sprays and fertilizers used in gardening and farming initially appear to increase crop production and eliminate plant and insect pests, at least over the short term view. However, there is now evidence that such substances interfere with and even destroy the soil ecosystem thus preventing normal decomposition of organic matter, e.g. crop residue in the soil, thus slowing down or inhibiting normal biological turn-over. This in turn locks substances much needed by plants in the soil: therefore, such nutrients are not available to plants. If plants do not have these substances, such as trace elements, minerals etc., they are not healthy. If people and/or animals eating these plants do not obtain these substances then they too are not healthy. Therefore, any substance which interferes with the natural cycles of life such as mentioned should not be used, even though there appears to be a short term higher production or financial advantage. In the long run results will be disastrous to soil, plant, animal and human. If humus in the soil is depleted, crop production will decrease in quantity and quality. The expense to raise future crops will become astronomical. If soil is to be rebuilt, it takes time and, during this time production of human food on that soil is minimized. Therefore, the long term consequences of using an expedient to increase profit and crop production which inhibits and/or destroys natural soil ecosystems should be avoided at all costs.

Robert Rodale in an article noted an advertisement by a pesticide company. The advertisement stated that "Every year American farmers plant over one billion acres of crops, but each year over 40%-almost 500 million acres is destroyed by pest insects. Our crop losses, in terms of acrage, equal the combined area of Texas, California, Oregon, Washington and Idaho." Rodale further states that he doesn't consider a 40% crop loss good advertisement for the petro-chemical method of farming. There is not 40% of the land in the United States organically farmed, but only about one percent. The 500 million acres lost were not those farmed organically, but ones heavily sprayed, costing farmers in money, time and exposure to deadly substances.

I personally know of ecologically operated (organic farms) ranging in size from 70 acres to over 1,000 which use no petro-chemical fertilizers or pesticides with little crop damage. One of the large farms is ranked in the top five percent of highest producing farms in the United States.

Recent studies of "organic farming" in the United States and Europe by the United States Department of Agriculture are providing amazing information which is beginning to dissolve the myth that pesticides, weed killers, and petro-chemical fertilizers are necessary for high crop production. It is better for the human and the environment to operate the farm and/or garden as a managed ecosystem and not as a "trade".

"Those deer and woodchucks have nibbled on about two rows of our beans," my father was saying as he and I stood at the end of the bean rows near the woods. It was a fresh sunny morning in early July 1943. I can recall my father making comments on the limited damage that deer and woodchucks occasionally inflicted on our crops. However, I cannot recall hearing my father comment on insect damage. Nor can I remember my father using poisons on his fields. At the time all this meant nothing to me, but years later when it became common to use commercially manufactured fertilizers, I began to hear a lot from farmers about insect damage. Nature will tell very quickly if a method of farming is harmonious with her laws or not, but you must be able to read the signs. Now it is clear to me that exploiting the humus using substances which resulted in amazing plant growth and production was not harmonious. Why? Because the signs are there to read, the signs of increased insect damage and problems with weeds. The insect is a predator and, like most predators, seems to be attracted to the weak. Even though the plants looked healthy to the human eye, the insect could tell that this was not the case. Soil which is out of balance (and using anything which decreases the humus and adversely affects the soil ecosystem can unbalance the soil) produces unhealthy plants. Although such plants may be larger than the average for that variety and have a higher production, the nutrient quality may not be as high, and extensive insect attack and plant disease will be the sign to tell us all is not well. What looks good to the human eye and pocket books, may not be good for human health. If plants suffer disease and general attack by insects then something is wrong! The problem is not permanently solved by killing the pest insects, as chemical farmers well know. The insect is only a symptom of the problem and not the cause. There is considerable evidence among those practicing biological gardening or eco-agriculture which indicates the major causes for unusual insect problems and plant disease problems. All are related to the imbalance of the soil ecosystem. Again illustrating the necessity of thinking in terms of the basic, simple drawing presented in figure one on page 8, and looking for causes. Does the type of ecosystem management interfere with the flow of energy and cycling of nutrients in the environment or will it fit in and become another viable component of the ecosystem? This is the question always to be asked. A poison is a poison and is not to be introduced into the ecosystem, be it the environmental ecosystem or the internal ecosystem of the human body. The following quotation from the book Findhorn Garden, expresses to me a more rational attitude toward the human relationship with the plant kingdom, than does the philosophy expressed in the actions of agri-bizz.

Love and communion, ... help you to manifest things in harmony with all who are involved. If the kingdoms of nature see that your love is greater than your anxiety for food, then in honor of the God we all serve, they will pour their cooperative energies into the manifestation of all that you need, not always in terms of size or amount but always in the greater values of quality, the quality of life that, coming from God, is the ultimate nourishment.

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The well known biologist and environmentalist, Barry Commoner, in his book, The Closing Circle, summed up an awareness that we must have at all levels with his "Four Laws of Ecology:"

1. Everything is connected to everything else;
2. Everything must go somewhere;
3. Nature knows best;
4. There is no such thing as a free lunch.

ECOLOGY, RELIGION AND SCIENCE

Not only the modern day scientists are talking and writing about how we must integrate our activities with natural law, but every major religion with which I am familiar, including religions and cultures of native peoples living in remote areas close to nature, teaches ecology. At first the layperson may not recognize this. But if one carefully examines the laws, taboos, and teachings of ancient cultures and religions (from which our modern religions have sprung) and native cultures and religions still intact, the environmental teachings are there. The Essene Gospel of Peace from the Aramaic and Old Slavonic text preserved by Nestorian priests provides us with some of the teachings of Jesus as recorded by John. These teachings on which modern Christianity is based are what we would call today, principles of ecology. That is, how to live harmoniously with your environment and yourself.

The pre-colonial Native American religious-cultures have some amazing similarities in their teachings to the teachings of Jesus as recorded by John in the Aramaic language almost 2,000 years ago. In these Aramaic-Old Slavonic texts Jesus speaks of "Mother Earth" and that we are her children. The pre-colonial Native American cultures lived by the teachings that the earth and life upon the earth should be respected. Some tribes would not even dig a hole in the ground because they had such respect for "Mother Earth" and would not pierce her bosom. Pre-colonial Native Americans were well known for their conservative lifestyles. In their day-to-day living they would take plant or animal life only when necessary and then only that which was needed. Often times the taking of plant or animals by these Americans would involve a ceremony asking permission to take the creature and giving thanks for it. It was a usual practice when taking herbs to leave something behind as a token of thanks and appreciation to "the herb tribe." This practice may seem superfluous or even silly to those of modern western culture, but it certainly served to focus the native's attention on what they were doing and where their necessities came from, as well as engendering respect. In reviewing information recorded in diaries of early missionaries, travelers, and explorers and by examining the traditions of native peoples themselves, one is aware that these peoples were a model for the saying "waste not, want not" and to show the human functioning as a harmonious component of the ecosystem. These Native Americans were taught from childhood that to love the Creator was to love and respect Creation. This was not an empty teaching reserved for religious ceremonies, but one which

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3 Hyemeyohsts Storm, Seven Arrows, (Ballantine Books, N.Y. 1978) pp 373

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was lived every day as a part of their culture and personal lifestyle. The end result of living these teachings was to live harmoniously within the laws of nature, functioning as a part of the ecosystem and not interfering in any way with the normal cycles of life. The fruits of this life style certainly were good. The first European explorers came to the United States and found a beautiful, bountiful land, rich in every way. It abounded in clean air, fertile soil, clean water, game animals, forests and all that is necessary for the good life. Great treasures under the earth provided all that was necessary for enormous industries which today threaten the very life of this earth.

The European colonists who came to this country also had religious teachings which, if understood and practiced, would have had the same benefit to the environment that the Native American teachings had. In the religions of these settlers calling themselves Christians, it is taught "Thou shalt love the Lord thy God with all thy heart, and with all thy soul, and with all thy mind. This is the first and great commandment. And the second is like unto it; Thou shalt love thy neighbour as thyself." Is this saying the same thing as the Native Americans' teachings to love the Creator and to love and respect Creation? In Christianity is not God considered to be the Creator and are not our neighbors, the plants, rocks, air, water, animals, our fellow humans? If indeed we lived these commandments, as the pre-colonial Native Americans lived their teachings, we would not have the environmental problems of today. The famous Indian leader Mahatma Gandhi made the statement that "there is enough in the world for everyone's need, but not enough for everyone's greed." There is a quotation from the Veda writings of India which states "Knowledge is structured in consciousness. Is it that we lack consciousness to understand and apply the teachings to love God and Creation? If one truly loves the Creator and Creation as oneself, then it is not possible to destroy oneself nor Creation. No rational, sane person seeks consciously to destroy himself. In view of the fact that humankind depends solely on the Creator and Creation for life, then it is not rational nor logical to destroy that Creation-Environment upon which we depend. How many people realize their health problems are symptoms of destruction of the environment? We are part of the environment, and Creation: as we destroy it we destroy ourselves. As we sow so shall we reap. We cannot sow poison and reap purity and life!

MOTHER'S CLASS ROOM IN THE WOODS

I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach and not, when I came to die, discover that I had not lived. Henry David Thoreau

As I read this work by Thoreau, I wondered, how many have "gone to the woods" or to the wilderness to learn about life? Having spent a good many years myself in Mother Nature's class rooms, I understand the rightly placed value on this type of education. One day while in the woods I began thinking about pollution. "Why are man's cities polluted and not the city of creatures I was now visiting," I thought. "What is pollution anyway?" As I looked around at the leaves, and twigs and general

4 The Book of Common Prayer of The Episcopal Church in America,p.69
litter I knew all of this forest floor litter was destined to become rich humus which would nourish the present plants and animals as well as their descendents. It was all life promoting, all of the waste products of the natural communities were life supporting, and were part of the eternal cycles which renew life. My thoughts came back to my original question, "What is pollution?" I thought, "Pollution is simply that which interferes with that which is life supporting, or any substances or actions which causes breaks in the ecosystem, be it the environmental ecosystem (outside of the body) or the ecosystem within the body." What is important to realize is that any activity that interferes with proper functioning of the environmental ecosystem or the ecosystem of the human body causes sickness. Illness indicates an imbalance and the cause of this imbalance must be discovered so that it can be corrected. The flow of energy must not be interrupted. If it is, then some portion of the whole suffers and ultimately the whole suffers. It was there in Mother Nature's class room I learned that real knowledge is whole knowledge and the knowledge that views all of life holistically and gives one the perspective with which to become whole.

A LESSON NOT TO BE FORGOTTEN

On a lazy autumn afternoon, I drove past a place I had once known. A leafy smell drifted to me through the open window from the wooded area I was passing. Could it be the same place where once a field of weeds and bushes grew? Thoughts of the past came to me and I remembered that time long ago when it was weeds and bushes. Many years ago the owner of that property was telling me of the expense it had been to him to keep cutting the shrubs and young trees which continuously sprang up in that field. I recalled asking him why he went to the trouble and expense. He replied that it was because he and his wife liked to be able to see down the road around the bend. As the trees grew they obstructed this view. "Oh," I replied, thinking, "Should I tell him about ecological succession?" I did not tell him and the man and his wife have long since gone from that place.

Nature, long suffering and enduring, has fulfilled the law. The one time field is now wooded. What has happened is, in the language of ecologists, called ecological succession. Ecological succession is a series of changes in plant and animal communities which an environment might evolve through. The purpose of this short term, relatively rapid evolution (which may take a few years to several hundred years) at a specific geographical location seems to be the environment's way of reaching a dynamic equilibrium. That is, to come to a state of the most efficient use of the sun's energy falling on that place, as well as the other local physical conditions at that point in time, including topography and weather conditions. Each stage in this evolution is called a seral community which refers to the series a location might pass through while moving to a state of relative equilibrium-a state referred to by ecologists as climax. Climax stage is that point at which existing plant and animal communities will remain much the same as long as conditions, weather, etc., remain the same. Evolution, however, is an impulse of nature and as we can see from the fossil record, climaxs also change over geologic time. For it is the nature of life to progress, evolve and grow.

When succession occurs on land it is called a xerosere. When the succession commences from bare rock, it is called primary succession, because there is no existing soil. When the successional series starts on substrate which has soil it is referred to as secondary succession. A classical example of primary xerosere succession in the northeastern United States is as follows:
on newly exposed rocky surface lichens commence to grow, comprising 
the pioneer seral community. Lichens in turn catch dust and 
contribute to soil-making by their own life activities, producing 
debris and a habitat for other plant and animal creatures. Event-
tually conditions become favorable for mosses and other small 
plants. The activities of the new plants speed the soil forming 
process. This new series of plants can support more and larger 
fauna peculiar to the habitat it provides. As more soil is formed, 
various herbaceous plants (soft stemmed) gain a hold and further 
modify the habitat providing conditions suitable for woody plants.

By this time pioneer plants such as lichens and some mosses 
are being shaded and crowded out and their bodies feed the newly 
forming soil. The waste products and debris from all organisms in 
the habitat add to soil formation. The soil is the wealth of the 
environment. As the soil builds it can support more plants and 
animals, which hold more energy from the sun in that environment, 
and in turn the activities of this life add more soil.

Therefore, over a long period of time, deep rich soil is 
formed. With the increase in the amount and richness of soil, 
more and varied vegetation and animal life can be supported. 
This process of change in plant and animal communities will continue 
at that location until climax is reached. The most stable 
community which can be supported in that location, under the 
existing conditions at that point in time has now been reached. 
A typical climax community in the area south of Lake Ontario in 
New York State on the clay soil substrate is the beech, maple, 
hemlock climax, so named because the dominant or most numerous 
types of trees found in that relatively stable community are 
beech, maple and hemlock. In dryer, sandier soil of this area 
a climax of oak and hickory may be found.

Knowing this basic concept of ecological succession, one can 
begin to comprehend some of nature's laws. Understanding these 
natural occurrences, i.e., succession and climax, is of great 
value to farmers. The farmer who understands this can plan his 
activities in such a manner that they work with this tendency 
of nature to evolve. As we saw in primary succession the natural 
impulse was to build soil. Any farmer knows if a field is left 
fallow, vegetation in that field will change. So in farming, 
the farmer through exerting energy, keeps his fields at a seral 
community most beneficial to his livelihood. Because of this he 
must also ensure that soil is being built. The fact that he is 
taking crops from the land to sell elsewhere means that he must 
compensate for this loss and return the equivalent or more to the 
soil. By doing this he is cooperating with the environment and 
his activities are approximating that which would go on in nature.

For example, in nature if one observes a forest, it will be 
noted that plants and animals if left undisturbed will use the 
soil in the forest, returning their waste products to the forest 
floor, including their body when they die, and therefore nour-
ishing and building the soil. The farmer must take this lesson 
seriously and copy nature. A selfish attitude will not do, we 
must give back to the soil from which we have taken.

By giving back to the soil all of the human, plant, and 
animal organic waste we are building topsoil and humus. This 
layer, which is the loose organic part of the soil, is necessary for 
plant roots and the micro and macro organisms which comprise the 
soil ecosystem. The Humus layer, is often called the living part 
of the soil. Chemical farming mines and depletes the humus, there-
fore gradually reducing the soil's fertility.
To be healthy, plants must have a healthy environment for their roots. There is an important relationship between plant root and the life in the soil. Many nutrients necessary for healthy plants may be present in the soil, but can only be made available to plants by the activities of life in the soil, especially that around plant roots. Again the farmer and gardener must copy nature to insure that soil friability is maintained and humus is not depleted. Otherwise, if the grower does not farm or garden in a way which maintains and/or increases the humus content of soil, a cycle is started which is the reverse of ecological succession, that is one which uses up or mines soil rather than building it. There is no need to fight and control, just a need to understand and cooperate with natural law—

A LESSON NOT TO BE FORGOTTEN! As humus is depleted there is a tendency for plants which formed earlier seral communities to become prevalent as weeds. Weeds can be used as indicators of the condition of the soil 1.

Weeds are there because the soil, through mismanagement, has become imbalanced and is no longer at its original stage in ecological succession. There are many instances indicating that Native American peoples used ecological succession to their advantage. The laws of nature have not changed since their time even though fashions in agriculture have.

FIRE, DEER AND BLUEBERRIES

There is something about a pleasant summer's day, with azure skies, white puffy clouds and the scent of new mown hay in the air that invites me to lie in the grass and watch moving clouds overhead. It was during one of those ideal times that my thoughts wandered to various past conversations and lectures in which speakers had alluded to the chaos in nature, or how chaotic and little sense life made.

I was puzzled by such statements because it seemed to me that there is a very dependable orderly course that nature follows. Occasionally it may seem temporarily disrupted through unwise human actions, but universal laws always operate. Ecological succession, I believe, demonstrates this orderliness quite well. If a forest is cut down, there is an orderly succession of plants and animal communities which appear until the relatively stable climax community of the forest is again in place. Each seral community in this succession has plants and animals peculiar to that stage. This is so predictable that ecologists call certain plants and animals index plants and animals. By this they mean when these creatures are present they indicate the stage in succession of that environment. Those not conscious of such order do not have the knowledge or awareness to see the orderly predictability of nature and therefore say that all is chaos.

There is a certain kind of habitat suitable to particular types of animals, and when that habitat is available one usually finds the animal present. For example, if there is garbage, or food left unprotected in a city, there is going to be rats. Cities have spent millions on rat eradication, and still have rats. The money would be better spent in eliminating the conditions necessary to support rats. If there is no food and no habitat for a particular kind of plant or animal, then one is not likely to find that plant or animal present.

On the other hand, if there is the necessary food and habitat conditions for a particular animal or plant, then you are very likely to find it. Common sense, one may say, but this orderly predictable fact is still overlooked by many who are directly involved in working with the environment.

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1 E.E. Pfeiffer, Weeds and What They Tell, Bio-Dynamic Farming & Gardening Association (Box 253, Wyoming, Rhode Island 02898) 16
An illustration of the 18th-19th century Native Americans' understanding of ecological succession is pointed up in the following story. Early settlers around the Cape Cod area of Massachusetts noticed from time to time over the years there were great fires on the Cape. They could not understand how such fires were started. Settlers were even more puzzled when they discovered that the natives inhabiting the Cape were purposely starting these fires. This made no sense at first to the settlers. Why would anyone burn their own habitat? Oh, yes, of course sometimes farmers would burn over old fields occasionally to get rid of some of the weeds and/or plant debris from harvest, but to burn a whole area was just not comprehensible.

It was then discovered that the natives depended a great deal on deer and blueberries. The deer of that area were browsers preferring brushy country, not mature climax forest. Blueberries need sun and cannot tolerate a lot of shade from tall forest trees. In fact deer and blueberries represent one of the seral communities or stages in succession toward climax community in the Cape Cod area. By burning the area occasionally, the succession never went beyond the seral community best suited for deer and blueberry bushes. Actually the inhabitants of Cape Cod were providing the conditions which caused the deer-blueberry community to be the highest seral community which could exist in that environment under those conditions at that time. Therefore in that sense, it was an edaphic climax community. Without the burning, the area of course would evolve beyond the bushy seral community to a forest climax community.

The Cape Cod area was not being appreciably harmed by burning, just being managed and held at a particular stage in ecological succession most convenient to the human inhabitants at that time.

YOU CAN FOOL YOURSELF, BUT NOT MOTHER NATURE

"Here he comes over the ridge, look at those four horses pull that plow!" We were visiting an Amish farm in the spring and watching one of the sons turn over rich earth with the horse drawn plow. As I listened to the creak of the harness and the jingle of the tug chains, my thoughts flew back almost three decades, to the sound and smell of working horses, back to a time when a good farmer took pride in the richness of the soil.

The capable and skilled farmers incorporated the element of management, rather than environmental exploitation. Most farmers in the 1930's to 1940's used crop rotation and also put their organic farm waste back on the land. The present day Old Order Mennonites and Amish farmers farm this way. Their method works with nature, as is demonstrated by the fact that Amish buy farms worn out by exploitive farming (methods which mine the soil rather than feed and build it) and in about five years build up the soil by biological farming, again having productive land.

What is important to remember is "there is no such thing as a free lunch". Cheap petroleum fooled us into thinking we could control nature or were outside the laws that govern our other non-human neighbors. Petroleum is no substitute for common sense nor for cooperating with the laws that govern Creation.
It takes energy to hold an area at a particular seral community short of climax. The Cape Cod inhabitants in the 18th and 19th century used the energy of fire. A modern suburban dweller uses gas and oil to keep his lot at the grass stage of succession. It is amazing when one thinks of the time, energy and natural resources expended in the United States each year just to maintain short grass on residential and institutional property. In terms of ecology, and energy conservation, it would make more sense to have a garden plot, or grazing animals.

Yes, one would expend energy, hopefully one's personal energy. But, one would be rewarded by the satisfaction of growing one's own edible plants and beautiful flowers: one would save some money on groceries; one would produce fresh, untreated, ripe food which would feed oneself and, the physical labor would keep one's body in good condition. A far cry from the riding-lawn-mower-approach to property maintenance.

If one did not choose to convert one's entire lawn into a vegetable garden, he could find what the natural climax vegetation is for his area. Then find the appropriate plants and plant them on his property. This way he would not have to continuously expend energy to hold back succession. He would encourage climax vegetation and therefore promote the stable plant community for his area.

**TO RAKE OR NOT TO RAKE?**

Cheering from the football field reached my ears that bright autumn afternoon. The smell of burning leaves was in the air and I was there raking leaves instead of cheering the home team on to victory. I had to work in my spare time to help pay my college expenses. But this work gave me the opportunity to think. I thought of the money and energy expended on raking leaves, and the loss in humus to the lawn or garden when they were burned. I really did not understand why people wanted their leaves raked. Nature never rakes leaves. The leaves fall and protect the ground around the trees through winter. Often they provide enough insulation so that many soil organisms remain at least partially active in soil building during winter months. Eventually the leaves are broken down (earthworms feed on leaves and leaf mold and are largely responsible for turning leaves into soil) and become part of the soil. It amazes me to see people rake their leaves, and burn or throw them away. Then in spring they go to a garden store and purchase peat moss and fertilizers for their lawn and garden, when all they would need to do is to leave them where they fall or compost them with their kitchen scraps and have a natural fertilizer in the spring. Recycling leaves this way is good not only for the environment, but also good for the pocketbook.

**BEHAVIOR, ECOLOGY AND POPULATIONS**

Population dynamics is another aspect of understanding how nature works and maintains proper balances of the various kinds of plants and animals. Ecologists generally define a population as groups of individuals of any one kind of organism. Ecologists also speak of communities or biotic communities. The term "community" as used by ecologists, refers to all of the populations occupying a given area. For example, the community of a woods might be comprised of populations of earthworms, birds, deer, ferns, wildflowers, trees, etc. The size of a population of any one organism depends on numerous factors, ranging from the amount of
suitable living space, food supply and biotic potential (reproductive capacity) to the resistance the environment has to the increase in numbers of that organism. Generally speaking, the smaller the organism, the larger the population of that type of creature. Insects are more numerous than frogs; there are more frogs than snakes; more grass than rabbits; and, more rabbits than foxes. The prey species, e.g. the frog, is more numerous than its predator, the snake.

To illustrate a very simplistic example of population regulation, the grass-rabbit-fox relationship can serve. As the grass population increases providing abundant food, the rabbit population increases. As the rabbit population increases, its predator, the fox, increases in numbers. However, there is a lag between the increase of the rabbit population and increase in the fox population. The rabbit under ideal conditions might have as many as 4 litters per year of 5 young per litter, while foxes produce only a few young each year. By the time the rabbit population has reached numbers which exceed or nearly exceed the capacity of that environment, the fox population is still far below a number which would make any significant impact on the excessive rabbit population. The high rabbit population, however, already is on the decrease because of dwindling food resources. Factors such as stress and reduced habitat also lower fertility and survival of the excess rabbit population. The stress of too many of their own kind in a given area, also the competition for food, shelter and mates causes stress in animals and they are weakened and die. The fox population, however, is beginning to increase, and take larger numbers of rabbits, therefore hastening the reduction in rabbits. As the drop in the rabbit population continues fewer foxes can be sustained, so the fox population eventually declines. One can see that in this case predation by foxes was not the primary factor in reducing the rabbit population.

Wildlife populations research has led some population ecologists to view the predator's function as not primarily one of reducing the numbers of a prey population, but actually doing that population a service in taking out diseased and weak individuals. By doing this, more food and space are left for healthy members which will contribute to the reproduction of the species.

The real population control seemed to come from within the rabbit population itself (intrinsic factors). The stimuli which brings these factors into operation are those which produce stress on rabbits, and is largely caused by a reduction in available energy (food) to the rabbits, as well as living space, and just too many of its own kind in a limited area. From this imbalance in the population, imbalances were brought about in the individual rabbit by stress. In nature there does not appear to be an entirely homoeostatic condition, at least it is not recognizable in some aspects of population ecology studies. Change and evolution is the norm and what we might call a balance in nature or a homoeostatic condition at best is more of a dynamic equilibrium.

There are many ramifications to the topic of population ecology. This brief section on populations is only a superficial glimpse of one aspect of the regulation of animal numbers. Be aware that there are many variations on this theme—as there are on the theme of life itself!
Populations of organisms tend to increase when more energy becomes available to that population. Our modern day so-called, "human population explosion", can be traced to a previously untapped energy source becoming available. This was in the form of petroleum. Although we do not, for the most part, directly eat petroleum, the energy it supplies enables humans to produce more food with a smaller labor force. In pre-mechanized agriculture a farmer with horse and a simple plow might expect to plow one acre of land per day. Within the last few years farm equipment has been produced which is operated by one farmer and can plow over 40 acres per day. This of course means more land can be put under cultivation by fewer farmers. The energy available to run the machines (petroleum) indirectly allows higher food production, thus more energy available to the human population.

But this "energy intensive" method of farming is very costly in terms of fossil energy expended. It has been estimated that in the United States chemical agriculture expends about 3.6 calories of energy to get 1 calorie of energy back as human food. In Mexico, a more "labor intensive" type agriculture expends about 1 calorie of energy to get 12.5 calories back as food 1. Anyone can see which is more efficient in terms of return on energy invested. When more energy becomes available to the human population it reacts as any other population, it reproduces more of its own kind. We are also seeing, with this increased population, greater pollution and a higher level of stress among people. Studies done in the past by demographic economists have shown a direct relationship between economic conditions and the birth rate. The birth rate apparently drops when the economic conditions are not favorable. Economics seems to be an effective population control, at least in some western countries.

WOLF'S VINDICATION

In Farley Mowat's engaging book, Never Cry Wolf, a good perspective is given on the functions of predation. Mr. Mowat presents the wolf as nature's agent for culling out weak and diseased members of caribou herds and keeping down the small rodent population. Studies by other biologists examining wolf kills, find that invariably the animal taken by the wolf was infirm or not in top notch health and most likely would not have survived harsh environmental conditions much longer 2. The view taken by many on such predation is the predator culled out those that perhaps would not have survived a harsh winter, but before their demise would have eaten enough food from the winter range to impair the survival, in good condition, of healthier members of the population. By the predator keeping numbers of unhealthy individuals down in a population, that population is left with more space and food for healthy members. Therefore, the predator performs a function beneficial to the species by culling out the weaker and leaving strong healthy animals to reproduce.

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A. Murie, The wolves of Mt. McKinley, U.S. National Park Service no. 5, 1944, pp 238
INSECTS: THE WOLVES OF THE PLANT WORLD?

The same principle of predator-prey relationship that was discussed concerning the wolf and its prey seems to be in operation between plants and their predators. J.I. Rodale, founder of Organic Gardening Magazine, observed that unhealthy plants were the ones subject to disease and insect attack. He made the comment in an interview that his observations led him to believe insects which are garden pests seem to have a preference for "sick plant tissue". He cited many cases where one plant might be infested with pest insects and the plant of the same kind next to it remained untouched by these pests.

Others, especially in biological agriculture, have made similar observations. I have observed this in my own garden. I have noticed plants which were damaged in their early growth or in some other way were not strong, attract insects, whereas their healthy neighbors are untouched. Gardeners and farmers employing the Bio-Dynamic, a system concentrating on soil building and balance and using an ecosystem approach to growing, method of agriculture have observed that providing a balanced soil, tends to produce balanced, healthy plants. They have noticed, as have I in my own gardening experience, that as the soil improves, the incidence of insect attack and plant disease diminishes. Healthy plants have minimal insect damage and the use of dangerous pesticides is unnecessary. The Bio-Dynamic approach to plant growing seems to recognize what has been found in studies of predator-prey relationships in higher animals such as was previously mentioned. That is, the predator attacks the unhealthy individual in a population.

To the farmer or gardener this would mean he should work toward balancing the soil to produce healthy living soil and therefore produce healthy plants. Concentration should be on the basic problem, poor soil, rather than on the obvious symptom of insect attack and disease. Of course the presence of pest insects or diseased plants is easy to see and this is all too often where attention is placed. We focus on death, killing and fighting the pest or disease, rather than on encouraging life and understanding why the pest is there. By eliminating the reason(s) for the pest's existence in the field or garden we minimize or eliminate the pest.

Another advantage to the farmer or gardener who understands some basics of population dynamics, is that of recognizing the need to not only feed the soil so it will provide a living balanced ecosystem for the plant root, but also to provide conditions which will encourage the presence of pest predators. Hedge rows are very valuable for nesting birds which take large numbers of pest insects, especially during the nesting season when they are feeding not only themselves but also their young. These wild patches also provide a place for toads to hide and predatory insects such as lady bugs and mantids to reproduce undisturbed by human activity.

Many growers today are using predatory insects to control their pest insect problems as they work towards balancing their soil. Pest insects have also been controlled by infecting them with diseases harmful to the pest but not to beneficial insects, animals or humans.

1 Rodale Press Film, "A visit with J.I. Rodale", from Emmaus, Pa.
The behavior peculiarities of pest insects are also used in controlling their population in crop growing areas. A system of companion plantings have been found effective in repelling or otherwise discouraging the presence of pest insects in crops.

A well known example of applying this method to pest control is that of planting French marigolds among beans. French marigolds seem to repel the bean beetle. Bush beans planted near potatoes control the Colorado potato beetle. Other companions found useful are petunias, sage, and dill among cabbage: chives, nasturtiums, stinging nettles and parsley among tomatoes, and the list goes on. There are a few excellent books on companion planting. This system is not foolproof, and may have varying results depending on condition of soil and other local variables. Some experimentation by each individual gardener or farmer is necessary. It seems reasonable that one who wishes to do as little environmental damage as possible should take the time to find and to utilize the biological approach which best suits their particular situation. Think life, not death; think cooperation, not fighting, struggling and competing. Balance the soil, use pest predators, use companion plants, use natural biological sprays, and conduct your garden or farm as an ecosystem and not as a trade. If your experience is like that of the many who have worked with nature on 10' X 10' garden plots to 1,000 acre farms, you will be rewarded with better health, rich balanced soil and a healthy environment in which to live.

THE WORMS KNOW

"Where are the birds?" asked a friend of mine, as he and I watched a big modern diesel tractor pull a plow that would have taken at least 12 draft horses to move through the earth. We walked over to the land being plowed. We watched the huge tractor move back and forth. "The birds come for the worms", I said. "That's right", replied my friend, "but where are the worms?" We both searched the newly turned furrow without finding a single worm. We both looked at each other in wonder. "Remember", we both spoke at once, "when we were children and used to follow our father's plow and see the hundreds of worms the plow exposed"? There were always lots of birds, especially gulls, around at plowing time. But now there is nothing to attract the birds. As we looked down at the furrow with no worms and the hard un-crumbling soil thrown into a ridge by the plow, we knew the soil was dead. There was not enough organic matter in the soil and too much pesticides and other chemicals to support worm life. I thought, "What an upside down way we run our waste disposal in this country". Streams, rivers and landfills are choked with organic waste and the farm land is starving for organic substance. The very organic substances which are pollutants when concentrated by towns, cities and cattle feeder lots, are the life of the soil and the wealth of a nation when put back on the land. In a natural community waste from the organisms living in the community does not pollute. There really is no waste disposal problem. The habitat of the community is not littered with dead bodies of animals or dead plants. It is not smelly nor waist deep in waste products of the organisms living in that community. Why? Because over the evolutionary history of that community, organisms have been attracted to the food which the community produces for its kind. What is waste to one organism is a niche or livelihood to another. Leaves that trees drop in autumn

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contain many of the metabolic waste products of the tree in a form no longer of use to the tree. When leaves are dropped the tree is rid of these waste products which have been stored in the leaves. However, left to nature the leaves provide food for many organisms.

Mold that grows on dead leaves is using the leaf for food and in turn is itself food for earthworms. As the leaf and leaf mold is ingested by the earthworm it is digested. The waste passing from the body of the earthworm (castings) is made up of the digested leaf mold, leaf and other organic material and minerals. These castings are rich in microlife, nitrogen, trace elements and minerals vital to a balanced soil ecosystem. The balanced soil is vital to the life and health of trees and other plants.

So in a sense there are no waste products in nature, just a flow of energy and nutrients. As energy becomes unavailable to one type of organism, its new form is a food to another organism. This process gives some hint in understanding the reason for great diversity of plants and animals. The more diversity, the greater the efficiency with which energy and nutrients can flow through the environment. Finally through the action of the great diversity of life the one time waste product comes full cycle in its transformation back to a source of food or other substance of value to the existence of the organism which originally generated that waste.

When human activity poisons organisms and reduces the diversity of life, it also reduces the efficiency of the ecosystem, which in turn lowers plant and animal production in that environment. Ultimately "what happens to the beasts happens to the human." This example of recycling in nature very simply traces a basic pattern of energy flowing through an environment.

Many people in our society are ignorant of the vital part in recycling waste that worms and various bugs play. I've seen people kill worms, toads, frogs, snakes, spiders, trees, and an assortment of other plants and animals because they fear or are ignorant of their function or are disgusted by such organisms. They are really killing a part of themselves. This of course is a result basically of their ignorance in not knowing about these organisms and the vital role they play in human survival. They do not realize that the environment can get along much better without the human than it can without the worm or tree.

Thus through fear or ignorance humans may destroy the very forms of life which aid in the energy flow-recycling in their ecosystem. Again this illustrates the environmental wisdom woven into the statements of "love thy neighbor as thyself," and "show love for the Creator by loving the Creation." If you love and respect something you certainly do not think of killing it. So we come back to the basic commandments as originally lived by the Native Americans and stated in the world's great religions, that of loving God and all of God's Creation! We should also remember as we sow, so shall we reap. We cannot inflict pain and death on other creatures without being repaid in like coin.

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Think of the problems of human waste disposal which would be solved if we simply copied nature and recycled everything. A simple illustration of how a change in thinking from getting rid of something we do not want, to thinking in terms of how we can recycle or return to nature what we no longer can use, can make a great difference. Getting rid of, usually implies throwing away, almost in any manner which will get the waste product out of sight and therefore out of mind. Our road sides are a constant reminder of this attitude. The throwaway container easily pitched out of car windows and quickly left behind, out of sight therefore out of mind, epitomizes the disposal philosophy. Unfortunately our society has carried too much of this simplistic philosophy of waste disposal into large scale waste handling systems of towns and cities. The very term waste disposal reflects this philosophy. Perhaps a change of thinking to waste management for recycling would cause a revision of the philosophy toward a more positive attitude for returning our byproducts to nature.

A VOTE FOR THE WOODSY SMELL

It was a gray overcast day and the early spring chill seemed to penetrate the body regardless of the amount of warm clothing one might wear. The students from my ecology class shifted from one foot to the other, commenting on the all-pervading smell. I thought, "Why a centralized sewage treatment plant? Surely the smell of a woods is more agreeable than what we are all experiencing here." Over the years I have come to realize that very few people know or care about how the byproducts they generate from every day living are dealt with. What happens to the human metabolic byproducts once they are voided from the body? What happens to the papers, bottles, cans, and kitchen scraps once they are placed in the garbage cans?

In the case of human waste it usually goes through a treatment plant such as the one our ecology class visited. There the solids are settled out and sent to a digesting unit, and the liquid portion, which is mostly water from the flush toilet is sprayed into the atmosphere, falling back on filtration beds of rocks and sand. This water is then treated with chlorine (another poison) and piped into some convenient stream, river, lake or ocean. The digested solids are usually put into land fills.

There are a few localities that put this rich solid material immediately back into the ecosystem, by spreading it in forest, farm land or other appropriate areas. There is a lot of nitrogen in the liquid waste water which goes into streams and lakes. The highly enriched water acts as a fertilizer and causes a dramatic increase in water plant growth as well as adding many undesirable substances to the water. In many cases industries dump their liquid waste containing heavy metals into the sewer system or stream. All too often the local water supply comes from the very streams and lakes into which the "sewer streams" flow. Some localities use fossil fuel to burn their solid waste, thus using up a precious non-renewable source of energy as well as polluting the air and robbing the soil of its organic return. All these methods which I have mentioned are common approaches used in the "disposal" philosophy of dealing with the byproducts of the human body and our American way of life.
Under the waste management philosophy there are more creative and more ecologically sound ways available to process our waste products. So far they have gained only limited popularity mainly because they are new (it takes time to get used to a new way of doing something) and initially it would be costly to change. Also, many local ordinances would have to be changed.

For the sake of illustration let's look at the idea of composting garbage. All the organic residue from cooking and eating, including uneaten table scraps, we call garbage. Garbage disposal is a very big problem in many localities of the United States. Yet, in nature this same garbage produced by left overs from the meals of animals, is the very stuff that enriches the soil ecosystem, which in turn promotes more plant production and is a vital part of ecological succession. Nature composts all organic waste. Why should not cities follow this simple waste recycling process which has contributed to the richness of America?

Composting garbage is something that could be done on an individual basis in any locality. For example, there are groups in many cities promoting community gardening within city limits. Such gardens are made from vacant neighborhood lots, rooftops, or any other space suitable for growing plants. Garbage from households of a neighborhood could be composted, and the compost in turn used to enrich the garden soil. Rats and smell are no problem if people are taught to compost properly and strictly follow these procedures.

A large volume of garbage when completely composted produces a comparatively small amount of soil. I have composted in the winter time using a 30 gallon drum. We, a family of six, using mainly unprocessed foods, producing considerable amounts of parings and kitchen scraps, have never filled up the 30 gallon drum in a winter. Why? Because hundreds of pounds of garbage we produce is continuously acted upon and broken down by worms and microorganisms, which constantly reduce it in volume. What in terms of garbage might fill a small truck (about 48 cu.ft.) when composted produces about 20 gallons or approximately 12 cu.ft. of compost. This means you could have a 20'x20' community garden and by using the compost generated by 200 families of six per family or 1,200 people be able to spread about six inches of compost on the plot each year. In one garden season this compost would be thoroughly incorporated into the soil and be virtually unnoticeable to a casual observer.

A city of one million people would need only an equivalent of eight acres of garden space spread throughout the city to take care of all the city's garbage. Of course the compost could also be used in parks, flower beds, around trees or even sold to farmers, greenhouse operators or gardeners needing more compost than they can produce.

All people in a town or city are not going to be interested in composting and gardening. For those non-gardening people the same garbage pick-up could be used as is now prevalent in most localities. However, it would be necessary for the people to separate the waste into paper, glass, metal and garbage. By doing this the municipality could compost the garbage as is done by many commercial composters.

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1 Institute for Local Self-Reliance, 1717 18th St., NW., Washington, D.C. 20009
2 Fletcher Sims, Jr., R.R.#1, Canyon, Texas 79015 is but one of the many professional composters. He also teaches large scale composting.
The compost could then be sold to gardeners and farmers to regain for the city budget the cost of waste collection. Of course the city could also sell the paper, glass and metal for recycling and gain additional income to defray city expenses. Such an operation might even lower taxes! The waste management approach is already in operation in the city of Davis, California. Davis has mandatory newspaper recycling and trash separation. It sells the recyclable glass, metals and paper for over $3,000.00 per month, this money defrays about half the cost of trash collection costs as well as using ecologically sound waste management procedures.

WATERLESS AND RIGHT

Returning human body waste to the ecosystem is a more controversial topic than composting garbage. Many local and state health departments claim that there could be danger from pathogenic organisms if composting toilets were used. This is an opinion and has not been proven. In nature pathogenic organisms seem to be kept in check by other "anti-pathogenic" organisms found in the soil. In a balanced soil there is the same system of checks and balances which was discussed in the brief presentation on population ecology, that is internal (intrinsic) and external (extrinsic) factors regulating natural populations. It is interesting to note that one of the early "antibiotics", Aureomycin, makes use of an organism isolated from the soil ecosystem. It functions as an "anti-pathogen" in the soil and keeps populations of potentially harmful microbes in check. The question of pathogens being spread by using composted human waste is one which to my knowledge has not been conclusively resolved. However, there is research being conducted. The Syracuse University College of Forestry at Syracuse, New York is one of the places carrying on investigations in the occurrence of pathogens in human waste composted by the Clivus Multrum which is a waterless composting toilet of Swedish design. This unit composts household garbage and human wastes much as such wastes are broken down in a natural soil ecosystem. The Farrallones Institute of Occidental, California is also experimenting with composting and Solar pasturization of human waste.

A PLEASANT SURPRISE

I stood in the basement of a house with a composting toilet looking at the composting unit of their Clivus Multrum. The unit had been in use for over a year. My curiosity was moving my hand toward the handle on the inspection lid. At the same time some memories of the "colorful" odors of past country outhouses I had known, with all due respect to Chic Sales*, came to mind. With full anticipation of renewing my acquaintance with the notorious odors, I lifted the door. To the great SURPRISE of my nose, only a pleasant woodsy odor issued forth. I could hardly believe my nose and eyes. I saw the waste mixed in with other soil-like material, but I only smelled the pleasant odor experienced on a walk through the woods. I was overjoyed to think that a non-flush soil-producing toilet, costing about the same as a septic system, virtually trouble free, requiring no energy, was actually coming into use. The result of using this system is, that at the end of two years of usage by a family of

Invented by Rikard Lindstrom over 30 years ago, and has been in use in Sweden for about the same time span. Available from Clivus Multrum USA, Abby Rockefeller, Cambridge, Massachusetts.

* Chic Sales author of the humorous book The Specialist, well known to old time country folk, on the construction, merits, etc. of the privy.
four, the humus is shoveled out of a special door as odorless soil. The amount of soil this two year usage produces ranges between 15 to 25 cubic feet (approximate estimation). This of course would be good for enriching your lawn, trees, or garden. Some prefer to use composted human waste only on above ground crops such as corn, tomatoes, or grains, and would not use it on root crops such as carrots, beets, or potatoes. I know of no evidence to indicate that thoroughly composted human waste would be harmful to humans if used on crops grown under the ground. Of course if such vegetables were cooked before consumption there should be no danger from pathogenic organisms.

**INSIGHTS INTO CHANGE**

The wind was blowing a mighty gale and low clouds moved rapidly across the face of the sun. I watched a tree flex and change positions before the wind. With each gust the tree would bend and then straighten as the wind momentarily subsided. I heard that various people had made use of the movement of the trees to pump water. Although I have never seen the technique in operation I can believe that it is possible to harness this energy. Change is of great use in nature. It can produce energy; it can promote evolution; and, as in the case of the flexing tree, prevent destruction. Meaningful change can be of great value. In a natural ecosystem stability is based on change (consider ecological succession). There is an ancient changeless rhythm of the days, with climatic and seasonal variations. There are the daily cycles and changes such as day, night and tides. There are seasonal changes brought about by the position of the sun, moon and other celestial bodies. Even though there are changes, there is the stability of the rhythm of the cycles. Some cycles are relatively short, such as day and night, some quite long involving immense periods of time incomprehensible to most people. Change is necessary to maintain a balance, creating a dynamic equilibrium. Throughout a natural ecosystem one sees change. In the north eastern United States this can be observed through the dramatic changes in the seasons. The forest ecosystem in the summer is quite different from that of spring, autumn and winter in the same forest. With each season there comes a change. Yet, there is stability, there is order in the ecosystem through growth, birth, death, immigration, emigration and evolution. These changes promote the most efficient utilization of the available space and energy in that location, under those conditions at that point in time. Through the fossil record we have discovered change. This record provides us with perspective in geologic time which gives us insight into a larger change called evolution. Change, I believe, tells us a secret of nature. It is an impulse of nature which causes energies to progress, evolve, and grow. The energies move in cycles from unmanifested energy to the manifested back again to the unmanifested or vacuum state, still retaining the template for the highest evolution obtained in the previous cycle. Thus subsequently manifesting more advanced forms than were manifested in the last cycle. Yes, meaningful, orderly change seems necessary for life.

**THE ECOSYSTEM WITHIN**

The pine bough brushed against me bringing my awareness back from the beautiful snow capped Wellsville Peak to the reality of the tree I was sitting under. It was a warm sunny spring day in Cache Valley, Utah, and very pleasant to be studying on the beautiful front lawn of the Utah State University campus. I had been reading in a text on endocrinology before my vicarious journey to the highest peak of the Wellsville Range. My thoughts had been on how the systems of the human body seem to obey the same laws as the systems of plants and animals, and populations in the external environment.
Later when I was teaching a course in human physiology, the functioning of the basic principles of ecology through the human internal environment seemed undeniable. This probably was my first conscious realization of what is now called a holistic approach to understanding living systems. With this perspective I found order and a larger understanding of life. I also found the ecological approach to studying and understanding the workings of the internal human environment exciting. It is my opinion that no physician can practice effectively without a feeling for an ecological or holistic approach to the human. Ecological physiology and ecology should be taught in all medical schools.

Dr. Edward Bach (1886-1936) an English Physician responsible for discovering the Bach Flower Remedies, after years of research in healing, came to the conclusion that imbalance or illness in the human has its origin in the mental state of the individual. If an individual does not change (or evolve) this unharmonious mental attitude to a positive life supporting one, then illness is manifested in the body to draw the person's attention to the imbalance. Of course one's thinking affects one's lifestyle and one's lifestyle affects one's health. So, we see an inseparable relationship between mind, body and environment. We all know that the human life style affects the environment. So, by disharmonious thinking, disharmonious actions occur. These actions may unbalance the environment, which the human depends upon. The unbalanced environment affects the human and a vicious cycle is begun. To be harmonious and healthy one must obey the laws of nature.

The greatest physician and highest form of healing comes from the Sage who can teach people how to live a harmonious life, therefore a balanced life, thus a healthy life. This holistic view of healing is part of ancient Chinese tradition as well as other eastern cultures. Jesus was such a sage. He taught that health and wholeness comes from obeying the laws of nature. Jesus states,

"I tell you truly, you are one with the Earthly Mother; she is in you, and you in her. Of her were you born, in her do you live, and to her shall you return again. Keep, therefore, her laws, for none can live long, neither be happy, but he who honours his Earthly Mother and does her laws." 2

By Earthly Mother, Jesus refers to the relative manifestation of earthly life and the natural laws that govern this life. Many do not comprehend the stability, the security of change. The real security in life and all time is not found in acquiring and holding material goods for these will pass. The erroneous view that acquiring and holding great personal material wealth will somehow provide security, by having the power through wealth to insulate against change, holds back one's view from evolving in the higher life. This view that material wealth will provide security is one of the greatest detriment to keeping one from obeying natural law and realizing personal fulfillment or enlightenment through the evolution of consciousness.

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1 A system of psychosomatic medicine based on the personality characteristics of the individual. The Bach Flower remedies (there are 38 of them) are all prepared from the flowers of wild plants, bushes and trees, and none of them is harmful or habit forming. For full information write to: The Secretary, The Dr. Edward Bach Centre, Mount Vernon, Sotwell, Wallingford, Oxon., OX10 OPZ, England

"Do not continue to live in the same old way. Make up your mind to do something to improve your life, and then do it. Change your consciousness; that is all that is necessary."  
- Paramahansa Yogananda (1893-1952)

It was a bleak, overcast, breezy day in Higher Disley, Cheshire, England. I had recently telephoned the only chiropractor in the area, to find that I would have to wait almost two months before I could have an appointment at his office. I was being bothered by some painful back problems and had found relief in the past through chiropractic. In the United States I usually could get an appointment on the same day. This experience left me with a sense of dependence and helplessness. While I sat by the hearth with a coal fire ablaze, comfortable from the unpleasant January weather, I began to think. Think about my family and my own dependence on so many for life's necessities.

Later that year it was the electric workers slow down, then the coal strike, then the postal strike. All of those were re-enforcing my feelings of being completely dependent on centralized sources for our heat, light, health care and communication. "What if the railroads and truckers strike," I thought, "from where would our food come?"

It was during the years 1970-71 when my family and I lived in England near Manchester, that I began to realize how very dependent we in the western world, especially the industrialized sector, have become. Without realizing it at that time, this was the beginning for us on the long road to becoming more self-reliant. My eyes had been opened, and now I began to understand what my father and the other farmers I had known in my early years had been talking about and why they were such individualists. They had seen the depression of the 1920's-1930's. They knew that those who could feed and shelter themselves suffered the least or not at all during those "hard times."

A feeling of frustration and impatience was my first reaction, as I began realizing my complete dependence on outside sources for the health and welfare of my family and myself. As I reflect on that backache in England I realize what a blessing it was. I finally discovered an osteopath who helped my backache. But little did I realize at that time how a backache and Mr. Brian Shey (the osteopath) of Prestbury, England would start me and my family on the path toward becoming more self-reliant.

Later that year my two year old son had a condition that did not respond to the kindly treatment of the local medical doctor. After almost a week with little change in my son's condition we began thinking of alternative treatment. I thought of how Mr. Shey had helped me, so perhaps he could help my son and so we went to Mr. Shey. He adjusted my son's spine and gave him one white pill. He said it was a homoeopathic remedy. Mr. Shey sent along one or two more of these pills and

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The principle of "like cures like" was known to Hippocrates & Paracelsus but the modern system is indebted to Samuel Hahnemann 18th century German Physician. For full information on this system of healing contact: National Center for Homoeopathy, 6231 Leesburg Pike, Falls Church, Virginia 22044, U.S.A.
gave us elaborate instructions on the handling and care of the pills and only to give them if the condition returned. The healing was immediate and the condition did not return. I had never heard of homoeopathy although I had post graduate degrees in the biological sciences.

It was a fine spring day in London. Connie, my wife, and I were there on a short holiday. As we walked along we realized we were near one of England's largest bookstores. We went in and the idea struck me to look in the healing arts section to see if they had any books on self-help in healing. I discovered two books on naturopathy which looked promising. These books opened up a whole new world to me on health care. The emphasis was on preventative medicine through proper diet. One of the books by Turner dealt with using the naturopathic approach in first aid. Again the word homoeopathy appeared in suggested uses for first aid treatments. In the back of the little book a listing of useful homoeopathic remedies, tinctures and ointments appeared along with the address of Nelson's Homoeopathic Pharmacy in London where these remedies could be purchased. I sent to London for the remedies and that was our first major step in the direction of self help in the health care and minor accident department. I had also written my American chiropractor, Dr. Stanley Wieczorek, about the unavailability of chiropractors and he sent me a chiropractic first aid book, to help us through some of our minor health problems. Armed with my new books and remedies we had made a great step toward more self-reliance in the area of health care. To go into details of our evolution in the area of preventative medicine through proper diet, natural vitamins, meditation, etc. and the use of various inexpensive, non-prescription remedies such as herbs, homoeopathy, etc. is not the intention here at this time. But it is necessary to point out that we were absolutely amazed to find how effective these types of remedies, diet changes etc. are. We found it is possible through obtaining proper books and instruction to become quite self-reliant in the matter of your own health. By taking responsibility for your own health you have the freedom which comes with it. Of course I would not encourage anyone to not seek professional help when needed in the case of serious problems. If more people took responsibility for their health through reducing the stress in their life, by using effective meditation techniques, proper nutrition and using natural remedies such as accupressure, herbs, etc., for minor complaints, the health professionals would have more time for people who are seriously ill.

The success we experienced in becoming more self-reliant in the health sector encouraged us to look into other areas of our dependence in which to develop more self-reliance.

Becoming self-reliant is not a simple matter. It means developing many skills. It involves time, study, and sometimes the purchase or making of necessary equipment. Unfortunately education in the United States teaches us to be good consumers and not independent, self-reliant persons.

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3 Based on the fact as stated by Hippocrates, "Nature alone heals". Naturopathy is a system of healing using natural approaches to curing disease, e.g. fasting, rest, diet, manipulation, herbs, etc.


5 Chiropractic is a system of health care and treatment based on spinal manipulation. It was established in 1895 by Daniel David Palmer. The Palmer College of Chiropractic, Davenport, Iowa was subsequently founded by him.
Being an ecologist and having been reared on a farm which was for the most part what is now called organic, I never felt comfortable eating foods treated with sprays and chemicals of various kinds. I knew that by running a farm as an ecosystem and using biological pest controls that such poisoning of the food supply and contamination of the earth could be avoided. But how does one obtain such food? The answer at the time was to grow it yourself. I discovered quickly that knowing how to grow field crops did not provide one with the skills necessary in gardening. So we have been experimenting and learning how to become skilled gardeners since 1972. The rewards in terms of good food, knowledge and greater self-reliance have been well worth the time and effort. As the price of flour went up we began contemplating raising our own grain and grinding it into flour ourselves. I was amazed to find I needed a little less than one quarter of an acre of land (a plot approximately 106' X 108') to produce about 500 pounds of "organically grown" wheat.

In 1973 and 1974 I had been thinking about getting a wood stove to help cut our heating bills and be less dependent on the oil companies. We have a beautiful 150 year old Count Rumford fireplace in the house, but it only heats one room effectively and uses wood very quickly. I purchased the wood stove in the year of the oil crisis. Petroleum products went up greatly in price, and rationing of gasoline was temporarily introduced. We were told that heating oil was in short supply. The price of wood stoves doubled (we were glad we had bought ours before) and a new era of heating with wood began.

The occurrences of the oil crisis again caused me to focus my attention on how dependent we are on centralized sources for most of the necessities of life. It seems that all those folks like Dr. Ralph Borsodi, Helen and Scott Nearing, who had been pointing out the wisdom of decentralization, harmonious living, and self-reliance for years were absolutely right. Now we are heating mainly with wood. There is no lack for exercise, but we are warm regardless of what the oil and electric companies do. I will confess that I gained great satisfaction in walking out to the garden during the blizzard of 1977 and digging carrots, rutabagas and beets that I had buried in a pit that autumn. To carry an arm load of crisp fresh vegetables into a cozy warm wood-heated house cut off by the blizzard, has a certain magic about it. A very real feeling of being provided for through the bounty of God's Creation always comes to me at times such as that. Such bounty by cooperating with the Creator and obeying HIS laws is truly a miracle.

As long as the sun shines and the grass grows the adventurous person will find self-reliance an exciting challenge. Perhaps this book will encourage you to look for stepping stones which will carry you to greater freedom and satisfaction through self-reliance and a growing consciousness.

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6 Dr. Ralph Borsodi (1886-1977), best known for his highly successful experiments in self-sufficient living during the 1920's. He was an author and founder of the School of Living. For information write to: The School of Living, Route 7, Box 388A, York, Pennsylvania 17402, U.S.A.

7 Helen & Scott Nearing, Living the Good Life (New York: Schocken Books, 1970), pp 213
A REMINDER

Probably most of us have seen in the movies or on T.V. a thundering herd of buffalo plundging headlong trampling everything in their path. But how many of us have seen the lesson to be learned from watching this flight? Do we see the parallel to modern western man rushing headlong, plundging in full flight into the activities of the world without questioning why? How many ask themselves why am I doing what I am doing? Am I doing it for money, recognition, personal gain or some form-some worldly reason? Why do we rush in this society, full of stress and anxiety? Where are we going? Why greater production, longer hours, higher gross national product etc.? Isn't it time we planned for people and not always for worldly profit? It is instructive to reflect on the words of Jesus, "What does it profit a man if he gain the world but lose his life?" (Matt. 16:26).

This image of modern western urban man is a familiar one. Where is the peace and tranquility? How do we have a peaceful world when those countries with the greatest power have so many individuals not at peace?

We are like children who have become so engrossed in their play that they ignore the body's signals that they are tired. It takes a parent to see that the child is overtired and tell the child to rest, even sometimes enforcing rest on the weary child. The great teachers have come to humanity, as a parent to a child and encourage us to rest. Jesus said, "Come to me all you who labor and I will refresh you and give you rest."(Matt. 11:28). Jesus was speaking of the way of spirit. We need to rest from the over emphasis on the material and become more balanced in the spirit.

We humans need to be reminded of who we are, where we are and what the ultimate priorities must be if we are to find peace, happiness and retain a fruitful earth upon which to live, and learn.

Books which will expand your awareness:

**Environmental-Self-Reliant**
- Clark, B. Becoming an Environmentalist, Cottonwood Pub. Co.
  P.O. Box 1644, Walla Walla, Washington 99362
- Nearing, H. & S. Living The Good Life, Schocken Books, N.Y.
- Turk, J. Introduction To Environmental Studies, Saunders, Phil.

**Ecology of Food Growing and Distribution:**
- Lappe, P.M. & Collins, J., Food First: Beyond the Myth of Scarcity, Ballantine, N.Y.

**Psyche:**
- Bentov, I., Stalking The Wild Pendulum (on the mechanics of consciousness), Bantam Books, N.Y.
This section will offer you some suggestions and references to aid you in becoming more self-reliant and environmentally harmonious.

**NUTRITION**

"You are what you eat", is a statement I have heard and read many times over the years. Recent information relating behavior to diet would seem to lend credence to this statement.

Our environmental and energy crises of today are the result of a consciousness crisis. Our behavior reveals our consciousness and there is ample information documenting the influence on behavior of poor nutrition. A sage when asked by disciples, "What foods should we eat?", avoided giving specific instructions by commenting, "one does not find enlightenment through the stomach". His purpose for being non-committal was to avoid starting a food fad associated with his teachings. I certainly agree with the sage. Food fads come and go, but to be healthy it is necessary to pay attention to your diet.

Modern nutritional writers have amply documented the negative effects of poor nutrition on general health and behavior. If we are to become more self-reliant, more responsible, happy and healthy people we should start with basics. What you eat is something you can largely control. But you must have knowledge, awareness, and understanding of good nutrition in order to do this. Remember the human was designed by evolution to eat what nature provides, not foods designed for convenience and profit.

Some suggestions for a start:

**Helpful books -**

- Diet for a Small Planet, by F. M. Lappe
- Recipes for a Small Planet, by E.R. Ewald
- So You Want To Cook Naturally, by Catherine J. Frompovich, C.J. Frompovich Pub., R.D. #1, Chestnut Rd., Coopersburg, Pa. 18036

A book on the whys and hows of eating a wholesome diet, with recipes.

- Psycho-Dietetics, by Cheraskin, E., Ringsdorf, & Brecher, A Bantam Book. Excellent on effects of nutrition on behavior.
- Nutrition Against Disease, By Dr. R. Williams, A Bantam Book. Solid scientific documentation on diet, behavior and illness.

More suggestions for becoming healthier and more self-reliant:

1. Purchase foods from Co-ops. If a Co-op is not available in your area, talk with friends about pooling your money and buying whole foods such as grains, dried fruits, dairy products, flours etc. in bulk from grower or wholesaler to be divided among your group later. By avoiding processed food and retail purchasing you save money and conserve energy.

33
2. If you find it necessary to shop at supermarkets you can learn how to shop for the best foods for your money by studying The Supermarket Handbook, by Nikki & David Goldbeck, Signet Books.

3. If you have space, time and interest you may wish to start growing some of your own food. There are many excellent books on biological (organic) gardening. Some I have found useful are:

- Down-to-Earth Gardening Know How, by R.O. Raymond, Garden Way Pub., Charlotte, Vermont
- Gardening for Health the Organic Way, by John & Helen Philbrick, Multimedia
- The Pfeiffer Garden Book, from Bio-Dynamic Literature, Box 253, Wyoming, Rhode Island 02898. Bio-Dynamic Literature also carries a number of other books on biological gardening and farming.

HEALTH CARE

Our society today has taught us to be good consumers. The educational system and advertising in the media, especially T.V., do not emphasize being self-reliant. Nowhere in the mass media or our public primary and secondary schools is the importance of taking responsibility for one's own health and well-being taught, much less simple natural procedures for helping oneself in times of minor distress or illness. We are taught to rely solely on "the expert". To rely on the expert for everything is costly in terms of money and freedom.

If we took greater responsibility for our own health, professionals in the healing arts would have more time and energy to spend on keeping themselves updated, doing research and helping the critically ill.

If you commence following good nutritional practices as suggested in the reference books indicated in the previous section on nutrition you are well on your way to self-reliance in health care. Good nutrition is a major factor in following an illness-prevention/health-promotion program. But there are other practices besides good nutrition which must be included in a health-promotion life style. Paavo Airola, an internationally known natural healer and author of numerous books on diet and natural health care, stated that relaxation and peace of mind are vital. He also commented that "Emotional and mental stress can tear your health down faster than inadequate nutrition can."

Dr. Airola places mental-emotional state, exercise, and diet, in that order as being the key to good health.

I have seen many people obtain positive benefits in altering mental attitudes such as impatience, fear, indecision, lack of confidence and many more by using the Bach Flower Remedies (page 28).

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1 Paavo Airola, How To Get Well, (Health Plus Pub., Box 22001, Phoenix, Ariz. 85028, 1974) p. 200
There are also herbs and homoeopathic remedies which are safe, natural, inexpensive and when used properly, very helpful. However, I look upon all of these remedies as temporary measures. They are only bridges on the path to full knowledge. There is no substitute for a systematic practice which leads to full knowledge (enlightenment-self-realization).

If you do have health problems which need attention by a health professional be aware that there are 'healers' who can promote healing without the use of drugs and/or surgery (see pages 29-30).

Viktoras Kulvinskas' book Survival into the 21st Century is a very good source book for information, ideas, organizations, books, etc. which promote natural living, alternatives in healing and some uncommon attitudes toward life style.

Many of the larger cities have holistic healing information centers which can put you in contact with health professionals who subscribe to natural healing and preventative medicine. Co-ops, and health food stores usually can provide addresses and telephone numbers of such centers.

Some helpful books related to self-health care:

Airola, Paavo, How To Get Well, Health Plus Pub.,

, Are You Confused, Health Plus Pub., about proper diet.

Blate, Michael, Natural Healers Acupressure Handbook, Holt, Rinehart, Winston, N.Y. (formerly the C-Jo Handbook)


Luyties, Homoeopathic Practice: Family First Aid (available from, Luyties Pharmacal Co., 4200 Laclede Avenue, St. Louis Missouri 63108


Magazines:

Well Being, 833 W. Fir St., San Diego, California 92101
The do-it-yourself journal for healthy living. All about natural health care and natural healing, a good resource.

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2
V. Kulvinskas, Survival into The 21st Century (Omangod Press, Box 255, Wethersfield, Connecticut 06109 1975) pp318
Herbalist, Box 53, Spanish Fork, Utah 84660, About diet, herbs, and herbal remedies.

Journal of the Nutritional Academy, 1238 Hayes, Eugene, Oregon 97402. Devoted to a holistic approach for healing cancer, heart disease, arthritis, multiple sclerosis, diabetes and other diseases generally considered incurable. This journal has articles written mainly by medical doctors (M.D.) practicing and researching into a holistic healing approach to the treatment of illness. For information on specific problems write to Nutritional Academy, Box 548, Arlington Heights, Illinois 60006, or telephone (312) 392-7766.

The Linus Pauling Institute of Science and Medicine Newsletter, 2700 Sand Hill Rd., Menlo Park, California 94025. Research on the use of vitamins, especially vitamin C, very good source of solid scientific research on diet, vitamins, cancer treatment etc.

Other:

Arlin J. Brown Information Center, Inc., P.O. Box 251, Fort Belvoir, Virginia 22060. His center provides access to information, phone numbers, address etc. of clinics which treat cancer holistically with a natural healing approach.

Natural Childbirth, Children, Allergies and Hyperactivity:


LaLeche League International, Franklin Park, Illinois 60131. Organization encouraging breast feeding and humane birthing, child rearing etc. Write for local chapter contact near you.

May, I., Spiritual Midwifery (Book Pub. Co., Summertown, Tennessee) A sensitive writing on natural childbirth, baby care, etc.

Rapp, Doris J. M.D., Allergies and the Hyperactive Child, (Sovereign Books, N.Y. 1979) Dr. Rapp is a Buffalo, New York physician. She has had amazing success in treating hyperactivity and allergies with diet.

Rochester Association for Choices in Childbirth, 296 Melrose St., Rochester, N.Y. 14619, telephone (716)-436-5488 an affiliate of National Association of Parents and Professionals for Safe Alternatives in Childbirth (NAPSAC). Excellent organization promoting comfort and consideration for mother and child rather than the convenience of hospital administration, doctors and nurses.

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YES! Bookshop, 1035 31st St. NW, Washington, D.C. 20007

If books mentioned in this book are not available at your library, or bookshop, they are obtainable from YES! Bookshop, send for there complete catalog there is a charge for the catalog.

36
"A person's home is his/her castle" is an old saying we've all undoubtedly heard at one time or another. Yes, your home should be a sanctuary where you can enjoy the privacy, warmth and love you may not find outside the home. But, all too often our homes in America are almost as expensive to build as a castle was and usually no more energy-efficient.

Over the years I have observed that often the most sought after and respected is the most impractical and useless. I have noticed this phenomenon in operation in many areas. For example in the field of education, technical programs which teach real, practical, useful knowledge do not enjoy the status enjoyed by liberal arts curricula, even though a liberal arts graduate is usually not trained in any specific marketable skill upon graduation. Clothing is another area in which we see this aspect of human behavior in operation. Comfortable, long wearing clothing does not command the status that flimsy impractical clothing and awkward high-heeled shoes have gained. Automobiles also come into the status game. I have heard it said of people driving oversized, overpowered cars that, "it takes 20 or 30 horsepower to move the car and the body and the other 300 horsepower to carry the ego." I have the distinct feeling that a good proportion of houses are desired, designed and constructed in this same vein. We laugh at the binding of women's feet in ancient Japan and new refrigerators on the porch of homes without electricity in the rural American southwest as status symbols, but are we also guilty of this mentality in much of our shelter construction and design?

The need for status derives from fear and insecurity, a poor self image, which in turn springs from ignorance. We can no longer, nor should we, indulge ourselves in building housing and shelter which is not comfortable, energy efficient and attractive.

Nature herself shows us that form and function can be combined in a very practical and useful manner. Consider the eagle, a beautiful sight to behold soaring above the mountain tops, yet of practical design and fully functional as a part of its ecosystem. Fashion, established design and status can all get in the way of beautiful form, fully functional in our shelter designing.

When choosing or building a shelter, be sure to review your reasons for what you want. People living close to nature have shown us that a shelter springing from dictates of the environment can also be a delight to the eye. Consider the Tipi, Mongolian Yurt, ancient Celtic round houses, thatched cottages, grass huts (as illustrated on page 38): they are all attractive and practical for the environment in which they developed. As Frank Lloyd Wright (the great American architect) commented, "A building should grace and not disgrace the landscape!"

Energy necessary for a shelter should be derived on site or at least locally from renewable sources if at all possible. At the present time, centralized sources of energy which is derived mainly from fossil fuel or nuclear are easy to obtain. But we pay the price charged by the power company and have virtually no control over the source. Renewable energy sources are practical for the home owner, but very few are willing to pioneer it (see pages 6 and 20)
TIPI

YURT

GRASS HUT

CELTIC ROUND HOUSE
Shelter, Environmental Resources:

The Mother Earth News magazine, P.O. Box 70, Hendersonville, North Carolina 28739, is an excellent resource for those wishing to become more self-reliant. They have an extensive book shop stocking many of the best books on self-reliance in almost all aspects of life. A few such books they sell dealing with shelter are:

Keyes, J., *Consumer Handbook of Solar Energy for United States & Canada*

Wade, A., & Ewenstein, N., *Energy-Efficient Houses You Can Build*

Watson, D., *Designing & Building A Solar House*

The Integral Urban House: Self-Reliance Living in The City, by Farallones Institute, Occidental California

The Nicholson Solar Energy Catalog & Building Manual from Mother Earth News

Earth Sheltered Housing Design Guidelines by Underground Space Center of University of Minnesota

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Programs on Self-Reliance:

Goddard College, Plainfield, Vermont 05667

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Shelter Institute (and Publications), P.O. Box 279, Bolinas, California 94924

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Organizations to support:

Environmental Action, Suite 731, 1346 Connecticut Ave. NW, Washington, D.C. 20036

Friends of the Earth, 124 Spear St., San Francisco, California 94105

International Biomass Institute, Suite 600, 1522 K. St., NW. Washington, D.C. 20005

The Institute for Food & Development Policy
2588 Mission St., San Francisco, California 94110
(founded by F.M. Lappe & J. Collins)

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There are many organizations not listed here which are doing a splendid job to help promote harmony between humans and the environment. The organizations listed above are but a few to get you started on the road to helping yourself by helping others and the earth.
COMMUNITY

It is the nature of the human to live as communities. Simple observation, personal experience and common knowledge show us this. A community as I define it is not the same as people living in a cluster of buildings in the same geographical location. To me community denotes the spirit of cooperation, not competition.

True community is everyone helping each other. Individuals of a community have their own special interests and talents. Given the freedom, in the spirit of cooperation, each member of a community finds his or her own niche.

When people are doing what they most enjoy they are happy, and happy people are pleasant people. Pleasant, happy people under no stress of competition or anxiety of criticism are usually healthy, peaceful people. This ideally is what a community should be.

I have had the good fortune to visit intentional communities where these ideals of community are practiced. It is heartwarming, uplifting, and like a breath of fresh air to see the human potential for community actually in practice and functioning well.

The way our society is today is far from the ideal community that I describe. Our educational system which reflects our value system is not conducive to fostering the ideal community. Instead, competition is encouraged. This is based on comparison. Instead of comparing and fostering competition we should be encouraging each person to develop in a positive manner most consistent with their interests and abilities.

Competition stems from the same source as status, as talked about before. Ego and poor self image often drive us to show that we are "better" than someone else. This arises from lack of understanding that there is a unity—a oneness underlying the diversity—we are all part of the whole and we all have our reason for being. In the human body is the liver more important than the heart? Is the lung more important than the kidney? If someone says the heart is the standard all organs should attain to, then the other organs trying to obey or be like the heart stress themselves, do not function as a heart, and yet because they divert their energy to compete with the heart, do not do what they are best suited to do and therefore cause the whole organism to suffer.

In a way isn't this what happens in human society where people are forced or force themselves into career activities they do not like and for which they are not well suited?

A properly functioning organism is healthy, with every cell functioning to the support of itself and the whole, so should a healthy society function. This is simply the way natural systems operate. To live and be healthy an organism must function as a cooperating, integrated whole, be it the individual organism, the ecosystem or a society.

The health, crime, energy, educational and environmental crises we suffer today are the symptoms of the underlying crisis—THE CONSCIOUSNESS CRISIS! We must develop the holistic (wholistic)
consciousness which is illustrated by the basic principles of ecology. We must apply this consciousness at all levels and then society will function as a healthy organism.

Our educational system is the mechanism we can use to foster the holistic, community awareness. The primary purpose of education should not be to cram facts and intellectual knowledge into young people, but to help them become healthy, happy, strong human beings enjoying their God-given talents, developing their full potential, which enables them to be contributing, valuable members of the whole: progressing, evolving and growing.

By educating and organizing, cooperating not competing we can commence to form ideal communities among our nearby friends and neighbors. We do not have to immediately give up our present job or residence and go somewhere else. Start where you are to encourage and form real communities.

Addresses-resources for community-education:

Updated information on intentional communities, directories, etc. can be obtained by writing:

Green Revolution, Box 3233, York, Pennsylvania 17402
(directory on communities in U.S. & Canada)

Mother Earth News, Box 70, Hendersonville, N.C. 28739
(books, suggestions etc.)

Education as an Art from Green Meadow School, Hungry Hollow Rd., Spring Valley, N.Y. 10977

Waldorf Institute of Mercy College, 8469 East Jefferson, Detroit, Michigan 48214

You will find this a beginning for a humane way to educate and live.
GLOSSARY

Amish - The so-called Old Order of the Amish people is a Mennonite sect. Taken from the name of an influential member Jacob Amman 1693. They hold a strong belief they should conform to being in the world but not of the world (Rom. 12:2). They shun modern customs of dress, and avoid many modern mechanical conveniences including automobiles. They do not go to war, they are peaceful people.

Aramaic - A Semitic language once widely used throughout the Near and Middle East. Jesus the Christ spoke Aramaic, but most of His words in the New Testament were translated into Greek.

Bio-Dynamic - A system of agriculture which focuses on soil building and soil balance (see pages 21 & 22).

Chiropractic - An aspect of the healing arts using spinal manipulation (see page 30).

Climax - The end, or apex, of an ecological succession (see pages 14, 17).

Composting - A system of treating plant residue by piling, working into the soil, mixing with animal manure etc. to encourage decomposition and production of humus-soil.

Coops - People banding together to gain the advantage of lower prices by buying in large amounts. Members of a coop do the work involved to avoid overhead and labor costs.

Dynamic Equilibrium - A system of anykind which is kept healthy or functioning properly by orderly changes, see pages 14, 19 and 27.

Ecology - The study of the interrelationships among plants and animals and the interactions between living and their physical environment. The interrelationship of everything with everything else (see page 7).

Ecological Succession - The series of changes an environment might experience as it evolves to climax (see pages 14, 27).

Ecosystem - Populations of plants and animals occurring together and interacting with one another including the physical environment. An ecosystem is nearly self-contained, see p.8.

Holistic - Complete or whole. A view which considers everything as being interrelated, see pages 28 and 35.

Humus - The complex mixture of decayed organic matter which is necessary for healthy soil. The living part of the soil.

Mennonites - Menno Simons, a priest influenced by Luther gave up his priesthood to reorganize the Dutch Anabaptist after 1536. Followers of Simons were called Mennonite after his first name. They observe a strict Biblicist piety, reject the oath and the use of violence, and strongly advocate separation of church and state. They are pacifists and will not go to war.
Glossary

Photovoltaic- Energy cells which convert sunlight into electricity.

Phytoplankton- Any microscopic, or nearly microscopic, free-floating autotrophic plant in a body of water. There are numerous species; these plants account for most of the primary production in bodies of water.

Pioneer community- The first community to establish itself in the process of ecological succession (see page 15).

Pollution- The contamination of the quality of some portion of the environment, be it internal or external, by the addition of harmful impurities, see page 13.

Population Ecology- The study of the interrelationships of populations, as well as the dynamics of a population of one species (page 19).

Predation- An interaction in which some individuals eat others (pages 20, 21).

Primary Succession- Ecological succession occurring on a location i.e. substrate where there is no soil, e.g. open water (hydroseric succession) or dry land (xeroseric succession) see page 14.

Secondary Succession- Ecological succession occurring where soil already exists, e.g. the cutting down of a climax forest would leave the soil the subsequent resulting succession is secondary, p.14.

Seral Community- One of the transitory communities found in ecological succession.

Transcendental Meditation- A simple mental technique which allows the nervous system to release stress. It was brought to the United States from India by Maharishi Mahesh Yogi. It is fully explained in Dr. H.H. Bloomfield's book Happiness.

Veda- A Sanskrit word meaning knowledge. Early texts written in India about 1500-900 B.C. or perhaps much earlier, about the nature of life.
INDEX

Airoa, P. 34
Alligators 6
Alternatives - healing 15, 36
Amish 17
Aramaic language 12
Aureomycin 24
Bach, E. 28
Bach Flower Remedies 28, 34
Bio-Dynamic 21
Biological Gardening 11
Blueberries 17
Borosodi, R. 31
Canada, Science Council of 6
Cape Cod 17
Celtic round house 37, 38
Centralized source of supply 31
Change 27
Chemical sprays 10
Chickadees 5
Chief Seattle 4
Chiropractic 30
Christianity 12
Climax stage 14, 17
Clover Kill toilet 26
Commandments 12
Community 12, 40, 41
Composting 25
Consciousness crisis 40
Coop's 33, 35
Darwin, C. 7
Davis, City of 26
Deer 11, 17
Diet For A Small Planet 9, 33
Doctors 5
Dynamic equilibrium 14, 19, 27
Eagles 4, 5
Earthly Mother 28
Earworms 18, 22, 23
Eating Habits 9, 33
Ecology 4, Laws of 12
Ecological Physiology 28
Ecological Succession 14, 27
Ecosystem 8
Education 41
Electricity 6
Emerson, R. W. 3
Energy, cheapest food 9
Energy flew 8
Energy Intensive 20
England 29
Environmental books 32
Evensen Gospel of Peace 12
Falcons 5
Farallones Institute 26, 39
Findhorn garden 11
Fire 17
Florida 4
Form & Function 37
Fox 19
Freedom in self-reliance 31
Frog 19
Gandhi, Mahatma 13
Garbage 25
Garden 18
Gardening books 34
Glossary
God 2, 3, 13
Goddard College 39
Gould, S. J. 7
Great South Bay 3, 4
Grass hut 37, 38
Gross national product 32
Hahnemann 29
Healing Alternatives 35, 36
Health, self-reliance 30, 34, 35, 36
Hedge rows 21
Herbs 35
Hippocrates 29, 30
Holistic 28, 35
Homeopathy 29, 35
Human population explosion 20
Humus 10, 11, 14, 18
Hut 37, 38
Hydrogen production 6
Index, plants & animals 16
Inner life of humans 2
Insects 10, 11, 21
Iroquois 4
Japan 27
Jesus 7, 2, 12, 28, 32
Kulykinskas, Viktora 35
Lappe, F. M. 9, 33
Lawn 18
Leaf mold 23
Leaves 18, 23
Leopold, A. 7
Life style affecting health 28
Lindstrom, E. 26
Maharishi Mahesh Yogi 2, 6, 7
Meher Baba 3
Mennonites, Old Order 17
Mold 23
Mother Earthly 28
Mother Earth News 39
Mother Nature's Classroom 13
Mowing lawn 18
Muir, John 3, 4
Native Americans, pre-colonial 12
Naturaphy 30
Nearing, H. & S. 31
Nelson's Homoeopathic Pharmacy 30
Nestorian Priests 12
Nuclear energy 6
Nutrition 33
Odum, E. 3
Organic farms 10
Osteopath 29
Oysters 4
Palmer, D. D. 30
Paracelsus 29
Paramahansa Yogananda 29
Peacefulness 1, 32
Pesticides 5, 10, 21
Petroleum 20
Petro-chemical 10
Photovoltaic 6
Physician, Sage 28
Physiology 28
Phytoplankton 6
Pioneer community 15
Plant eating 9
Pollution 13
Population ecology 19
Predation 20, 21
Primary succession 14
Priorities 32
Psychosomatic medicine 28
Rabbit 19
Raking 18
Rats 16
Recycling 24, 26
Religion 12
Resource books 32, 33, 34, 35, 36
Rockefeller, Abby 26
Rodale, J. 1, 21
Rodale, R. 10
Safe energy test 6
Sage, physician 28
Sales, Chic 26
Schiller, C. 5
Seattle, Chief 4
Secondary succession 14
Self-reliant 29, 30
Self-reliant community 17
Shelter 37
Shey, B. 29
Slavonic, Old Texts 12
Soil 9, 10, 15, 16, 18, 21
Status 37
Stress 19
Succession 14
Syracuse University 26
Tipl 37, 38
Thoreau, H. D. 13
Transcendental Meditation (T.M.) 2.3
Turner, R. N. 30
Urban man 32
Utah State University 27
Vacuum state 7
Veda 13
Vegetarian 8, 9
Waste disposal 24
Water management 26
Waterless toilet 26
Water power 6
Wellsville Range 27
Wiczezerek, S. 30
Wind power 6
Wholistic (Holistic) 28
Wolf 20
Woodchucks 11
World peace 1
Worms 22
Xerosee 14
Yogananda, Paramahansa 29
YES Bookshop 36
Yurt 37, 38
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Peace, Love and Gratitude

John I. Mosher