The harmony seekers : ecologically cultivating land and learning
by Janet Amundsen Boyle

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University

Abstract:
In a world where critical environmental issues of pollution and degradation of the land base exist, there is increased need for better understanding of and learning the ecology of life in order to promote the healing of these environmental wounds and sustain a healthy earth. Learning ecologically means grasping the concepts of the interrelatedness of all living organisms with each other and their surroundings. With this consciousness of the connectedness of life actively engaged, a harmony with the earth's systems is promoted in human actions. The purpose of this study was to describe the learning paths of individuals who have deliberately chosen to live with ecological consciousness. How they have overcome any educational and societal-imposed barriers to their ecological way of living and how they sustain that consciousness in everyday life are described.

A qualitative descriptive case study was utilized to discover and gain insight into the learning paths of ecologically conscious adults. Sixteen interviews were conducted with certified Organic Crop Improvement Association (OCIA) organic agricultural producers who by the nature of their organic production methods and practices are considered ecologically conscious. The study examined the learning paths of these ecologically conscious adults which included travels on established courses of learning such as that provided through formal educational systems and through their informal social and natural environments. Significant side trips involving reflective and critical thinking processes were often undertaken. Findings revealed learners best described as responsive, self-directed, and as those who think connectively.

Through this study, it can be concluded that among the individuals interviewed, the land is the context within which connective thinking reveals a value in health of land and family. These connective thinkers move on less traveled, more natural-ways-of-knowing paths as responsive learners whose learning processes have been shaped by self-directed actions. They continue to seek learning paths of empowerment and harmony of land and life. Recommendations from this study focus on actively promoting more earth education through exposure to and immersion in holistic, integrated, and multidisciplinary thinking processes related to an ecology of life.

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This thesis has been read by each member of the graduate committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

Robert A Fellenz — 8-26-99

Dr. Robert Fellenz
Chairperson, Graduate Committee

Date

Approved for the Major Department

Gloria A Gregg — 8/26/99

Dr. Gloria Gregg
Head, Major Department

Date

Approved for the College of Graduate Studies

Bruce R. McLeod — 9-28-99

Dr. Bruce McLeod
Graduate Dean

Date

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Date September 14, 1999

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CHAPTER 1

BEGINNING THE QUEST

Introduction

> Modern natural history deals only incidentally with the identity of plants and animals, and only incidentally with their habits and behaviors. It deals principally with their relations to each other, their relation to the soil and water in which they grew, and their relations to the human beings who sing about my country but see little or nothing of its inner workings. 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 the 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 things, then what is education for?
>
> Aldo Leopold, A Sand County Almanac

Leopold (1949/1966) is symbolic of what today can be described as a challenge for rethinking the foundations of education. His Sand County Almanac laid the groundwork for an ecologically sound land ethic. He was a scientist and a philosopher who asked questions that no one else bothered to ask about the proper role of humans in nature. This led to the proposal of more radical ideas concerning one's citizenship in the natural order of things. He regarded "biological education as a means of building citizens" (p. 208). His philosophy of science went like this:

> We are not scientists. We disqualify ourselves at the outset by professing loyalty to and affection for a thing: wildlife. A scientist in the old sense may have no loyalties except to abstractions, no affections except for his own kind . . . . The definitions of science written by, let us say, the National Academy, deal almost exclusively with the creation and exercise of power. But what about the creation and the exercise of wonder or respect for workmanship in nature? (cited in Flader & Callicott, 1991, p. 276)

Leopold had a deep concern about the aims of education. He contemplated that perhaps too much investment was being made in professional education, the emphasis being on preparing students to earn a salary rather than to embrace life. He speculated that a liberal education offered opportunities to all students to see, understand, and enjoy the ecology of life. He reflects:

> One of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on land is quite invisible to laymen. An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself to be well and does not want to be told otherwise. (Leopold, 1949/1966, p. 197)

Environmental education can either teach <u>about</u> the environment or it can teach <u>for</u> the environment. Current educational methods and practices focus on learning about the environment rather than for the environment. Promoting awareness of connections between one's actions and the consequences of those on the surroundings and other living things is paramount to developing an ecological consciousness that supports a <u>for</u> the environment mentality. <u>About</u> the environment education infers a kind of detachment from the environment. Typical curricula are

data based and involve disconnected divisions, disciplines and sub-disciplines. Students are led to believe, for example, that politics is separate from ecology or that economics has nothing to do with physics (Orr, 1994, p. 23). However, the world is not this way. There is need to think in whole systems, find connections, and ask questions. Naturalist John Muir recognized this and eloquently said, "when we try to pick out anything by itself, we find it hitched to everything else in the universe" (cited in Miller, 1994, p 113).

Two recently published reports about American attitudes on consumption, materialism, and the environment provide results from a national public opinion survey commissioned by the Merck Family Fund. A large percentage of the respondents felt that too much focus is placed on getting what we want now and not enough on future generations; 88% believe that protecting the environment will require "major changes in the way we live" (cited in Taylor, 1995, p. 12). Indeed, Americans from all walks of life feel our system of living is seriously unbalanced, that our priorities are all out of order.

Current practices are intensifying the need in education for the environment. Business executives are more intent on profits than on building good communities. Students know more about growth economy than about the economy of nature. An educational system which responds to the demands of the capitalistic power structure continues to support a design with

aims and purposes of "equipping our nation with a first-class labor force . . . to compete more favorably in the global economy" (Orr, 1994, p. 26). One ecologist, Stan Rowe, states that the university has "shaped itself into an industrial ideal" (cited in Orr, 1994, p. 29), producing citizens with a consumptive mentality. Alisa Gravitz, Executive Director, Co-op America, believes that the way business is done in our global economic system is at the heart of the problem. She states,

> It forces too many decent people--in business, public and private life--to put their efforts into the wrong priorities . . . increasing income instead of quality of life, improving profits instead of the environment, building power bases instead of healthy communities. (p. 4)

David Orr (1995), professor of Environmental Studies at Oberlin College and author of Earth in Mind, says that:

> Those who are now being educated will have to do what the present generation has been unwilling to do: stabilize world population . . . protect biological diversity, reverse the destruction of forests everywhere and conserve soils. (p. 43)

Therefore, education's challenge of the next century will be to educate people on how to use energy and materials with great efficiency and to rebuild economies in order to eliminate waste and pollution (p. 43). Rethinking curriculum and foundational principles of higher education as well as of adult education will need to be seriously considered.

It may be possible that individuals or communities who truly understand and appreciate the beauty and fragility of the natural environment may be driven to act upon that appreciation. Then

armed with diverse knowledge and experience, these individuals will continue to proactively support and implement environmental actions on their own and in their communities. The sciences are taught in our schools from elementary through higher education. Adult environmental education workshops and seminars are conducted within a scientific basis. If this education is effective, shouldn't there be cleaner water and air with the dissemination of this vital scientific knowledge? Despite today's educational approaches, society continues to conduct themselves within a "throw-away" mentality that further impacts our water, air and soils in overused landfills and groundwater contamination (Miller, 1994, p. 69). Is science to be challenged, and what of technology?

Orr (1994) suggests that "All education is environmental education" (p. 12). The goal of education "is not mastery of knowledge but mastery of self through knowledge" (p. 13). Fostering "ecological design intelligence" (p. 2) means meshing human purpose with larger patterns of the natural world, taking how nature works into ways people build and live. Education should "prepare people for lives and livelihoods suited to a planet with a biosphere that operates by laws of ecology and thermodynamics" (p. 12). Unfortunately, however, the American society still adheres to an educational system that is conventional in design and soul. A know-how institution ought to be a know-why institution and should eliminate knowing in

fragments, knowing without direction, and knowing without commitment (Orr, 1994, p. 29).

Environmentalism

Environmentalism is steeped in historic roots of nature protection. Two major cultural shifts launched the environmental activism movement--the Agricultural Revolution which began 10,000-12,000 years ago, and the Industrial Revolution which began about 275 years ago (Miller, 1994, p. 43). These economic and culturally-based revolutions have provided more energy and new technologies with which to alter and control more of the planet to meet basic human needs and to instill an attitude of increased want. By expanding food supplies and raising average living standards, each era increased the human population. The result has been soaring resource use, pollution, and environmental degradation.

The Native Way of Knowing Mother Earth

There is a long held sentiment that Indians were true people of nature. Indeed, early environmentalists stereotyped Indians as "the original conservationists." Certainly many environmentalistic writings make reference to the many inspirations of American Indian actions and attitudes which suggest reverence and respect for all life. Indian writers such as Vine Deloria Jr. and N. Scott Momaday have expressively written of nature relations as the center of American Indian

religions and lives. Their message speaks of loving references to the non-human world.

Historically speaking, before contact with white people, Indians depended upon their environment as the source of their life. They engaged in a relational subsistence with their environment. They defined themselves by the land and sacred places, recognizing a unity in their physical and spiritual worlds. It has been said "an ethical practical relationship to the environment is American Indian to the core" (Vecsey & Venables, 1980, p. 7). Nature and spirituality were connected. They were rooted in Indian culture. Perhaps it is this very rootedness in the environment that becomes the legacy of Indian environmentalism and the underpinnings of so many environmental philosophies evoking reverence and respect for Mother Earth. Clearly then Indians have something to offer that will improve mankind and the world if we would just learn from their example.

It is ironic to note that in contemporary years tribal development and land use have promoted a different view of Indians, one that is not so transcendent in describing Indian relations to the Earth. It relates to the need of modern Indian cultures to place need over cultural patterns which creates a "dilemma of synthesizing practical reality and idealism" (Vecsey & Venables, 1984, p. xxii). Even more interesting is the idea of how this relates to a rootlessness of white Americans in their approach to the environment. Evidence abounds that Americans and

their colonial ancestors "altered their natural surroundings and set in motion physical and biological processes that have had reverberating effects on the environment" (p. 46). Exploitation of nature took place as an anthropological response to the environment. Indeed, the term "natural resources" developed in the West in the 15th century, indicating a view of the environment as material to be exploited, existing only for its worth to humans (p. 33). It is particularly interesting to note the lack of "affectionism" that exists in literature of the New World:

> The first Spanish to pass through the Grand Canyon made no comment about its beauty or unusual formations. Puritans for the first century wrote virtually no poetry describing nature. Instead, whites treated the land as a piece of property, something to be surveyed, parceled, bought, sold, argued over, stolen, and abandoned for land elsewhere. (p. 33)

Education and the Environment

Conventional and discipline-oriented education can contribute some understanding as to how the Earth operates, but it does little to connect us to the holistic nature of the environment; this is an equally important consideration. This means that we need to understand how environmental, economic, and social systems function and realize that environmental, economic, and social issues are inseparable. A major function of education should be to help citizens do these things.

In 1972 the United Nations Conference on the Human Environment recommended that every nation promote the development

of environmental education programs. The underpinnings of this recommendation lie in the idea that a proper role for education is the preparation of world problem solvers. For citizens to be able to effectively participate in decision-making processes, they must understand how environmental, economic, and social systems interact Engleson & Yonkers, 1994, p. 10).

Perhaps the emphasis of education should be the recognition of the connectedness of systems of thinking, intellectual and emotional, whereby all things are not just valued for their uses, but valued because there is recognition of their symbolic, aesthetic, or cultural importance. A systems thinker embraces the web of relationships, knowing that humans evolve with the earth, and not on it. How often is the science student taught value thinking? Rachel Carson (1962) was a scientist who authored a book, Silent Spring, the results of which engendered an environmental movement that changed the course of history. In another work by Rachel Carson (1956), one that is less known but is revealing, nonetheless, she writes of a nature that inspires feelings of joy and wonder. She relates in The Sense of Wonder:

> A child's world is fresh and new and beautiful, full of wonder and excitement. It is our misfortune that for most of us that clear-eyed vision, that true instinct for what is beautiful and awe-inspiring, is dimmed and even lost before we reach adulthood. If I had influence with the good fairy . . . I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strength. (p. 43-44)

Adult Learning

What happens between childhood and adulthood that causes the diminution of Carson's "sense of wonder" in people, this kind of spiritual connection to the natural world? Are adults capable of learning, recapturing, this affective sense, traditionally characteristic of a child-like purity of heart?

J. R. Kidd (1973) has studied the affective domain of how adults learn. He suggests that feelings and emotions are found in any learning situation, that "the interests and motivations of any learner, child or adult, are primarily a matter of the emotions, not of the intellect" (p. 94). He emphasizes that feelings are "not just aids or inhibitors to learning" (p. 95), but that the goals of learning and of emotional development are identical in many ways and are realized in self-mastery.

Reflecting upon the influences that emotions--attitudes and motivations--play in learning, Kidd suggests that there are two burdens that adults carry as stigmas in their perceptions of learning. One stigma relates to a prevailing view that they are not efficient learners. The other stigma is an unpleasantness associated with learning during childhood (p. 95). Contemporarily speaking, future adults may not have as many negative feelings about their schooling. However, many who grew up shaped by a highly pedagogical model of learning still carry feelings about their education that range from "mild dissatisfaction to hatred and loathing" (p. 96). Learning

associated with past failures and ill feelings tends to keep adults from engaging themselves. There is strong evidence to suggest a relationship between fear and anxiety and impaired learning (p. 99). One could speculate that the negative educational atmosphere in which some adults were raised as children has left some deep scars, impressions that have shaped unfavorable attitudes and behavior and which may interfere with their ability to undergo change that could beneficially lead to the realization of a self-actualized person.

According to Kidd, "change means disturbance, and a human being is ready to bear disturbance only under some conditions and not at all under others" (p. 97). Attitude change seems to occur when there is the acceptance of responsibility to oneself and to others. Optimistically, this notion could also be expanded to include acceptance of responsibility to the natural environment that sustains us.

Allen Tough (1978), an adult educator, alludes to the fact that a conventional focus in adult education emphasizes the providing of education or instruction and "professionally guided learning" (p. 253). Contrast this with an emerging focus--the facilitating of relevant learning where adults self-plan their own learning tasks ordinarily performed by an instructor of a course. Tough suggests that when adults engage in a learning activity on a self-directed basis, their own expectations provide

the primary guide to activity. Other people serve mainly as sources of encouragement and learning resources (p. 258).

Malcolm Knowles (1970), humanistic adult educator and critic of the usefulness of traditional theories of learning for adult education, proposed the development of a unique adult learning theory--andragogy, the art and science of helping adults learn. Premised upon a traditional conception that the purpose of education is the transmittal of knowledge and skills, he defines pedagogy as the art and science of teaching children. This well established pedagogical model of education might have deeply conditioned many adults such that they perceive the appropriate role of the learner to be one of dependence, a recipient of transmitted content. Is it possible that the entrenchment of this behavioristic and deterministic model has created adults who resist engaging in or are unable to engage in a humanistic learning process that promotes a self-concept for actualizing oneself in the natural environment?

Knowles' first assumption of andragogy addresses the concept of the adult learner, that of moving from being dependent in a learning setting to that of increased self-directedness. Evaluating psychologically the humanistic notion of self-concept, one is able to determine that it is not a negative concept of self-centeredness, but one that emphasizes one's responsibility to others (and perhaps to one's environment?). For humanists the self "is the heart of the person, the enhancement of which is

possible through actualizing individual potentialities" (Elias & Merriam, 1980, p. 119).

Knowles considers the self-concept notion of adults with regard to learning as a critical matter. He suggests that adults who have experienced failure in earlier schooling and who have little confidence in their ability to learn will find their negative self-concept a barrier to success in adult education (p. 132).

Statement of the Problem

Earth is our home. It is also the home of other living things with which man interacts. Consider this spectrum of life: there are people who recognize the holistic nature of the environment in which they live, work, and play; there are those who recognize only the utilitarian nature of the environment in which they live, work, and play. There are many who practice an environmentalism with a deliberation that is descriptive of their lifestyles. All practice some environmental exploitation for the human economic benefits it affords us. It cannot be denied that devastating environmental problems exist. Humans are part of these environmental problems, and they can be part of their solutions if they can think and learn more with an ecological, a connective consciousness.

Many human attitudes and activities have been shaped by the formal and informal educational systems in which people find themselves for the greater part of their existence. It may be

that the conventional educational approaches with their compartmentalized learning focus are not working. A disconnected learning environment may very well have disabled many from connecting to the natural environment in more diverse, sustainable, and sensitive ways. "There are better reasons to rethink education that have to do with the issues of human survival which will dominate the world of the twenty first century" (Orr, 1994, p. 26). Conventional educational systems do not seem to be teaching connectiveness, and yet some people still learn it. How they learn it, overcome barriers and obstacles, and sustain themselves in ecological consciousness will be the problem examined in this study.

Questions to contemplate include: Do present higher and adult educational systems and curricula development indeed promote a kind of detached learning from ecological consciousness? Do adult environmental education programs give the learner more opportunity to explore his/her feelings in the environment or is it an extension of the traditional science curricula? Is there a pervasive assumption that persists which suggests that any kind of exposure to science education automatically infuses within us respect, and reverence for the environment?

Statement of Purpose

The purpose of this study is to describe the learning paths of individuals who have chosen to live deliberately with an

ecological consciousness. This is not to suggest that there are many other individuals who cannot be recognized as actively involved with environmental protection or conservation. This study will relate how these identified ecologically conscious individuals have overcome any educational and societal-imposed barriers to their ecological way of living, and how they implement and sustain that consciousness in everyday life.

Research Questions

In order to explore the problem, several questions will be addressed. They include:

1. How is an ecological consciousness acquired?
2. How does the development of an ecological consciousness relate to adult learning processes?
3. What formal and informal educational systems effect development of an ecological consciousness?
4. What resources are used or sought out to create and sustain a conscious connection to the natural world?
5. What are the social and economic implications to the practice of this ecologically conscious life style?
6. What roles do nature or outdoor experiences play in the learning process, and how are these related to the development of an environmental or ecological consciousness?

Significance of the Study

The results of this study are meaningful in several ways.

First, the study has explored a type of learning that goes contrary to what is generally proposed through formal learning and economic practice. The adults in this study have found value in learning with ecological consciousness.

Second, this study has examined an area of learning and practice that has important environmental and ecological implications. Opportunities arise to develop formal and informal educational learning environments that promote healing of environmental wounds and support a more sustainable earth.

Third, this study provides a look at a natural way of knowing that has foundation in indigenous education. The American Indian way of knowing the earth relating to a connective view of inner and outer realities of life may assist educators in development of programs that encompass a more holistic approach to one's surroundings.

Limitations

This study was limited to a selected number of individuals involved in an organic system of farming, the art of partnership with nature instead of control over nature. Given the ecological nature of the production system, which is foundational in this approach to agriculture, responses from these organic producers represent appropriate and fertile sources in which to develop descriptive paths of learning assumed by these identified ecologically conscious individuals. Further, by communicating knowledge from a distinctive organic producer point of view,

there is potential to grasp a fuller understanding of the connective and ecological nature of affective and cognitive realms within a framework of learning.

Definitions

Bioregion: In an attempt to work with the earth on a micro- scale level, a bioregion is viewed as a unique life territory with its own soils, landforms, watersheds, native plants and animals, and other distinctive natural characteristics. On a bioregional scale it becomes easier for people to determine the most ecologically sound and sustainable ways for people to live in a certain place.

Certified Organic: As a label referring to independent verification of organic practices on a farm, "Organic certification is a system of institutionalized trust, allowing consumers to identify and reward conscientious stewards of our natural heritage" (Organic Crop Improvement Association, 1998). The purpose of certification programs is to ensure that foods that are represented as "organically grown" have indeed been raised, processed, and packaged in a manner consistent with established organic food standards. The certifying agency for all of the organic producers in this study is the Organic Crop Improvement Association (OCIA) International, a Nebraska-based organization.

Conventional Production: Within a modern network of

agribusinesses associated with farm inputs, conventional production of food is an agricultural system that uses a chemical-dependent model of farming and which finds a strong foundation in a paradigm of industrialized agriculture.

Ecological Consciousness: As a way of thinking and feeling, it is an epistemology of the terms ecology and mind (Thomashaw, 1995, p. 18); this epistemology can be described as a mode of expression that offers a synthesis of knowledge, whereby an understanding of ecological concepts is considered in combination with corresponding cognitive and affective orientations toward one's surroundings. In other words, ecology and mind together "offer a new synthesis of knowledge, based on a comprehensive reappraisal of various normative views of the world" (Thomashow, 1995, p. 18).

Environment: From the French word "environner" which means to encircle or surround, environment can be defined as the conditions that surround an organism or group of organisms; or it can be viewed as a complex of social or cultural conditions that affect an individual or community (Cunningham & Saigo, 1997, p. 4). Broadly speaking, everything that affects an organism during its lifetime is collectively known as its environment.

Holism: Opposed to reductionistic, or interpreting nature by examining successively lower levels of organization, holism is an attempt to describe or be concerned with all

properties of whole systems, such as organisms or ecosystems, rather than the properties of their constituent parts. Ecologically, it is a view of the living environment in terms of interacting wholes that are more than the mere sum of their parts. In addition, holistic thinking may be thought of as "the perceptual skill of seeing and understanding the world not as separate parts but as an integrated whole" (Kittredge, 1998, p. 21).

Learning Paths: In viewing learning as an internal process whereby the whole being of the individual or learner is engaged (Knowles, 1970, p. 56), learning paths can be described as those intellectual and emotional functions that inform learning. Additionally, those functions are influenced by the interactions of the learner with his or her environment, that interactive process being defined as experience. A learning path can also be interpreted metaphorically as a journey through life in which knowledge, understanding, and wisdom are gained and reinterpreted many times by diverse interactions with one's surroundings or experiences throughout life. "The quality and amount of learning is influenced by the quality and amount of interaction between individuals and their environment and by the educative potency of the environment" (p. 56).

Linear Process: Process is a phenomenon that involves a series of actions. A linear process is a one in which there is a

single dimensional, straight-line, and causal analysis of those actions "that strives to isolate simple relations between small sets of variables" (Leff, 1978, p. 7). This process is the antithesis of a systems approach to a phenomenon that "stresses examination of the intricate interrelations among interacting elements" (p. 7).

Organic Production: As a system of growing food crops or gardening, it references "organic" as the highest standard available for food producing methods that replenish soil naturally, respect biodiversity, and are uncontaminated by other non-organic methods. Organic producers are then those who embrace this process and are the pioneers engaged in a partnership with nature.

Sustainability: Refers to the long-term endurance of a system. As an action, sustain means to support adequately, completely, and by implication, indefinitely. Ecological sustainability "is the preservation of nature--that is, the plants and animals, as well as the soil, air, and water on which all organisms depend for sustenance" (Soule & Piper, 1992, p. 79). Sustainability in agriculture relates to the indefinite endurance of the system without depleting its ecological support base (p. 79).

CHAPTER 2

UNFOLDING PATHS OF LEARNING

Introduction

Inasmuch as "no problem in education exists in isolation from other areas of human behavior" (Merriam, 1988, p. 62), a probing literature review reveals not only what has been researched in an area of interest, but the revelation itself proffers a significant contribution to the already existing knowledge base.

A plethora of research exists on the independent issues of environment and education. Education for the environment has become an area of interest for contemporary research in which one finds a blending of educational approaches with ecological approaches to the environment. Oftentimes, this blend has found a reference in environmental education. In order to better understand the nature of connection between the environment and education and that relationship to individuals described as ecologically conscious, it is important to examine the research and writings available on several different subject areas. They include environmental activism, environment and ecology, anthropocentrism, ecological consciousness, American Indian ecological consciousness, American Indian education, earth education, and education and the adult learner.

Environmental Activism

There are several different stages of environmental activism which focus on different problems and which suggest distinctive solutions. Pragmatic resource conservation is indicative of the era of Theodore Roosevelt and Gifford Pinchot. President Roosevelt and the first chief of the U. S. Forest Service were influenced by a publication by George Perkins Marsh, a geologist. Written in 1864, Man and Nature has been considered the wellspring of environmental protection in North America. Alarmed by the wanton destruction of resources occurring on the American frontier in his lifetime, Marsh warned of its ecological consequences. As a result of his book, national forest reserves were established in the United States in 1873 to protect dwindling timber supplies and endangered watersheds.

The basis of the Roosevelt and Pinchot policies in the early 1900s was Utilitarian Conservation (Cunningham & Saigo, 1997, p. 6). Their argument was one that suggested forests should be saved "not because they are beautiful or because they shelter wild creatures of the wilderness, but only to provide homes and jobs for people" (cited in Cunningham and Saigo, 1997, p. 6). This utilitarian approach can still be seen today in the multiple use policy of the Forest Service, a principle of managing public lands for a variety of purposes--timbering, mining, recreation (Miller, 1994, p. 392).

At about the same time opposition to utilitarian conservation influences came about largely from the efforts of John Muir, geologist, author, and first president of the Sierra Club. He argued that nature deserves to exist for its own sake regardless of its usefulness to people. Muir wrote:

> The world, we are told, was made for man. [This is] a presumption that is totally unsupported by facts . . . Nature's object in making animals and plants might possibly be first of all the happiness of each one of them . . . . Why ought man to value himself as more than an infinitely small unit of the one great unit of creation? (cited in Cunningham and Saigo, 1997, p. 6).

This aesthetic and spiritual outlook has been called Altruistic Preservation because it emphasized the fundamental right of other organisms to exist and to pursue their own interests. To that end, Muir worked hard for the establishment of Yosemite and King's Canyon National Parks.

A growing concern about health and ecological damage caused by pollution from the tremendous industrial expansion during and after the Second World War added a new set of concerns to the environmental agenda. Published in 1962, biologist Rachel Carson's Silent Spring alerted the public to the threats of pollution and toxic chemicals to humans as well as other species (Miller, 1994, p. 38). Her documentation of the pollution of air, water, and wildlife from pesticides such as dichlorodiphenytrichloroethane (DDT) engendered a movement that helped broaden the concept of resource conservation to include preservation of the quality of the air, water, and soil. This

came about during a time when the country was experiencing rapid economic growth and was not accepting of such a view. Regardless, her efforts were a driving force in the birth of what is now known as Environmentalism in the United States, or the Environmental Movement because its concerns are extended to include both environmental resources and pollution.

Both activism and research remain hallmarks of the modern Environmental Movement. Techniques descriptive of the movement include litigation, intervention in regulatory hearings, book and calendar publishing, and mass media usage for publicity campaigns. The environmental agenda expanded in the 1960s and 1970s to include issues such as human population growth, atomic weapons testing and atomic power, fossil fuel extraction and use, recycling, air and water pollution, and wilderness protection (Miller, 1994, p. 38). All of this contributed to awakening people to the interlocking relationships between population growth, resource use, and pollution.

In the late 1970s, a coalition which consisted of mostly ranchers, miners, loggers, developers, farmers, and politicians, launched a political campaign which was commonly referred to as the Sagebrush Rebellion (p. 39). In response to the large percentage of public lands under federal control, these various groups together sought to remove most western lands from public ownership and turn them over to the state. The plan then was to persuade state legislators to sell or lease the resource-rich

lands at low prices to ranching, mining, timber, land developers, and other private interests. Then in 1981, Ronald Reagan, a self-declared Sagebrush Rebel and advocate of less federal control, was elected president. During his eight years in office, Reagan mounted a massive attack on the conservation and environmental laws established over the previous 80 years (p. 39). Many people strongly opposed his environmental policies that were overtly attacked by members of Congress. Public outrage and legal challenges by environmental and conservation organizations marked activist activities during this period. The net effect of the Reagan years was to slow down the momentum of environmental protection and resource conservation built up in the 1970s.

> Environmentalism is frequently seen as the attempt to work only within the confines of conventional political processes of industrialized nations to alleviate some of the worst forms of air and water pollution, destruction of indigenous wildlife, and some of the most short-sighted development projects. (Devall & Sessions, 1985, p. 2)

These special interest activities do not challenge, question, or change the basic assumptions of economic growth and development. Reformist activists often feel trapped in this very political system. If they do not use the language of resource economists, then they are labeled sentimental, irrational, and unrealistic (p. 3).

Global Environmentalism represents yet another stage of ecological concern (Cunningham & Saigo, 1997, p. 7). Photographs

of the Earth from space reveal how small, fragile, beautiful and rare the home planet is. Humankind shares a common environment at this global scale, and our concerns may shift from questions of preservation or preventing pollution to concerns of the life-support systems of the whole planet. Current human impacts are changing the planetary weather systems, reducing the natural variety of organisms, and degrading ecosystems that could have devastating effects both on humans and on all other life forms (p. 375). Protecting the environment has become an international cause. Major international conventions such as the 1972 United Nations Conference on the Human Environment in Stockholm and the 1992 United Nations "Earth Summit" on the Environment and Development in Rio de Janiero addressed these new issues (Miller, 1994, p. 676).

Another consideration, which is more urgent in its environmental agenda, is a new environmentalism. Peter Montague, research analyst for Greenpeace and director of the Environmental Research Foundation in Washington D.C. says:

> Environmentalism as we have known it for over 27 years is dead. The environmentalism of the 1970s advocated strict numerical controls on releases of dangerous wastes into the environment. Industry's ability to create new hazards, however, quickly outstripped government's ability to establish adequate controls and enforcement programs. After so many years of effort by government and by concerned citizens, the overwhelming majority of dangerous chemicals is still not regulated in any way. In short, the "pollution management" approach to environmental protection has failed and stands discredited; 'pollution prevention' is our only hope. An ounce of prevention really is worth a pound of cure. (cited in Miller, 1994, p. 41)

Launching a new environmental revolution will require significant changes in worldviews, economic and political systems, and lifestyles, and it will involve much controversy. Paradigm shifts from pollution cleanup to pollution prevention, from waste disposal to waste prevention and reduction, from species protection to habitat protection, and from increased resource use to increased resource conservation will have to take place. Parts of the world which have been damaged will have to be allowed to heal; severely damaged areas will need to be restored; the remaining wild areas will need to be protected from destructive development. Lester Brown, president of the Worldwatch Institute, argues that there is no precedent for the rapid and substantial change that needs to be made:

> Muddling through will not work. Either we will turn things around quickly or the self-reinforcing internal dynamic of the deterioration-and-decline scenario will take over. The policy decisions we make in the years immediately ahead will determine whether our children live in a world of development or decline . . . . Building an environmentally sustainable future depends on restructuring the global economy, enacting major shifts in human reproductive behavior, and making dramatic changes in values and lifestyles. Doing all this quickly adds up to a revolution that is driven and defined by the need to restore and preserve the earth's environmental systems. If this "Environmental Revolution" succeeds, it will rank with the Agricultural and Industrial Revolutions as one of the great economic and social transformations in human history. (cited in Miller, 1994, p. 43)

Environment and Ecology

It is essential to describe some persistent kinds of thinking that characterize environmental and ecological thought

processes which have existed and continue to exist in society today. For purposes of this thesis, it is important to clarify these characterizations to fully appreciate the direction of this research.

According to most dictionaries a literal translation of the term "environment" refers to "the complex of climatic, edaphic, and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival." (Webster's New Collegiate Dictionary, 1977). A homocentric connotation may translate environment as the "outdoors." The term suggests a composition of factors, living and nonliving, which affect an organism or ecosystem during its lifetime. It refers to the external conditions or surroundings of organisms. Pollution of the environment constitutes a condition that would affect an organism or ecosystem.

On the other hand, environment can also reference "an aggregate of social and cultural conditions that influence the life of an individual or community" according to Webster's New Collegiate Dictionary (1977). One might infer from this definition that it is an association made more in terms of human societal systems than to biological systems. Culture, too, connotes more of an application to a human society than to the social systems of other living things, metaphorically-speaking. Culture is most often interpreted as the customs, beliefs, and social forms of a group of people. However, a more classic

definition of culture comes from Edward Sapir, professor of anthropology and linguistics at Yale from 1931 to 1939:

> Genuine culture is . . . the expression of a richly varied and yet somehow unified and consistent attitude toward life, an attitude which sees the significance of any one element of civilization in its relation to all others. (cited in Szasz, 1979, p. 66)

A relational element here is the common thread running through much of the fabric of environmental terminology. Even as one might consider each of these two definitions of the environment in a separate and literal light, they resemble one another figuratively as well, which then expands upon the meaning of the term.

The term "ecology" is relatively a contemporary one. A German biologist (also a philosopher), Ernst Haeckel, coined the term in the middle 1800s (Miller, 1998, p. 95). However, the discipline of ecology is only about a 100 years old. It is interesting to note that there are various types of science, philosophy, and social-related disciplines that have emerged with this term in tow. They include more Western and anthropological thought processes that emphasize such areas as human ecology, deep ecology, the Science of Ecology.

The term itself was initially "oecology." It was derived from the Greek "oikos" that referred originally to the family household and its daily operations and maintenance (Fox, 1995, p. 31). Contemporarily, the term ecology is defined as the study of how living organisms interact with one another (family) and with

their non-living environment (home) (p. 32). More recently the discipline of ecology has become analogous with some interesting concepts relating to the environment and nature. For example, "home" and "family" have become synonymous with earth as home to all living things. The very etymology of the term tends to be appealing in a hopeful sort of way, emphasizing the connective relationship of earth and all living things including humans.

It is the distinctions between these two terms, environment and ecology, that have led to various perceptions, tending to confuse and entrench themselves via the establishment of social, economic, political, and environmental interest groups. A resulting problem is that do-good, legitimate activities to protect the environment have alienated other interest groups to the point of negative action, including incidents which are sometimes physically violent, sometimes scathingly insulting. It is important at this point to consciously reflect upon an extremely pervasive factor underlying the foundation of these various environmental and ecological distinctions and their rationales--that of a human-centered mentality.

Anthropocentrism

Anthropocentrism, or human-centeredness, permeates many of the ideas that comprise interpretation of ecology and environmentalism. According to Fox (1995):

> The assumption of human self-importance in the larger scheme of things has, to all intents and purposes, been the single deepest and most persistent assumption of

> (at least) all the dominant Western philosophical, social, and political traditions since the time of the classical Greeks. (p. 9)

This idea of humans as the measure of all things is deeply embedded in our culture and our consciousness. Even as those who argue for conservation or preservation of the nonhuman world as environmentalists, they do so because of the value that it brings to humans in the form of scientific or recreational worth. Even the more noble intrinsic view of aesthetic value of the nonhuman consideration is human engendered. It is rarely argued that the nonhuman world should be conserved or preserved for its own sake, for its "use value to nonhuman beings" (p. 11).

There is a movement to challenge the anthropocentric assumptions that have dominated American culture, beyond just the referenced environmental context, but as it relates to such disciplines as sociology, economics and political theory (Fox, 1995, p. 14). Thinking about man's place in the larger scheme of life, it is important to be reminded of several considerations. Humans do not live at the center of the universe and are not biologically unrelated to other living organisms. In fact, man is not even so socially or culturally different from other animals either. It is well known that some animal species have evolved a harmonious system of communication (such as the orcas). Others have made use of tools, educated their young, and live in complex social organizations. It can be argued that it is the degree to which these considerations apply to humans and to other

living things that implies that humans do much better and therefore are of superior status.

> The attempt to assimilate other animals to the status of inferior humans makes as little sense as "regarding women as defective men who lack penises, or humans as defective sea mammals who lack sonar capability and have to be rescued by dolphins." Assimilations of this kind succeed only in degrading other beings by failing "to respect them for having their own existence, their own character and their own forms of excellence, their own integrity, their own grandeur." (Fox, 1995, p. 15)

The study of the interrelations of living things to each other and to their environment must be recognized as foundational in the development of a sustainable guiding principle for future earth activities. Humans are part of this principle, and as such, man must recognize the nature of connectivity that exists in the pursuit of cultivation of place. An anthropocentric mind-set represents not only a deluded orientation toward the world but a dangerous one--one based on a consciousness of unsustainability that has given rise to ecological ills on the earth today (p. 13).

In contemplating the historic roots of environmentalism, it can be noted that in the traditional American conservation movement, Conservationists and Preservationists are:

> . . . at bottom "anthropocentric": both believe that only people possess <u>intrinsic</u> value, while nature possesses <u>instrumental</u> value; and both regard human beings or human interests as the only legitimate ends and nonhuman natural entities and nature as a whole as means. (Callicott, 1991, p. 24)

It is this anthropocentric thought process that has permitted the entrenchment of an economic system based on a free-market

mentality stressing profits and prices at the expense of the environment. The market does not take into account the external costs of economic goods. All economic goods have both internal and external costs associated with their production (Miller, 1994, p. 644). For example, the price paid for a new car reflects the costs of the factory, raw materials, labor, marketing, shipping, and company and dealer profits. After the car is bought, one pays for gasoline to run it and the maintenance and repair. These are all internal direct costs to the seller and buyer, respectively. Not included in these direct costs are social and environmental costs. These "externalities" are the result of extracting and processing of raw materials to make and propel the car--disturbances to the land, pollution of air and water, reduction of biodiversity, and acute and chronic health effects on humans and other living things.

Since these harmful external costs are not included in the market price, associating them with the car or type of car one drives does not take place. However, consumers pay these hidden costs sooner or later in the form of higher taxes (regulation of pollution), higher health costs, and higher maintenance bills. Clean air and water, good health, and biodiversity are not free. Their costs, however, are hidden from the marketplace.

A suggested solution to the dilemma is full-cost pricing of economic goods and involves internalizing the external costs (p. 644). This may involve government action as few companies will

increase their costs of doing business unless others have to do it as well. The benefits of a redirection in economic growth certainly outweigh the continued destructiveness of the hidden cost mentality of our present-day system to the environment. External costs would no longer be hidden. Consumers would have the information needed to make informed economic decisions. Is this not the essence behind the theory of a true free-market economy?

Moreover, internalizing external costs may stimulate producers to cut costs with inventions that are more resource-efficient and less harmful to the environment and all living things in the production process. The results of the stimulus then become the self-reinforcing dynamic of an ecological-and-sustainability scenario for future human activities impacting earth. New paradigm shifts might result--pollution prevention, not pollution management; waste prevention, not waste disposal; habitat protection, not species management; and increased efficiency of resources, not increased resource use.

There is also a stewardship version of resource conservation echoing from a Judeo-Christian theology which can be linked to an anthropocentric mind-set in its interpretation. These human self-important theological underpinnings relating to the environment suggest that:

> People retain a privileged place in the creation--as God's specially favored creatures, and morally accountable regents. We may freely use nature so long as we do so wisely and responsibly; and that could

> easily be interpreted to mean efficiently, equitably, and sustainably--the greatest good, for the greatest number, over the long run. (Callicott, 1991, p. 24)

It was John Muir, wilderness preservationist, who suggested that people are just a part of nature on par with other creatures. His theological argument defended the rights of nature and stirred the ecological consciousness of many when in 1916 he wrote:

> Why should man value himself as more than a small part of one great unit of creation? And what creature of all that the Lord has taken the pains to make is not essential to the completeness of that unit--the cosmos? The universe would be incomplete without man; but it would also be incomplete with the smallest transmicroscopic creature that dwells beyond our conceitful eyes and knowledge. (cited in Callicott, 1991, p. 24)

Here are two assumptions and two very contrasting ways of interpreting the connection of man and nature on a theological level. It would be difficult to argue the stewardship viewpoint on a less than "goodness of man" level. Theological interpretations usually withstand criticisms by the very nature of God's involvement. In fact, even Muir's campaign for the preservation and appreciation of wilderness was seen largely in terms of "superior human spiritual values" (p. 24), consistent with an anthropological mind-set.

However, Muir seems to suggest that nature itself possesses intrinsic value, value in and of itself. Certainly this challenges the entrenched historical anthropocentric views of intrinsic value only in terms of humans and nature as only of

instrumental value. Muir articulates through biblical means his vision of an ecological worldview:

> God created humans and all other creatures; each are "good" in His eyes as is creation as a whole; impious destruction of God's creative work is indicative of human arrogance (p. 25).

It was Aldo Leopold who carried forth and expanded upon Muir's emerging bio-egalitarian and ecological worldview. Trained as a professional conservationist in the Pinchot philosophy of the wise use of natural resources, Leopold soon concluded that knowledge of ecology is essential to efficient forest and wildlife management. However, ecology was evolving into an entirely different scientific paradigm than that which characterized the foundations of Pinchot's philosophy. Thinking more ecologically meant that nature was being perceived as "more than a collection of externally-related useful, useless, and noxious species arrayed upon an environmental landscape of soils and waters" (Callicott, 1991, p. 24). Leopold expressed nature as more of a vast organism:

> Ecology is a new fusion point for all the sciences . . . The emergence of ecology has placed the economic biologist in a peculiar dilemma: with one hand he points out the accumulated findings of his search for utility, or lack of utility, in this or that species; with the other he lifts the veil from a biota so complex, so conditioned by interwoven cooperation and competitions, that no man can say where utility begins or ends. (p. 24)

In a Sand County Almanac, Leopold (1949/1966) proposed a new land ethic and urged people to develop an ecological consciousness to protect wildlands and wildlife. He likened human beings as

citizens of one biotic community, of no greater, no lesser importance than other living things in the great scheme of life. Leopold simply enlarged the boundaries of community to include the soils, waters, plants and animals, thus affirming the recognition that they too have intrinsic, not just instrumental value. He elevated the status of soils, waters, plants and animals from that of natural resources (an anthropocentric view) to that of fellow members of the whole biotic community (an ecological view) (Leopold, 1949/66, p. 239). An ecological consciousness implied respect for the holistic nature of the biotic community.

Contemporarily speaking, an even deeper ecological environmentalism is emerging. Deep ecology can be understood as premised on several fundamental conditions that build toward a more sustainable earth. From Muir to Leopold to a contemporary environmental awareness, a major theme in deep ecology involves the condition that everyone and every living species is interconnected. The role of humans is not to control nature but to work with nature through ecological understanding and application. On a more global and holistic level, deep ecology suggests that our major goal should be to preserve the ecological integrity, stability, and diversity of the life-support systems for all living organisms. One can infer from this that deep ecology is related to modern science (ecology) with its systems approach. However, deep ecology goes beyond a scientific

interpretation to a more spiritual vision. An awareness of a oneness of all life calls for a fundamental shift of human attitudes and behaviors toward a more biocentric level of thinking about the earth.

Many people are indeed making strides that reflect an ecological awareness in their own lives, perhaps in an effort to heal their own broken connections to their environmental surroundings. Eating healthier foods, growing their own without synthetic inputs, and living more in harmony with their bodies and spiritual selves are examples of an emerging consciousness of life. Author, Brian Tokar (1987) suggests that:

> Personal changes, crucial as they may be, are not enough. For our species to survive on this earth, we need to evolve a new culture, a new way of relating to each other and to the world around us. An ecological consciousness has to spread to those who have thus far not been affected by the subtler changes we see occurring. This can create the openings necessary for larger social and cultural changes. (Tokar, 1987, p. 27).

Ecological Consciousness

A concept relating to environmental learning is one most often steeped in ethical and moral theory. Ecological consciousness can be viewed metaphorically as an attempt to bring together the terms "ecology" and "mind." Mitchell Thomashow (1995), author and environmental educator, suggests that when viewed together, ecological consciousness offers "an approach to knowledge based on an understanding of ecological concepts, not

only as they are derived from scientific ecology but also from vernacular cultures and ancient philosophies" (p. 18). Thomashow makes reference to Herbert L. Leff (1978), an environmental psychologist, who suggests four components of an ecological consciousness: ecological systems thinking, a high ability to enjoy and appreciate things in themselves, an ecocentric value system, and a synergistic orientation in interactions with one's social and physical environment. In essence, an ecological consciousness integrates intuitive, spiritual, and rational forms of knowledge. Leff discusses an ecological consciousness as "a specific ideal cognitive, valuational, and motivational orientation toward the world . . . more a goal to strive for than a particular pattern of psychological functioning that we can readily investigate" (p. 282).

According to Leff, ecological systems thinking is a holistic, non-linear thought process that finds expression in the connectiveness of all things (p. 283). It is most difficult to deny the fact that man is fundamentally connected to our physical and social environments, not independent of them. Humans are an integral part of the biosphere. Ecological systems thinking involves the sense of self as part of larger systems. Leff also suggests that it encompasses an awareness and/or a high level of understanding of the ecological processes and how these operate in one's life and surroundings (p. 284). This is not to suggest that a high level of knowledge of ecological processes implies

thinking integratively. Leff contends that the failure to use "cognitive sets that would actively relate this knowledge to [one's] own ongoing environmental experiences" does not relate to a full expression of ecological systems thinking" (p. 285). Of course, the converse is just as important. One may try to engage in attending to ecological processes, but the initiated "cognitive set" may be mute without an understanding of ecological principles. Thus "both knowledge and the activation of cognitive sets that used such knowledge effectively and experientially would be essential for . . . ecological awareness" (p. 285).

Another component to Leff's interpretation of ecological consciousness is the ability to appreciate things in themselves. Leff relates this component to Maslow's concept of "Being-cognition (B-cognition) or the total focusing on the object of perception and a suspension of processes of comparing and evaluating" (p. 141). Leff is quick to point out that carried to extreme, total object-centeredness can lead more or less to a kind of irresponsibility to one's self, others, and surroundings. Clearly, though, possessing a high level of aestheticness, appropriately engaged, contributes to Leff's ideas of ecological consciousness. He points out that it finds expression in those who have a high ability to enjoy this mode of experiencing.

An ecocentric value system is a third component of Leff's version of ecological consciousness. An ecocentric mind-set

might be described as focusing primarily on the welfare of the ecosystem as a whole, an earth-centered view. In other words, it might be conceived as going beyond species and organisms and being concerned with non-degradation or destruction of earth's life-support systems as well as with preservation of earth's biodiversity and ecological integrity (p. 286). This perhaps is the underlying spirit of ecological consciousness. Leff suggests that this component embraces high levels of ecological systems thinking and B-cognition already alluded to, and "an internalized concern for the welfare of all sentient creatures" (p. 287).

A final component of Leff's view of ecological consciousness revolves around "a creatively cooperative pattern of relating to people and other aspects of nature" (p. 283)--a synergistic orientation. He defines synergy as "combined action" or a cooperative action (p. 287). He states that "this term, when applied to human action or thinking, also carries connotations of creative integration, recognized interdependence, and doing good for all parties concerned" (p. 287). As evidence of this, Leff recounts Maslow's study of the Blackfoot Indian culture, a group of people high in synergy:

> Among these people, esteem was accorded the person who gave away wealth or shared possessions freely (as opposed to the dominant American practice of according highest esteem to the persons or families who acquire and keep the most wealth for the longest time). The synergy is represented by the correspondence between satisfaction for the giver in high social (and self-) esteem and satisfaction for other members of the culture in meeting needs for food, clothing, transportation, and so on. (p. 52)

Leff admits that the picture he paints of an ecological consciousness is one that may be criticized for being more unrealistic than for the "undesireable cognitive, valuational, and motivational orientations toward the world" (p. 288).

It is important at this juncture to establish how an ecological consciousness is connected to the land. There is an ecological concept that relates individual actions and the effects of those actions on a cumulative level. The concept suggests that even though each individual impact may not seem to produce an effect on anything, the cumulative effect of several instances may lead to impairment. The concept can be viewed negatively when one considers the polluting actions of individuals on a drainage basin or a watershed. For example, eroding soil from one fallow farm field may summon up very little attention if the stream that is receiving it is not muddy. However, suppose there are contributions of soil erosion from many fields on several farms along a meandering stream such that it becomes muddy and choked with suspended material. Not only is the water in the stream impaired but the aquatic system of life is at risk as well. The land, too, is denuded of its fertile abilities. Humans and other living organisms that depend on the life-giving waters and soil for survival as well as for aesthetic comfort are critically affected.

Leopold (Flader & Callicott, 1991) contemplated this ecological concept when in 1942 he attempted to bring some

insight into what he perceived to be a lack of progress toward conservation of the land. He thoughtfully considered the valuelessness of conservation education within the context in which he perceived it being used at the time--volumes of efforts but little heed to a content lacking in meaning. He describes a basic defect:

> We have not asked the citizen to assume any real responsibility. We have told him that if he will vote right, obey the law, join some organizations, and practice what conservation is profitable on his own land, that everything will be lovely . . . . This formula is too easy to accomplish anything worthwhile. It calls for no effort or sacrifice; no change in our philosophy of values . . . Obligations have no meaning without conscience. (p. 338)

Leopold emphasizes that the changing of human conduct must be reflected in internal efforts that would allow transformation of thought processes and attitudes. Without the ability to engage in a transformation process, self-improvement would be tenuous at best and is translated into unconscious scarring of the face of the land. What is lacking, according to Leopold, is an ecological conscience. He defines it within the context of both science and society. "Ecology is the science of communities, and the ecological conscience is therefore the ethics of community life" (p. 340).

One cannot study ecology without thinking in terms of relationships. The interrelational nature of ecology is community oriented. Ecosystems are interrelated communities of living organisms interacting with each other and their non-living

components, functioning in harmony. So, too, a human society is composed of interacting communities of people who are able to intellectualize and perhaps have the capacity to think with their hearts or with conscience also. It is being able to translate the idea of the interrelational workings of community to that of one's environment or place where one lives that is crucial toward development of an new appreciation of one's own interrelatedness with other people and with the ecosystem. Leopold acknowledges a pervasive lack of this systems-type thinking process within the community of people:

> I have no illusions about the speed or accuracy with which an ecological conscience can become functional. It has required 19 centuries to define decent man-to-man conduct and the process is only half done; it may take as long to evolve a code of decency for man-to-land conduct. (Flader & Callicott, 1991, p. 345)

In addition, Leopold suggests that an ethical element must be considered in man's conscious interaction with the environment. "A thing is right only when it tends to preserve the integrity, stability, and the beauty of the community, and the community includes the soil, waters, fauna, and flora, as well as people" (p. 345).

American Indian Ecological Consciousness

N. Scott Momaday, Indian author, speaks of a deeper sense of knowing one's place, a reflection on the Indian way of seeing life. "I am interested in the way that a man looks at a given landscape and takes possession of it in his blood and brain"

(cited in Redbird, Chatham, & Griffin, 1980, p. 28). The way people feel and think their connection with nature or the environment is at the heart of human ecological consciousness. The development of this consciousness of nature has not been given the cultivation it deserves as an approach to connecting with the natural world. It does not seem to be an inherent practice in the way a majority of humans approach nature. The subjective underpinnings of the terms used to describe it--feelings, consciousness--are considered inapplicable to an entrenched scientific approach of dealing with nature or the environment. American society has identified nature or the environment with methods of science.

The state of the natural environment today does suggest that man has and continues to foul his own nest in the name of economic liberty. For example, the extraction and processing of raw materials to build new and increased numbers of automobiles disturbs the land, pollutes the air and water, reduces biodiversity and is harmful to people's health (Miller, 1994, p. 644). There is reason to believe that this desecration of the place where we live is related to a lack of true ecological consciousness for Mother Earth. Was there ever a time when a deeper human consciousness of nature existed beyond or in tandem with the physical considerations related to man's survival needs?

The American Indian has long been thought of as the first true ecologist. American and European literature abound with

American Indian perspectives, legends, and oral tradition referencing a people who lived in harmony with [earth] life cycles.

> They were different groups of people who had different languages, different cultures, different religions, different beliefs--nations of people joined together. . . . Each nation thought of itself as 'The People.' All nations had one underlying commonality-an understanding and a respect for the total environment. Every rock, every plant, every animal, every insect, every person had a role to play in maintaining the delicate balance that made life possible . . . they were the first environmentalists. (Redbird, Griffin, & Chatham, 1980, p.2)

To reference the term "American Indian" is not to make an assumption that all Indian people are alike. As the passage above suggests, differences exist related to culture and to language. However, it is noted that there was a significant commonality among all Indian people--reverence for the earth, the land, the natural world. N. Scott Momaday writes:

> Ecology is perhaps the most important subject of our time. I can't think of an issue in which the Indian has more authority or a greater stake. If there is one thing which truly distinguishes him, it is surely his regard of and for the natural world. (p. 29)

The American Indian concept of the environment is ecological in essence. Historically speaking, Indians were ecologists before it ever became a westernized concept. It was the Indian who originally conceived ecology in its truest sense, living in harmony with the cycles of life. The foundation of this approach is established in a consciousness that was innate in American Indian cultures. Not only is that consciousness

connected to survival needs but it embraces a sense of the spiritual and promoted wisdom. In essence, the two are one in the same. Gregory Cajete (1994), educator and author of Look to the Mountain, says that this holistic consciousness is the essence of American Indian education:

> Understanding the depth of relationships and significance of participation in all aspects of life are keys to traditional American Indian education . . . In Tribal education, knowledge gained from first-hand experience in the world is transmitted or explored through ritual, ceremony, art, and appropriate technology. Education gained through these vehicles is then used in everyday living. Education is . . .learning about life through participation and relationship in community, including not only people, but plants, animals and the whole of nature. (p. 26)

In the video, The American Indian's Sacred Land, (Freewheelin, 1977), a Cheyenne ritual is used as a way of learning. A young Cheyenne would venture out to the sacred mountain with his father and an elder. This process along with fasting was to bring about a vision which was deemed "teacher". It is said then that the people are taught. In describing white man's approach to nature words such as subdue, conquer, and dominion are often used. Words that might best describe the American Indian approach are harmony, reverence, and respect, often expressed through rituals. A ritual is communal and expresses a tribe's unity with the earth and dependence on it for sustenance (Grinde & Johansen, 1995, p. 41). Iroquois festivals celebrate the vital role of the "three sisters"--corn, squash, and beans.

Typically, the white man's approach to nature is control. In American Indian literature reference is made to a connective world. Chief Luther Standing Bear of the Sioux speaks of this:

> The white man is still troubled with primitive fears: he still has in his consciousness the perils of this frontier continent. . . . The man from Europe is still a foreigner and an alien . . . The roots of the tree of his life has not yet grasped the rock and soil. (cited in Redbird, et al, p. 5)

In contrast, reverence, deep regard for nature, and respect for the land and environment are the major unifying themes expressed throughout American Indian literature. John Lame Deer gives this account:

> We Sioux spend a lot of time thinking about everyday things, which in our mind are mixed up with the spiritual. We see in the world around us many symbols that teach us the meaning of life. We Indians live in a world of symbols and images where the spiritual and commonplace are one. To us they are part of nature, part of ourselves--the earth, the sun, the wind and rain, stones, trees, animals, even little insects like ants and grasshoppers. We try to understand them not with the head but with the heart, and we need no more than a hint to give us the meaning. (p. 18)

It is this innate and indigenous spiritual connection with Mother Earth that has escaped the Western approach to the natural world. Could it be that notions of environmental exploitation were innate in a Euro-American identification with nature? Christopher Vecsey and Robert W. Venables, in <u>American Indian Environments: Ecological Issues in Native American History</u> state:

> One of the themes of this book is the consequences of a conflict during which indigenous Indian nations, who saw their environments as the sacred interdependence of the creator's will, confronted waves of post-

> Renaissance Europeans who saw in the environment a natural resource ordained by God for their sole benefit. (p. 33)

Strong underpinnings of a Western anthropocentric religious concept have disallowed the interweaving of ecological and religious themes so constant among most native peoples in North America. The practice of Western religions tends to separate spirituality from nature or the environment and stresses God and man, apart from the place where man lives. This place, Mother Earth, seems to find its interpretation in a separate Western emphasis of the sciences and the scientific method. This separate scientific mind-set seeks causes and effects. As Grinde and Johansen (1995) point out:

> While scientific method seeks to explain and regularize the spirit of nature, the native mind makes inquiries into the nature of spirit, finding both concepts intertwined in a natural theology that establishes a sense of sacredness in place and tradition. (p. 14)

Thus there exists a native view of religion that embodies "reciprocal relationships between people and the sacred processes going on in the world" (p. 43). A "god" may not be part of this view. Prayer and favor-asking may not be significant. These may be the signs of "looking" religious, but to many American Indians almost everything is related to nature and the life cycles of all living things. Written and oral histories of many American Indian peoples indicate that cultures evolved over thousands of years largely in symbiosis with the earth that sustained them. The earth is the "sustainer" of all things. The welfare of the

earth to the people who live there is inextricably linked. All things share life, even the inanimate rocks.

This connectiveness to the natural world is the very foundation of ecology--the interactions of life with the living and non-living. Yet, contemporarily, academic study of these interactions is devoid of spirit. There is separation of things that can be quantified and researched through scientific methods from the essence of harmony with and reverence for the earth. This essential connection has been relegated in parts to the realms of Western science education and theology, respectively. Western history abounds with narratives of struggles to separate church and state, science and religion. The relevance of indigenous knowledge and wisdom suggests a more holistic approach to caring for the earth. Spirituality is dispersed throughout everyday life and not concentrated in a single monotheistic Supreme Being. A sense of place is steeped in humility and reverence for all life.

The way much of American society perceives its relationship with nature and the role people play in the scheme of things can be viewed as objective. Rediscovery of a true kinship with the earth by holistically interweaving the spiritual with the earth sciences is needed. Moving toward a more holistic awareness of our surroundings may allow the birth of an ecological consciousness and enhance the respect of indigenous knowledge and wisdom of the earth.

A study of American Indian knowledge and wisdom is not complete without reflection on its effect in a Eurocentric America. Ecological consciousness can be viewed as that which interweaves earth knowledge with a sensitivity to one's place in the universe. In any discourse on the environment it can be noted that the Eurocentric thinker focuses on control while the Native thinker focuses on harmony (Grinde & Johansen, 1995, p. 271).

Native people were present in this world tens of thousands of years before Columbus. The arrival of Europeans in indigenous America correlates well with European abstract constructions of the world which were highly anthropocentric. The indigenous Indian world in which they arrived was highly ecocentric, the focus being participative harmony with their environment through ritualistic activities respective of Mother Earth. The Indians succumbed to developing European ideology, and thus began the devaluation of deep Native ways of knowing, including traditional Native ecological insights (Suzuki & Knudtson, 1992, p. 8). In Ecocide of Native America, a contemporary Native American intellectual, Ward Churchill, expresses this view:

> Eurocentric intellectual isolation of American Indian environmental spirituality and thought is a form of monocultural orthodoxy that excludes Native American wisdom not for its message but because it fails to live up to European norms which involve assumptions about "savages". (Grinde & Johansen, 1995, p. 270)

Assumptions can be powerful motivating forces in human behavior and thought processes. Stephen Brookfield (1990), noted

adult educator, describes assumptions as "heuristic mechanisms through which we account for events in our lives" (p. 177). Further, they can be defined as taken-for-granted ideas that inform our thoughts and actions. The problem with this process is that these entrenched assumptions become second nature to us. Questioning them means questioning our own behavior. This can be very difficult. Admitting that our assumptions may be distorted or wrong tears at the very fabric of our social, political and environmental existence. Psychologically speaking, it can be devastating.

The development of many environmental perspectives in the civilized world today are the result of powerful European configurations applied to natural resources of the earth, land ownership, and social control (Grinde & Johansen, 1995, p. 269). These highly anthropocentric applications are finding expression in such activities as exploitation of earth's minerals, pollution of the water and air, development of land, once home for wildlife. Ultimately, the social implications of these continued negative, environmentally-related activities will be even less consciousness about the connective nature of all living and non-living things. Thinking and acting ecologically as the American Indians have innately done for generations holds the most promise for healing a sore earth and for instilling hope for learning to care for her more respectfully.

The Haudenosaunee (Iroquois), in their summarization of environmental problems, expressed this message:

> The traditional Native people hold the key to the reversal of the processes of Western Civilization, which hold the promise of unimaginable future suffering and destruction. Spiritualism is the highest form of political consciousness. Our culture is among the world's surviving proprietors of that kind of consciousness. Our culture is among the most ancient continuously existing cultures in the world. We are the spiritual guardians of this place. We are here to impart that message. (Grinde & Johansen, 1995, p. 269)

Indian Education

It is apparent from the literature that a struggle has existed and continues to exist in the education of Indian people. One notes immediately that the majority of education taking place in the United States is primarily that of the dominant culture. There is little consideration for other types of educational processes that might encompass a more holistic approach to learning. Ironically, a contemporary struggle exists within Indian cultures that relates to a desire of the Indian people that "the schools teach the skills required to participate in the dominant cash economy" (Fuchs & Havighurst, 1983, p. 118). These educational dilemmas have a profound effect on the contemporary view of American Indian education. Cajete (1994) defines it this way:

> A pervasive problem . . . is that its [American Indian Education] definition and evolution have always been dependent on American politics. Much of what characterizes Indian education policy is not the result of research predicated upon American Indian philosophical orientations, but the result of Acts of Congress, the history of treaty rights interpretation

> through the [American] courts, and the historic Indian/White relations unique to each Tribal group . . . (p. 19)

So it is then that education for Indians "parallels the troubled history of European conquest and colonization of the New World" (Fuchs & Havighurst, 1983, p. 2). It is a history that has assumed a somewhat distorted and unjust image of the Indian people themselves while extolling the virtues of a Western educational system that is linear in design. This American system was to be the civilizing force in the education of the Indian people. Assimilation, a kind of acculturation, was to be the result of this American educational goal. It would involve "one culture [Indian] changing significantly more to resemble the other culture [Euro-American]" (Ahler, 1988, p. 63). It is important to note that this process of assimilation is often established deliberately through force to maintain control over conquered peoples (p. 63).

The establishment of boarding schools by a federal branch of government, the Bureau of Indian Affairs (BIA), have left a legacy of unpleasant memories that affected attitudes and policies today, and which have left a misguided interpretation of Indian education and learning. Course work in these schools was usually unrelated to the environment and culture from which the student came. Children were removed, sometimes forcibly long distances from their homes. The students were taught to speak, read and write English, to dress and live like white people.

General Richard Henry Pratt, founder of the Carlisle Indian School in Pennsylvania in 1878, believed the mission of the school to be a process of civilizing the Indians. According to Fuchs & Havighurst (1983),

> To Pratt, the essential process of making American citizens out of Indians was immersing the Indians in our own civilization, and after getting them under, holding them there until they were thoroughly soaked. (p. 225)

Even though many of the results of a past century of assimilated education of the Indian have left deep scars in the cultural fabric of many Indian tribes, there are gentle breezes of change occurring related to more modern approaches to education. An increased interest in and subsequent research of indigenous education and learning is evolving. As it relates to Indian cultures, the indigenous basics of education emphasize and foster culturally-based ways of learning.

Contemporary American education can be viewed as:

> The transfer of academic skills and content that prepares the student to compete in the infrastructure of American society as it has been defined by the prevailing political, social, and economic order. (Cajete, 1994, p. 19)

It is not, in fact, of Indian making, but Indian people have been forcibly made to adapt to this Western, objective educational system which tends to subdue and de-emphasize the importance of the affective elements:

> The subjective experience and observations, the ritual and ceremony, the sacred ecology, the psychological and spiritual orientations--that have characterized and

> formed Indigenous education since time immemorial (p. 20).

Further, an objectivist mind-set, when viewed in relation to traditional Indian education, does not take into account or seriously consider the holistic and relational orientation of Indian cultures. As Cajete suggests, these inherent dimensions are not easily observable or verbalized within Indian cultures and thus lack acceptance in mainstream approaches to education (p. 20).

The learning process in traditional Indian societies encompasses a holistic thought process. An examination by Marashio (1982) of two aspects related to learning, teachers and instructional techniques, reveals the essence of Indian learning that could serve as a model for contemporary education. Marashio speaks of teachers in traditional Indian societies as helpers, those who would foster the bringing together of natural and spiritual worlds, and "to bring those two worlds into harmonious relationship" (p. 2). The Indian has many teachers. Family conveys the importance of self-discipline. A father may have fostered the meaning of societal precepts, thus enhancing development of family unity (p. 3). Other relatives may convey the boundaries of clan or act as sponsors for youngsters in the various "rites of passage" (p. 3). Animals are teachers, too, in that they may have been the guardians whose spiritual presence bring comfort in times of trouble or critical decision-making. Pervading nearly all Indian societies is the "over-riding spirit

forces that govern the universe; from these spirits, the people learn (p. 3).

The applied instructional techniques in traditional Indian societies are geared to "helping the learner learn in the most effective way" (p. 3). As this process pertains to helping adults learn Brookfield (1986) evaluated:

> Adults learn best when they feel the need to learn and when they have a sense of responsibility for what, why, and how they learn. . . . The learning method used will foster, to different degrees, the adult's exercise of autonomy. Adults will, however, learn best in an atmosphere that is nonthreatening and supportive of experimentation . . . (p. 30)

Thus a diverse array of approaches were made available in traditional Indian societies--songs, stories, questioning, dances, plays, ceremonies, visions, symbolism, impersonating spirits, playing and mimicking, and observation (Marashio, 1982, p. 3). A suspenseful story arouses a learner's imagination; songs may elicit the contemplation of important questions of life related to origin and leading a good life. Ceremonies instruct on traditional beliefs and the learner is then led "along the path of becoming" (p. 4), while knowledge is gained on changing disharmony into harmony. Observation intensifies sensitivities and awareness of the learner's surroundings. These instructional techniques are of second nature to traditional Indian cultures. Their application has instilled a cultural way of life that stresses holistic thinking. Marashio contends that these

instructional techniques "foster total immersion of the mind and the body into the learning process" (p. 7).

"Holistic" takes on many meanings depending upon the context in which it is used. Within the context of education, Robert Rhodes (1988) describes it as:

> A fostering of a broader base and context for understanding, a multi-level approach which encourages understanding of many aspects at the same time and of the interrelationships involved, which, in turn, encourages involvement, ownership, and commitment. (p. 27)

A holistic approach to education is realistic. It is a full dimensional framework in which there is a bonding of the practical experiences with those that foster a reverence and respect for life. The learner is exposed to life that is universally connected to everything. The interrelatedness of life is always considered in this approach to educating learners. Art, music, ethics, culture, farming and self are life. Indian people find difficulty learning in a segmented environment that is indicative of the contemporary Euro-American style of learning.

Marachio (1982) contends that "by directing a curriculum toward a balance between humanities and utilitarian, a harmony will lay upon the psyche of the learner with a clearer understanding by the learner of his/her universal role" (p. 9). Euro-American education needs to reassess its segmented push on math and sciences, for example, in consideration of the holistic mentality, giving learners the opportunity to experience life in

full bloom. A wounded earth may find a healing element in this humanistic approach to education.

Earth Education

Conceptually, environmental education is viewed as a response to a concern for the state of the environment in terms of use, overuse, and abuse of natural resources. In the 1970s, establishment and growth of subjects and courses in secondary and post-secondary education claim to teach about the environment. By the 1980s increasing confusion about the role and function of many environmental courses created problems in defining environmental education or in identifying major goals.

In 1977, the world's first intergovernmental conference on environmental education was organized by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and assembled in Tbilisi, Georgia (USSR). In recognition of the important role of environmental education in the preservation and improvement of the world's environment, the Tbilisi Declaration was released. It provided a rationale, goals, objective categories, and guiding principles for environmental education.

In 1990 Congress passed the National Environmental Education Act. Two broad goals were established. One was to improve understanding among the general public of the natural and built environment and the relationships between humans and their environment, including global aspects of environmental problems. The other was to encourage post-secondary students to pursue

careers related to the environment, an emphasis reminiscent of a conventional educational system. Specific objectives proposed to meet these goals included developing an awareness and appreciation of the natural and social environment, knowledge of basic ecological concepts, acquaintance with a broad range of current environmental issues, and experience in using investigative, critical-thinking, and problem-solving skills in solving environmental problems. Several states, including Arizona, Florida, Maryland, Minnesota, Pennsylvania, and Wisconsin have successfully incorporated these goals and objectives into their curricula.

It has been suggested that the biggest national demand over the next few years will be for environmental educators to help develop an environmentally literate populace and to encourage the next generation to prepare themselves for jobs in this area. Outdoor activities and natural sciences are important components of this mission, but environmental topics such as responsible consumerism, waste disposal, and respect for nature and nature's ecological systems can and should be incorporated into reading, writing, arithmetic, and every other part of education.

Some guidelines that have been proposed for an environmental education program come from the Minnesota Office of Environmental Education and are described as outcomes from environmental education. There are four contexts--natural, social, valuing, and action--in which an environmentally educated person is

described. In developing their environmental education GreenPrint plan, the Minnesota Environmental Education Board identifies priority audiences for environmental education. They also identify and prioritize behavioral outcomes and strategies for each audience. The outcomes are observable measurable behaviors that demonstrate an increase in environmental literacy, and each outcome contributes to one or more of the state's goals for environmental education.

Still other educators believe that Earth education should be the core of all education in schools and in public discourse. G. Tyler Miller, Jr. (1994), teacher for 36 years, expressed his philosophy of education through a quote from Norman Cousins: "the first aim of education should be not to prepare young people for careers, but to enable them to develop a respect for life" (p. iii). Miller admits that making Earth education the center of the learning process will not be an easy task because most teachers and members of the educational establishment are trained to think primarily in terms of disciplines.

Miller professes that formal education is important but that it is not enough. He relates that Earth thinkers such as Aldo Leopold and Henry David Thoreau believe that the essence, rhythms, and pulse of the earth within and around us can only be experienced at the deepest level by one's senses and feelings (p. 690). He calls this emotional learning. Emotionally experiencing connectedness with the earth leads to a recognition

that "the healing of the earth and healing of the human spirit are one and the same" (p. 690). People need to discover the "green fire" that burns in their hearts and use it as a force for working with the earth (p. 690).

Research by numerous investigators show that knowledge does not exist apart from the attitudes, feelings, and emotions. During the past 20 years, a large number of studies relating environmental education and the affective domain have been completed. Engleson and Yockers (1994) cite some major ideas of Louis Iozzi's evaluation of the research on environmental education and attitudes (p. 69). First, an unclear relationship exists between environmental knowledge and positive environmental attitudes, implying that teaching only for greater knowledge is insufficient for promoting positive affective growth (p. 69). Additionally, the implication also suggests that teaching about the environment does not infuse a sense of connection to or respect for the environment. Second, there seems to be a long lasting effect on acquired positive environmental attitudes and values (p. 69). Third, conflicting and inconclusive relationships exist between environmental attitudes and age, socio-economic status, place of residence (geographical, urban or rural), and gender (p. 69).

Further, Iozzi's evaluation of the research suggests that the development of environmental attitudes and values should begin before kindergarten and be further developed as students

progress through elementary, middle, and senior high school. Ideally, an assumption could be made that the building process in developing environmental attitudes and values would foster the development of adults whose environmental attitudes become a part of who they are. Experiencing the natural environment could allow one to "get in touch with our deepest selves, which has sensed from birth that when we destroy and degrade the natural systems that support us, we are attacking ourselves" (Miller, 1994, p. 690).

Education and the Adult Learner

A learning environment predicated upon a Western rational tradition may have affected many adults shaped by a highly conventional and pedagogical model of learning. Mezirow (1996) suggests this paradigm holds that "the most significant learning is that which enables the learner to understand and shape his or her behavior to better anticipate and control the real world" (p. 159). These learning experiences are often molded through an objective educational process responsible for transmission of what was thought to be real world representations that were often held up first to scientific methods of investigation (p. 159). This objective model suggests that knowledge exists in the external world and established rational means are utilized in the education of learners. Traditional conveyances of learning would include teachers and curricula that would foster the transfer of this rational knowledge to learners.

Kidd (1973) makes reference to the fact that, "For centuries some people spoke and acted as if learning was not possible unless accompanied by pain . . . and various forms of corporal punishment [as] necessary for learning" (p. 94). Even though fewer people believe that these methods foster learning, he alludes to another related phenomenon manifested in learning psychology that is comparable. "Scare campaigns . . . [are] attempts to terrify people into acting in some different and improved fashion" (p. 94). Although there is a lack of evidence substantiating the validity of this phenomenon, Kidd suggests that there may be a negative effect to these scare tactics. One may find manifestations of the above mentioned scare campaigns in the educational assimilation process of the American Indian or in adult learners who lack confidence in their own learning abilities.

Kidd suggests that adults who associate past failures with learning "will stay away [or] be too busy" (p. 96). The rationality of the objectivist paradigm excludes the importance of feelings, attitudes, and motivations within the framework of learning. There also seems to be a lack of consideration of the learning process within the contexts of culture or community.

What of the generations of people subjected to this paradigm of learning? Has this long-held traditional objectivist approach to learning left more scars than one would suspect, especially as it might pertain to establishment of assumptions about and within

frameworks of education and learning? According to Stephen Brookfield (1990), "assumptions . . . are self-evident rules of thumb that inform our thoughts and actions" (p. 177). They provide direction in solving a problem within a matrix of understanding that is not well defined itself. "As explanatory devices, they both confirm and shape our perceptions" (p. 177). Brookfield suggests that assumptions may not be totally right or totally wrong. What constitutes the nature of our assumptive world and the interpretive mechanisms triggered by it is "a central task of critical education" (p. 178). One might infer from all of this that learners in an objective learning environment over a long period of time establish the paradigm and all its elements as a frame of reference about the nature of learning or education--an evolved and developed assumption. It may not be totally wrong, but it is not totally right, considering the changing social atmosphere toward more critical examination of what constitutes how we learn.

In any case, learning how we learn may aid in a more complete understanding of why we do what we do. It may suggest why conventional learning paradigms have left what seems to be an indelible stamp on many adult learners and a less than satisfying approach to learning, which is not totally right but not totally wrong. Mezirow (1990) sums it this way:

> In traditional societies learning focuses on acquiring the outlook and the skills necessary to perform according to well-established rituals and customs. Learning in adulthood is confined to preserving these.

> ways of knowing by interpreting them in different practical contexts and perpetuating them by socializing the young. Traditional sources of authority are unchallenged. Old ways of seeing the world and one's life in it become cherished sources of solace and comfort. (p. xiii)

Fellenz and Conti (1989) reflect on a shift in the field of adult education, from educational programs to that of real world learning. Implications associated with this shift suggest the development of a process toward self-reflection that has the potential for modifying not only how we sense our world but our experiences in the world, and how we sense those of others. It calls for emphases on empowering the learner as a key factor in the process of education. According to Fellenz and Conti,

> Trends in adult education and cognitive psychology that advance the understanding of the individuality of learning experiences and that promote learner self-knowledge and control of personal perceptions and judgements provide for potential empowerment of the individual. (p. 23)

Mezirow (1990) expands upon the significance of "transformative learning" when he contends that its emphasis can also "lead to action that can significantly affect the character of our interpersonal relationships, the organizations in which we work and socialize, and the socioeconomic system itself" (p. xiii). It is the direction that the field must go into order to effect the real-life dynamics of a society (of adults) in need of a more reflective populace, one that perhaps would foster a more holistic understanding of the social and natural environment and actions to advance that transformation.

Fellenz and Conti (1989) suggest that empowerment means more than just development of the individual potential. Real life considerations put that individual in a world of people, a society in which that individual is immersed. The extension of the empowered individual to his society "entails an increasing awareness both of the social-cultural context that affects one's life and the potential one has for transforming that society" (p. 24).

Conti and Fellenz (1991) characterize real-life learning within a problem-based context. They suggest that real-life situations differ from those in academic settings. Adults in the real world must recognize problems rather than have them recognized for them; real world problems are less structured than those in academia; and real world problems are "highly contexualized" whereas those in academia are "decontexualized" (p. 64).

The implications of these few contrasted learning situations infer that our experiences in academic systems are not necessarily realistic representations of the real world of social and environmental interactions. And yet we are led to believe from the halls of academia that a role of education is the preparation of the adult who will be faced with events in the objective world, namely, those affecting a career orientation or control of the natural environment for economic purposes. Learning derived within the constructs of this educational

paradigm fosters a subconscious indoctrination of the participating learners to the views of a dominant educational paradigm that supports a value-free, objective approach to learning. In real life, however, learning is interactive, taking into account not only our objective interpretations of our world but our feelings about those interpretations which influence our actions.

What of the adult learner who would be self-directed, seek internal fulfillment, and transform society? It might be concluded that academic transformation needs to take place in an atmosphere where "an appreciation of one's learning style, the development of strategies that promote learning, and the insight into metacognitive processes enable people to exert control over learning processes and outcomes" (Fellenz & Conti, 1989, p. 23).

CHAPTER 3

LEARNING ABOUT THE HARMONY SEEKERS

Design

This is a qualitative case study inquiry. Guba (1978) suggests that this natualistic approach is where the researcher goes out open-minded, not empty-headed. The researcher in a qualitative case study is the human instrument for data collection and analysis. It is my intent as researcher to be the instrument differentiated from other inanimate data collection instruments by certain characteristics that add meaning to this study. As the researcher I can be responsive to experiences which are contextual in nature as is knowledge in case studies. As the human instrument I can process, clarify, and summarize these experiential events as the study evolves. The total context is considered. I am witness to nonverbal aspects that can be explored or expanded with a sensitivity to the situation. The goal of my study is to understand and discover learning paths of ecologically conscious individuals.

Case studies in education approach a problem from a more holistic perspective, that is, understanding how all the parts work together to form a whole. Insight and

discovery describe this approach rather than hypothesis testing. Sharan Merriam (1988), professor of adult and continuing education at the University of Georgia, references case study as an examination of a specific phenomenon such as a program or a social group. This "bounded" system is selected because it represents some issue or concern. Inquiry occurs in a natural setting where observation, intuition, and sensing form the basis of the perceptions. Research is exploratory and emphasizes process rather than ends. In a naturalistic setting, meaning is derived within the context in which behaviors take place. Sampling is purposive. The intent is to select a small sample in order to acquire in-depth understanding through a collection of narrative data.

Consciousness could be thought of as "a constellation . . . of interrelated cognitive sets, values, and resulting motives and action tendencies" (Leff, 1978, p. 282). An ecological consciousness could be viewed as consciousness with a specific intention, components of which reflect natural workings of ecology and the synergistic elements of the social/physical environment (p. 282). Considering the intricate web of interrelatedness in this phenomenon, a research study describing learning paths of ecologically conscious adults is better served within the realms of

naturalistic inquiry. This process considers multiple realities within its constructs, and provides credible mechanisms for accessing a specific group of people in a real environment to gain insight (Guba & Lincoln, 1981, p. 59).

This study is based on semi-structured interviews with those identified as possessing an ecological consciousness by the very nature of their activities as organic producers in agriculture. A qualitative case study was conducted to discover, gain insight into, and describe learning paths of this rural group of people. Rural, in this instance, can be defined as "not just having characteristics of the country, but also more specifically to being economically and psychologically tied to agriculture" (Kittredge, 1997, p. 26).

Case study is a rigorous process. Pertaining to inquiry, it can be defined as " an intensive . . . examination of a facet, an issue, or perhaps the events of a geographic setting over time" (Guba & Lincoln, 1981, p. 370). Less formal definitions define it as "a slice of life, a snapshot of reality, an episode" (p. 371). Merriam (1988) relates a descriptive case study as "one that presents a detailed account of the phenomenon under study" (p. 27). Descriptive research is often undertaken when "it

is not possible or feasible to manipulate the potential causes of behavior, and when variables are not easily identified or are too embedded in the phenomenon to be extracted for study" (p. 7).

As a descriptive case study, this research undertook to discover and gain insight into the learning paths of ecologically conscious adults. Learning is a process that takes place within a holistic framework of cognitive and affective domains. Process implies a series of actions (learning). Holistic denotes an interweaving of wholes (knowledge and feelings). This descriptive case study was undertaken with an acknowledgement and respect for the intricacies of this phenomenon of learning and its relationship to ecological consciousness.

Organic producers are guided by principles of organic farming that focus on emulating nature's productive ecosystems which translates into a sensitive commitment of stewardship to the land. Soil is life not only in terms of the microorganisms that abound within the organic matrix, but as it relates to the health of people. Caring for the soil through natural regenerative activities fosters a healthy soil that grows healthy plants and contributes to the good health of people. Because these organic producers are consciously in touch with the natural, ecological, and

chemical-free workings of the land, their perceptions relating to learning provide a bounded viewpoint within this descriptive case study (Guba & Lincoln, 1981, p. 98). The ecological characteristics of organic producers provide a context within which an examination can occur in describing their particular journeys of life in learning.

Traditional and emerging paradigms of research continue to be debated and evaluated as to their merit in educational inquiry. A quantitative approach to research can be loosely characterized as a numerical analysis of data. Typically, this approach has been widely adopted by the "hard" sciences, exemplified by physics, chemistry and biology. Overall, quantitative research seeks to explain and/or predict phenomena through collection of numerical data. "Quantitative approaches are applied in order to describe [numerically] current conditions or to investigate relationships" (Gay, 1996, p. 14). This method of investigation has been emulated by the social-behavioral sciences as well.

A growing enthusiasm for an emerging humanistic qualitative approach to inquiry is occurring because there is "probably dissatisfaction with more traditional quantitative approaches for investigating certain kinds of educational problems, those that do not lend themselves

well to numerical analysis" (Gay, 1996, p. 209). This rationale reflects contemporary thought "that behavior is significantly influenced by the environment in which it occurs" (p. 209). In other words, learning is affected by real world influences that prompt behavioral outcomes; and the qualitative researcher seeks answers to questions of how people feel about those situations, how they believe, and how they attach meanings to various activities in a particular contextual setting.

Naturalistic inquiry assumes multiple realities of the world. Each provides "a different perspective of reality, and none can be considered more 'true' than any other" (Guba & Lincoln, 1981, p. 57). They are best understood in terms of interrelated patterns of truth. To separate them into independent and dependent variables, characteristic of a quantitative method, is to suggest that there is "some 'real' thing on which social-behavioral inquiry could converge . . . . Social reality is, experientially, not singular, convergent, or fragmentable" (p. 59).

The goals of this study are to describe learning paths of a social group of people who have a conscious connection to the ecology of the land. Such a connection is a prerequisite for certified organic producers. The goals of this study also fit the naturalistic approach where the

focus is to describe as accurately as possible a phenomenon in its natural, "non-contrived environment" (Guba, 1978, p. 16).

In order to gather information to describe learning in relation to ecologically conscious adults, this study was designed to focus on people connected to the land and who sensitively utilize an ecological awareness in their process of food production. The adults selected for this study are actively involved in an international organization representing certified organic producers. There are four Montana chapters of the Organic Crop Improvement Association (OCIA) International with locations in eastern, central, north central, and western Montana. Organic producers in Montana represent a minority group in the realm of agricultural producers. In addition, as a group committed to organic production, they tend to be misunderstood by the more conventional producer, or are largely unrecognized due to a lack of information related to organic practices and philosophy.

With a background knowledge of and respect for the ecological activities of these certified organic producers, it became important for this researcher to interview these individuals within the environment and context in which they cultivate their organic crops and their learning

activities. Additionally, interviewing these producers on-site helped place them at ease by their being on familiar ground.

The naturalistic investigator is keenly aware of the relationship of the researcher to the context of the study. The researcher is the human instrument for data collection and analysis, and as such

> is responsive to the context; can adapt techniques to the circumstances; . . . what is known about the situation can be expanded through sensitivity to nonverbal aspects; . . . can process data immediately, can clarify and summarize as the study evolves, and can explore anomalous responses. (Merriam, 1988, p. 19)

Within a naturalistic framework, the researcher designs the inquiry only partially at the beginning, eventually allowing a full emergence as "new information is gained and new insights are formed" (Guba, 1978, p. 14). To intentionally construct a research study design would be to place constraints on the inquiry, and that is the antithesis of naturalistic inquiry purpose. Fixed designs are more in line with scientific investigations.

The naturalistic researcher "does not manage the inquiry situation but uses it; he is less a stage manager than a member of the audience" (p. 14). Organic gardening methods have been a way of life for this researcher for more than 15 years. In this study, she was "a member of

the audience" due to her long-term, ongoing examination and application of an organic approach to gardening. At first, in light of neutrality considerations in the more accepted scientific investigation, the rationalistic researcher may interpret this situation as unacceptable. Upon further examination of the issue of neutrality, "commonly called 'objectivity' within the scientific paradigm" (Guba & Lincoln, 1981, p. 124), critical consideration is given to the concern for the objectivity of the data itself (p. 125). One person's opinion may be considered subjective, but it becomes objective when a number of people refer to the same experience (Guba, 1978, p. 73). Therefore, this researcher's knowledge of organic practices could be deemed subjective if taken out of context of the interviews conducted. "The confirmability of the study through numerous interviews insures the intrinsic adequacy" (Kittredge, 1998, p. 101).

Often objectivity is focused on the investigator. It is not always true that individual concerns are biased and unconfirmable. The burden of proof as to the confirmability of one person's report versus that of a group may be invoked when considering that

> one would be more inclined to accept the reports of one magician standing in the wings during another magician's performance than the reports

> of a large audience, all of whose members were being systematically deluded (Guba & Lincoln, 1981, p. 125).

This study is based on the information collected through the conduction of numerous interviews, by implication a continuous process that "tap[s] into the experience of others in their own natural language, while utilizing their value and belief frameworks" (p. 155). This "human-to-human" technique assumes a continuous assessment process throughout the interviewing. "Thus, internal adequacy is, to some extent, a function of the amount of time and effort which the naturalistic inquirer invests in repeated and continuous observation" (Guba, 1978, p. 65).

Personal Description

The researcher in this study has 25 years of experience with farming and ranching operations in Colorado, Wyoming and Montana. With a Bachelor of Science degree in biology, she spent 7 seasons in field experiences as a park ranger with Grand Teton National Park. Upon moving to Montana, she was employed with the Beaverhead National Forest as a crew leader for conducting timber stand exams. She has conducted creel censuses on the

Missouri River as part of a Montana Fish, Wildlife and Parks' fisheries management study.

In addition to a degree in biology, she holds a Master of Education degree with an environmental emphasis from the University of Montana. Her thesis project involved facilitation of a nature program in the forest setting of a western guest ranch to a non-English-speaking group of young adults.

For over 10 years she has held a Training Coordinator position with MSU-Northern where she conducts water quality programs for environmental professionals. As an adjunct faculty member with MSU-Northern she teaches and facilitates environmental health and issues courses. Her philosophy of life involves working with nature ecologically while experiencing the inner joys of that relationship.

Population and Sample

All the participants in this study are certified organic producers within an agricultural framework. They encompass the small-scale operator as well as large-scale farming and ranching operators. They are distinguished from the more conventional group of food producers by the nature of their practices and methods that involve an

absence of synthetic pesticides, herbicides, and chemical fertilizers. Organic producers utilize a whole biosystem approach that focuses on natural soil-building practices emulating nature's models of diverse productive ecosystems. These restorative and sustainable practices represent the foundational premise from which these organic producers operate.

All of the organic producers in this study have farmed organically for five or more years. All of them have been certified as organic producers through the Organic Crop Improvement Association (OCIA) International (1998) for at least five years. This internationally recognized certifying agency is based in Lincoln, Nebraska. It is farmer-owned and operated with programs in 29 states, along with Provincial chapters and trade members throughout the world. A Preamble to the International Organic Standards states that OCIA certification arises from several basic principles, including, "Diversity, interaction, adaptability and competition are characteristic natural elements to be respected in the organic system." Standards are backed up by an audit trail through which a product can be traced from the final consumer back to the farm and field.

Criteria for selection of these individuals to be interviewed include:

- certified as organic by OCIA, the internationally recognized certifying agency.
- certified organic for five years or more. This criterion lent an element of commitment to the practice of ecological methods and philosophy in organic production.
- a demonstrated knowledge of natural history and science (peer reference). As a group, certified organic producers usually have varied knowledge about many of their peers. Thus referrals made to other certified producers within this context is recognized. After all, who best to recognize characteristics of a fellow certified organic producer than a fellow certified organic producer.
- a recognition and understanding of the interactions of living things with each other and their environment, along with the application of the concepts to production practices and methods. Again the peer references are recognized here because organic producers generally understand how important this criterion is to the philosophy of organic practices.

In order to describe the learning paths of ecologically conscious adults, interviews were planned with individual certified organic producers from the four Montana OCIA chapters. These chapters are Mycorrhiza OCIA of Montana (MOM Chapter), Organic Crop Association of Montana (OCAM) or South Central Chapter, Montana Northeast Chapter, and North Central Montana Chapter.

For this study certified organic producers in the chapters were identified using a referral system (Stephens, 1991, p. 52). Initially, letters requesting nominations of certified organic producers, based on the criteria for selection, were sent to the officers of each Chapter. From the responses received, several interviews were set up and conducted. These interviews yielded referrals to other certified organic producers and established the network for the rest of the interviews. In all, 16 individuals were interviewed. Four sessions (eight interviews) were conducted in the presence of two respondents. Two of the above four sessions involved both the husband and wife of the organic operation, and the other two sessions involved business partners. Totally, this group included four women and twelve men.

Procedures

This naturalistic study engaged a descriptive design to collect information and gain insight into learning patterns of ecologically-minded adults. In order to accomplish this goal appropriately, inquiry took place in the natural setting of the respondents. Wolf and Tymitz in Guba and Lincoln (1981) suggest that:

> [Naturalistic inquiry] is aimed at understanding actualities, social realities, and human perceptions that exist untainted by the obtrusiveness of formal measurement or preconceived questions. It is a process geared to the uncovering of many idiosyncratic but nonetheless important stories told by real people, about real events, in real and natural ways. . . . Naturalistic inquiry attempts to present 'slice-of-life' episodes documented through natural language and representing as closely as possible how people feel, what they know, and what their concerns, beliefs, perceptions, and understandings are. (p. 78)

In consideration of the busy schedules of these organic producers as they make preparations for spring planting and fall harvests, introductory telephone calls to those chosen for interviewing were made to explain the reason for the interview. In the course of conversation, a request for an interview was made to each of the individuals. All of the organic producers contacted expressed interest in participating in this study, and several interviews were set up from early March 1998

through the summer and into the late fall. Follow-up telephone calls were made to those who had initially agreed to be interviewed but could not commit right away to a date and time. After a precise interview date and time were established, telephone calls were made two or three days in advance of the appointment to either gain more accurate directions to the farm or residence or to establish a site for the interview. This process also allowed for adjustments of the time to fit most conveniently with the individual's updated schedule.

Three certified organic farming households were visited and five interviews conducted in eastern Montana with locations in Lambert, Scobey, and Circle. In central and south central Montana, a certified organic farm in Lewistown and a rural residence with a certified organic garden in Belgrade were visited and interviews conducted. In north central Montana, an on-farm interview was conducted with a certified organic producer in Floweree, who voluntarily sent several days after the interview a letter adding additional information in retrospect. Another north central Montana certified organic producer from Big Sandy found it more convenient to meet and interview in Great Falls during the evening where he was making a presentation on organic production and sustainable

agriculture. Two other north central Montana organic producers from Big Sandy and one from northwest Montana in Browning, were interviewed after they attended an annual pea and lentil field tour in Conrad. Two certified organic producers from Conrad, who are partners in an agricultural business, were interviewed together on-site. In western Montana, with two small-scale certified organic producers, one in Dixon and one in Missoula, interviews were conducted.

The interviews followed several general strategies.

1. An introduction to the purpose of the study was explained in more detail, along with how the information would be collected by a tape recorder. Assurances of privacy were established. Demographic questions were posed to the respondent as a way of "locating the respondent in relation to other people" (Merriam, 1988, p. 79). Education, residential, and organic certification questions were documented for each respondent.

2. A semi-structured format was used. This was important in that the essence of less structure in the setting permits more chance of a natural emergence of the unique views of the respondents. It establishes a conversational atmosphere of rapport with the person being interviewed and

allows for an expression of feelings, thoughts and intentions (Merriam, 1988, p. 72).

3. Open-ended questions were posed to the respondent in a funneling sequence (Guba & Lincoln, 1981, p. 180). Beginning with a general "tell me about your operation" question that set in motion a general experiential dialogue, a thoughtful probing for more "associative and elaborative responses" followed (p. 179). Preliminarily, a list of questions was drawn up as reference for the interviewer but were not asked in any kind of order. These can be found in the Appendix. The responses to and discussion from the initial general question led the researcher to thoughtful and appropriate selection and presentation of more probing or "interviewer cued" questions (p. 179).

During an interview, the investigator occasionally summarized the informant's responses in order to verify understanding. At the end of the interview, the respondent was asked to make any other additions as a way of allowing other last minute thoughts to emerge. Sometimes this opportunity prompted an elaboration on a previous point or additional associative thoughts. The investigator also solicited from the respondent recommendations of others with whom it would be valuable to visit. All the

interviews were tape recorded with written notes taken on a notepad as corroboration to the tapes. In addition, the investigator had the opportunity immediately afterwards during return trips home or between interviews to review the tapes via earphones. These trips often involved hundreds of miles home or anywhere between 50 and 150 miles between interviews. The immediate review of the recently conducted interview allowed for additional notations and contributed to the validation of the information gathered and the observations made. Merriam (1988) states "At this stage the researcher is virtually holding a conversation with the data, asking questions of it, making comments" (p. 131). In addition, the review exercise allowed assessment to determine if linkages indeed existed between informant and the ecological nature of organic production.

Upon returning home after each interview, the tape was once again reviewed. Information was encoded into a word processing program of keywords, quotes, and comments to be sorted later for reference. Upon completion of all 16 interviews, these pieces of data were organized and categorized using the six research questions as a guide.

CHAPTER 4

THE JOURNEYS

> The good farmer, like an artist, performs within a pattern; he must do one thing while remembering many others. He must be thoughtful of relationships and connections, always aware of the reciprocity of dependence and influence between part and whole.
>
> Wendell Berry

Introduction

In this study interviews were conducted with 16 certified organic producers in order to describe their learning paths relating to a consciousness of ecological knowledge and philosophy. Since this group can be considered on the "fringe" of more conventional agriculture production systems, they are given less notice by the community of agriculture and are often misunderstood in their methods, practices, and philosophy. In spite of this, a sense of tenacious commitment existed to the ecology of food production that emulates nature's more sustainable models of productive ecosystems. From this group of organic producers emanate strong determinations to move ever deliberately in this ecological direction for the future survival of the land, the ecosystems, and the humans who are but a part of the interconnectedness of life.

These organic producers were willing and eager to share their experiences and thoughts related to farming, organic production, education, economics, and a philosophy of life. In order to capture a small glimpse into the nature of each respondent and the setting in which each live, farm, or garden, a brief picture is painted and presented of each producer interviewed. In addition, the rural country in which they reside is characterized in terms of western, north central and central, and eastern landscapes of Montana. Recognizing that there is vastness of rural vistas and unique physical and cultural characteristics of each area, a limited and brief description of each landscape is provided for contrasting purposes. Respectful of their privacy, the adults interviewed were given fictitious names for this study.

Western Montana Profiles

Three small-scale organic gardeners and one farmer of a larger-sized organic operation were interviewed in western Montana. In this setting the Rocky Mountains rise majestically above the conifer and poplar trees that cover the rolling hills of the lower landscape. Open agricultural areas from a few acres in size to hundreds of

acres are dispersed throughout this highly populated environment.

Annie lives in a two-story homestead that is being renovated by her carpenter husband. Her garden of a few acres is shaped in rows of raised soil beds, indicative of Eliot Coleman's philosophy in his The New Organic Grower of maximized efficiency in small scale operations such as gardening. "I use a lot of his methods. Everything here is designed and managed around what I have to do for this climate and my ability to cover my [soil] beds." Jars of tomatoes adorn the kitchen shelves. Annie markets her produce locally and credits an artistic background and a vegetarian mother as philosophical influences in her desire to garden organically. "I do it for the enjoyment. It's the way I think."

Rachael is an artist who shapes and paints clay stoneware figurines of animals and useful mugs and plates. Trained as an agricultural technical assistant in an overseas country where she grew up, she admits to thinking less in technical terms and more in "being in touch with what's going on." Drying organic garlic braids adorn the walls of one of the seasoned homestead buildings built by her partner's parents. A garden of waning flowers and herbs surround the house, proof of recent fall frosts. A

round stone building with window frames of glass houses the honey operation. Upon the death of her grandfather whom she credits for her interests in nature, Rachael found herself in a more urban and modern world when the small country place tended by her grandfather was sold. "It was clear from very young that I wanted to live the life of my grandfather. I left to seek a life that involved the soil."

John runs a two-acre, non-profit gardening project in western Montana that grows vegetables organically which are then distributed to low-income needy people. John founded this project with several others. In his association with a near-by university, John utilizes university students to operate it. He began gardening organically on his own two-acre home farm by growing specialty crops for local area restaurants. His partner and wife continues operation of the home farm full-time while he cares for the non-profit gardening project. With a master's degree in agriculture from an eastern United States college, John's background is steeped in family farming. He fondly remembers hiking with his father and working for a farm neighbor as philosophical influences in his decision to return to farming and produce food organically. "I like food, hard work, and being outside--farming is the choice."

Peter is a soft-spoken man who acknowledges a vegetarian life style. With the help of his family, he farms several hundred acres of diverse food crops organically and raises a garden. "I've farmed organically all my life. I never considered farming conventionally." He admits readily to an excitement in seeing his efforts in organic practices pay off in more fertile soil and high germination of planted seeds. "I'm a grower and personally it's important to me. It's [organic] the only way to farm because all conventional farming is like a dead-end street." Peter holds a Bachelor of Science degree in biology.

Central and North Central Montana Profiles

Seven organic producers farm in central and north central Montana, and all are relatively large-scale operations involving several hundred to several thousand acres. Tabletop buttes and rolling hills of amber grain dominate this setting broken by shelterbelts of golden willows, shrubs, and grassy pastures.

Donald and Don are father and son, respectively, and partners in their organic operation. Donald took over the family farm in the late 1960s and began farming organically in the early 1980s. His son, Don, is 29 years old and a

high school graduate. Don sees the organic or chemical-free method of his father's production process as "a way of life for me." It's how he grew up with his dad. Donald admits to the joy of challenge that is part of organic production practices. "I feel blessed that I can change since many [farmers] do not want to change." Both Donald and Don are growing new crops in their food production rotations as the markets open for them. Donald holds a Master's degree in agricultural economics.

Mark P. and Charlie K. are business partners in a local agricultural endeavor. Mark and Charlie are certified organic on their own individual farms. They each had to downsize and modify their own operations in order to run the their business together more efficiently. Mark grew up on the family farm and attributes his initial sense of connection to the land to those experiences. Eastern religion and philosophical studies during his college years led to a degree in philosophy. His partner Charlie K. is slight in stature and emits a strong willed nature. He speaks frankly and knowledgeably about the contradictions between conventional and organic agriculture. His satirical sense of humor is softened by his smile. Upon addressing a question about what it means to be organic, Charlie cheerfully responded, "to die and let the bugs eat

you." Charlie attended a vocational technical program for one and a half years.

Soft-spoken and contemplative, Michael farms several thousand acres of land steeped in homestead history that he recalls fondly and respectfully. He collects and recycles old machinery for use on his place. As a former licensed chemical applicator, Michael recalls his experiences with chemicals as "a growth thing. It took some time for me to think about the factors affecting the soils using chemicals and fertilizers. I didn't think about them at first. Then I grew." Reflectively, he speaks of Native wisdom in relation to the land. "Land is sacred and its value cannot be priced. It can't be owned but borrowed for our lifetime." Michael has two years of college education in agriculture.

Quietly reserved, Joe works as a carpenter in addition to running the organic family farm. Along with his wife and children, Joe lives in the house in which he was born. He recalls that throughout all his schooling he did not think about being a farmer. He spent four years in an electrical engineering technology program at an out-of-state college. His father's retirement convinced him to return to the farm, and he began testing the practices of organic production inspired by his contact with out-of-

state organic farmers. The essence of organic for Joe is "a moral obligation, more heartfelt than an intellectual thing. I'm motivated by what I think we should do and how people should be living, ethically and morally." With a big grin, Joe recalls his first experiences with farming when his father gave him an opportunity to choose one field on the place and do whatever he wanted on it. "Of course, I chose the worst field to prove I could grow a great crop. It was a complete disaster. I had a horrible crop and lost the wheat and that was that." Joe points out that he eventually returned to that field and through various experimental crop growing activities has experienced success.

Exuding an excitement about the art of organic production, Ron speaks of seeing, smelling, and feeling the soil as the story of organic production for him. Ron has been involved with the family farm all of his life, and runs a grain processing business in addition to the farm. "Organic means sustainability. It mimics natural cycles. [Organic is] how I can build the soil in natural ways without adding harsh chemicals." A spiritual and family man, Ron expresses his philosophy of life as "stewardship of the earth from the biblical days of Adam. Earth is a gift to us, not to own but to care for, utilize, nurture

and replenish." Ron holds a doctoral degree in plant biochemistry.

Eastern Montana Profiles

Eastern Montana seems remote in the sense that "the land stretches for miles and miles with untrammeled horizons, which are sometimes broken only by a line of trees or the undulations of gullies or protruding rocks" (Kittredge, 1997, p. 128). This was the setting for the interviews conducted with three organic farming households.

Jim and Carol are parents of two teenage children and live in a small rural town. Jim exudes an enthusiasm about organic farming. He grew up on a farm and opted for organic practices on his own place after experiencing first-hand the effects of chemical exposure from activities involving treated grain. Carol works outside the farm for the local school district. Sharp-witted and intelligent, Carol speaks critically on the notion of power in contemporary political and social contexts. "Organic is a powerful term, but power is the chemical companies." Both are high school graduates.

Gary has been involved in farming all of his life. His grandfather homesteaded the farm. For the last eight years he has been certified as organic. Gary is a family

man, and speaks fondly of his Scandinavian heritage. He is a former commercial chemical applicator. Pensively, he relates a story of chemical exposure that generated serious contemplation of the long-term and ill effects of this conventional farming method. "We're killing ourselves with chemicals. The skull and cross bones (on chemical containers) should be a clue." Gary has five quarters of college.

Frank and Sara have farmed organically for nine years. It is their sole livelihood. Frank has been involved with farming all of his life. Sara comes from a non-farming background. When Frank left to attend college, he remembers not wanting to farm. He pursued an interest in technology, but a vision of the farm as his best option for caring for a family brought him back. Frank is a risk-taker and innovator, trying new alternatives to conventional farming. "You have to have an attitude not to pollute. Then the idea of organic is right." They have two small children. Sara, who is vivacious and concerned, would like to see more education on the connection of grain grown by the organic farmer and the loaf of bread people eat. Having not grown up on a farm, Sara shyly admits to not thinking connectively herself until she met Frank. Frank and Sara each attended college for several years.

Responsive Learning

How these adults learn as they are immersed in an ecological way of life is the focus of this study. Thinking and acting connectively or holistically are the learning modes practiced by these adults in their approach to organic production and life. A strongly rooted sense or consciousness of farming tied to place, the willingness to risk change over convention, a deliberate sensitivity to and action for a healthy land and people, and the voluntary commitment and responsibility to organic practice describe these organic producers as "Responsive Learners" (Kittredge, 1997). "This is a learner who is not only a reflective thinker but who also takes reflection one step further into action through response" (p. 261). Kittredge highlights several actions indicative of the learning process:

> They [responsive learners] do not think linearly . . . . Instead, they are aware of the land and its totality . . . . Because of this holistic approach, they tend to see change more as an evolution of systems. (p. 264)

Considering the ecological or interrelated nature of organic farming practices, systems thinking goes hand in hand with the actively practiced systemic process of organic production employed by these organic producers.

These individuals are in touch with the land, a trait shown by their connective thinking. Even though an individual action is occurring, such as planting seed, these individuals are able to process this piece of information within the whole of the organic process.

In addition, Kittredge describes responsive learning as contexual in that it is within a context that the learner has opportunity to observe people, places and things (p. 262). She states:

> In utilizing such observations, the Responsive Learner needs an open attitude along with the traits of flexibility and adaptability to recognize ideas that may have merit and then apply them. (p. 262).

Considering the unconventional agricultural approach taken by these organic producers, they, as learners, have had to actively recognize organic as "having merit" beyond a more mainstream convention of agricultural practice. In fact, the process of reflection and action undertaken by these individuals toward organic practice has defined them as ecologically conscious. Because they have applied less conventional practices to their farming livelihoods for many years, they come into this study as responsive learners.

Learning Paths

In describing the learning paths of these adult learners in this study, one can metaphorically think of a learning path as a journey through life in which knowledge, understanding, and wisdom are gained and reinterpreted many times by diverse interactions with one's surroundings. Mezirow (1990) suggests that "learning may be defined as the process of making a new or revised interpretation of the meaning of an experience, which guides subsequent understanding, appreciation, and action" (p.1). The journey through life is experiential and lifelong in nature. The journey involves travel on established routes, much like paved interstate highways connecting big cities, and on seldom traveled rural roads where at times only the parallel lines of compressed bluegrass can be observed in the fields.

The learning paths of these ecologically conscious adults include travel on established courses of learning such as that provided through formal educational systems, and through their informal social and natural environments. During their travel on these established routes, significant side trips were undertaken by these adult learners and are represented by reflective and critical thinking processes engaged by these adults in order to make

sense of their of environmental, social, natural, and economic surroundings related to their ecological consciousness. These deliberate side trips are the seldom-traveled routes, but they are, nonetheless, vital learning paths for these ecologically conscious adult learners.

In describing these learning paths, themes give order and form to the information. Using an ecological consciousness as a foundation, educational, social, natural, and economic thematic learning paths form connective ways of looking at the learning process. These paths, which include reflective and critical thinking, should not in any way be viewed as linear or disconnected in design.

Connecting Consciously

In ecological consciousness, "ecology" or "ecological" is best defined in terms of interrelationships of living things to each other and to their living and non-living environment. The nature of interrelationship is connective in design, as is the nature of organic practice. Approaching the land organically necessitates an ecological understanding of the environment. By definition ecology is the connective actions and interrelationships of life and non-life. Equally important to ecological consciousness

are the holistic actions and responses by the adult learners in this study to the land. Such an approach is prompted by a consciousness of the interrelated ecology of the land.

Learning for these adults within the entrenched conventional chemical model of agriculture is best described through what Mezirow (1990) identifies as transformative learning. The adults in this study have already undergone a process of critical reflection, whereby the assumptions of well-established customs and "traditional sources of authority" (p. xiii), such as that defined by agribusiness or farm-input manufacturers, have been challenged. The responsive learners in this study have initiated self-directedness in the sense that they have freed themselves of the dependency imposed upon them by an ingrained process of a modern agricultural industrialization in society today.

> The serious ecological problems caused by modern agriculture are the often overlooked aspect of agricultural industrialization in the twentieth century. . . . The economic instability of farms is rooted in the process of industrialization also. The key components of this industrialization process [are] mechanization, chemicalization, and new crop-breeding priorities . . . each has created new ecological and economic problems. (Soule & Piper, 1992, p. 52)

The responsive learners in this study have responded with inquiry into other more suitable expressions of their way of life. They want to choose their way, how it fits what they think works for them. They see value in this action. Upon investigation, ecological wisdom of the environment in which they find themselves becomes the driving force for making change. An evolving consciousness of the ecology of the land in which roots are developed results. It is within this more transformed holistic frame of thinking that empowered motivations emerge in these organic producers and relate to a sensitive and ecological caring for the land and its future sustainability. Mezirow (1990) states:

> Understandably, one may find transformative learning threatening, exhilarating, and empowering. Such learning requires interaction with others to identify alternative perspectives, to provide emotional support during the process of transformation, . . . and to provide models for functioning within the new perspective. (p. xiv)

These individuals function within a peer network of fellow organic farmers that provides not only emotional support but provides a conducive atmosphere for sharing thoughts, ideas, and solutions to problems. Ultimately, their collective vision translates this way: healthy soil, healthy plants, healthy animals and people. Such

connective thinking is the foundation for their ecological consciousness.

With strong conviction, Peter in western Montana expresses his connective thought process this way:

> For me personally, organic is farming in a natural way that leaves the soil better off, and it grows the most healthful food. The cancer epidemic is related to chemicals in our food. I would never use chemicals because they are incredibly toxic. Ecology is equated with sustainable agriculture. It is an ecological thing and so is the use of toxic chemicals. They both are ecological issues. I farm organically because I know that chemicals are not good for the farmer or the people eating the food.

Donald in north central Montana recalls taking over the family farm in 1966. Thinking connectively evolved slowly for Donald and involved not only a health concern but an awareness of what others were doing.

> I can't say exactly what one thing got us to organic. It was partly a health thing. The sprays were there but we were not having all that good success with sprays in killing weeds. Then you see others were trying different things. We were fortunate in that we weren't tied to a single system of monoculture. Subconsciously, something moved me in that [organic] direction.

Contemplatively, Gary in eastern Montana associated his connective thought process of organic production to the environment and people.

> My first commitment to organics is the environment--a healthy environment, healthy food. The people part is just starting to connect with

> me personally now. The value of good land and good food makes healthy people. The people side of it is really connecting to me. If I'm going to produce it here, sell it, and make a living, I want it to be good for somebody.

An Educational Connection

"The good farmer's mind, like any other good mind, is one that can think, but it is by that very token a mind that cannot in any simple way be thought for" (Jackson, Berry, & Colman, 1984, p. 28). The minds of those who are intimately connected to the land through the art of farming are those that think through action. The application of those actions is particular to their farms, their gardens, stemming from their experiences there. Textbooks can be useful to these minds, but only if the information is applicable to their ideas of how they view their farm.

Education can be thought of in terms of formal systems in which learning takes place in classrooms of learning institutions. Education can also include less formal approaches to learning including voluntary activities such as reading of books and publications of interest and attending seminars. Other voluntary actions include initiating the senses of sight and smell along with trial-and-error activities. These formal and informal systems of learning are discussed within an educational connection.

The formal educational systems in which these organic producers participated proved to be less of an influence on their learning than did a self-directed, self-motivated mind functioning within a particular world of nature, whether it be the farm or garden. Even though 14 of the 16 organic producers had post-secondary education, these experiences were conceived mostly within a programmed framework of institutional information. One organic farmer, Michael, with college courses in agriculture speaks of this information-based system this way:

> I was trained in agriculture. It's like what the college says works. Now it's the hardest thing to forget. It was right in dollars and cents from their [agricultural] point of view, I guess. But it's too narrow of a focus.

A linear process of learning common in contemporary education fits well with the more linear focus of a paradigm created by agribusiness. Michael elaborated by relating an anecdote he had heard:

> 'You gotta a real nice place here. God's been good to you.'
> 'Yea', the guy said, 'you ought to have seen this place when just God was doing it.'
>
> He figured he had improved it. It looked neat, was producing a crop, but if he'd looked a little deeper he maybe hadn't made it as good as he thought he had. I don't believe that I can improve the land. I can just quit hurting it as much.

Through this little story, Michael acknowledged how many farmers are caught up in a conventional mode of farming practice, one that fits the elements of objective education reflected in the control of nature. Nature as an element of learning and education completely escaped his anecdotal character's thought process.

Ron has a graduate degree in plant biochemistry and described his formal education as mostly conventional. He spoke of his graduate work as learning based on unquestioned tenets or information presented before his eyes:

> I think the scientific method is ingrained in me. I use it all the time in running controls and experimentation on my own farm. [Today] I have an appreciation now for questioning dogma, because I've learned it is evolving all the time. But, yes, it was difficult to question [dogma], and those that did were easily met with resistance.

Outside the encapsulating walls of conventional education, Ron initiated his own opportunity to activate a "pioneer mentality" in the practice of organic production on his own farm. Within the context of the land on which he farms, Ron was inspired by other innovative producers to try new things. He not only found success but admitted to it being "much more fun." He made the transformation to a system less accepted in mainstream society through a self-

directed, reflective process of learning that included gaining new knowledge and new attitudes and testing them out--an organic praxis.

"Information-based, not research-based" is how other organic producers described their educational experiences. In eastern Montana, Jim described the conventional education he experienced as:

> Stereotype. It's a set way. Change does not come easy. We are not encouraged to change. The education system tends to edge out the really free thinkers. It [educational system] goes up to the university level and our agricultural system is operating on that.

Carol pictured conventional education as "parentheses. It's like being held in, penned in. Even university research is on a linear path."

Although the information-based agricultural experiment stations associated with the University System are utilized by several of these organic producers, they mostly served as general informational sources relating to regional crop and soil activities in particular areas.

Rachael in western Montana equated the state of her education through images she had of the students. They "look worn out with no color in their cheeks. Voluntary education is fine. If it's not voluntary then it's violence to my eyes. I don't learn if I'm pushed."

Testimonial of a self-directed learner, Rachael was responding to Mezirow's (1994) description of indoctrinating education:

> Education becomes indoctrination only when educators try to influence specific action as extensions of their will, or perhaps when they blindly help learners to blindly follow the dictates of an unexamined set of culturally assimilated assumptions that determine how learners perceive, think, and feel about themselves, their relationships, and their world. (p. 362)

Rachael liked to think of herself as an "artist of life. I find my way through, take obstacles and meet them, and be happy."

While there is a sense that agriculture courses in academia did the job of informing many of the producers interviewed about conventional methods of practice, several of these organic producers cite philosophical underpinnings as inspirational in either their reassessment of conventional approaches in farming or influencing their decision to farm organically. Philosophy generally implies more intrinsic concepts on the meaning of life. According to Webster (1977), philosophy is defined as "all learning exclusive of technical precepts and practical arts." What is left are the inward reflections indicative of a sense of the spiritual. These more intrinsic reflections also inform learning and guide and inspire our actions. Cajete

(1994) describes these intrinsic reflections through inner and outer realities typical of traditional tribal education that:

> Revolved around experiential learning (learning by doing and seeing), storytelling (learning by listening and imagining), ritual ceremony (learning by initiation), dreaming (learning through unconscious imagery), tutoring (learning through apprenticeship), and artistic creation (learning through creative synthesis). Through these methods the integration of inner and outer realities of learners was fully honored, and the complementary educational processes of both realties were fully engaged. (p. 34)

Ultimately, then, learning is expressed through an inner spirit as much as through the mind. It is within the context of the "inner reality" that several of these organic producers have responded.

John, an organic producer in western Montana, has a background steeped in family farming. He relates that it was his undergraduate philosophy degree program that triggered his decision to:

> Spend one's time in a way that is worthwhile. For me, that was farming. Philosophy influenced me. It taught how to use my time. It pushed me away from other choices. I like food, hard work, being outside. Farming is the choice.

It led him to producing food organically.

Mark P. speaks of how an Oriental Studies class:

> Opened my mind, opened the door to a small appreciation of nature. It allowed me to see that there are other ways to look at things,

> other ways of existing in the world. My primary experience came with growing up on a farm and the Oriental and Native American philosophies made sense of it, put words to it. It enhanced those [farm] experiences for me.

Inner and outer realities expressed through hands-on experiences are what Peter, a northern Montana organic producer, considered as he made application of previous knowledge gained to his own farming activities now.

> I raised a garden organically for 25 years. I studied it. Organic agriculture has been going on for years. There are conventionally farmed fields that are 50 years old. If they were to make the transition [to organic production], it would flop because the soils are depleted. The weeds would take over. But it's the weeds that are the indicators. They are better at growing on sick land. Weeds are saying that there is a need to heal this soil.

Wes Jackson, founder of The Land Institute in Salina, Kansas, alluded to thinking about agriculture with a human face. "The human face of organic agriculture is a farmer's face" (Lipson, 1998, p. 39). It is within this context that several of the organic producers expressed their concerns with present-day educational systems that should be fostering a reconnection with the farmer but are not. Sara in eastern Montana talked about how common it is that many young people and older people alike still connect a loaf of bread only with the grocery store. Little thought

is given to the "human face" that grew the grain from which the flour came to make the loaf of bread.

Formal education and connective thinking seem to have a disconnected relationship. Gary in eastern Montana spoke of an observation he made one time of an educational food flow chart with which he came in contact:

> It started with a railroad car and a truck. Right there you've lost John Q. Public. You've lost the farmer and his relationship to the soil and the environment. The raw product is gone. People make unconscious relationships between truck and store and where bread comes from.

These organic producers learned their "craft" in spite of a restrictive atmosphere in which they experienced their formal education. This atmosphere motivated them in an opposite direction--to question, to seek insight within the conducive environment of their farms and in their gardens and be enlightened by the inspirations of those who walked the unbeaten path. Charlie, a north central Montana organic producer and vocal business entrepreneur, conveyed it this way:

> Half the reason I'm into this [organic] is that my education drove me to the other side. They tried force-feeding stuff down me and I didn't believe it. So I did the opposite which, you can say now, is positive.

Informal paths of learning utilized by the adults in this study involve their physical and mental senses engaged

in organic approaches to the land. Many spoke intuitively of "looking and listening to the land" as their gauges for responding to what they were doing or to what the ecology of the land required. Within the context of the land and its interrelated whole, they critically reflected upon their senses of sight and smell and responded to those experiences. They learned to trust those inner feelings, those inner realities that proved to be critically important in making decisions for the land as well as for their livelihood.

Ron, a north central Montana farmer, energetically conveyed the developing process of his organic farm. "It's a personal drive, the success on my own farm; I saw and smelled it happen. I didn't read the book." It was Ron's participation in the process of practicing organic that created a momentum for praxis and led to the choice of farming organically. Real life learning was more meaningful to him than was a recipe from a book.

Peter spoke of "the excitement that comes when you see progress in more fertile soils and the seeds that germinate [there]." Peter utilized and was motivated by patience and self-directed progressive activities:

> In organic farming, one has to find a little more patience. In all of my life, the most productive thing for me has been [exercising] patience.

> When I've had problems, it was due to impatience. When I back off a little bit, let things all fall apart, then see what will work, things come together better.

Learning for Peter is expressed through an experiential framework. As an adult with a wealth of experience in life, he was able to recall results of many past experiences and reprocess them into new actions for solving problems. According to Knowles (1970), the role of experience is definitive of adult learning (p. 49). A human reservoir of experience becomes a rich resource for learning.

Other informal learning activities or paths descriptive of these organic producers involve self-directed study of non-conventional, innovative, and alternative methods of farming espoused in publications and seminar sessions. Orchard (1996) describes one such alternative farming method, Holistic Resource Management (HRM), as "not yet accepted within the larger community of land managers, scientists and policy makers" (p. 7). According to Orchard, HRM was developed by Allan Savory as a model that "integrates the economic and social components while embodying ecological principles to sustainably manage a farm, ranch, or other piece of land" (p. 6).

Gary, an eastern Montana organic producer, directed his attentions to organic production through his interest in HRM:

> A newspaper article on cell grazing got my interest. I went to some of the schools and even built the fences. A group of us here began studying HRM and put on some range tours. It got me thinking about caring for the land.

Frank, another eastern Montana organic producer, liked the radical nature of HRM:

> At the time it sounded way out, but it involved long-term goals. It dealt with land descriptions and farm planning. It was sort of military in a sense that it involved planing, financing, monitoring, re-planning. It brought me back to the farm.

The New Organic Grower, by Eliot Coleman, is another resource for innovative food production methods. This method of gardening is a biologically based food production system and is designed for small-scale food production. For Annie, a Western Montana organic gardener, Coleman's ideas inspired her to evaluate her own food-growing environment and engage in actions to maximize her production.

> I've always had an organic garden in my adult life. That's where my head is at. I must do this because I like the challenge. I use his [Coleman] methods that involve beds of land for transplants and [ground] covers that I use. My intent is to maximize my operation that is designed for this climate. I can't help but

> think ecologically doing organic because of the beneficial organisms involved.

These other than formal academic approaches to learning have value for these adult learners and are respected through active implementation by these individuals in relation to their organic practices. In addition to such educational learning paths, other learning for these individuals is stimulated through social networks.

A Social Connection

A major path of learning for these organic producers is a network of other organic producers. Local chapter meetings, field events, and organic farm tours allow opportunities for sharing of information and mentoring activities with each other, and, indirectly, provide an atmosphere of learning for those who would seek to know more about organic agriculture. These formal networks are sources of strength and support for this independent fringe group of food producers. Many of these organic producers find themselves surrounded by more conventional farm neighbors in their communities. The OCIA chapter within their particular area is a source for organic information, an opportunity to share results of experimentation and trial-and-error activities related to organic production. Chapter meetings provide a forum for solving problems

associated with organic practices and marketing as well as dealing with the chemical spray drift from their conventional neighbors. These social networks of organic producers are learning environments for the adults in this study. Arlene Fingeret (1983) found that:

> Individuals create social networks that are characterized by reciprocal exchange: networks offer access to most of the resources individuals require, so that it is unnecessary to develop every skill personally. (p. 134).

The networking activities undertaken by the individuals in this study afforded them opportunity to experience the real world experiences of others in the organic production of food. Most of the required resources needed by the organic farmers for organic practice come not only from their own self-directed activities but from the results of social networking with other organic producers. Organic farm tours are arranged to bring together other organic producers for sharing knowledge and information. Oftentimes, these tours are opportunities for the conventional farmer to interact with the organic producer.

Several of these organic producers have experienced interest from some of their conventional farming neighbors to explore organic production. However, the less structured or informal social networks of community interaction indicate mixed feelings. Many of the

individuals in this study have known their neighbors for years, and most of them farm conventionally. "The neighbors are good. The community doesn't care [that I farm organically] as long as it doesn't affect them" commented Donald, a north central Montana organic producer, summing up reflections of several other organic producers. Disappointment was conveyed, however, in Donald's observations of little local support in his community. "They are enamored with the hugh retailers. Local produce and products are not used much." Charlie K., another north central Montana producer, reflected that "community, economy, land, and people--it all begins with the soil. The majority of people don't appreciate it this way."

Within highly conventional agricultural communities in which the individuals of this study live, socio-political implications of an organic life style play out both negatively and positively. While discussing the power of the chemical industry, Carol, in eastern Montana, observed:

> When you think about political issues, you think about this poorly organized group of farmers [organic producers] who are too independent thinkers to become politically organized in a group verses this big powerful chemical company who is organized. We have the food sources. We should have the power, but we're just not organized enough to use whatever power we have to command a price for our food. The grassroots effort is a start but it needs to be bigger.

Carol lives in an environment, a community steeped in a conventional framework of chemical agriculture. As a rebel with a cause in her world of organic production, she recognizes the oppressive power of an agrichemical emphasis. She sees the unconventional organic producers as lost in this powerful midst of a chemical model of food production in her community. Carol's statement, "whatever power we have", represents an appeal for understanding. Myles Horton (Moyer 1990) characterizes this situation from an adult learning perspective:

> Adults are--come out of the past with their experiences. So you run a program at Highlander based on their experiences, their experiences in learning--from which they may not have learned very much, because they haven't learned to analyze it, but it's there, and the grist for the mill is there. And our job is to help them understand that they can analyze their experiences and build on those experiences, and maybe transform those experiences, even. Then they have a power that they're comfortable with. (p. 2)

Within this same frame of thought, John, an organic producer in western Montana, made a critical observation about a socio-political condition related to food production. "Our present agricultural system doesn't reward farmers. Americans pay a smaller proportion of their dollar for food than any other people in the industrialized world." He conveyed that in order for farmers to make it,

they have to farm a large amount of acres and produce in volumes just to make it pay, which chemicals help accomplish.

> They can't exercise the same care that I can on a smaller farm, where such alternative practices as green manuring, crop rotations, cover crops, and composting can be applied. It's almost as if we've created a system by which the only way to make it in agriculture is to get real big, and to be big you have to use chemicals and unsound farming practices. I'm seeing the problem, not as a technical one, but as a socio-political one.

Farmers are boxed into a traditional system that suggests bigger is better. Within a social context, the farmer loses a connection to the land and to community in order to produce in volumes. John pondered that farming smaller acreage would allow a focus on the health of the soil and create a more cohesive community.

> If we as a nation would make a collective decision to reward farmers and pay the real cost of producing food, rather than having a subsidized cost, then farmers could make a living on small amounts of land. We could take the extra energy to look after the long-term health of the soil.

John concluded that, "organics worked before chemicals, and it could work now."

Several of the small-scale organic producers spoke of the importance of community interaction in their on-going assessment of their own organic production. Rachael, a western Montana organic grower, stated that, "We talk with

neighbors, with what other people do around here." For her, the local atmosphere is important in gathering information on the soils and exchanging information on trial and error plant growing activities. Annie, another organic gardener in western Montana, belongs to a local grower's association:

> It's not organic specifically, but just the connection with other people who are trying to do the same thing has been helpful. I've learned things from them. It's sharing experiences, not feeling like you're the only one.

All but two of the organic producers interviewed have a history of farming and/or gardening in their family backgrounds. Several of the organic producers returned to the land after having left to pursue a more technologically-oriented education.

Frank, an eastern Montana organic producer, stated his motivations for returning to the farm and developing an organic life style:

> It's where we want to be, what we want to do. It's a place for our kids, and it's [organic] a healthy practice for producing healthy food and promoting the health of people.

Although Mark P. in north central Montana earned his degree in philosophy studies, he was drawn back to the farm and recalled:

> My primary experience came from growing up on the farm. My dad farmed with horses. I like the smell of manure. I like picking rocks.

For many of these individuals the farm and the land are like magnets, drawing them back to a sense of place where roots were laid a long time ago.

A Natural Connection

Ecological consciousness, a characteristic of the individuals interviewed, has foundations in nature. Considering the natural elements of the farm and garden, the land becomes a context in which these individuals find themselves and in which their learning finds performance, both in the application of knowledge as well as in expression of inner realities of the senses. The natural surroundings for these individuals are a learning path upon which they travel extensively. Experiences in working the land, observations of activities within the natural surroundings of the farm, and responses to those observations provide a basis for connective thinking for many of the individuals in this study.

Farming is a system of food production, and these organic producers are at the heart of producing food that is both reflective of a healthy ecology of the land and of healthy human sustenance. Soil health and the absence of synthetic pesticides, herbicides, and chemical fertilizers

are related to healthy food for people and animals in this system of food production. "Not using chemicals is a plus" as Jim put it. He related his own connective thoughts on environmental impacts by way of an incident involving the spraying of grasshoppers in his community during several infestations in the late 1980s:

> [Farmers] sprayed waterways and it kills everything, killed the beetles. What happens is the grasshoppers are thick, they spray, and it kills everything, some of it even killed the birds, and rabbits, and deer that ran through [the fields]. Now it's the perfect place for grasshoppers, no predators. The grasshoppers develop immunity. Now they have to develop new sprays to kill them.

His wife and partner, Carol, elaborated on "the health thing also" with some thoughts on what she perceived to be increased incidences of cancer in the conventional farming community. "Several [conventional neighbors] have sprayed and sprayed for years. One has since died from cancer and the other is recovering from a bout with cancer." Carol connected the use of chemicals and to an unhealthy lifestyle. A "defining point", a "turning point" for Jim is related through an experience of exposure to chemical dust in a grain truck. "After I vomited, I thought this can't be good for you; it just isn't safe." The reality of this personal learning experience for Jim within an established chemical model of agriculture was defined

enough in his mind to initiate critical evaluation of this chemical practice. He reflectively challenged the assumptive nature of the conventional model of farming and opted for a healthier alternative. Mezirow (1990) suggests that:

> To make meaning means to make sense of an experience; we make an interpretation of it. When we subsequently use this interpretation to guide decision making or action, then making meaning becomes learning (p. 1).

The young son and partner of a central Montana organic farmer "doesn't want to be around a sprayer." Don spoke of losing his grandfather to cancer and relates that there seems to be a correlation between aging farmers who ran an open sprayer for years and death from cancer. "It's the men who die . . . Grandma is 90 now. None of the other widows have cancer." Young Don's concern was connective in that male farmers are typically the ones in the fields. The chronic exposure to the chemical drift from frequent spraying of chemicals and the high incidence of cancer in these farmers was connected in Don's mind to an unhealthy practice in farming.

Rachael, a small scale western Montana organic producer, emphatically recounted her feelings about organic production and health:

> I would not do it [garden] any other way. I like clean food. I like the smell of 'clean'. It's not like chemicals. They kill and smell awful. They're not good.

The connection between human health and chemical use was often recounted among these organic producers as was the connection between soil health and use of chemicals. Two guiding principles serve as the cornerstones for the organic philosophy of production. One is abstaining from the use of synthetic pesticides, herbicides, and chemical fertilizers. The other is the utilization of growing practices that focus on soil building and diversity.

> It takes a good farmer, because organic farming is a sophisticated blend of intuition, skill and scientific knowledge involving plants, soil cultivation and natural forces" (Lipson, 1998, p. 41).

Joe defines his ecological consciousness as "working with nature as closely as possible rather than trying to conquer, and keeping things clean [absence of chemicals]."

For Frank, an eastern organic producer, an approach to farming ecologically involved "a lack of action rather than taking action." He explained that a lack of action in this context means "taking time for observation to gain insights into the situation and resisting reaction without thinking first." Within the context of nature that includes the land on which he farms, Frank engaged his inner and outer realities of the environment in assessing the problems on

his farm. Observation, reflection, patience, and then action were Frank's praxis for learning.

"There is nothing natural about farming" was the way Michael and Joe described agricultural food production practices. However, there is an ever-present sense of appreciation for how natural systems function. Respecting the intricate web of life, organic producers try to emulate nature's productive ecosystems through natural soil regenerative activities. In this way, they contribute to the sustainability of the soil for the future. Ron refers to the soil as a "lifeline" in that:

> Destroying the soil affects our lifeline for the future. Organic means sustainability and sustainable organic systems are self-perpetuating. They mimic natural cycles and do not introduce synthetic materials into the environment.

Michael from north central Montana realistically attends to the farming by:

> Trying to do the least amount of damage to the land and still survive. It's [land] better off as native sod, and as a farmer the closer I can put it back to that the better. The land needs to be protected, not just for the next hundred years but for thousands of years.

The organic farmers in this study take seriously their responsibility toward farming. "The way I see it, it's our God-given duty to take care of the land" commented Michael in eastern Montana. From a practical standpoint, John in

western Montana described organic as "farming in such a way that the soil is improved for a sustainable future." Another western Montana producer, Annie, expressed not using chemicals because "I don't want to hurt the microorganisms that benefit soil conditioning." Annie's approach involves systems-thinking within the context of nature's model of productive ecosystems.

> "I work with the [natural] processes, not battling them. I work with what is there. I use cover crops and compost in order to maintain organic matter. The quality of what I do is high and that gives me a sense of satisfaction.

Fred Kirschenmann is a leading proponent of non-chemical farming. He suggests that in contrast to a systems approach, "the more conventional farmer is accustomed to thinking of soil as a factory--you put in predetermined amounts of seed and chemicals and take out a certain amount of crop" (in DeSilver, 1990, p. 41). This linear way of thinking is in direct contrast to a more complex and systemic way of thinking assumed by these organic producers. It is not just the product from the land that is the focus of their efforts. It is the conscious attending to of an entire interdependent ecological system in which the product is produced that contributes to a continued health and sustainability of the system. Kittredge (1997) suggests that:

> Learning in the context of the land involves systems thinking and a holistic approach . . . If one views learning as just such an integrated experience, it is easy to understand the Responsive Learner's perspective. (p. 266)

The world of the organic producer is impacted by many environmental elements, such as the land and the living soil, the diversity of plants and animals, both domestic and wild, and the gifts of sunshine and water. "Each element then is part of a system, which although recognizable on its own, derives its deepest meaning from being understood as a whole" (p. 267).

It is the little successes along the journey of organic practice, the experiences of trial-and-error in a partnership with nature, a belief their actions do make a difference that motivate and give these organic producers a sense of purpose. Reflection and action describe a praxis for an ecological consciousness.

The Economic Connection

Organic production is no different than conventional production when it comes to farmers providing a living for family. "One can't live today without income," and "economics has to be there, too, but it's not the initial reason for me being organic" were echoed by several organic producers.

Peter made this observation about the economics of organic farming:

> A movement is occurring that can be due to the fact that one can make more money at it [organic production]. Isn't it ironic that this [perspective] suggests that the person must become cleaner [organic] which means clean soil and then the earth benefits.

Although the monetary motive of organic production could indirectly foster a "cleaner" environment, Peter questioned whether this kind of monetary-focused movement in organic production represents the true essence of organic farming philosophy.

An element of frustration for several of these organic producers involved the current industrialized worldview of agriculture. It is an issue with which several of them struggle. Agrichemical farming is pervasive and represents an entrenched mindset in conventional agriculture. Michael, a central Montana organic farmer, described his feelings this way:

> To live in our capitalistic society, we must talk in net dollars. If I want respect from neighbors I must talk to him in dollars and cents. The most important focus is to produce the most bushels per acre. If you don't talk in those terms to those people, they'll turn you off real quick.

Michael's frustration lies in the fact that he does not speak the same language or hold the same worldview as that

of his conventional farming neighbors. A chemical model of agriculture uses large amounts of commercial fertilizers, pesticides, and herbicides to produce large quantities of single crops for sale. It has become a worldview of agriculture for many who farm and ranch. A worldview is how people think the world works and what they think their role in the world should be. Michael views his world as one in which there is an absence of chemicals in his approach to growing food and a conscious focus on the ecology of the land that he works. A healthy soil and a healthy crop are critical elements in his worldview of agriculture.

> I believe it's [chemicals] bad for the environment, for the health of everybody--for me or the applicator. [It's possible] that the neighbor here may think sprays are doing harm and he doesn't want to be around it. So he hires it done [because] he can make money at it. That's still number one--a good high yield, a good-looking crop, and no weeds. That's the way we're suppose to look at it.

Mark P., an organic producer and business owner, shared a perspective on an industrialization mindset from his personal business experiences with buyers of agricultural products:

> Part of the frustration of doing organic business is that people don't have a belief system. Never ever is the question "tell me about the farmer who grew these seeds. Do they have kids?" No, the question is "How cheap is this?" There is

> some sense of concern about product quality in that it must look clean and unbroken to these buyers, but there is a lack of concern as to whether the product was produced with manure or chemicals.

He emphasized, though, that his business has allowed him contact with many interesting farmers and people who have been sources of "little gems" of thought. These triggered in his own mind ideas of beneficial organic research that could be initiated through his business. Even within the business of organic certification, feelings from several organic producers concerning the bureaucratic nature of food production were shared. Mark P. in central Montana said, "Paperwork has little to do with an organic life style. Bureaucracy contributes to commerce but not to life style."

Unfortunately, a historical misconception of the organic philosophy of agriculture developed within the established belief systems of industrialized agriculture. Mark and Charlie in north central Montana related that 10 or 15 years ago many conventional producers perceived organic production as an economic threat. Charlie stated, "The threat was if it developed into something it meant that conventional farmers would have to give up their chemicals among other things that contributed to their farming way of life." Mark continued:

> It gets back to a paradigm, the way you look at things, your worldview. If someone threatens your worldview it causes you to build those walls, creates animosity. The [organic] philosophy was the threat.

Unfounded fear was generated as a result. Throughout this period of unrest, committed organic producers remained sustained in their organic production activities. Today many conventional farmers are expressing a curiosity about organic production, an indication of interest in alternate approaches to food production.

Mark lived through this rather tenuous time of unrest and shared his thoughts of times when organic farming might have been viewed as "eco-farming" foremost and "economic farming" second. The former emphasized diversification factors and the latter focused on costs and net income.

> Costs had nothing to do with the way I began farming organically. Years ago we could afford to farm [organically]. Today costs have everything to do with the next generation of organic farmers who would convert or continue to farm organically. They've become removed from that "wider wisdom". My Dad still had a connection to a more diversified agriculture. Those who are now in their 20s and 30s do not have that direct link there. Decisions for them now are going to be driven by economics rather than by the philosophy, but that's the industrial link.

Food production practices within the paradigm of an objectivist education in agriculture taught Donald that "bigger is better--produce the heck out of it." The

chemical companies oblige by offering more and more products to control weeds and insects and thus contribute to increased crop yield. Donald emphasized:

> They never tell you everything about the nature of these chemicals. Many farmers are brainwashed and led to believe that they better use them or they'll have wrecks [decreased production].

Friere (1970) suggests that this type of "overwhelming control is necrophilic" (p.58). Further, the type of educational process imposed upon the farmers by the chemical companies is one that "attempts to control thinking and action, leads women and men to adjust to the world, and inhibits their creative power" (p. 58). As an organic farmer for many years, Donald has already intervened in this world of chemicals and made a transformation to organic by engaging in a critical consciousness of the situation. He has freed himself of passive acceptance through the process of reflection and action or praxis. "Organic is an exciting challenge--trying new things to see if they'll work. I hope I live long enough to try all the things I want to do with new crops."

Within a subliminal context of the interviews with these organic producers, many of whom have farmed organically for years, there existed an element of

commitment over and beyond that of an economic emphasis. Little snippets of conversation with all of these organic producers express a deeper commitment. "It's the right thing to do" and "any other way was not an option for me" were frequently conveyed throughout the interviews. Other organic producers cite "challenge", and "enjoyment" as additional guiding lights in organic production. These are inner realities for many of these organic producers. They are the motivating factors that contribute to the outer reality of organic practice and together engage the learning process in an experiential framework.

CHAPTER 5

A BASIS FOR LEARNING ECOLOGICALLY

An Ecological Overview

The earth is home for many living things. Humans are a part of this natural world. Existence is dependent on clean water, clean air, and a healthy, fertile land base that provides sustenance for life. These requirements are not independent of each other. They are an intricate web in which the effects upon one can affect the entire system. Polluted water is not healthy for man or the land that supports a diverse abundance of life. Both human and natural activities can produce negative effects on the water, air, or land in which pollution and degradation become problems for sustaining life.

Nonpoint sources of water pollution are those that cannot be traced to any single discharge. They include runoff and deposition from the atmosphere. In the United States "nonpoint pollution from agriculture is responsible for an estimated 64% of the total mass of pollutants entering streams and 57% of those entering lakes (Miller, 1994, p. 595). Sediment from erosional activities, inorganic fertilizer, manure, salts dissolved in irrigation

water, and pesticides represent various types of nonpoint pollutants (p. 595).

Overpopulation in the world has put ever-increasing pressures upon the land and waters resulting in soil depletion and water contamination in order to meet the demands of food production. The Industrial Revolution in this country led to solutions, such as chemical agriculture, that would increase food production to meet the demand. Through the use of chemicals, weeds and insects are eliminated and crop yields are increased. Yet fertile soils continue to be depleted and watersheds are contaminated through those chemical activities. This chemical technofix of food production is inflicting wounds upon the land which are slow to heal.

The individuals in this study are organic food producers. As such they possess a consciousness of ecology by the nature of organic practices and methods. Organic farming is an art of partnership with nature instead of control over nature. A natural way of knowing emphasizes this partnership by recognizing the interrelatedness of life. The learning paths favored by the adult learners in this study reflect those in which this recognition is emphasized. They are learning paths seldom traveled by many within established paradigms of an objectivist

education and an agricultural industrialization that are linear in design. However, these less traveled paths became viable options for these organic producers in their pursuit of non-chemical approaches to their livelihoods that are rooted in the land. Directing their own activities related to their unconventional food production practices holds value for them. Praxis is a learning path for these organic producers.

Learning Ecologically

The most effective means in which to describe the learning proclivities and paths of those adults who can be defined as ecologically conscious was through a qualitative case study which permitted a semi-structured interview process, an opportunity to engage in conversation with these individuals. The testimonies of the individuals in this study within a connective framework of educational, social, natural, and economic themes reveal rich reflections on the development of a connective consciousness to the natural environment in which they are immersed.

The individuals in this study are committed to organic philosophy and ecology of food production. They hold to that commitment beyond just principles of a certifying

agency. Deeper ties to the land are felt that drive and motivate these individuals to continue in the face of adversity. "[Organic] is the right thing to do", and "I don't believe I can improve it [land], but I can quit hurting it as much" are the testimonies of these adults to a deeper commitment, one that professes a relationship with the land. This conscious relationship serves as a context in which learning takes place.

Many of the adult learners in this study were raised on family farms, or are the innovative gardeners who "breathed life" into such words as organic and sustainable by implementation of those associated practices and methods. The natural environment is where cultivation of the land occurs, and many of these individuals grew up immersed in that world. Outdoor experiences with family, observation of the works of nature, the earthy aroma of the land, and "ears" to life that abound in those surroundings are the cornerstones to a more natural way of knowing. Interrelated with experiences of the senses are the inner realities of feelings and philosophical considerations that also serve as learning paths for these adults. Rowland (1994) describes the holistic harmony of a Cheyenne way of knowing, one that is more natural in focus and esteems the inner realities of life:

> By being attuned to other life forms, the Cheyenne understood that all living things, including the spirits, were connected. . . . Further, the Cheyenne recognized that because of the interconnectedness of life, spirituality, which is tantamount to life's existence, cannot be dissected and set aside. (p. 67)

In other words, separating the affective side of human consciousness from the outer reality of life creates disharmony. In tandem, inner and outer realities interact and together influence learning.

These ecologically conscious adults made a transformation from conventional ways of thinking to non-conventional as "Responsive Learners" (Kittredge, 1997, p. 261). Thinking reflectively and actively responding to those reflections were learning processes engaged by these individuals. They moved on the less-traveled routes of learning and directed their own actions through response to experiential phenomena. Critically reflecting upon experiences within contexts of both land and life, reassessing them, and acting upon them to achieve desired results were those significant side trips of learning that were chosen by these adult learners. Established routes, those traveled on by mainstream society and indicative of learning institutions, were less of an influence upon these individuals and the direction they wanted to go. They moved on seldom-traveled paths with deliberation.

An ecological consciousness, indicative of the individuals in this study, could be a means in the reduction of negative impacts upon living earth systems and therefore a chance for sustaining a healthier environment. Thinking and acting in connective consciousness as if it makes a difference could be a significant step in addressing some of the wounds inflicted upon the earth by human activities. A study of ecologically conscious individuals, such as those involved in this study, and their paths of learning may provide a basis of understanding for potential future adult learning actions in developing human ecological consciousness for the benefit of the earth and the human inhabitants.

Conclusions

1. Within the context of the land and application of ecological concepts the individuals in this study think connectively.

The individuals in this study are described as ecologically conscious by the nature of their organic production activities. More than just awareness of ecological concepts, these individuals practice this ecology within the context of the land they cultivate.

The land is viewed less as a factory than a holistic system of interrelationships of living and nonliving environments. There exists a strong sense of place within this context, and deeply embedded roots drive these adults in self-directed actions that connect land, family, and the health of both in their minds. The land is the foundation, the natural basis for interrelatedness of life. The land becomes a path for thinking connectively.

This type of connective thinking reflects the values that these individuals hold for their lifestyles, despite mainstream America's view of them as unconventional. Healthy soil means an absence of synthetic chemicals and a focus on soil building activities. Growing food in this healthy environment promotes healthy families and animals. Thinking connectively developed from choices that were made by the adult learners in this study.

Some left the farm to pursue formal educational goals or seek out other interests only to be drawn back to their relationship with the land. The motivation for these individuals to become organic was not the result of their participation in a formal educational system that inspired or moved them. It did not. Their choice was not made exclusively within an economic framework either because the economics of organic were not conceived as more profitable

than the economics of conventional food production. They chose to be organic because there was enough reason to believe from personal life experiences that chemicals and good health were an oxymoron, not only in terms of human health but that of the soil in which are laid the seeds of sustenance for life.

From those connections stems a consciousness of the interrelationships of living things and the human effects that would alter them. It is not a "mechanistic concept of consciousness," that "attempts to control thinking and action, leads women and men to adjust to the world, and inhibits their creative power" (Friere, 1977, p. 58), such as might describe an objectivist paradigm of education. It is an ecological consciousness that seeks knowledge of and respects the intricacies of a web of life. It is a consciousness of human activities and their results on the land. It is a consciousness in which there is an association, an intermingling, of the outer realities of ecological knowledge and practice with inner realities of experiential feelings and attitudes. Friere (1970) might have come to see this fringe group of organic producers as a liberated people. "Liberation is a praxis: the action and reflection of men and women upon their world in order to transform it." (p. 60).

Learning in compartments, learning in fragments, learning without a legitimate acknowledgement of the expression of feelings and attitudes does little to connect us to the reality of the intricate ecology of life that is our surroundings or environment. "Education is never neutral. Either it is an instrument to facilitate conformity to the present system, or it is a process for helping people deal critically with the realities of their world" (Conti, 1977, p. 39). The realities of the world for these ecologically conscious individuals do not conform to a conventional system of education nor a conventional agriculture in which there are measurable objective inputs and outputs. A majority of the adults in this study viewed these activities as primarily information-based education. Realities of life for these individuals are emulated in more of a natural way of knowing, one that is connective and holistic in its approach to learning actions.

2. The Connective Thinkers in this study move on less traveled paths of learning as responsive learners.

Kittredge (1997) describes responsive learners in terms of actions involved in the learning process (p. 261). Considering the connective context of land and actions taken by the individuals in this study toward a healthful

lifestyle, and the nature of ecological as interrelatedness of life, Kittredge describes responsive learners as systems thinkers:

> They do not think linearly, seeing their ranches in segmented fragments. Instead, they are aware of the land and its totality. The whole of their land is seen as a system with smaller systems within it, a model which is not unlike a living body. Because of this holistic approach, they tend to see change more as an evolution of systems. Because they see themselves and the land as a system, they find it difficult to see themselves as separate from the land. (p. 264)

The adult learners in this study are responsive learners who think connectively. A strong rootedness in the land is apparent from the number of individuals who are farming on family homesteads. Other influences associated with a connection to the land include conducive social climates in which many were raised. Family and their lifestyles have encouraged nature experiences associated with the outdoor environment of farming and gardening in which many of these responsive learners were raised. The land represents their sense of place, their connection to life. The individuals in this study have already undergone a transformative process of learning in relationship to their chosen organic lifestyles. Within a contemporary chemical mode of agriculture, the individuals interviewed have taken deliberate personal actions in response to

perceived and experienced negative effects of chemically intensive practices. Strong roots held them to the land, but not to the convention of agrichemical practice. The conventional chemical frame of reference became problematic to their personal health as well the health of their family and their land. The decision to be organic was right for them. Mezirow (1990) describes this adult process of reassessment as unique to adulthood and defines it as perspective transformation:

> Perspective transformation is the process of becoming critically aware of how and why our presuppositions have come to constrain the way we perceive, understand, and feel about our world; of reformulating these assumptions to permit a more inclusive, discriminating, permeable, and integrative perspective; and of making decisions or otherwise acting upon these new understandings. (p. 14)

In the process of creating this new perspective, these responsive learners have remained conscious of the conventional paradigm of agriculture in which they live. This other way of cultivating the land was not conducive to a new idea of a healthy life and land as they now perceive it to be from real life experiences.

3. These individuals' learning processes have been shaped by self-directed actions on less established, more off-the-beaten-paths of learning.

The adult learners in this study traveled on established routes of education revealing that learning within an objectivist paradigm of learning, exemplified by contemporary institutions of learning, did little to motivate or support these adults in an ecologically conscious direction. Actively seeking out information and applying innovative activities, networking with others to gain insights, attending seminars and meetings on alternative practices, using experiential reflection and action along with trial-and-error activities, all exemplify paths of learning most engaged by these adult learners.

A technological emphasis in society today places little value on learning from a natural perspective, just as little value is placed on a Native way of knowing or a rural way of knowing where nature serves as teacher and a context for thinking connectively and holistically. Through their journeys on less-beaten paths, so much so that there is a need to preserve this more natural way of learning, the individuals in this study have recognized a value in less conventional ways of learning. Some may have been lured into the technological arena only to be drawn back to the land. Adjusting and conforming to the standards of a contemporary technical world left little satisfaction for these individuals. Reflecting upon their

own experiences in the real world and responding to the inner and outer realities of that world, these responsive learners chose their way, how it fit and worked best for them in the real world of their lives.

In subscribing to a more natural way of learning, one cannot make generalizations. Every situation is different and must be approached that way. The dynamics of life related to the land and environment are not generalized standards, but are reflected in an ever-changing character of nature. These responsive learners are aware of their surroundings and work within this dynamic framework of ecology, taking responsibility for their actions. The active process of reflection and response taken by these adult learners within the dynamic context of the land is praxis for them.

Within contemporary society, an adult's formative learning years are shaped by a highly pedagogical model of education, one that stresses the role of the learner as dependent. To a large extent adults are products of that environment, spending 18 years or more of early life in formal classrooms for the better part of a day. The inside classroom and the "inside attractions of the shopping mall" (McClaren, 1989, p. 9) have taken many away from the wonders of ecological insights drawn from natural

experiences. The assumption that learning is an inside activity and is associated with formal education still persists.

Subjects are taught within the confines of separate disciplines such as science, social studies or economics. Instruction is centered primarily on the content of the disciplines with little focus on instruction that is based on experiences of the learner. This disconnected learning environment and lack of focus on the learner may well prevent many adults from engaging in an understanding and appreciation of the ecology of life, which is based in the consciousness of connectedness and interrelationships of a natural world. The adult learners in this study have a consciousness of the diverse and interrelated web of their natural surroundings of which the land they cultivate is but a holistic part. There is commitment to and application of this consciousness in their life activities.

Effective learning for these ecologically conscious adults is connective in design. Their views find foundation in the interrelatedness or ecology of things, be it a lesson in the negative association of agrichemicals to human and soil health or in a harmonious connection with the web of life that surrounds them. As for these adults and those who work closely with nature, their teachers are

the soil, the natural surroundings in which they cultivate the land. Their farm or garden is the environment most conducive to their learning. Their practices are those that seek harmony with the natural environment, "without hurting it as much." Their motivations are internal. Their actions reflect a synergy of feelings, attitudes, and knowledge that is synonymous with an ecological consciousness. These are self-directed adults, choosing learning paths less traveled because of their concern for their families' health as well as that of the land that sustains them.

4. Within the folds of mainstream socio-political paradigms related to power elements of big business and corporate structures, these responsive learners continue to seek learning paths of empowerment and harmony of land and life.

The adults in this study have evolved through an experiential process to an ecological consciousness within the context of their natural surroundings as responsive learners. However, it was evident from the interviews that these individuals live in and struggle with a socio-political climate of big business in agriculture within their rural communities. This atmosphere is not a conducive environment for these organic producers, and it

manifests itself in feelings of powerlessness for this fringe group of food producers.

Within mainstream America, conventional paradigms of education and economics express standards of living in which technology and technofixes rule. The political system and corporate structures esteem the technological activities indicative of the chemical model of agriculture. They are supported by private and public educational institutions and are taught in the classroom. Dollars from corporate America and big business support and control these contemporary centers of learning and create a value in continued technological education. These forms of education become a barrier within contemporary society to more natural but less accepted ways of knowing and learning which are used by the ecologically conscious individuals in this study. The established institution of agricultural industrialization and the power elements associated with it become a challenge for those who travel on other than established paths of learning where real life experiences are sources for learning.

Fellenz and Conti (1989) suggest:

> Trends in adult education and cognitive psychology that advance the understanding of the individuality of learning experiences and that promote learner self-knowledge and control of

> personal perceptions and judgments provide for potential empowerment of the individual. (p. 23)

Empowerment for these adults who already move on critically conscious learning paths within mainstream power structures, not only must come from achieved individual efforts but from efforts to transform society. According to Friere:

> Even when you individually feel yourself most free, if this feeling is not a social feeling, if you are not able to use your recent freedom to help others to be free by transforming the totality of society, then you are exercising only an individualist attitude towards empowerment or freedom. . . . While the individual empowerment . . . the feeling of being changed, is not enough concerning the transformation of the whole society, it is absolutely necessary for the process of social transformation. (cited in Fellenz and Conti, 1989, p. 23)

For these organic food producers, there is a realization that society is apathetic about the cheap and plentiful food supply available to them and how it is grown. In their efforts to address power institutions related to the established chemical model of agriculture, they grapple with issues of power and empowerment. They continue to direct themselves on seldom traveled paths of learning to become empowered by "using learning from their social environment to understand and deal with the political realities of one's social and economic situation" (p. 21).

Recommendations

The conclusions formed by this study of learning paths of ecologically conscious individuals would indicate that indeed they travel on paths of a natural way of knowing. Connective thinking is an outcome of their chosen ecological way of approaching the land. There is value in this more natural way of knowing as demonstrated by the tenacity of this group to remain committed to it even within the stronghold of conventional paradigms of education, agriculture, and economics.

In order to promote an ecological education or an Earth education, formal, adult, and community educational systems and actions should not only expose people to, but immerse them in holistic, integrated, and multidisciplinary thinking. Conventional, reductionist, and discipline-oriented education are useful ways in understanding some of Earth's complexities, but it remains an established objective way of thinking. To take on the challenge leading to a paradigm change in education means thinking contrary to the grains of contemporary thought.

Actions that formal and informal education administrators and faculty can initiate to transform the learning process for environmental and human benefits are:

1. Offer side-by-side specialist-holistic programs of study. In order to initiate change, it is sometimes necessary to work within an established system to promote it. A dual program offers choices and alternatives to contemporary thinking within an established paradigm of objective education. Disciplinary thinking would remain important, but a parallel teaching and research track would be established for those wishing to pursue holistic, integrated, interdisciplinary education (Miller, 1994, p. 691). It would stress understanding of the connections and interactions within nature, between people and nature, among people with different cultures and beliefs, among the problems that humans face, and the solutions to those problems. Interaction would be encouraged between the two tracks by creating activities in which teachers and students participate together and share their impressions and evaluations on the merits of both.
2. Develop bioregional activities toward understanding the natural cycles, flows, and rhythms of a particular place. In order to initiate this understanding, people must learn as

much as possible about how the place where they live works, "what networks of symbiotic and synergistic relationships sustain its human and nonhuman inhabitants" (p. 692). At the same time, there must be awareness of what we have done to disrupt those relationships. Even within the conventional educational framework, it could mean offering more environmental health courses designed to actively bring bioregional thinking into the classroom and encourage innovative projects that highlight a sense of place within each participating student. Individuals could address a set of questions assisting in a determination of an "ecological identity" (Thomashow, 1995). For example, these questions could include, Where do the things I consume come from? What do I know about the place where I live? How am I connected to other living things? What is my purpose and responsibility as a human being? Adult learners could initiate local community and social events that promote a sense of place and where adults can reconnect with their local environment.

3. Promote Environmental Literacy. If the environmental changes that are occurring around us are taken seriously, then there is need to take action at a higher level of public and personal awareness and commitment. "Knowledge carries no automatic set of instructions converting it into appropriate actions" (McClaren, 1989, p. 9). Educators therefore must foster development of praxis in adult learning situations, and learners must actively seek out such experiences and engage in them in order to contribute to the solution of environmental problems. There may be awareness of a pollution problem in a local creek, for example, but moving beyond awareness into a decision to do something about it generates new learning. Interaction with the environment and community is not the same as learning about it inside a classroom. Practice in problem-solving activities is needed.

4. Include holistic earth thinking examples at all levels of teaching beginning with kindergarten. This progressive process lays the foundation for building an ecological consciousness. Community organic gardens and internships with organic

producers are alternative educational activities that are action-oriented within a framework of ecological awareness and knowledge. Engaging people in these real life situations promotes connective thinking in which they and their surroundings become fertile elements in an interrelational environment.

5. Encourage earth education for adults. Being exposed to earth education may not necessarily infuse ecological thinking into all adults. However, many adults are confused and discouraged with what is happening to the earth. A re-education and re-energized effort that involves thinking with and learning an ecological consciousness is not an unrealistic goal. Organic farmers and gardeners could serve as "teachers" during farm tours or symposiums on organic agriculture. Interrelated aspects of a social, economic and ecological nature are shared. Retreats for teachers that include the outdoor nature of organic production could bring alive the ecological environment in which food production occurs. People have to eat, but there are many

who have little connective insight into the origin of the food we eat or "where bread comes from."

6. Promote appropriate technology. Technology is the creation of new products and processes that are supposed to improve our chances of survival, our comfort level, and our quality of life. Often technology is viewed as an answer to the many environmental problems we face today. Technofixes, or technological solutions, tend to contribute to existing problems of environmental pollution and degradation. Using appropriate, just and humane ways to protect life on earth is possible. Appropriate technology is a "form of technology that is typically fairly simple, locally adaptable, resource-efficient, earth-friendly, and culturally suitable" (Miller, 1994, p. 689). Ecological design emulates nature as a model in building houses of natural or recycled materials, utilizes the sun and the earth for heating and cooling, and composts and recycles wastes. This same designing concept can be applied to neighborhoods and communities. Use of appropriate technology can help in exploring

solutions to environmental problems of a local nature without added environmental stress.

7. Blend an "ecology of indigenous education" with that of an ecology of conventional education. Gregory Cajete (1994), author of Look to the Mountain: An Ecology of Indigenous Education, offers a view of the natural world from eyes that see life in a relational reality that includes the inner realities of affective elements and the outer realities of natural ecological processes. A conventional approach to the study of ecology is rooted mainly in the science of ecology. Embracing emotion (inner reality) in connecting to our surroundings and intertwining it with the cycles and rhythms of the natural world (outer reality) is a more holistic approach in understanding the ecology of life. Accepting the interrelational nature of this human process of learning and reality within a fuller dimensional framework of ecology can contribute to development of an ecological consciousness.

8. Enhance on-farm research and networking. Rich experiences of trial-and-error activities that have come to work for organic farmers in their

particular regional locations, along with associated community activity emphases could be gathered and organized via appropriate computer programs. Through a farmer-directed, farmer participation organic research network, these activities could be documented and made available through several media including electronic and mail-based systems. The research network would serve as a resource for other organic producers and for other farmers looking for alternatives to chemicals. A dialog between conventional and organic producer could be initiated in an effort to bring a personalized perspective for the merits of each approach to cultivating the land. At the same time, information could be made available on the human and environmental benefits of ecological agriculture. The information gathering process would be on-going contributing to organic production research for long-term benefits. University agricultural research is hampered with time constraints. In order to amass data for short-term grants, scientists need to obtain quick research results in a chemical-dependent paradigm of agriculture. Modes of research are still those

that fit only within the established paradigms of both education and agriculture. Applied research would take advantage of this synthesis of on-site organic farm research. By combining real farming practices under real farm conditions with a collaboration of those who formally study cropping systems, a long-term, problem-solving and sustainable process is begun, leading toward a more ecological emphasis in agriculture. This participatory learning effort represents real world learning.

9. For those who would like to learn or teach something contrary to general practice, engage in or offer learning activities that stimulate connective thinking. For example, water is the life blood of humans. As it is consumed try to think of it in terms of its source, the impacts on that source, and how people can participate actively in protecting it from polluting activities.

Summary

It is possible to hoe potatoes and to hear the birds sing at the same time, although teaching has not much developed this completeness in the minds of the people. (Bailey, 1915/1980, p. 36)

The learning paths in the real world of the ecologically conscious individuals in this study can be described as those that are less traveled by mainstream society. They are not established paths, descriptive of learning institutions, although these individuals have traveled upon them also. The unbeaten learning paths upon which the adult learners in this study travel most often are those that support interrelational experiences of reflection-action-response processes of learning. These activities are indicative of self-directed and responsive learners within a connective framework of ecological reference. For the adult learners in this study there is value in traveling these less established paths of holistic learning because, as Bailey stated, "our teaching has not much developed this completeness in the minds of people."

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APPENDIX

A GUIDE FOR THE INTERVIEW PROCESS

Demographic Information

Regional Location of Organic Producer_____

Years as Certified Producer_____

Years Involved in Farming and/or Ranching Organically_____

Years Involved in Farming and/or Ranching_____

Organic Production as Only Livelihood_____

Work Outside of the Ranch or Farm_____

Last Year of Formal Education_____

The following questions serve as a guideline during the interviews, not necessarily presented in any kind of order. Special emphasis is given to seek out the learning paths upon which these individuals travel.

1. What does it mean to you personally to be organic on your farm or ranch? The essence? How does it relate to community and to the environment?

2. Recalling your learning experiences in grade school, high school, and college, what phrase would describe your feelings about each of those periods? What effect, if any, did these experiences have on your decision to be an organic producer?

3. What factor or event or experience brought you to a consciousness of the ecology of the land and the organic practices you employ?

4. What resources do you utilize to sustain your organic process? Human? Organizations? Publications? Extended Studies? Training? Community events?

5. What hurdles, if any, have you encountered as an organic producer? How have you managed to address them?

6. Is there a philosophy of life related to your farming organically? Would you mind sharing it with me?

5. What hurdles, if any, have you encountered as an organic producer? How have you managed to address them?

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