THE INTERRELATIONSHIPS OF NATURE
BASED ON
THOREAU'S WALDEN AND
LOVELOCK'S GAIA HYPOTHESIS

by

Amanda Meyers

Thesis submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of
MASTER

in

Landscape Architecture

APPROVED:

Dean Bork, Chairperson

Wendy Jacobson

Mark V. Barrow, Jr.

October, 1994
Blacksburg, Virginia
LD
5655
V855
1994
M494
c. 2
THE INTERRELATIONSHIPS OF NATURE
BASED ON
THOREAU'S WALDEN AND
LOVELOCK'S GAIA HYPOTHESIS

by
Amanda Meyers

Dean Bork, Chairperson
Department of Landscape Architecture

(ABSTRACT)

James Lovelock and Henry Thoreau propose a world view based on the connections between an individual and their personal landscape. This viewpoint is an alternative to the more prevalent world view of our mass society. The pervasive outlook disregards these connections and concentrates instead on isolationism. By viewing elements of the natural world as isolated entities, individuals are unable to comprehend the larger context, or environment of which these entities are a part.

William James, a philosopher of the early twentieth century, poses a philosophical foundation which reinforces Lovelock's and Thoreau's ideas. James' philosophy is "pragmatism, proposing ideas of relational thinking and the absence of absolutes. Lovelock and Thoreau illustrate the philosophy of James in the exploration of three concepts: (1) Beauty; (2) Spirituality; and, (3) Human Experience and Knowledge. The acknowledgment and internalization of these concepts leads to a different understanding of an individual's place in the world. Since this conception is not the prevalent viewpoint of the general public, this difference
has the potential of creating a communication gap between student and professor, and between landscape architect and client. The implications of this communication gap are discussed.
Near the beginning of my landscape architecture education, a professor spoke to our class regarding the importance of a personal position on life. Developing a position, she told us, would help to guide our designs by providing a theoretical basis, without mandating form. Over the past several years of learning and struggling with projects, I have contemplated my position many times. This usually occurred when I critiqued my own project and wondered, "What does this have to do with how I feel about my life; the relationship of my life to others and to the landscape of which we are all a part?" The culminating project of our education is the thesis and this gave me the opportunity to fully explore the tenets of my position and at last articulate what was sometimes glimpsed in my projects but more often lost behind new, vaguely understood concepts and last minute rushes to meet deadlines. The following represents my position of which the essence is trying to view life in terms of connections and inter-relationships, regarding elements not as isolated entities but rather as parts of dynamic processes. Stated in this manner, the concept may seem obvious to some, but it took some time for me to reach this understanding.

As I was reading background literature and trying to choose a thesis topic, I noticed that James Lovelock and Henry David Thoreau were cited quite frequently. I, too, was drawn to their writing and wondered what qualities made these two authors so compelling. After reading about them as well as reading some of their major works, I discovered that their lives embodied the ideas that their writing depicted. Thoreau's work emanated from the experiences of his life, his travels, and his thoughts. *Walden, or Life in the Woods*, written during a two year period in which Thoreau lived at Walden Pond, is an excellent example of the Transcendental literary period. During the Transcendental period of the mid nineteenth century, authors such as Ralph Waldo Emerson and Henry David Thoreau idealized the human relationship with Nature. "The core of Transcendentalism was the belief that a correspondence or parallelism existed between the higher realm of spiritual truth and the lower one of material objects. For this reason, natural objects assumed importance because, if rightly seen, they reflected universal spiritual truths"
Transcendental writings encouraged a harmonious relationship with Nature in order to find the higher truths. Emerson "came to see the woods as a source of inner harmony and moral strength, a place suffused with divinity and beauty...To Emerson, who always valued the seeing eye over the shaping hand, nature was to be contemplated, not conquered" (Shi, 1985, p.130). Simplicity of living was a major element in achieving this harmony. A common goal of the Transcendentalists was "to develop modes of living that reduced their material and institutional needs to a minimum so that they could more easily pursue spiritual truths, moral ideals, and aesthetic impulses" (Shi, 1985, p.127). One focus of this discussion will be on the manner in which Thoreau's experience of the land helped shape an attitude about his personal environment.

Over a century later, this idea of Nature as a source of inspiration and knowledge is reiterated by James Lovelock. Trained as a chemist, Lovelock worked as a researcher for many years before attaining the job that would prompt his work on the Gaia hypothesis. He was asked by NASA to develop a method for determining if there was life on Mars. Probing the existence of life on Mars led to questions about the intrinsic quality of life and how that is represented on Earth. Eventually, Lovelock's thoughts and questions crystallized into the Gaia Hypothesis.

Although he approaches the topic from a more pragmatic basis than Thoreau, similar concepts of harmony and unity are present. Lovelock's Walden Pond is the Gaia Hypothesis, which he proposed in the 1970's and continues to develop today. Gaia - A New Look at Life on Earth, and The Ages of Gaia - A Biography of our Living Earth are two of his books that develop the Gaia hypothesis. This theory challenges us to look at established ideas in different combinations, recognizing connections and reincorporating forgotten ideals. The Gaia hypothesis considers the Earth and everything on the Earth as a single living entity. This entity, which he has termed Gaia, after the Greek Earth goddess, has the capacity to regulate and maintain an atmosphere which keeps it healthy (Lovelock, 1979, p.9). "The atmosphere, the
oceans, the climate, and the crust of the Earth are regulated at a state comfortable for life because of behavior of living organisms. Specifically, the Gaia hypothesis [says] that the temperature, oxidation state, acidity, and certain aspects of the rocks and waters are at any time kept constant, and that this homeostasis is maintained by active feedback processes operated automatically and unconsciously by the biota. Solar energy sustains comfortable conditions for life. The conditions are only constant in the short term and evolve in synchrony with the changing needs of the biota as it evolves. Life and its environment are so closely coupled that evolution concerns Gaia, not the organisms or the environment taken separately" (Lovelock, 1988, p.19). Accepting this as true allows humans to see the wonder of being a part of this system. As members of Gaia, we impact the entity of which we are a part. Understanding these connections can profoundly influence the way we view our relationship with our personal environment.

I decided to concentrate on three books by these influential authors. Thoreau's Walden, or Life in the Woods, and Lovelock's Gaia - A New Look at Life on Earth and The Ages of Gaia - A Biography of our Living Earth were chosen both because of their appeal to me and the consistency with which they were cited in the environmental literature I was reading. I later found that Walden and Lovelock's first book Gaia - A New Look at Life on Earth are among the most influential books in a survey of more than 200 environmental experts (Environmental Law Institute, Jan/Feb, 1993, p.9).

In addition to Lovelock's and Thoreau's work, I read other more general literature, trying to grasp the difference between these authors' ideas and the more pervasive view of life in the United States. I was intrigued by the fact that, over time, authors such as Lovelock and Thoreau have written about an alternative way of viewing life, and more specifically an alternative way to consider humans' relationship with the land. However, although authors have expressed this alternative for centuries, this viewpoint has never become the viewpoint to which most people subscribe. The literature offered some assistance in defining this more prevalent
world view, which asserts that there is a distinction between the concepts of nature and technology, and that this distinction results in seeing elements primarily as isolated objects rather than integral parts of a process.

The Separation Between Nature and Technology


Nature and technology constitute essential components of human identity. In some way every human being defines his or her social and cultural roles in relation to these components. The human environment plays a crucial role in the main doctrines of world religions. Islam identifies nature with signs of God, and similar ideas are found in most other major religions. A number of religious and philosophical schools of thought in the East Asian countries, such as the Chinese philosophy of Taoism, are characterized by a conscious and active relationship with nature. [However], modern secularism and exploitation of natural resources seem far removed from such attitudes.

Technology is also integrated into the lives of human beings; technologies of every conceivable kind are used everywhere by human beings in order to provide food, shelter, transportation, and all other basic material appurtenances of life. Technological change has become vital for modern economic development. (Baark and Svedin, 1988, p.1)

As technological advances have become commonplace in our lives, the distinction between these two concepts, Nature and Technology, has increased. Both Lovelock and Thoreau wrote about the changes in society which have influenced the ideas of the relationship between a human being and its environment. Lovelock points to the process of urbanization as an example.

As society becomes more urbanized, the proportion of information flow from the biosphere to the pool of knowledge which constitutes the wisdom of the city decreased, compared with the proportion entering the wisdom of rural or hunting communities. At the same time the complex interactions within the city produced new problems requiring attention. These were resolved and their solutions stored. Soon city wisdom became almost entirely centered on the problems of human relationships, in contrast to the wisdom of any natural tribal group,
where relationships with the rest of the animate and inanimate world are still given due place. (Lovelock, 1979, p.135)

Thoreau can also see the transition from a life within nature to a life apart from nature.

The very simplicity and nakedness of man's life in the primitive ages imply this advantage, at least, that they left him still but sojourner in nature. When he was refreshed with food and sleep he contemplated his journey again. He dwelt, as it were, in a tent in this world and was either threading the valleys, or crossing the plains or climbing the mountain-tops. But lo! men have become the tools of their tools. The man who independently plucked the fruits when he was hungry is become a farmer; and he who stood under a tree for shelter, a housekeeper. We now no longer camp as for a night, but have settled down on earth and forgotten heaven. (Thoreau, 1948, p.29)

Over time, one can see how the more prevalent attitude of our society has shifted toward a distinction between ourselves, including our byproducts, and the concept of the natural world. This distinction is due to a change in our social structure evidenced in part by our progressing reliance on technologies.

The so-called mass consumption society that emerged in North America following the Second World War created not only greater quantities of consumer goods but also a new 'social world.' Individuals have been encouraged to abandon long-established practices (such as thrift and the production at home of such things as food and clothing) and to adopt different ones: rapid turnover of possessions, waste, credit buying, constant attention to the stimulus of the market-place, denigration of 'home-made' items. (Leiss, 1990, p.109)

A heightened pace of life focuses attention on the products as isolated objects, and neglects placing these objects in the context of their immediate landscape or the larger environment. Marketing and advertising provide good examples of how products are marketed on the basis of their existence. This is an arena which has optimized the use of technologies, and has had great influence on the American mindset. One such example is automobile advertisements, which portray images of the car that primarily stress its appearance, its visual impact, as opposed to its function.
In the book, *Disappearing Through the Skylight - Culture and Technology in the Twentieth Century*, Hardison writes of how our attachment to technology and machines has shaped our attitudes and our actions.

If man creates machines, machines in turn shape their creators. As the automobile is universalized, it universalizes those who use it. Like the World Car he drives, modern man is becoming universal. No longer quite an individual, no longer quite the product of a unique geography and culture, he moves from one climate-controlled shopping mall to another, from one airport to the next, from one Holiday Inn to its successor three hundred miles down the road; but somehow his location never changes. He is cosmopolitan. The price he pays is that he no longer has a home in the traditional sense of the word. (Hardison, 1989, p.144)

This universalization changes the way we see things. We see objects as objects, not as pieces of something larger. Hardison points out that even as an individual moves, "his location never changes." In a society where objects are most often seen as isolated entities, there is no need for a Holiday Inn or a shopping mall to have a connection, physical or symbolic, to the changing particularities of the landscape. The location and context of objects has become irrelevant as we have lost the ability to see the unity between Nature and Technology.

Lovelock and Thoreau provide an alternative way to view our land, looking to the individual as the beginning of the process of understanding. By acknowledging our personal impacts, capabilities, and responsibilities, we are able to see ourselves as part of something larger. The individual is seen as a source of strength. This strength comes from a variety of sources; Lovelock and Thoreau stress experience and knowledge, elements which begin to intertwine. As we lead a life full of rich experiences, such as those expressed by Lovelock and Thoreau, we are better equipped to recognize connections between many different aspects of life. As these connections become more apparent, our experiences become more fulfilling. Knowledge of the world around us also helps us to see these connections and enrich our experiences. This alternative emphasizes the presence of relational concepts in our everyday
lives. It illustrates how viewing our landscape in terms of connections can lead to a quite different perspective of our place in the world.

**Lovelock, Thoreau, and Connections**

The two authors develop the idea of connections between a person and the landscape differently. Thoreau puts himself into the midst of it all, becoming a part of the natural processes. The connections effect him quite personally. On the other hand, Lovelock recognizes humans as a factor in these connections, but not the fulcrum around which those connections revolve. In this way, the connections are seen as bigger than us and therefore all the more important. In their different ways, both authors are effective in illustrating the importance of recognizing and understanding these interrelationships.

Thoreau uses his powers of observation and attention to detail to highlight relationships between elements of the natural world.

This is a delicious evening, when the whole body is one sense, and imbibes delight through every pore. I go and come with a strange liberty in Nature, a part of herself. As I walk along the stony shore of the pond in my shirt-sleeves, though it is cool as well as cloudy and windy, and I see nothing special to attract me, all the elements are unusually congenial to me. The bullfrogs trump to usher in the night, and the note of the whip-poor-will is borne on the rippling wind from over the water. Sympathy with the fluttering alder and poplar leaves almost takes away my breath; yet, like the lake, my serenity is rippled but not ruffled. These small waves raised by the evening wind are as remote from storm as the smooth reflecting surface. Though it is now dark, the wind still blows and roars in the wood, the waves still dash, and some creatures lull the rest with their notes. The repose is never complete. The wildest animals do not repose, but seek their prey now; the fox, the skunk, and rabbit, now roam the fields and woods without fear. They are Nature's watchmen, --links which connect the days of animated life. (Thoreau, 1948, p.106)

By seeing the details of nature, Thoreau immerses himself and becomes a part of nature. His immersion is also facilitated through his personification of nature, which he refers to in
glowing terms. This lessens the distinction between nature and himself, as he is part of something quite wonderful.

The indescribable innocence and beneficence of Nature--of sun and wind and rain, of summer and winter--such health, such cheer, they afford forever! and such sympathy have they ever with our race, that all Nature would be affected and the sun's brightness fade, and the winds would sigh humanely, and the clouds rain tears, and the woods shed their leaves and put on mourning in midsummer, if any man should ever for a just cause grieve. Shall I not have intelligence with the earth? Am I not partly leaves and vegetable mould myself? (Thoreau, 1948, p.113)

Having a personal relationship with nature, as Thoreau does, results in a harmony with nature which is fulfilling. Elements, whether dirt, or grass, or animals, are a source of wonder and when observed in connection with many other elements can gain a new importance.

There can be no very black melancholy to him who lives in the midst of nature and has his sense still. The gentle rain which waters my beans and keeps me in the house to-day is not dreary and melancholy, but good for me too. Though it prevents me hoeing them, it is of far more worth than my hoeing. If it should continue so long as to cause the seeds to rot in the ground and destroy the potatoes in the low lands, it would still be good for the grass on the uplands, and, being good for the grass, it would be good for me. (Thoreau, 1948, p.107)

True to the Transcendental outlook, Thoreau idealizes his relationship with Nature. He does not delve deeply into his impact on the natural processes. He concentrates instead on the benefits of a relationship with nature in which the distinction between man and nature is united.

Lovelock's thoughts about connections come from a different perspective. Human beings are not searching for a harmonious relationship with nature in order to gain a sense of personal fulfillment. Instead, the health of the entire system, Gaia, is paramount. The human role is to recognize the intricacies of these connections so that our decisions are based on a broader basis of knowledge. Lovelock asserts his point through an example of cybernetic systems.
The over-long delay in the understanding of cybernetics is perhaps another unhappy consequence of our inheritance of classical thought processes. In cybernetics, cause and effect no longer apply, it is impossible to tell which comes first, and indeed the question has no relevance. The Greek philosophers abhorred a circular argument as firmly as they believed that nature abhorred a vacuum. Their rejection of circular arguments, the key to understanding cybernetics, was as erroneous as their assumption that the universe was filled with the air we breathe.

Think again about our temperature controlled oven. Is it the supply of power that keeps it at the right temperature? Is it the thermostat, or the switch that the thermostat controls? Or is it the goal we established when we turned the dial to the required cooking temperature? Even with this very primitive control system, little or no insight into its mode of action or performance can come from analysis, by separating its component parts and considering each in turn, which is the essence of thinking logically in terms of cause and effect. The key to understanding cybernetic systems is that, like life itself, they are always more than the mere assembly of constituent parts. They can only be considered and understood as operating systems. A switched off or dismantled oven reveals no more of its potential performance than does a corpse of the person it once was. (Lovelock, 1979, p.52)

The analogy of an oven impresses the need for us to understand the land as a system, not as isolated parts. When we view elements of the world as separate entities, situations may appear satisfactory on the surface. As evidenced in the following passage, Lovelock explains that if we do not understand the connections with larger realms we can not see the whole picture.

Let us now examine contemporary pollution from a Gaian rather than a human angle. So far as industrial pollution is concerned, by far the most heavily affected places are the densely populated urban areas of the north temperate zones: Japan, parts of the USA, of Western Europe and of Soviet Russia. Many of us have had a chance to view these regions from the window of an aeroplane in flight. Provided that there is enough wind to disperse the smog so that the surface is visible, the usual sight is of a green carpet lightly speckled with grey. Industrial complexes stand out, together with the close packed housing of the workers, yet the general impression is that everywhere the natural vegetation is biding its time and waiting for some unguarded moment that will give it a chance to return and take over everything again. Some of us remember the rapid colonization by wild flowers of city areas cleared by bombing in the Second World War. Industrial regions seldom appear from above to
be the denatured deserts which the professional doomsters have led us to expect. If this is true of the most pollute and populous areas of our planet, it may seem that there is no urgent cause for concern about man's activities. Unfortunately this is not necessarily so; it is merely that we have been led to look for trouble in the wrong places. (Lovelock, 1979, p.111)

Lovelock asks us to question what we see, hear, and think we know, and look again at connections between one thing and another. It is this search for connections and relationships that begins to expose the different paths down which we can travel. For it is under this philosophy of connections between all living and non-living elements of the earth, that options become apparent, whereas an isolationist viewpoint encourages a straight path with one definite end.

Lovelock also uses the concept of time to show the continuity of these connections. This next passage places particular relevance on the idea that we are a part of something that has existed for so long.

But the excellence of our planet takes on a different significance in light of the evidence that geochemists themselves have gathered. Evidence that shows the Earth's crust, oceans, and air to be either directly the product of living things or else massively modified by their presence. Consider how the oxygen and nitrogen of the air comes directly from plants and microorganisms, and how the chalk and limestone rocks are the shells of living things once floating in the sea. Life has not adapted to an inert world determined by the dead hand of chemistry and physics. We live in a world that has been built by our ancestors, ancient and modern, and which is continuously maintained by all things alive today. (Lovelock, 1988, p.33)

Regardless of how one approaches this concept of connections, it is clear from the writing of Lovelock and Thoreau that a different relationship can be established with the land if a more holistic attitude is applied.

As I gained an understanding of the idea that there was a distinction between the manner in which Lovelock and Thoreau viewed our place in the landscape and the more isolationist view of the general society, I had difficulty trying to express what these two authors had already so
eloquently written. Each attempt was an experimental application of the ideas of relationships and connections, yet I never actually addressed the basic concept. After several unsuccessful drafts, I realized that I did not truly understand the concept I was attempting to apply.

Thankfully, I found a new source, William James. His philosophies, developed at the beginning of the twentieth century helped to clarify what I had been writing around for so long.

**William James and Pragmatism**

James proposes a philosophy in which the search is not about finding a beginning and an end but rather about understanding how the relationships unfold from any point. The broad term for this philosophy is 'pragmatism,' which purports that no truth is final because there are always other individuals who can offer a new perspective. Therefore, if there is not an absolute point of view in regard to observing the world, then each individual’s perception of the world contributes to its definition (McDermott, 1986, p.112). "The pragmatic approach is precisely the opposite of that characterized by ideology and claims of certitude. When the search for truth is experimental, probing, and open to surprises, novelty, and setback, the tendency is to take a wide view of the evidence" (McDermott, 1986, p.100). Pragmatism encompasses two main ideas, the first of which is a relational view of life. In *Pragmatism*, James writes:

> There can be no difference anywhere that doesn't make a difference elsewhere - no difference in abstract truth that doesn't express itself in a difference in concrete fact and in conduct consequent upon that fact, imposed on somebody, somehow, somewhere, somewhen. (James, 1975, p.30)

Realizing this presence of connections and influences upon our perceptions helps us to understand how our experiences are influenced by these relationships and especially those which disappear from view when we are only seeing things as isolated (McDermott, 1986, p.110). Our view is greatly expanded when we start to see the relational qualities among things.
James refers to this relational quality as a "stream of consciousness" in our mental life. "Movement, change, and occasional moorings are the richer stuff of life than the time-honored boxes in which so many of us, lamentably, spend so much of our lives" (McDermott, 1986, p.111). Looking at life as a process of dynamic interrelated parts helps to lead to richer experiences.

James also speaks of pluralism which is closely connected with relational thinking. Under a pluralistic viewpoint, there is no way to determine a solution as absolute and final. There are a multitude of opportunities for solutions because of the manner in which things are related. James explains this in his 1909 writing of *A Pluralistic Universe*:

> Everything you can think of, however vast or inclusive, has on the pluralistic view a genuinely 'external' environment of some sort or amount. Things are 'with' one another in many ways, but nothing includes everything, or dominates over everything. The word 'and' trails along after every sentence. Something always escapes. (James, 1977, p.145)

Although James is not specifically writing about people's relationship with their landscape, it is easy to see how relevant and appropriate his ideas are to this discussion. At this point, one might question what comprises nature? Is it forested land upon which man has had little influence? Is it the back yards of suburban America filled with non-native ornamental plants and plastic bird feeders? Or is it an industrial plant on the waterfront of a large city? According to James' ideas of relations, all of these environments are a part of nature, for if we accept the fact that people are a part of nature, then everything we do is a part of nature as well. In addition, the concept of relativism and the absence of absolutes implies that Lovelock's and Thoreau's concepts are the not the correct way to view our relationship with the world, but only one more perspective.

Although Thoreau wrote before the time of James, both Lovelock and Thoreau beautifully illustrate the concepts of James in their writings of our connection with the land.
Compared to the isolated view of life, their approach leads to a different set of premises about the land and our place within and on it.

Finally understanding what I wanted to write about, I was able to return to the analysis I had completed on *Walden* and the *Gaia* books. With distance and increased understanding, the analysis acquired new clarity. I was able to distinguish three concepts which best illustrated the ideas of connections between people and the manner in which they interact with the land.

The first of these concepts is *Beauty*. A initial response to the definition of beauty often entails one dimensional descriptions of surface qualities. While this superficial definition of beauty is certainly an aspect of Lovelock's and Thoreau's writing, they also employ descriptions of beauty which speak of connections. For them, elements attain a beauty in the manner in which they relate to other elements. Using this range of perceptions of beauty, from superficial to connective, can help people to establish an understanding of the way they are connected to the land.

Another range of perceptions deals with the aspects of physical matter and non-physical matter. A distinctive quality of our humanity is our capability for feelings and emotions, for thoughts which go beyond the tangible. *Spirituality* is one outlet through which we can integrate ideas that are not rooted in fact and science. Lovelock and Thoreau also acknowledge spirituality as a way of utilizing the emotional component of ourselves to gain a clearer vision of the connections in the land between the physical and the non-physical.

The third concept explores the role of *Human Knowledge and Experience* in the comprehension of this alternative, connective relationship with our earth. The possession of knowledge and the awareness of our experiences is also part of our special human characteristics. Through acknowledgment of this, the potential for questioning perceptions and encountering experiences with an open mind increases as does the potential of conceiving the interrelationships of life and our connection to them.
Beauty

Lovelock and Thoreau examine the beauty of the interconnections of elements as well as surface beauty. This broader definition, looking beyond the superficial meaning of beauty, helps to relate the individual to successively larger realms of understanding. Lovelock uses the concept of beauty as a way of acknowledging human nature and showing how an appreciation of beauty can influence emotions. He appeals to these emotions when he talks about the beauty of the countryside and the need to save that beauty.

So why should I fret over the destruction of a countryside that is, at most, only a few thousand years old and soon to vanish again? I do so because the English countryside was a great work of art; as much a sacrament as the cathedrals, music, and poetry. It has not all gone yet, and I ask, is there no one prepared to let it survive long enough to illustrate a gentle relationship between humans and the land, a living example of how one small group of humans, for a brief spell, did it right? (Lovelock, 1988, p. 232)

The England I knew as a child and a young man was breathtakingly beautiful, hedgerows and small copses were abundant, and small streams and rivers teemed with fish and fed the otters. It inspired generations of poets to make coherent the feelings we could not ourselves express. (Lovelock, 1988, p. 233)

Lovelock's descriptions of beauty also remind us of what we are missing by living in an urbanized and isolated setting with no opportunity to 'lay in a meadow' or 'look up into the deep blue black of sky clear enough to see the Milky Way' (Lovelock, 1988, p. 209-210).

Thoreau's writing is intriguing and pulls the reader in. It makes the reader want to be able to view the world through his eyes and see the beauty he sees. His descriptions of beauty are eloquent and show how much satisfaction he gains from observing nature.

But the ice itself is the object of most interest, though you must improve the earliest opportunity to study it. If you examine it closely the
morning after it freezes, you find that the greater part of the bubbles, which at first appeared to be within it, are against its under surface, and that more are continually rising from the bottom; while the ice is as yet comparatively solid and dark, that is, you see the water through it. These bubbles are from an eighth to an eighth of an inch in diameter, very clear and beautiful, and you see your face reflected in them through the ice. There may be thirty or forty of them to a square inch. There are also already within the ice narrow oblong perpendicular bubbles about half an inch long, sharp cones with the apex upward; or oftener, if the ice is quite fresh, minute spherical bubbles one directly above another, like a string of beads. (Thoreau, 1948, p. 206)

These descriptions help the reader to appreciate the natural world for what it visually presents at a superficial level, i.e., ice for ice's sake. The following passages speak about the connections between all things on earth and the beauty that emerges because of those connections. Thoreau often personified nature as a means of making those connections between man and nature.

A lake is the landscape's most beautiful and expressive feature. It is earth's eye; looking into which the beholder measures the depth of his own nature. The fluvialite trees next the shore are the slender eyelashes which fringe it, and the wooded hills and cliffs around are its overhanging brows. (Thoreau, 1948, p.156)

The ball of the human finger is but a drop congealed. The fingers and toes flow to their extent from the thawing mass of the body. Who knows what the human body would expand and flow out to under a more genial heaven? Is not the hand a spreading palm leaf with its lobes and veins? The ear may be regarded, fancifully, as a lichen, Umbilicaria, on the side of the head, with its lobe or drop. The lip-labium, from labor (?) - laps or lapses from the sides of the cavernous mouth. The nose is a manifest congealed drop or stalactite. The chin is a still larger drop, the confluent dripping of the face. The cheeks are a slide from the brows into the valley of the face, opposed and diffused by the cheek bones. Each rounded lobe of the vegetable leaf, too, is a thick and now loitering drop, larger or smaller; the lobes are the fingers of the leaf; and as many lobes as it has, in so many directions it tends to flow, and more heat or other genial influences would have caused it to flow yet farther.

Thus it seemed that this one hillside illustrated the principle of all the operations of Nature. The Maker of this earth but patented a leaf. (Thoreau, 1948, p.257)
Lovlock, too, speaks of the beauty of connections. To see the beauty of the individual as related to the beauty of the environment creates a strength between a person and their environment.

Another of our instincts which probably favours survival is that which associates fitness and due proportion with beauty in individuals. Our bodies are formed of cell cooperatives. Each nucleus-containing body cell is an association of less entities in symbiosis. If the product of all this cooperative effort, a human being, seems beautiful when correctly and expertly assembled, is it too much to suggest that we may recognize by the same instinct the beauty and fittingness of an environment created by an assembly of creatures, including man, and by other forms of life? (Lovlock, 1979, p.143)

When beauty can show the connection between a person and their environment, it also illustrates the way in which the distinction between man, nature, and technology blurs. A good example of this is Christo's *Running Fence* project. In 1976, Christo constructed an eighteen foot tall fence of white fabric which stretched for almost twenty four miles (Spies, 1977). Because of its immense size and impact on communities through which it traversed, the project encountered much community participation, both for and against. The complexity of the project makes unilateral classification difficult. It is not a static work of art due to its active presence on the landscape and the community. It can not be considered simply a social statement because of its acknowledged beauty. It is a project which wonderfully illustrates the results of thinking in terms of connections and relationships of people, nature, and technology. For it is the combination of all of these forces which comprise the entire conception and perception of the project. *Running Fence* can be compared to other linear structures of the twentieth century: railroads, high tension lines, highways.

Such structures are everywhere. They register on our consciousness and silently shape it. Christo's fence is, in effect, a name for this effect. Considered in relation to *Running Fence*, the dual lane highways of the American interstate system can be recognized as the most majestic linear sculptures created in human history, far surpassing in size, conception, and engineering the Great Wall of China. Seen from the air
they create grand reticulations, making the flat places of the earth look like huge Mondrian paintings. (Hardison, 1989, p.136)

In this example, the concept of beauty is broadened to include aspects of life which are normally taken for granted. Under the more prevalent isolated manner of thinking, a road is just a road. Yet when one is open to the relationships, both in how it is perceived by the public and conceived by the designer, the beauty becomes apparent in the way the road fits into the landscape, and how it effects the immediate environment around it. Projects such as Running Fence helps to open our eyes to this as does the art of Lovelock's and Thoreau's writing.

Spirituality

Thoreau uses a diversity of religious references in describing his spiritual experiences in Nature. He borrows from established religions (Thoreau, 1948, p.249, pp.72-74) and so called heathen rituals (Thoreau, 1948, pp.168-169) to make his point that there is little separation between the physical aspects of earth and the metaphysical aspects of our spirituality. Also contributing to the sense of unity between heaven and earth is his use of beauty and poetry.

Standing on the snow-covered plain, as if in a pasture amid the hills, I cut my way first through a foot of snow, and then a foot of ice, and open a window under my feet, where, kneeling to drink, I look down into the quiet parlor of the fishes, pervaded by a softened light as through a window of ground glass, with its bright sanded floor the same as in summer; there a perennial waveless serenity reigns as in the amber twilight sky, corresponding to the cool and even temperament of the inhabitants. Heaven is under our feet as well as over our heads. (Thoreau, 1948, pp.237-238)

Thoreau also projects spiritual qualities onto the plants and animals, characterizing the trees as shrines (Thoreau, 1948, pp.168-169), and the loons as gods (Thoreau, 1948, p.198). By viewing the environment around him as distinctive, it keeps him from taking his world for granted. It does not matter whether his outlook is based on spirituality or beauty or function, his
personal landscape attains spiritual meaning as his perceptions of beauty are able to make connections beyond the superficial aspects of its mere existence.

In a similar manner of thought, Lovelock believes that there can be no separation of the tangible facts of science and the intangible ideas of spirituality, the two are "a single way of thought" (Lovelock, 1988, p.212). Considering Gaia spiritually deals with making connections. Similar to Thoreau, acknowledgment of spiritual aspects in our lives is to begin to understand some of the connections beyond the self and to understand the interaction with other elements of Gaia, living and not living as spiritual experiences.

When I first saw Gaia in my mind I felt as an astronaut must have done as he stood on the Moon, gazing back at our home, the Earth. The feeling strengthens as theory and evidence come in to confirm the thought that the Earth may be a living organism. Thinking of the Earth as alive makes it seem, on happy days, in the right places, as if the whole planet were celebrating a sacred ceremony. Being on the Earth brings that same special feeling of comfort that attaches to the celebration of any religion when it is seemly and when one is fit to receive. It need not suspend the critical faculty, nor can it prevent one from singing the wrong hymn or the right one out of tune. (Lovelock, 1988, p.205)

Lovelock goes on to talk about the loss of old religions which worshipped the Earth as a living system (Lovelock, 1988, p.208). The progression of urbanization caused people to lose touch with Nature and in many cases this also meant losing touch with God or their spirituality.

In ancient times, belief in a living Earth and in a living cosmos was the same thing. Heaven and Earth were close and part of the same body. As time passed and awareness grew of the vast distances of space and time through such inventions as the telescope, the Universe was comprehended and the place of God receded until now it hides behind the Big Bang, claimed to have started it all. At the same time, as population increased so did the proportion forced to lead urban lives out of touch with Nature. In the past two centuries we have nearly all become city dwellers, and seem to have lost interest in the meaning of both God and Gaia. (Lovelock, 1988, pp.209-210)
Understanding the world as a living entity, though, begins to put these thoughts of heaven and earth, of scientific inventions and nature, back into perspective. Lovelock also discusses how a belief in Gaia does not necessarily conflict with established religions. He uses Christianity as an example.

The concept of Jahweh as remote, all-powerful, all-seeing is either frightening or unapproachable. Even the sense of presence of a more contemporary God, a still, small voice within, may not be enough for those who need to communicate with someone outside. Mary is close and can be talked to. She is believable and manageable. It could be that the importance of the Virgin Mary in faith is something of this kind, but there may be more to it. What if Mary is another name for Gaia? Then her capacity for virgin birth is no miracle or parthenogenetic aberration, it is a role of Gaia since life began. Immortals do not need to reproduce an image of themselves; it is enough to renew continuously the life that constitutes them. Any living organism a quarter as old as the Universe itself and still full of vigor is as near immortal as we ever need to know. She is of this Universe and, conceivably, a part of God. On Earth she is the source of life everlasting and is alive now; she gave birth to humankind and we are a part of her. (Lovelock, 1988, pp.206-207)

A person does not have to suspend one mode of belief for another. Looking at Gaia in this way also keeps the mind open to endless possibilities for questions. What else can Gaia be related to? It is the ongoing questioning, and learning about the self and about all that is beyond the self that helps to ground Gaia while at the same time, allowing it to be a source of spiritual fulfillment.

In Walden, Thoreau stresses that nothing should be taken for granted (Thoreau, 1948, pp.72-74). Acknowledging our personal landscape as worthy of distinction helps to create a sacred atmosphere and allows a person to have a spiritual relationship with those elements and connections to others beyond. It is through this series of connections that Thoreau describes how little difference exists between the spiritual and the physical. Lovelock agrees and states that everything is part of one system (Lovelock, 1988, pp.206-207). We are part of that system and our spiritual beliefs are part of that system.
In an analogy expressed by McDermott in his book, *Streams of Experience*, he illustrates the parallels and the interconnections between a physical life and a spiritual life.

We are floating, gestating organisms, transacting with our environment, eating all the while. The crucial ingredient in all uterine situations is the nutritional quality of the environment. If our immediate surroundings are foul, soiled, polluted harbors of disease and grime, ridden with alien organisms, then we falter and perish. The growth of the spirit is exactly analogous to the growth of the organism. It too must be fed and it must have the capacity to convert its experiences into a nutritious transaction. In short, the human organism has need of two livers. The one, traditional and omnipresent, transforms our blood among its 500 major functions and oversees the elimination from our body of ammonia, bacteria, and an assortment of debris, all of which would poison us. The second is more vague, having no physical analogue. But its function is similar and crucial. This second liver eats the sky and the earth, sorts out tones and colors, and provides a filter through which the experienced environment enters our consciousness. It is this spiritual liver which generates our feelings of queasiness, loneliness, surprise, and celebration. And it is this liver which monitors the tenuous relationship between expectations and anticipations on the one hand and realizations, disappointments, and failures on the other. We are not simply in the world so much as we are of and about the world. (McDermott, 1986, pp. 131-132)

**The Role of Human Experience and Knowledge**

In a world where elements are viewed as isolated, and nature is thought of as 'other,' the role of humans in the environment is thought to be as observer, manager, sometimes even sovereign. How does the role of humans change in a world view based on connections and relationships? The role becomes one of both observer and participant, an individual intimately involved in the processes of the world. In order to understand how we are involved, the circular linkage between experiences in the landscape and knowledge of the landscape becomes important and can be used to strengthen our understanding. Acquisition of knowledge influences our experiences, while at the same time, our experiences impact the level of our knowledge.
The widest and most profound obligation of human pedagogy is to teach ourselves and others how to make relations, that is, how to diagnose both the continuity and discontinuity in our experience, which [James] contends are 'cognitive of one another.' Experience, as such, is potentially pedagogical, if we but pay attention. Everything we perceive teems with relational leads, many of them narrow and therefore blocked from our experience by the narrowness and self-defining, circular character of our inherited conceptual schema. (McDermott, 1986, p.109)

Lovelock and Thoreau also stress the importance of experience and knowledge in one's personal relationship with their environment. Lovelock emphasizes the importance of knowledge. By pointing out what we do not know about the world around us, he shows how much we can know if we begin to look at the world in terms of connections. This knowledge helps us to realize our position in the scheme of things.

From a Gaian perspective, humankind does not hold a position of primacy. Human beings are not rulers of Gaia, nor did Gaia begin functioning as soon as people became established (Lovelock, 1979, p.127). Gaia does not begin and end with us, we are simply one link in the complex chain. However, even though the presence of human beings may not be vital to the smooth operation of Gaia, their impacts may be effecting the operation. In this sense, people are very important. Lovelock provides numerous examples of how technology, farming, urbanization, and population growth are areas in which we are affecting Gaia (Lovelock, 1979, p.128, 131, 138, Lovelock, 1988, p.210, 211).

The things we do to the planet are not offensive nor do they pose a geophysiological threat, unless we do them on a large enough scale. If there were only 500 million people on Earth, almost nothing that we are now doing to the environment would perturb Gaia. Unfortunately for our freedom of action, we are moving towards eight billion people with more than ten billion sheep and cattle, and six billion poultry. We use much of the productive soil to grow a very limited range of crop plants, and process far too much of this food inefficiently through cattle. Moreover, our capacity to modify the environment is greatly increased by the use of fertilizers, ecocidal chemicals, and earth moving and tree-cutting machinery. When all this is taken into account we are indeed in
danger of changing the Earth away from the comfortable state it was once in.

There is no way for us to survive without agriculture, but there seems to be a vast difference between good and bad farming. Bad farming is probably the greatest threat to Gaia's health. We use close to 75 percent of the fertile land of the temperate and tropical regions for agriculture. To my mind this is the largest and most irreversible geophysiological change that we have made. Could we use this land to feed us and yet sustain its climatic and chemical geophysiological roles? Could trees provide us with our needs and still serve to keep the tropics wet with rain? Could our crops serve to pump carbon dioxide as well as the natural ecosystems they replace? It should be possible, but not without a drastic change of heart and habits. I wonder if our great grandchildren will be vegetarian and if cattle will live only in zoos and in tame life parks. (Lovelock, 1988, p.178-179)

The realization of the impact we have emerges with the understanding of connections between ourselves and the world in which we live. For once we are able to comprehend the direction of the path which has been chosen, we are better able to make decisions about traveling any further down that path.

The 'we' to which Lovelock refers is used in a collective sense and remains impersonal. If 'we' does not get translated to a more personal 'I,' then it is difficult for change to occur. Lovelock realizes this and is able to switch from the impersonal 'we' to the personal.

Poverty and suffering are not sent: they are the consequences of what we do. Pain and death are normal and natural; we could not long survive without them. Science, it is true, assisted at the birth of technology. But when we drive our cars and listen to the radio bringing news of acid rain, we need to remind ourselves that we, personally, are the polluters. We, not some white coated devil figure, buy the cars, drive them, and foul the air. We are therefore accountable, personally, for the destruction of the trees by photochemical smog and acid rain. (Lovelock, 1988, p.211)

After we recognize ourselves as part of the 'we,' accepting personal accountability helps to relate the reader beyond the self to Gaia. Each individual has a role in defining the larger 'we' and it is at this level that the importance of the individual becomes apparent. If individuals can begin to
understand the connection between person, society, and Gaia, eventually 'we' will come to understand them as well.

Another way in which an individual can begin to understand connections is through life experiences. Knowledge and acceptance of the processes of nature can help to make those experiences more fulfilling.

The worst fate that we can imagine for them [future generations] is to become immortal through medical science--to be condemned to live on a geriatric planet, with the unending and overwhelming task of forever keeping it and themselves alive for our kind of life. Death and decay are certain, but they seem a small price to pay for the possession, even briefly, of life as an individual. (Lovelock, 1988, p.236)

Thoreau also stresses the importance of living life to the fullest, as well as regarding life experiences as learning tools.

I mean that they should not play life, or study it merely, while the community supports them at this expensive game, but earnestly live it from beginning to end. How could youths better learn to live than by at once trying the experiment of living. Methinks this would exercise their minds as much as mathematics. (Thoreau, 1948, p.41)

Indeed, it was the reason he moved to Walden.

I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived. I did not wish to live what was not life, living is so dear; nor did I wish to practice resignation, unless it was quite necessary. I wanted to live deep and suck out all the marrow of life, to live so sturdily and Spartan-like as to put to rout all that was not life... (Thoreau, 1948, p.72-74)

It is his understanding of using experience as knowledge that helps foster his relationship with the land. Thoreau's experiences at Walden immerse him in the processes of his environment. Through his lifestyle choice and openness of mind, Thoreau becomes intimately aware of how he fits into the larger scheme of his personal landscape.
Both Lovelock and Thoreau concentrate on the manner in which a person can understand how they are an integral part of their personal landscape. The authors achieve this through their discussions of connections. These connections deal with the relationships between all living and non-living elements of the world and how each has an influence or impact on other elements, resulting in a whole unit--Earth.

This is not the prevalent view of most people, however. The more pervasive view of our society stresses individual entities, isolating them from other entities. For example, when we look at a car, we see a car. Obviously, that is what it is. But seen from a different point of view such as Lovelock's and Thoreau's, a car could be the product of a process consisting of people and their ideas, raw materials, machinery, and so on. This finished product, the car, initiates another process; driving a car on the roads, using gasoline, and eventually abandoning the car in a junkyard where it is recycled or reincorporated by the Earth. This conception of the entity we call a car is quite different than a car which is simply an object we have named a "car."

The car is just one example of how the ideas of Lovelock and Thoreau can be applied to discover a different way of viewing our environment. Lovelock and Thoreau wrote of many concepts which help the reader understand the relevance of connections between themselves and the rest of the world. This paper compared three of them, Beauty, Spirituality, and Human Experience and Knowledge. The concepts were discussed separately, but can quite easily be interwoven. As our lives progress, we are continually learning and having new experiences. As mentioned before, knowledge influences our experiences, and our experiences impact our knowledge. In addition, our knowledge and experiences also change our perceptions of concepts such as Beauty and Spirituality. Internalizing a broader definition of beauty, based on connections, rather than merely superficial aspects, can influence our experiences and also provide an opportunity to perceive spiritual facets in situations which were once rooted in the
physical. This explanation becomes circular, as the concepts work in concordance to illustrate a more holistic way of viewing our relationship with the earth.

Conclusions

In clarifying my personal position, I was able to understand that there is a distinctly different view of the world, ones that is based on the connections and relationships between all living and non-living entities. These entities are not isolated but, rather, are defined as participants in dynamic processes which influence our experiences as well as being shaped by a combination of our thoughts, perceptions, and experiences. It has also become clearer that this view of life is not in concordance with the more isolationist pervasive view of mass society in the United States.

This discord establishes a possible communication gap between professors and students in landscape architecture programs, between practicing landscape architects and clients, and how the basic school of thought, or pedagogy, of landscape architecture is presented to the general public.

Having recently graduated from the landscape architecture discipline, most of my experience and knowledge is confined in that sphere. Becoming aware of this dichotomy of ideas has helped me to understand many things about myself and where I hope to lead my life. The writings of Lovelock and Thoreau, as well as the philosophy of James, helped me to understand my personal position. In my landscape architecture education, I found that a holistic viewpoint such as this based on the relational character of elements was insinuated but not necessarily articulated as a distinct philosophy of the discipline. Having more clearly articulated this, I am able to return to previous projects and reevaluate them based on these principles. In addition, I now possess a foundation from which to design, a foundation open to surprises and rich with questions and experimentation. For this is what pluralism and the ideas of connections
allow the designer to accomplish. Especially in the formal education of landscape architecture, where students are engrossed in learning new skills, the ability to experiment and not worry about a final answer can be quite liberating. In order to accentuate this, the discipline could emphasize a way of thinking as yet another of the many skills which are taught. Lovelock and Thoreau write about viewing the world as a series of connections and relationships, and I have used James’ philosophy of pragmatism to apply these ideas in my own life. However, viewing the landscape in this holistic sense can be understood with any number of approaches, be they moral or otherwise. I chose the pragmatic approach of James’ because I felt this was the manner in which I would learn the most. The purpose of learning can be thought of as to explore as many perspectives as possible; pragmatic epistemology and the ideas of Lovelock and Thoreau are wonderful vehicles with which to help this occur. Acknowledging the difference between a general viewpoint of landscape architecture and the more prevalent viewpoint of isolationism in the United States can help students understand their personal position when they leave academia.

In the professional realm, recognizing the differences in viewpoints can help the landscape architect be aware that she is not always speaking the same "language" as her client. Without any professional experience, it is difficult for me to explore such a communication gap except in the form of questions. People often ask, "What does a landscape architect do?" There is no simple answer to that because the profession encompasses a large range of skills and interests, from site-specific residential design to large scale land management. A different question might be posed, "What are landscape architects about?" This may be an easier question to answer in a personal sense, yet the profession and even the more general pedagogy has a difficult time defining the profession. Perhaps it is because such a large range of work is covered, but it may also be because of the fact that this idea of relationships and connection voiced by Lovelock and Thoreau, among others, has not been clearly articulated in the pedagogy as one of the guiding principles. The profession may be reluctant to define itself thinking
something will be left out, yet if the pedagogy of James, along with Lovelock's and Thoreau's ideas are articulated, guidelines can be established, without resulting in confining boundaries.

I have been stressing the idea that the world and its landscape abound with connections; interrelationships between minerals, plants, and animals of which we are an integral part. However, it is also important to stress that in understanding the connections between elements, one does not bypass acknowledgment of those elements. The philosophies of James, Lovelock, and Thoreau use pragmatism and relational thinking to promote a richer awareness of those elements. For example, in *Gaia - A New Look at Life on Earth*, Lovelock discusses the importance of obtaining knowledge regarding the interacting components of the ocean environment in order to understand the ocean itself better.

Gathering information about the sea, its chemistry, and biology and their interacting mechanisms, should come right at the top of mankind's list of priorities. The more we know, the better we shall understand how far we can safely go in availing ourselves of the sea's resources, and the consequences of abusing our present powers as a dominant species and recklessly plundering or exploiting its most fruitful regions. Less than a third of the Earth's surface is land. This may be why the biosphere has been able to contend with the radical transformation wrought by agriculture and animal husbandry, and will probably continue to strike a balance as our numbers grow and farming becomes ever more intensive. We should not, however, assume that the sea, and especially the arable regions of the continental shelves, can be farmed with the same impunity. Indeed, no one knows what risks are run when we disturb this key area of the biosphere. That is why I believe that our best and most rewarding course is to sail with Gaia in view, to remind us throughout the voyage and in all our explorations that the sea is a vital part of her. (Lovelock, 1979, pp.105-106)

This introduces us to the relativism of values, because not everyone may feel this example of Lovelock's to pose a problem. I stated at the beginning of this thesis that there are no absolutes, that James distrusts absolute answers for their potential to restrict perspectives. However, each individual has a personal position which is based partially on their beliefs of right and wrong. How can our personal values, which are absolutes in our own mind, be reconciled
with a relativistic thesis? This thesis can not tell a reader what is right or wrong, because all perspectives possess equal validity. However, in terms of values, this thesis is meant to help a person clarify their own values, using the ideas expressed by Lovelock, Thoreau, and James. Understanding the landscape in terms of relational qualities can lead to any number of conclusions but can not generate a universal answer, unless you are looking for the conclusion that "there is no answer."

Hopefully, one should come away from this thesis with a list of questions. There is no way to begin and end this discussion in one paper. As I edited and re-edited this paper, I found myself embarking on tangents, avenues I could have taken, but simply did not have time for. The preceding thoughts on values is one such idea which warrants further exploration.

Another of these ideas is the concept of time. How can we explore the concept of time? We can take the ideas forward or backward in time, studying the evolution of the application of these ideas in the design world, both built projects, and the ones still developing in our minds and on our drawing boards. We can also explore time in a more finite sense as James does, viewing our time on Earth as the time about which to speculate. "If we are finite, if our experiences are finite, and if there is no higher meaning which transforms these experiences into something other than the way in which we undergo them, then the affairs of time, our things and events, are to be taken at face value. The flow of time is the only setting for judging the worth of human life and human activity" (McDermott, 1986, p.114). Or we can use the continuum of time as Lovelock does to reiterate our place in the world. "Just as the shell is part of a snail, so the rocks, the air, and the oceans are part of Gaia. Gaia...has continuity with the past back to the origins of life, and extends into the future as long as life persists" (Lovelock, 1988, p.19). How does one close the circle of connections and relationships in the time-frame with which we are allotted?
As I venture into the professional realm of landscape architecture, I will undoubtedly discover how our world of landscape architecture meshes with the rest of the world. This paper concentrated mainly on concepts dealing with perception. But how do the thoughts of Lovelock, Thoreau, and James translate into action? How are these thoughts manifested in the design profession? It will be interesting to explore how the conditions change from thought to perception, and how the communication gap between designer and client is reconciled, if compromises are made, and if boundaries can be stretched or broken.

Lastly, how well do the three realms of landscape architecture, the discipline, the profession, and the pedagogy, internally apply the ideas of Lovelock and Thoreau? Are they linked closely enough to be considered a process, or are each of the three isolated entities unto themselves? An interesting question to consider.
REFERENCES


