

# Animism through Demarcation: Using the Logic of an Eastern Precedent to Reveal Meaning

SUSAN ISABELLE FROSTÉN  
Philadelphia University

## INTRODUCTION

Through an understanding of the importance of ecology in the ancient Indian building practice of Vastusastra, the observation and marking of physical phenomena becomes a link to a symbolic expression of the cosmos and the individual's place within it. The Vedic<sup>1</sup> philosophy is outlined in the four volume, sacred texts, the *Vedas*, with the *Upanisads* as the conclusions. The four *Upanisads* are as follows: the law of nature creates an innate order and harmony in the universe; everything that exists is animated; all existence is interconnected; the essence of everything is part of the principle Unity.<sup>2</sup> According to Vedic philosophy, a building should satisfy both the physical and the intellectual needs of the individual.<sup>3</sup> In doing so, a building begins to embody a layering of meanings. The elements of the building relate not only to the existing sensed reality, but also symbolize an essential Form, or understanding of another metaphysical realm.<sup>4</sup> In this way, the physical has an inherent link to the spiritual.

## INTERWEAVING OF THE ECOLOGICAL AND SPIRITUAL

The term Vastusastra refers to the science of architecture. Vastusastra goes beyond being a treatise on aesthetics, but is rather an explication of the nature of the universe and the individual's place relative to it. The interrelationship of all organisms and their environments as a primary concern makes Vastusastra a precursor to the science of ecology. The term vastu is defined as "dwelling site" or anywhere that immortals and mortals live.<sup>5</sup> Vastu is categorized as the Earth (or the original dwelling from which the following three are derived), buildings, vehicles and furniture.<sup>6</sup> Obviously, the Earth is of primary importance due to her creative and supportive functions to all else.<sup>7</sup> Being dependent on the Vedic belief that

everything is interconnected and interdependent, Vastusastra necessitates a holistic view involving nature, people and time.<sup>8</sup> Therefore, for internal and external harmony, it is important to maintain the order that is inherent in the universe. Essentially, the external energies are inherently in balance, while the internal energies of a constructed space and individual are not necessarily so. Also fundamental to the Vedic beliefs is that all things that exist possess a sense of animism. As postulated in a theory of atomic structure of matter in the Ancient Indian text, *Nyaya-Vaisesika*, all the energy of the universe, including human beings, is composed of five elements of space: ether, air, fire, water, and earth.<sup>9</sup> To achieve a balance, Vastusastra engages the orientation of physical space to optimize the benefits of these elements along with the magnetic fields surrounding the earth.<sup>10</sup> In respecting these elements, one honors nature and oneself.<sup>11</sup> In many respects, there is not a sense of differentiation between the two.

The atomic theory suggested that the elements were the manifestation of different combinations of paramanus (a sub particle of an anu or atom) with varying characteristics, except for ether, whose structure was not considered to be atomic.<sup>12</sup> These paramanus were thought to vibrate in the dimension of time (Kala), thus producing an invisible energy that emitted light. This energy could either be engaged positively or negatively. This invisible energy is simultaneously composed of prakriti (the transcendent order of nature) and purusha (the cosmic person). While prakriti, consisting of the five elements, is the creative energy that forms all the material attributes that can be seen, purusha is the unseen spirit or animating principle. The purusha is both the measure and the measured. Although distinct, they are inseparable. The ultimate intent is to liberate the purusha from the prakriti. Allegorically, the vastupurusha becomes a visual illumination of this concept. Spatial and temporal, the vastupurusha mandala is symbolic of the science, the myth, the parameters for the design of a house.

and the context. These guidelines utilize a means of measure, order and proportions based on ecology and the body. All this points to the duality of meaning that results from the layering of context within the self and the cosmos.

#### MEASURE AS A MEANS OF CREATION

Through the concept of measure, humans are able to create a sense of order from the vastness of their world. This also provides an opportunity to create meaning. In Sanskrit, *ma* means to measure, to give existence to a thing, to actualize it, to give it reality within our world, as well as display relationship.<sup>13</sup> This stresses the experiential relationship of humans to their environment. "In the beginning the principal Unity divides itself to give existence to divided things, and this fragmentation of the One is a measuring out of the universe."<sup>14</sup> Thus, this very act of measurement differentiates and separates the elements of the world in a process of creation. The first act of measurement that occurred at "the boundary between time and the timeless, wrested the elements of our world from the continuum of chaos."<sup>15</sup> In this way, the ritual of demarcation is a re-enactment of the genesis of the world. Echoes of this as a built proposition occur in the following statement of the twentieth century European philosopher, Martin Heidegger:

The location is not already there before the bridge is. Before the bridge stands, there are of course many spots along the stream that can be occupied by something. One of them proves to be a location, and does so because of the bridge. The bridge is a thing; it gathers the fourfold, but in such a way that it allows a site for the fourfold.<sup>16</sup>

For Heidegger, location is created by the existence of an artifact. In this instance, the fourfold is the earth, sky, divinities and mortals. This reveals the importance of the physical and the metaphysical co-existing within the built. Further adding to this, Heidegger states, "Measure-taking is no science. Measure-taking gauges the between, which brings the two, heaven and earth, to one another.<sup>17</sup> This also resonates of the concept of the axis mundi, which in Vedic philosophy connects the individual to the cosmos. Correspondingly Heidegger states, "... spaces receive their being from locations and not from 'space.'<sup>18</sup> This suggests that the physical and spiritual character of a space derives its true essence from the nature of the site. The concept of measure or marking is instrumental in this disclosure.

#### DEMARCATING THE SITE AS A PROCESS OF MIMESIS OF THE COSMOS

The space was laid out by the measuring rod of Varuna. This measuring rod was the sun; and hence the measurers were the solar deities.<sup>19</sup>

Similar to various other indigenously based cultures, this idea of measure is encapsulated in the Vedic tradition. The role of the system of measurement is to achieve harmony between the absolute and the quantifiable.<sup>20</sup> Essentially, within the boundless cosmos, it is the marking of the site before building using the sun that sets the limits of a boundary of a place. The inscribing of the sun's impact diurnally and annually on the site was an essential ritual. In doing so, this location was set apart from all others. This rite of demarcating the building begins the mimesis of the creation of the cosmos out of chaos.<sup>21</sup> In this way, the sun becomes the architect of space.<sup>22</sup> This ritual also speaks of the marking of both space and time through the axes of the cardinal directions. The actual process determines the sun orientation and cardinal points using the cast shadows of a gnomon-pillar sitting in the center of a circle, which is to be considered the center of the building.<sup>23</sup> This also locates the sun as the center of the building. As the starting point of reference, bindu, for all constructs, this is also the beginning of the world scientifically and spiritually. The point, bindu, is representative of the point from which the universe emerged and to which it will eventually recede.

#### RESPONSE TO PHYSICAL PHENOMENA

These demarcation techniques directly involve the use of the senses in order to determine a physical phenomena that had a great impact on their lives, as well as our own. There was a realization of the importance of solar income to their subsistence and lifestyle. However, to be considered successful, all well conceived buildings in the Vedic culture had a multitude of meanings with the first being an understanding of physically perceived conditions. The understanding of ecology was intertwined with a mythopoetic meaning and an environmental response in terms of building. For example, the scientific knowledge of seven visible colors of the light spectrum is illuminated in the myth of the sun god travelling in a chariot pulled by seven deities across the sky from east to west. While the morning rays were seen as positive being ultra-violet, oxygenic, hydrogenic, and purifying, afternoon rays were seen as negative being infrared and thermally intense.<sup>24</sup> This influences the determination of the directionality of the vastu purusha mandala and thereby the layout of the house. The southwest corner denotes the element of earth. Thus, the southwest corner should have a thicker wall to protect against the intense heat.<sup>25</sup> Meteorological conditions were also considered in the mandala. The prevailing strong winds relating to monsoons and rains flowed from the southwest to the northeast as emphasized by the direction of the purusha. Thus, the sloping of the site was specified to offset the storms.<sup>26</sup>

Additional meanings were found in the transcendental.<sup>27</sup> A building often had numerous expressions. However, it is important that the symbolism was not added to the form, but rather was integral with the form.<sup>28</sup> In addition to signifying the

ideal Sun as well as the perceived physical sun, the axis of the Buddhist stupa also symbolized the world tree, Mount Meru, the *axis mundi*, and the vessel of the Buddha's enlightened state. It is significant that the meanings extend from the internal being of the individual to the vastness of the infinite, thus existing simultaneously both on the microcosmic and macrocosmic scales.

## CONTEMPORARY ISSUES

Although contemporary science has expanded exponentially on many of the notions intuited in this Vedic culture, the development of metaphysical meaning in the present world has been differentiated from scientific progress. In the traditional Indian culture, scientific notions were developed in harmony with spiritual beliefs. The importance of the Indian example is that the symbolism and meaning were not applied, but rather intrinsic to the nature of the forms. These forms can not in and of themselves automatically create meaning within the contemporary world. However, the logic begins to suggest a method to develop meaning in the present. The guidelines of *Vastusastra* cover the following topics: site selection, where and when to commence excavation, location and extent of open spaces, location of the well, laying of foundation stone, orientation of entrance door, number and placement of windows, direction and location of stairs, position of Puja room, placement of kitchen, locations of rooms, position of grain store and safe, bathrooms, and types of vegetation surrounding the house.<sup>29</sup> However, this technique was developed specifically for a particular climate, topography, lifestyle and culture. It should not become a checklist, but rather it can suggest a logic for design.

In many ways, the issues in this Vedic course of thought are similar to the goals of architects concerned with ecology. Contemporary environmentally sustainable goals often incorporate the following: the local context (including the climate, the topography, the local ecosystem, building precedents and culture), the effect on the local ecosystems (including human, animal and plant neighbors, the earth, water sources, and air quality), determination of land use, energy, transportation, energy efficiency (including use of local sources and current income), life-cycle implications of materials, minimal waste discharge, and the integration of ecologically sensitive systems. However, the next layer of meaning, the animism of the form, is not necessarily suggested by these objectives. These stated aims relate to an understanding of ecology and technical expertise. However, as the Ancient Indian precedent suggests, the poetics of the building are to be found in the structure's animism through a metaphysical or intellectual construct inherent in the process of making. The methodology should look to create meaning not just by understanding the land's constituent components, but also by trying to derive the essence of the site. This should involve an in depth analysis of the site, but it also

needs to go beyond it. A beginning to this process would entail a marking of the site by the natural elements.

## ECOLOGY AS A GENERATOR OF FORM: CONTEMPORARY EXAMPLES

William McDonough and Partners have explored in several projects using the surrounding nature as a generator of form. A design proposal for a 150,000 square foot complex hotel and conference complex in Calvission, France went through several renditions in the office, with the first being a rather stylistically contextual response. Further investigations turned away from the traditional building context as a generator of form, and turned to the micro- and macro-environment to create the form. Local building materials were still suggested, but used in a different manner. Instead of trying to make this project stylistically contextual, the driving concept was to make this complex as imperceptible as possible. The final version shows the complex engaging the terrain, rather than sitting upon it. (Figure 1) The center echoes the surrounding landscape in form and function rather than the built environment by burying it in the earth and using a grass roof. This was achieved by taking advantage of the change in grade, so that the buildings sit low to the ground. Local stone would be used for the walls. Some walls would act as retaining walls, holding back the earth and helping to bury the building. Aside from camouflaging the building, the grass roof is used to purify the air, deal with water drainage, and act as insulation. In addition to the relating to the curves of the land, the roofs become gently curved because of the functioning of the grass roof. Form is derived from the functioning of the product, which looks to nature.

William McDonough and Partners has actualized the use of the natural environment to engender form in the GAP Corporate Campus in California (Figure 2). The site was the last remaining example of the oak savanna ecosystem that had once been prevalent in the developed area.<sup>30</sup> In order to preserve this ecosystem, the green layer is raised in the air by use of a grass roof system. The form of the building derives metaphorically from the grasslands of the California coastal foothills. The roof becomes a rolling terrain planted with local sedum. The gentle

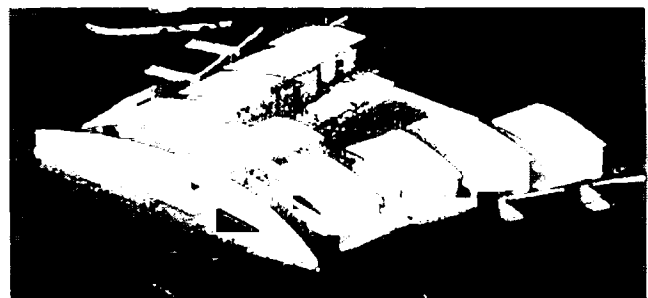


Fig. 1. Study model of hotel/conference center in Calvission, France by William McDonough and Partners.



Fig. 2. William McDonough and Partners, GAP Corporate Campus in California, early site model. (Courtesy of William McDonough and Partners.)



Fig. 3. William McDonough and Partners, GAP Corporate Campus in California. (Courtesy of William McDonough and Partners.)

curves of the roof reflect the logic of nature in dealing with the natural elements (Figure 3). The positive attributes include purification of the air by the vegetation, reduction of excess water runoff, insulation for both heating and cooling, protection from the northern wind and camouflaging of the building with the landscape. The building responds to its region not by looking to the built environment, but by reflecting on the local ecology. The existing oak grove is being extended beyond its present location to cover the majority of the site.

Inspiration for the design of Herman Miller's Midwest Distribution Center is intimately linked with the layered landscape of the region. This project is an ecological study in developing a balance between the needs of the program, the individuals and the site. The design strategy focuses on the building as part of the existing ecosystem. William McDonough and Partners recognize the processes of nature in the demarcation of the building. They allow these systems to give form to the building. In examining the local conditions, the architects discovered a series of horizontal and vertical layers.<sup>11</sup> Horizontally, the layers are additive and move from existing homes to new hedgerows

and woods, to fields and landforms, to the building and parking. Vertically, the layers progress from the river to the wetlands, and from low lying land to uplands where the facility is placed. (Figure 4) The approach to the building is through these series of layers of landforms. (Figure 5) A reforestation program, man-made swales and indigenous plantings all help to maintain the existing natural habitat and wildlife, as well as provide shelter from storms, drain storm water and lower maintenance costs. Not only is the building linked to the landscape, but the landscape also infiltrates the building.

The building's facade is composed of layers as well. These layers are vertical concentric planes that follow the natural

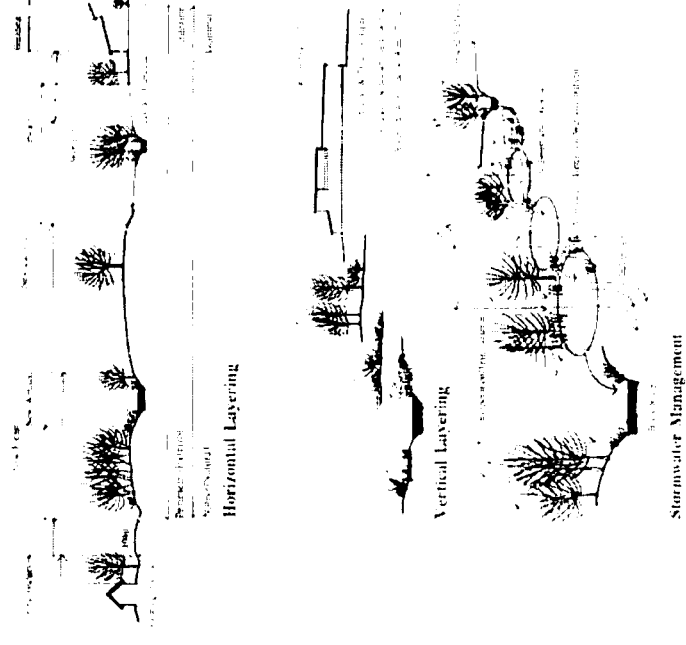


Fig. 4. Diagram of layering of site conditions from The Phoenix Designs Project.

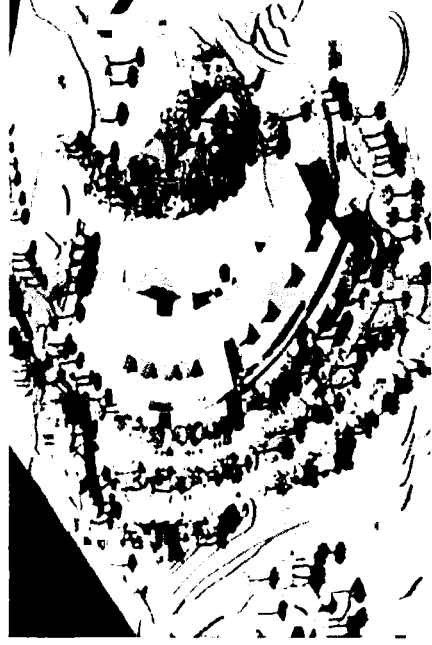


Fig. 5. Concept model of Herman Miller Facility from The Phoenix Designs Project.

ridge of the site. The first layer is that of the lower office block. The second is the glass atrium over the street, which is followed by the factory space beyond. All interior areas receive natural light and ventilation. The linear form cuts down on its perceived bulk and allows for needed surface area for truck docks. The organization allows for a separation of functions, but does not isolate them from one another. Cross-disciplinary collaboration is encouraged through casual and formal interaction between production, sales and management. The intent is to maximize social interaction between the inhabitants of the site, including humans, wildlife and vegetation.

Through a careful process of demarcation of existing ecological conditions, the landscape and the building are linked physically, visually and environmentally. The project acknowledges the complex interconnected nature of the world. It begins with an understanding of the site conditions and then expands on their ability to create form. The Herman Miller project responds to a multitude of ecological, functional and social conditions. Although the ecological conditions exist on both the micro- and macro-scale, the use of nature as a form giver primarily occurs out of micro-conditions without additional cultural signifiers.

#### PHENOMENOLOGY AND MAKING: THEIR IMPLICATION TO ECOLOGY AS A GENERATOR OF FORM

*"Making is, in Greek, poiesis."*<sup>32</sup> – Heidegger

Ecology has the potential for not only generating form, but creating identifiable layers of meaning that can translate between cultures as well. In that environmental elements are common throughout the world and time, human relationships' to them is often similar as well. Vastusastra suggests a process of measuring out the elements that has concurrent meanings. The intent is to create through a process of measuring the elements, symbolic meaning that can be universally understood. This can initiate a starting point for second year undergraduate students in designing a physical, functional link to something more ethereal.

In an attempt to direct the students towards developing their own connection with nature as a phenomenological discourse in demarcating macro-scale conditions of the environment, they are asked to create a measuring device for either sun, wind or rain. (Figures 6-8) In this project, the micro- and macro-conditions are initially separated so that the students are primarily engaging the macro-conditions of the environment as a starting point. The precise site is interchangeable, but the cardinal axes are fixed. The program of the measuring device allows for a focus on the intended goal: to animate a project with meaning through the demarcation of an element. The device suggests a relationship between the observer and the world.

The issues of marking using these elements, the application of the senses, and materiality are all essential in the students' interaction with the environment. Through the process, the students find meaning through a perceptual and analytical gathering of an element. The initial starting point is the task of defining measure. Next, the device needs to provide the means to quantify according to the definition. By asking the students to define measure as well as a way to measure, they have the opportunity to transcend the idea of quantifying physical phenomena. The intent is to allow for both denotative and connotative meaning to co-exist. The device creates a relationship between the observer and the observed, thus describing an attitude towards the natural environment. The goal is that in measuring the physical, a meaning that reveals characteristics of the element will lead to an animation of the element, the materials and the device.

The measuring device begins to address the issue of determining significance that becomes intrinsic to the piece through the marking of one of the elements, the application of appropriate materials, and the use of the senses. Occurring out of observation, this device measures one of the elements. The intent is that it is a device, not representational of one. It is required that it actually functions. In this process, it was essential that the students work with the project development at full scale.<sup>33</sup> The construction becomes a small design/build project. From day one, the task involves the building of a construct from a variety of materials and connectors. The

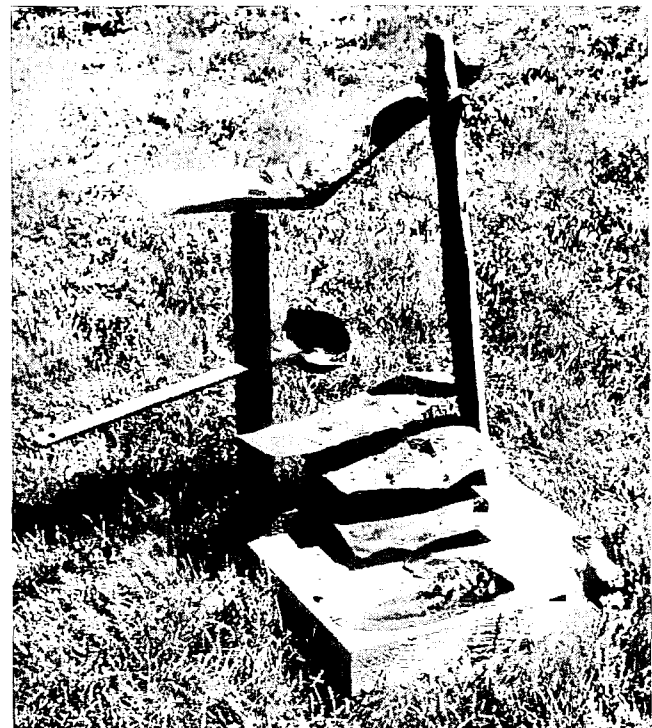


Fig. 6. Measuring Device for Rain. The "ether" is marked through the various tones played simultaneously as the differently tuned metal planes are struck by rain.

physical properties of the material and the inherent logic of its use are integral its construction. They are required to study how the materials touch through the use of connections and connectors. The students come to realize that all choices have a several layers of meaning: function and relationship to concept. The second stage to this project uses the device in a process of the transformation to design a building.<sup>34</sup> In this stage, the students must engage the issues of the microenvironment along with the macro-environment. The intent is to transform the essence of the idea concerning the measurement of an element into a building to display or experience the elements. The tectonic language used in the device can also provide inspiration for form making.

### CONCLUSION

In providing an inspiration for an ecological design methodology, the Vedic concept of demarcation can establish a mechanism in the contemporary world to reconnect with the micro- and macro-environmental world. Integrally based on the knowledge of the interrelationship between all organisms and the environment, *Vastusastra* is based on a sophisticated system of parameters that concurrently relate to ecology and a cultural spiritualism. By inscribing physical phenomena and revealing

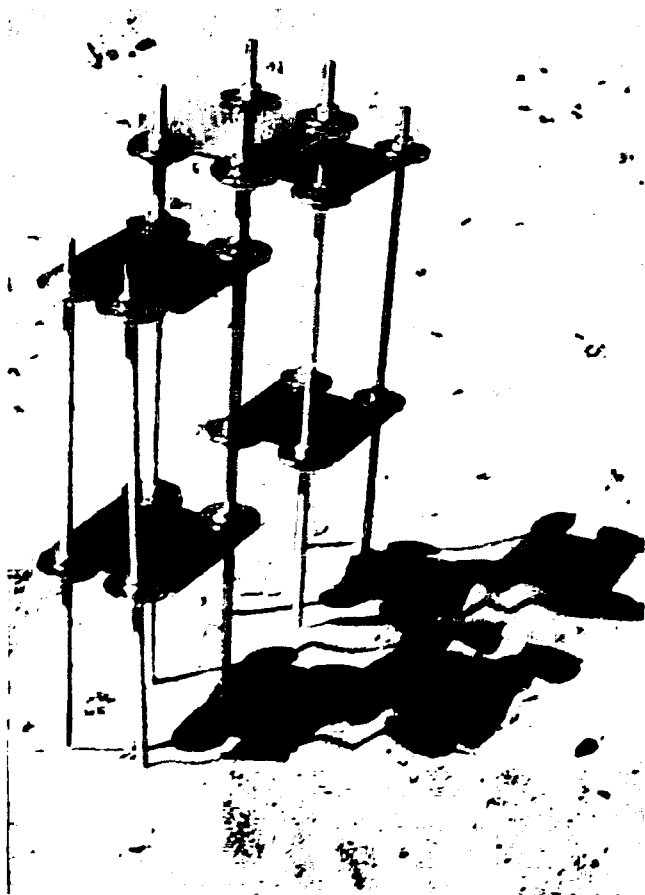


Fig. 7. Measuring Device for Sun. The ground is marked through the use of color, shadows, and the changing overlap of shadows.



Fig. 8. Measuring Device for Wind. The intensity and direction of the wind is measured through movement creating a "dance." The device changes character from static to fully engaged.

animated materialization, an integrated process of form making can be found. The meaning does not become an applied notion, but is intrinsic to the method of making and the resultant form. The process of making becomes the process of signifying. Through a method of demarcation using the sun and other environmental elements, as well as a simultaneous expression of metaphysical symbolism, a built form can possess a sense of animism. In this way, the observance and marking of physical phenomena can have an inherent link to the transcendental. Ecology becomes a generator of form. The additional aspect of being involved phenomenologically with the actual construction of the form lends a greater sense of involvement and communication between the individual and the environment. This resonance can transcend varying cultural identifiers, and create a poetic meaning that can be understood universally.

### NOTES

<sup>1</sup> The Vedic period in Indian history is categorized as approximately 3000 BC to 1000 BC.

<sup>2</sup> Kathleen Cox, *Vastu Living* (New York: Marlowe & Company, 2000), pp. 17-18. In Sanskrit, Veda means knowledge.

- <sup>3</sup> Adrian Snodgrass, *The Symbolism of the Stupa* (Delhi: Motilal Banarsidass Publishers, 1992), p. 1.
- <sup>4</sup> *Ibid.*, pp. 1-2.
- <sup>5</sup> Bruno Dagens, editor and translator, *Mayamatam: Treatise of Housing, Architecture and Iconography, Volume I* (New Delhi: Indira Gandhi Centre for the Arts, 2000), p.7.
- <sup>6</sup> *Ibid.*
- <sup>7</sup> *Ibid.*, p. 9.
- <sup>8</sup> Jin Purush Ashok Padam, *Vāstu: Reinventing the Architecture of Fulfillment* (Dehradun: Management Publishing Co., 1998), pp. xiii-xiv, and 57.
- <sup>9</sup> Anita Mookerjee and Madhu Khanna, *The Tantric Way: Art Science Ritual* (London: Thames and Hudson Ltd., 1977), p. 107. It is important to note that this theory was deduced through intuition and not guided by experimental knowledge. Each of the elements also had a direct relationship to one of the senses: earth to smell, fire to vision, air to touch, water to taste, and ether to sound. The stupa, especially as exemplified in the Buddhist precedent, also incorporates the five elements that comprise the cosmos. Each element relates to a figure and furthers the notion of representing the cosmos.
- <sup>10</sup> Kathleen Cox, *Vastu Living*, p. 3, and Padam, *Vāstu: Reinventing the Architecture of Fulfillment*, p. xiv.
- <sup>11</sup> Cox, *Vastu Living*, p. 33.
- <sup>12</sup> Mookerjee and Khanna, *The Tantric Way*, pp. 98-99, 107, 109.
- <sup>13</sup> Snodgrass, *The Symbolism of the Stupa*, p. 29.
- <sup>14</sup> *Ibid.*
- <sup>15</sup> Padam, *Vāstu: Reinventing the Architecture of Fulfillment*, p. 99.
- <sup>16</sup> Martin Heidegger, *Poetry, Language, Thought* (New York: Harper & Row Publishers, 1975), p. 154.
- <sup>17</sup> *Ibid.*, p. 221.
- <sup>18</sup> *Ibid.*, p. 154.
- <sup>19</sup> William Lethaby, *Architecture, Mysticism & Myth* (Wiltshire: Cromwell Press Ltd. 1994), p. 22.
- <sup>20</sup> Cox, *Vastu Living*, p. 35.
- <sup>21</sup> Adrian Snodgrass, *The Symbolism of the Stupa*, p. 17.
- <sup>22</sup> Adrian Snodgrass, *Architecture, Time and Eternity: Studies in the Stellar and Temporal Symbolism of Traditional Buildings, Volume I* (New Delhi: Aditya Prakashan, 1990), p. 103.
- <sup>23</sup> Adrian Snodgrass, *The Symbolism of the Stupa*, p. 14-15. The radius of the circle is twice the height of the pillar. In this way, at the two points in the morning and the evening where the shadows touch the circumference, the direction of the east-west axis is determined. This process only works flawlessly on the equinoxes. On other days of the year, an adjustment needs to be made for the midpoint of the line between the east points to be at the same location as the center of the circle. Another method avoids this issue by use of a different construction. In this system, in addition to the two points east on the circumference, a third point, which falls within the circle, is taken at midday. Using these three points as the centers, three circles are created. Lines are then created between the intersections of the circles. In this way, the north-south axis is determined.

- <sup>24</sup> Gayatri Devi Vasudev, *Vāstu: Astrology and Architecture* (Delhi: Motilal Banarsidass Publishers, 1998), p. 76.
- <sup>25</sup> Vasudev, *Vāstu: Astrology and Architecture*, p. 39.
- <sup>26</sup> *Ibid.*, p. 85.
- <sup>27</sup> Snodgrass, *The Symbolism of the Stupa*, p. 1.
- <sup>28</sup> *Ibid.*, p. 9.
- <sup>29</sup> Vasudev, *Vāstu: Astrology and Architecture*, p. 77-8.
- <sup>30</sup> William McDonough Architects, *The GAP Corporate Campus Competition* (April, 1994), p. #.
- <sup>31</sup> William McDonough Architects, *The Phoenix Designs Project* (May 15, 1994), p. 5.
- <sup>32</sup> Heidegger, *Poetry, Language, Thought*, p. 214.
- <sup>33</sup> In terms of the size of the construct, the students are given parameters of not exceeding a twelve-inch cubic space. This allows them the ability to control the project within the limited time frame, approximately two and half weeks.
- <sup>34</sup> The second phase of the project had a time frame of approximately three and a half weeks.

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