# Foundations: Mythical and Symbolic Implications of Building/Earth Relationships

PAUL F. HIRZEL
Washington State University

## INTRODUCTION

It is the premise of this paper that the ***building foundation,*** the constructed bridge or interface between earth and building, should be recognized as a potent symbol of a culture's beliefs (real and imagined) about the natural world and that by understanding and emphasizing these beliefs, an architecture of greater genuineness and appropriateness will be possible. Architects today are searching for formal determinants that will produce recondite environments—places which voice authenticity versus artificiality, places of cultural and environmental integration. It is my contention that one of those critical determinants is the why and how of a building's intercourse with the earth.

Fig. 1. The Hermit retreat as pictured by Chinese Artist Sun Chun-tse, Yuan Dynasty (1208-1368).

The why of a particular intersection between buildings and earth is embodied in one of three fundamental belief systems, each based on a perceived relationship between humans and nature. A Chinese landscape painting by Sun Chun-tse exemplifies the first relationship (Fig. 1). Representing humans in harmony with nature, the painting includes natural elements of heaven and earth, a human and constructed objects (a path and hut). To quote Mitchell Bring in his book ***Japanese Gardens,*** "Chinese painting implies that no matter how small the human element seemed in comparison to the majestic mountains and seas, the scene was not complete without some indication of human presence. Landscape painting tried to show the harmonic ideal."[1]

The subjugation of nature by humans is the basis for the second relationship type. Here, natural forces and circumstances are overcome and controlled by human intervention. Domination of nature is expressed by emphasis on great engineering feats. Regarding a painting entitled ***Opening of the Wilderness*** (Fig. *2)* by T.P. Rossiter, art critic, Barbara Novak, makes the following observation. "Rossiter focuses on five engines at rest, their cowcatchers spread elegantly in front of them like fans, the plumes of smoke like those of cavalry charges. It is a daring attempt by a painter to bring the powerful new giants into the pastoral clearing. To contemporary eyes, it must have incarnated the energy of progress itself: the new architecture of the round-house, the stumps testifying to fallen and consumed natural 'monarch~'."~

The third belief system, the antithesis of the second, intimates the domination of nature over humans. Thomas Cole's final painting of his ***The Course of Empire Series*** entitled ***Desolation*** (Fig. *3)* predicts the eventual victor in the struggle for domination between humans and nature. Again, I reference Barbara Novak. "Cole implies that, seen with the guiltless eye, nature would be perceived as perfection, as Eden. The flaws are not in nature, but in ourselves."[1]

The discussion which follows endeavors to provide ex-

Fig. 2. T. P. Rossiter, *Opening of the Wilderness,* c. 1846-50.

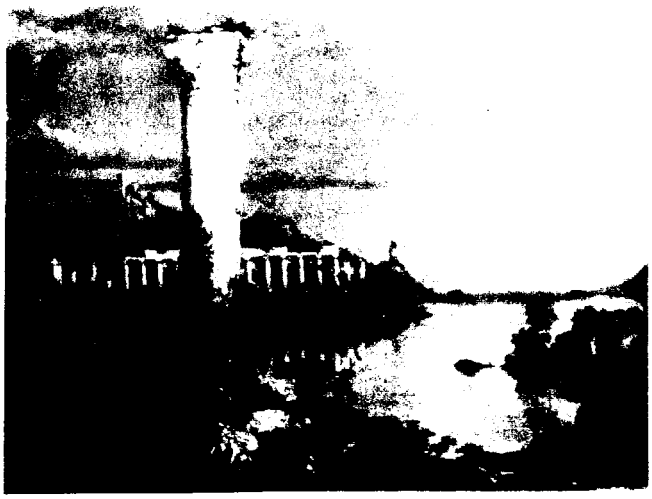

Fig. 3. Thomas Cole, *The Course of Empire, Desolation,* 1936.

amples of how these three belief systems have been manifested in physical form. Each physical expression is described and interpreted in relation to its formal characteristics and intent.

## THE CORNERSTONE

Historically, the setting of a foundation cornerstone symbolized the physical pronouncement of intended permanent habitation. Its size, position, material make up and weight expound the quality of stability. Defined as "something fundamental, of primary importance, giving security and sureness,"[4] its significance as an anchor in an unsteady cosmos is referenced numerous times in the Old Testament. In Isaiah 28:16, Isaiah speaks God's word, "Therefore thus says the Lord God: 'Behold, I lay in Zion a stone for a foundation. A tried stone, a precious cornerstone, a sure foundation; whoever believes will not act hastily'."[5] Job 38:4 describes God as the creator who lays a cornerstone upon which to construct the world. "The Lord answered Job out of the whirlwind, and said: "Where were you when I laid the foundations of the earth? Tell Me, if you have understanding. Who determined its measurements? Surely you know! Or who stretched the line upon it? To what were its foundations fastened? Or who laid its cornerstone. When the morning stars sang together, And all the sons of God shouted for joy?'"[6]

These metaphorical associations with the cornerstone illustrate the symbolic importance of this building element. The early religious mind sensed that the joining of earth and building required some specific act or physical symbol of recognition. Today, the cornerstone ritual many times is reduced to a small commemorative plaque attached to a side wall. A result of our pragmatic world view, the use of the immense stone placed at a prominent building comer is no longer considered a necessity.

## FOUNDATIONS AND SACRIFICE

To past cultures, building on the earth was seen as potentially disruptive to the cosmos and as a consequence, required elaborate rituals to appease angered demon inhabitants. To endow new buildings with good fortune and protect them from hostile spirits, building rites were employed, some by our standards quite gruesome. Richard Cavendish's book, *Man, Myth and Magic,* lists a number of these strategies. "It was once common practice to sacrifice a human being to the Earth deity as it was believed that no building would stand unless its foundations were laid in blood. In the old royal city of Mandalay, men were buried alive under the gate foundations. Foundation rituals have survived into comparatively modem times among some primitive peoples; in 1881, for instance, the King of Ashanti (now a region of Ghana) mixed the blood of 200 maidens with mortar when building a new palace foundation. The survival of the custom in the West until Christian times is suggested by the discovery of skeletons in the foundations of old churches, as at Darrington, in Yorkshire, in 1895 when the church walls were found to be resting on a human skull.'" Less offensive offerings were also used. Up until the 17th Century, a bottle of water and a piece of bread were built into the foundation walls of English cottages as charms to ward off starvation. "A human shadow was used instead of the living person, in places as far apart as the British Isles and Rumania; there were even 'shadow traders' who secretly measured a man's shadow and buried the measurements beneath the foundations."[8] Placing documents beneath a foundation was also an ancient custom. "It is recorded that Chaldean kings, interested in antiquity, used to tunnel into the ruins of old palaces for the foundation records deposited by their predecessors."[9] Few of these building rites have survived in our modern culture. Only public buildings and large earth works (bridges, dams, etc.) are begun with the ritual of the first sod being turned with a new spade, or the first mortar being laid with a new trowel.

These acts, both ancient and modern, recognize (as with the laying of the cornerstone), the potential consequence of placing a structure on the earth. Whether to provide a spirit guardian or additional insurance against bad luck, humans sensed that some extraordinary action or homage ritual to the earth is required.

## THE ANATOMICAL METAPHOR: FOOTINGS, FEET, AND LEGS

The metaphoric association between our anatomy and architectural form has been well documented; the terminal part of the human body which engages the ground is no exception. Building foundation elements are referred to as footings, legs and feet and function in some way similarly to their human counterpart (Fig. 4).

Foot, from the Oxford English Dictionary, Second Edition, is defined as "the lower (usually projecting) part of an object, which serves to support it, the base." Footings, from the same source, are defined as "the foundation, ground, or basis on which anything rests or from which it springs; a firm or secure position; an established place, foothold, or establishment."

A contradiction exists in the association between the human body and building foundation. Foot and footings, as just defined, suggest the qualities of stability and permanence where the human foot suggests quite the opposite effect — locomotion. Herein lies the potential expressiveness of buildings with feet or legs. Defiance or compliance to the force of gravity can be expressed by the introduction of feet and legs. Comparisons, for example, can be made between a ballet dancer's response to gravity and a building's response. "...much of modem dance and folk dance displays the pull and power of the earth with the actions of falling, stomping, and embracing the ground. In one of the revolutionary acts of early modem dance, Mary Wigman scandalized German audiences by bumping her way across the stage on her back, feet and hands. In this performance of 1919, she was saying that gravity, the earth, and down are real and that we are inevitably bound by such powers."[10]

Buildings can express similar "revolutionary acts." Architecture can also "display and celebrate the pull and power of earth with actions of falling, stomping and embracing the ground." ***Walking Stone*** (Fig. *5)*, a sculpture by Nobus Sekine, illustrates the potential of this idea. An ironic mix,

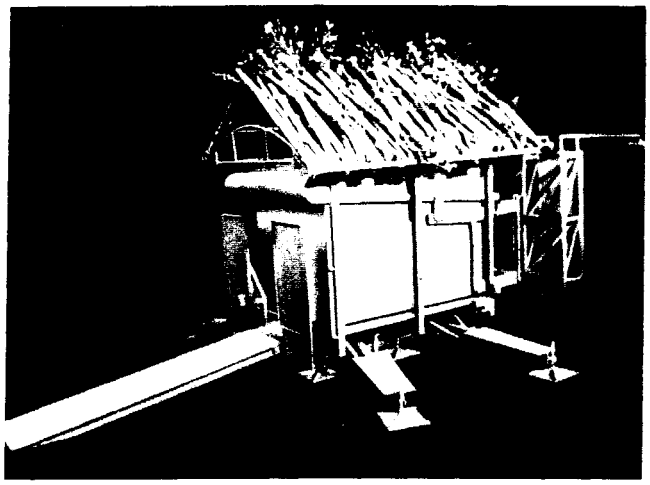

Fig. 4. "Feet" support a "Primitive Hut" proposal by Peter Pfau and West Jones. 1985.

Fig. 5. Walking ***Stone*** by Nobuo Sekine.

a building cornerstone (referencing stability) is given legs for an imaginary walk.

## EARTH INLAYS

Walter Pichler's earth work entitled ***Depressed Seating at Breittenbrunn*** (Fig. *6)*, provided a precisely balanced relationship between building and earth. Your sitting station focuses on both the earth and the sky simultaneously. The human body is positioned on the horizon so that one experiences what Aldo Van Eyck calls "the in-between realm." If the level of seating would have been raised or lowered, even slightly, this sensation of equilibrium would be lost. Van Eyck's description of an "inbetween realm" references a similar experience between earth and water. "Take off your shoes and walk along the beach through the ocean's last thin sheet of water gliding landwards and seawards. You feel reconciled in a way you would not feel if there were a forced dialogue between you and either one or the other of those great phenomena. For here, inbetween land and ocean—in this inbetween realm, something happens to you that is quite different from the seaman's alternating nostalgia. No landward yearning for the sea, no seaward yearning for the land. No yearning for the alternative—no escape from one into the other." Pichler has made a place where there is no skyward yearning for earth, no earthward yearning for sky.

Almost a thousand years earlier, another inlay was constructed in Modhera, India. A sanctuary and reservoir (Fig. 7) built by a sect called the Sun Worshippers, it achieves the same proportional equilibrium of skydome to depth of earth inlay.

## THE SKYHOOK FANTASY

Pilotis, Corbusier's strategy for raising a building "off the ground" on stilts initiated a search in modem western culture for methods of constructing more detached, more weightless buildings. From his treatise, "Five Points of a New Architecture," Corbusier makes the following statement: "Previ-

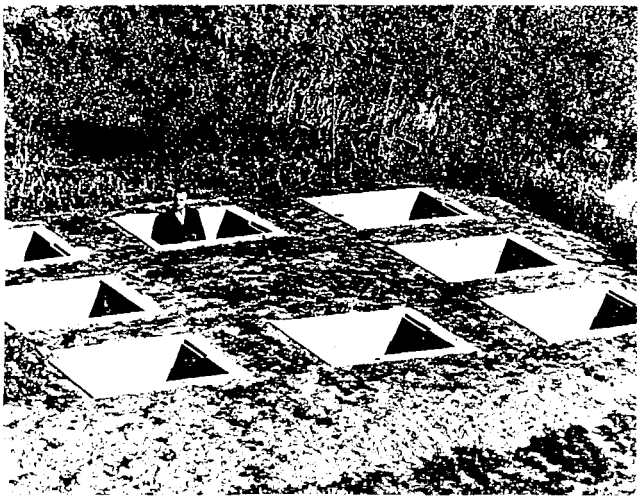

Fig. 6. ***Depressed Seating at Breittenbrunn by*** Walter Pichler, 1970

Fig. 7. Modhera Temple and Reservoir, India 1100

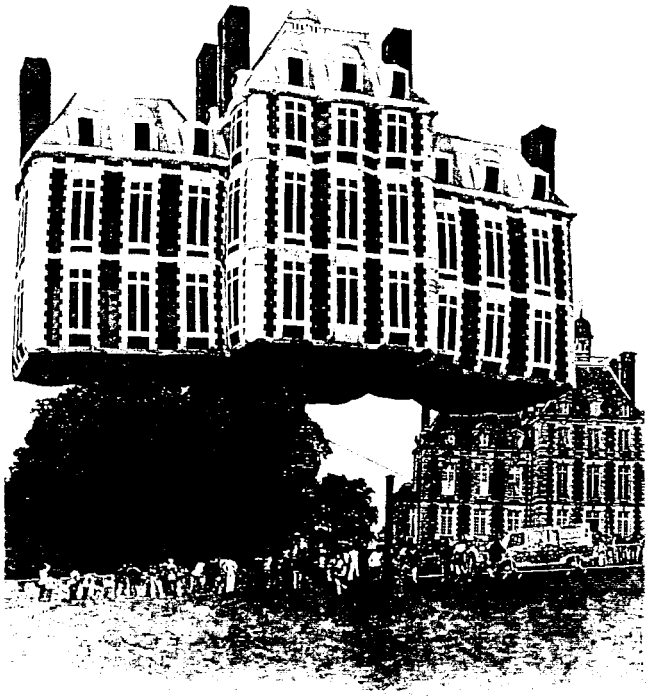

Fig. 8. International Balloon Museum, Normandy, France, 1983.

ously, the house had been buried in the earth and the rooms were often dark and damp. Reinforced concrete gave us the pilotis; the house in the air, far from the soil, with gardens stretching beneath the house as well as on the roof."[11]

His 1922 Ville Contemporaine proposal for Paris (1922) elevated the apartment towers above the ground to allow open parks and gardens to meander undisturbed by building walls. **A** house by Lawrence Kocker (1932), carried Corbusier's idea further. To increase one's sense of lightness, Corbusier's concrete pilotis were replaced by slender steel columns and walls were constructed of fabric canvas with foil insulation stretched over a plywood frame.

The most literal examples of floating architecture belong to Malcolm Forbes and R. Buckmister Fuller. Forbe's hovering chateau (Fig. 8), is a humorous interpretation of the Chateau de Belleroy in France, site of the world's first balloon museum. Fuller's proposed ***Floating Geodesic Spheres*** (Fig. ***9)*** claims that the weight of heated air in the interior of the 112-mile diameter spheres plus the weight of the structure and its inhabitants will be less than the surrounding atmosphere—the spheres as a result would float like clouds.

## LANDINGS: BUILDING AT REST

Harmonic, symbiotic exchange characterizes the union of building and earth in the traditional 17th century Japanese tea house. Architectural qualities, which the Japanese call ***Shibui*** suggest that complementary relationships are preferred over those which are hierarchical: Andre Corboz's preface to a book on Japanese architecture lists the following qualities: "Quiet, but not inert; beautiful, but not superficial; simple, but without ostentation; sober, but interesting and vital; original, but familiar; stable and indigenous, as opposed to the ephemeral character of fashion."[12] I would add to these qualities "grounded but with lightness." **A** section through the Kinkakuji tea house (Fig. 10), illustrates this inclusion. Here half of the structure is elevated above a ravine on wooden posts resting on base stones, and half is

Fig. 9. ***Floating Geodesic Spheres by R.*** Buckminster Fuller, 1967.

perched on a mound. Both the relationship to the hill and valley are considered and expressed with a connectedness that is subtly responsive. The effect is almost buoyancy. This expression contrasts with many western structures where buildings are perceived as massive, immovable objects that are firmly embedded in the ground; they are ***heavy*** both figuratively and literally.

Italo Calvino's discussion of the value of "lightness" in his book Six ***Memos for the Next Millennium*** is particularly relevant here. Although he is referring to literature, his message seems applicable to architecture as well. He writes that literature should have an existential function that is part of "the search for lightness as reaction to the weight of living ... the link between the levitation desired and the privation actually suffered."[13] The Japanese tea house and its associated ceremony represent in physical terms Calvino's "desired levitation," or to reference another Calvino phrase, "thoughtful lightness."

A more contemporary example of this effect is illustrated in a clinic by Shoei Yoh (Fig. 11). Here again, part of the structure rests on a mound and part is supported on posts—in this case, telescoping legs.

Completed approximately 400 years after the tea house, it is even more detached from the earth than it's predecessor. It's curved metallic form resembles a strange airship that has made a temporary landing on this site. The sense of weightlessness has reached a point where one could image it literally becoming airborne. Still there is a notable connection made with the earth which suggests a desire to stabilize the craft. The earth rises to the building entry just touching the building skin, as if the two are gently kissing. There is no violent embrace or ambivalent nod about the meeting. The impression is one of mutuality.

A final reminder is given regarding the idea of earth and human construction complementing one another. Likely done with tongue in cheek, Yoh has juxtaposed an embedded plus sign (+) in the earth with long thin clinic form, a minus sign (-), to reference electrostatic charges.

Fig. 10. Section of Kinkakuji tea house (early 17th Century).

Fig. 11. Japanese Clinic, Azankama, by Shoei Yok, 1979.

## STAKES—POPULIST VIEWS OF ATTACHMENTS

Seattle's negative reaction to a bank building (Fig. 12), designed by Minoru Yamaski (completed in 1977) can be traced to perceptions regarding its "stake like" building form. The public sees the building as being potentially unstable. "Looks like it'll fall over," a resident was quoted as saying. "I feel uneasy walking by the damn thing," another

Fig. 12. Bank Tower, Seattle, Washington by Minoru Yamasaki, 1977.

Seattleite remarked. A large mass supported on a tapered base, the structure resembles a giant pointed stake only partially embedded into the ground. Additionally, the structure is seen as an almost violent intrusion into downtown Seattle. Local columnist, Emmett Watson, labeled the tower, "a stake driven into the heart of Seattle." Watson's emotional statement goes beyond being a criticism of how successfully the building fits into the urban context. He is also reacting to how blatantly this tower thrusts itself into the ground.

Examples of the psychological impact of these earth penetrations can be found in other cultures as well. In India, the sensed power of driving a stake into earth has been interpreted in ritual. It is believed that before a mason can lay the first stone of the foundation, an astronomer must locate a spot which lies above what they call "the snake's head that supports the world." Quoting Mircea Eliade's book *The Sacred and the Profane,* "The master mason sharpens a stake and drives it into the ground exactly at the indicated spot in order to fix the snake's head...."[14] Formless, unmanifested chaos, which the snake symbolizes, is brought under the control of humans. A divine victory, fearsome, unpredictable nature has been subdued.

Stakes also have more practical associations with building. Where the preceding examples suggest more permanent symbolic installations, stakes are also used for temporary attachments to the earth. Tents and their accessory stakes require only small puncture wounds in the earth. The tipi, desert tent, and many other tent variations use tie-down anchors that are designed for easy installation. Part of the fascination with these structures is manifested in the act of driving stakes into the ground. The desire to physically penetrate the earth may be based on what Mircea Eliade calls our need for a "preeminent link" with the earth.

## THE BOTANIC METAPHOR: ROOTED BUILDING

A noted association between root morphology and architectural form was made by Frank Lloyd Wright in his design of the Johnson Wax Tower, completed in 1950 (Fig. 13). Deriving its structure from the form of a tree, Wright made the following observations. "In structural terms, a tree is a vertical beam cantilevered out of the ground. Most of its mass is above the ground, and most of the stresses applied to a tree—such as wind pressures and snow loads—are applied to it high up, close to its crown. The structural force that keeps a tree from toppling over is, of course, the restraint applied to its roots by the earth in which they are embedded; and any time a storm blows up, the wind pressures are counteracted by pressures applied by the earth."[15] Wright had designed a prototype for the Johnson Wax "glass tree" many years earlier in 1929. This use of a single column of support was a revolutionary idea, for tower structures until that time were supported by multiple columns.

Had Wright studied plant morphology more extensively, a number of additional living precedents might have influenced his tower forms as tree root architecture is exceedingly diverse. In Adrian Bell's book, *Plant Form, An Illustrated Guide to Flowering Plant Morphology,* a large number of tree roots systems are catalogued. Unlike Wright's single primary root metaphor, many have alternate support systems (Fig. 14). Prop roots may flatten to form horizontal matts (a, b) or flying buttresses (c, d). They may elongate to form stilt

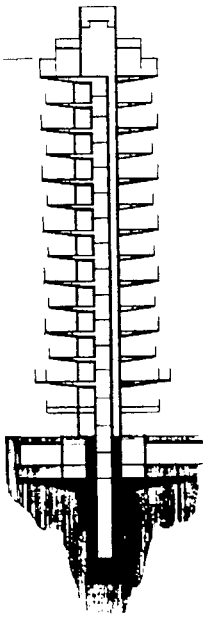

Fig. 13. Section through Johnson Wax Tower by Frank Lloyd Wright, 1950.

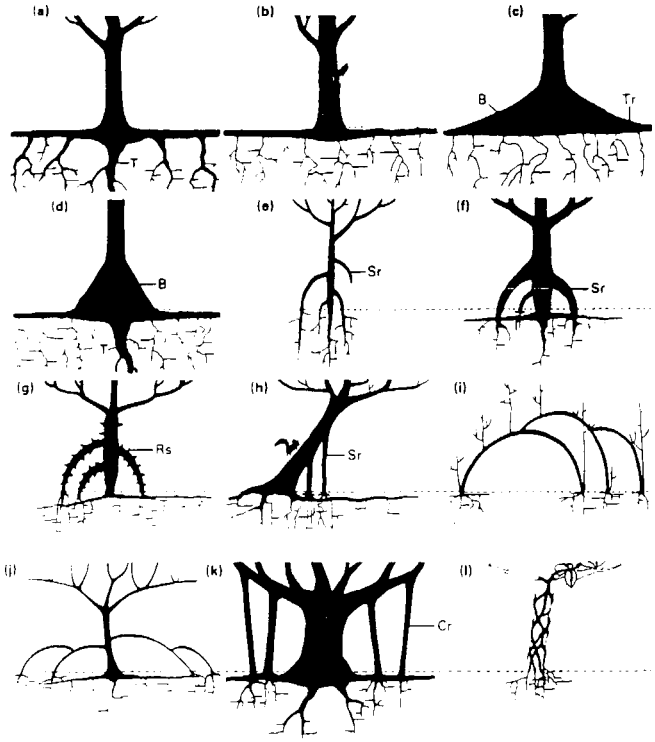


Fig. 14. Tropical tree root system. B: Buttress, Cr: Columnar Root, Rs: Root Stilt (Prop) Root, T: Tap Root, TR: Tabular Root.

roots (e, f, h), spines (g), arching roots (i, j), or thicken to produce columnar roots (k). "Strangling roots" (1) require a host tree for support. Study of how plants bridge between earth and sky (root and stem) may further innovate new foundation forms.

## VIOLENT BUILDING: COVERING THE WOUNDS

A curious condition exists at the intersection of building and earth in the suburban house. Almost without exception, houses are surrounded with a shrubbery mass which covers the building's point of entry into the earth. It is so prevalent that many amateur gardening books have entire sections on *foundationplanting.* Denise Scott Brown notes in her article on the suburbs that "decoration of the foundation varies from elaborately pruned trees to concrete blocks painted green."[16]

There are two plausible explanations for this treatment. The first is founded upon aesthetic reconciliation. Planting, it is argued, visually mitigates the abrupt shift from vertical wall to horizontal ground plane. Our aesthetic preference for this planting transition is based on native landscape precedent. Natural vegetation structure shows an ecological succession of grasses, perceivable in mass as horizontal to herbs, shrubs, and saplings, and finally to trees perceived as vertical. On the suburban site, the horizontal lawn transitions to the vertical wall of house by introducing flower beds and shrubs.

Our moral conscience may be the second source of motivation. Planting may be a way of masking a transgression. Our attitude regarding touching the earth may resemble an allegory by a Nez Perce prophet named Smohalla. He believed that humans must accept the transitory quality of existence; that to attempt to permanently attach oneself to earth is inimitable to both the habitat and inhabitant. "It is a sin to wound or to cut into, to tear or scratch our common mother... Shall I take a knife and plunge it into my mother's bosom? Then when I die she will not take me to her bosom to rest. You ask me to dig for stone! Shall I dig under her skin for her bones? Then when I die, I cannot enter her body to be born again.""

Maya Lin, architect of the Vietnam War Memorial in Washington, DC, sensed the potential emotion evoked by cutting the earth. "I had an impulse to cut open the earth ... an initial violence that in time would heal. The grass would grow back, but the cut would remain ... I didn't visualize heavy physical objects implanted in the earth; instead it was as if the black grown earth were polished and made into an interface between the sunny world and the quiet, dark world beyond, that we can't enter ... I chose black granite to make the surface reflective and peaceful."[18]

## ARTIFICIAL MOUNDS-ORIGINS OF THE CREPIDOMA AND STEREOBATE

In Victor F. Christ-Janer's article on the origin of forms, the existence of mound building is seen as a fundamental indicator. He speculates that early man's intuitive reaction to being separated from nature by consciousness is manifested in the act of *making* or *building.* "The making of the mount restates the earth image and humans become creators. At this level, we are at the 'origins' of human poetic response to nature. No greater act of creativity exists and no greater opportunity is offered than this simple making of the mound. It is a 'making' of great consequence."[19] Human manipulation of the horizon by the construction of mounds can be seen in many primitive cultures—Pre-Columbian, Egyptian, and Mesopotamian. They are distinctive in that they do not express or emphasize a base separated from the main mass of the building. They stair step down to the ground making no pronounced transition at the earthline (Fig. 15).

In contrast, the Greek temple (Fig. 16), represents a radical change in human attitude towards the earth/building relationship. Where the mound structures, prior to the Greeks were derivative of landscape phenomena (hills and mountains), the Greek temple to use Vince Scully's words, "divines ... human presence as the model for dialogue with the land."[20] The Greeks sough to contrast with the landscape versus mimic its forms.

The introduction and formal emphasis of the crepidoma, the stepped base of the Greek temple, became a crucial element in this emancipation. Crepidoma has its origins in the Greek word, ***crepida,*** which refers to "a kind of footwear consisting of a thick sole attached with straps to the feet."[21] The thick sole or platform on which the temple rests

Fig. 15. The Step Pyramid of Saqquara 2780 B.C.

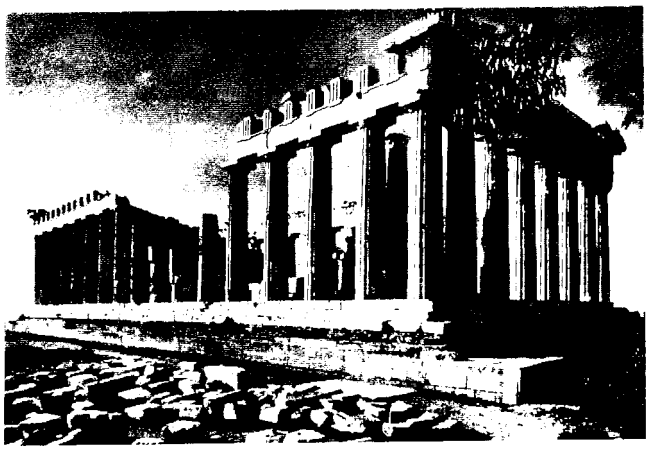

Fig. 16. Parthenon showing the crepidoma (stepped base) Athens, 447-432 B.C.

separates and elevates, both literally and symbolically the temple above the plane of the earth

The stereobate and stylobate are also of Greek origin and refer to more specific types of temple base conditions. Stereobate, which translated, means solid base, is the support under a temple wall. Stylobate, stylo meaning pillar, is the support under a row of columns. The specific naming of these base conditions in addition to its perpetuation in other world cultures reinforces the notion that this new layer of architectural matter (the platform) was considered a significant addition.

## CONCLUSION

From heavy stone anchors embedded in the ground to hovering spheres a half-mile in diameter, humans have developed a vast pallet of building/earth relationships which represent their attitudes towards nature. Whether generated by fear, domination, or communion, all of the examples cited in this paper illustrate how cultures, both past and present, have grappled with the question: How does one touch the earth?

Written to encourage foundation design governed by more than pragmatic concerns, it is intended that the intersection between earth and building will be viewed anew. Non-response and ambivalence will be replaced with carefully considered expression as the symbolic potency of this joint will once again become a fundamental form determinant.

## NOTES

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