WATER AS ENVIRONMENT
A VISITORS INFORMATION AND ARCHITECTURAL EDUCATION CENTER
COLUMBUS, INDIANA

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ABSTRACT

Water as Environment

My thesis project deals with creating an ecological and experiential balance in our environment. I propose that by integrating water into our buildings we can create pleasing experiences which will benefit the physical and psychological aspects of human behavior. Water can be used to create stimulating visual, audible, and tactile experiences which will enhance our spaces. Water will provide unity, variety, and vividness to the environment, and satisfy basic needs of human development—stimulation, variety, and change. My study will focus on the vividness of contrast that water is capable of expressing—water's ability to take on a powerfully active or tranquilly passive character.

Through the process of research, which involved identifying architectural uses and physical features present in existing water environments, I have been able to develop a water program. This was an attempt to classify and categorize water components into a catalog. The premise being, I could use the catalog for further reference and application to any design problem.

The design project for the testing and exploration of my thesis is a Visitors Information and Architectural Education Center. Critical programmatic spaces include Auditorium, Library, Staff Offices, Exhibition spaces, and a Garden. I chose a site near the White River, at the southwestern corner of Columbus, Indiana; a vital entryway into the city. The Project and site are crucial components in developing a sense of arrival into the city of Columbus.
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INTRODUCTION

I. Identification

My interest in the environment and human behavior has led me into an inquiry of cause and effect relationships, in an attempt to gain a better understanding of how certain components or elements of the environment influence and change behavior. Of particular interest to me is human interaction with water and water's influence on human behavior.

My interest in this subject first began a year ago while involved in a campus planning studio. In the inventory phase of the project (where we documented existing physical features of the campus) we put together an environmental evaluation questionnaire in which 150 or more students evaluated a variety of campus views and scenes in terms of their aesthetic preference. The results of this testing provided us with information which was useful in determining, correlating, and recognizing which environmental components or elements composed an aesthetically pleasing environment. Under examination, the study showed us that water played a significant role in students' perception of a quality environment.

As a result, it was curious to me how few of the campus's buildings related to or integrated water into their habitable spaces. In fact, no buildings had any physical relationship to any natural or manmade water feature. It is these findings which led me to a hypothesis about our environment:

The integration of water into building design will produce more vivid, exciting spaces, which will benefit human behavior.

II. Review of Literature

It seems more has been written on the subject of water and its use in the environment in relationship to the landscape rather than to architecture. Susan and Geoffrey Jellicoe, co-authors of The use of Water in Landscape Architecture, provide an enlightening account of how water has been used throughout history. Kevin Lynch, author of The Image of the City, suggests that humans have three basic needs, stimulation, change, and variety. I propose that these needs can be met through the use of water to create vividness in our environments. William H. White, in his film "City Spaces, Human Places", has determined that the use of water in urban plazas is one of seven crucial factors for creating a successful people space. I hope to learn from existing research in the landscape field and apply the basic principles and concepts to an architectural design.

III. Problem Statement

Architects and engineers often spend a large quantity of time and money in designing ways to keep rain, snow, and sleet from causing severe damage to the buildings and spaces they create. In doing so, they create an ecological imbalance and neglect to take advantage of water's ability to create vividness and contrast in the environment. The object of this research would be to demonstrate and illustrate a variety of ways in which water could be integrated into our people places to enhance our environments.

IV. Procedure

I propose to collect a
variety of images in which water already exists (photography and photocopy), classify these images into specific groups (such as natural or manmade environments), and analyze these images to determine what components of the environment create a pleasing aesthetic (by questioning a cross sample of people from varying age groups and lifestyles).

My goal is to create and develop a "Water Program" in which the components and elements of water environments can be cataloged. The premise of this catalog of parts being, that it can be applied to any building program to provide a more balanced, vivid, and stimulating environment.
This is a classification of the environment in terms of its relationship to water. In initial research, I collected a variety of images in which water was present. An attempt was made to understand what made those images or places unique, vibrant, and special.

I classified the environments into categories according to waters relationship to certain environmental components. They broke down into 4 groups:

- Water and building
- Water and nature
- Water and object
- Water and human interaction

These categories are interconnected, and yet very distinguishable in their connection with water.

I then took these categories and broke them down into scales of experience and degree of activity or passivity. This enabled me to better understand the character and expressions of water. It also allowed me to communicate to jurors and critics the range of experiences in which water played a significant role. This collection provided "ideal" models with which I could reference from when designing, to ensure the integration of as many water experiences possible into the environment.
WATER AND NATURE
WATER AND OBJECT
WATER PROGRAM

The water program speaks to an idea about integrating elements associated with water or water features into spaces to produce more active, vibrant, vivid environments.

The following are architectural uses and physical features present in water experiences and environments. These "pieces" can be broken down into 5 categories.

Source/Hearth

Falling water/fountain (active)

Reflection pond/Moat (passive)

Bridge/stepping stones (circulation)

Island/Oasis (places)

THE SOURCE

In the middle ages, the life giving properties of water were recognized by a wellhead or fountain set in the center of a cloister or courtyard. In my design, the source experience will be a space of reverence to water, capitalizing on the mystery of "where does this water come from?", and it will be the heart that supplies the other water experiences.

THE HEARTH

The hearth is a gathering place, associated with home and comfort. Generally a majority of interpersonal relationships are developed or maintained in this experience. It could be watching a football game on the television or having a drink by the fire. I am intrigued by the visual similarities of water and fire. Both seem to dance and reflect light in a way that mesmerize the observer (or participant), Yet, are two elements in the greatest of contrast. They can be enemies of each other or working partners. Water can quench a burning flame, while fire can draw moisture out of every living thing. When working together and properly controlled can power an engine or relieve congestion.

FALLING WATER

The waterfall is indeed as powerful an experience as the
fountain, if not more so. Its natural beauty combined with a sense of wonder and amazement, creates an atmosphere of mystery and intrigue. Unlike the spray of the fountain, which is delicate and fine, the waterfall is concentrated and demands your attention because of its visual and audible power. It can have a mesmerizing and hypnotic effect on the observer, and trigger a release into your imagination and creativity. The waterfall is one of the strongest magnets of the water experiences. In my design, I will use falling water in a variety of ways and a variety of scales. I will use the sound to mask undesirable noises and to arouse curiosity. The waterfalls may cue a person on entry, provide a backdrop for a special place, or draw the observer into the environment. Falling water can also be used to calm the spirit. "Roman emperors retired to trivoli to cure insomnia by sleeping within the sound of the falls".

(G. Jellicoe)

THE FOUNTAIN

At one time, the fountains spray was primarily used to cleanse insects from the surface of the water. The spray is now used as a stimulus to the eyes and ears. The spray, according to its direction, scale, composition, etc., can contribute to the feeling or level of excitement in the environment. The fountain can mark a spot, terminate an axis, start a progression, attract attention to itself, or carry on a dialogue with another element in the environment. Fountains are particularly effective when combined with special lighting or allowing for some tactile interaction to take place. Fountains can be further enhanced by the integration of sculpture. The water can become dispersed by the sculpture or can be a contributor to the sculptures dynamic movement. The fountain has been called one of the most "potent factors in the uplift of the spirit".

(G. Jellicoe)
REFLECTION POND

The reflection pond can be an intriguing enhancement to the environment. I can create illusions and mystery through the use of reflections. This can function not only as an interesting visual experience, but can also aid in solar collection and environmental cooling.

THE MOAT

Water has been used as a barrier for protection and security throughout history. It is now associated with romantic notions of grand castles and damsals in distress. By using the quality of barrier, I will be able to denote special activity, separate functions, distinguish hierarchical space, or direct and influence circulation patterns within the environment.

BRIDGE

The bridge is a connector, a pathway, a monument. It can
carry you over, under, or through. The sensation of displacement will vary according to its scale and height. Like the stepping stones, the bridge will provide an alternative for circulation opportunities within the environment. They may also evoke associations and meanings with romanticism or technology.

STEPPING STONES

Stepping stones provide a variety of pathways for circulation. It requires your attention and stimulates and heightens the senses. It breaks your rhythm and your stride, it slows you down. It also is associated with childhood memories and playful imagery. I will be using stepping stones in the environment to provide a variety of pathways when crossing water barriers.

OASIS

The idea of oasis as long been a part of the human experience. The function remains the same regardless if it is associated with a desert environment or with a highway overpass. An oasis gives refreshment to the body and spirit. This space will be a retreat from the environment and a relief from life, an escape, a place for meditation and treatment, with water as the vehicle.

THE ISLAND

This notion relates heavily to the idea of moat, because the moat is essentially the creator of the island. The island has been associated with "aloneness", "separation", and "helplessness", as well as "journey" or "destination". It often symbolizes a desirable lifestyle or has romantic imagery. The island is also associate with a creative, survivalist attitude; the making of something out of nothing, induring. By using the idea of separation from the norm or main, I can separate functions and specialize activities.
WATER TERMS

This is a collection of water terms that describe

Water's character or action

Water's function or use

Water's associative value

This list is a collection from preliminary writings of the Water Program as well as notes from lectures and filmstrips. I include this list of terms as an example of water's versatility and energy and its flexibility of use, which is proof positive for its application as an component in the environment. I don't believe any other component of the environment can be as descriptive or as inspiring as water potentially can be. Water is not limiting; it is enhancing the ability to communicate an idea or experience.

Water is...

wonderful
amazing
mysterious
intriguing
mesmerizing
hypnotic
magnetic
arousing
curious
calming
powerful
stimulating
exciting
dynamic
uplifting
playful
relieving
refreshing
meditating
illusionary
romantic
technological
desirable
sexual
delicate
harsh
exuberant
slow
fast
scary
rough
still
roaring
pulsating
gushing

Water acts as an...

Backdrop
mask
draw
cue
cleanser
marker
terminater
attractor
starter
disperser
quencher
cooler
source
barrier
directer
distinguisher
separate
denoter
connector
monument
pathway
seperator
destination
specializer
retreat
gathering place
Like much of our architecture, water can be a heavily dominating visual experience. Its contrast to the physical environment (because of its liquid flowing composition) insures its recognition in the setting. But unlike brick, stone, glass, and other materials, water can be pleasantly heard, touched, smelled, and even tasted. Thus giving it more flexibility and range of use when creating and constructing spaces and environments.

The sounds of water are numerous and various. Lawrence Halprin says that early Chinese cultures have recognized and identified 8 different water sounds, and that these sounds can be heard in many combinations.

As obvious as it may seem, water must be moving to generate sound. It need not fall however, although this is an effective way to create sound. To generate water sound, a variety of techniques are available.

If the water is flowing or moving in a horizontal direction. There are 2 ways of doing it.

1) Increase the speed with which the water is moving to produce a greater volume of sound by:

a) decreasing or narrowing the channel in which the water is flowing.

b) increase the slope of topography in which the water is flowing.

c) decrease the depth of the path.

2) Create more resistsants or friction by:

a) articulating the containers edge.

b) placing objects in the path of the water.

c) varying the texture of the bottom of the container.

d) move the path from side to side (serpentine).
If the water is falling in a vertical direction the sounds created depend on many factors. These include:

a) what the water is falling on to (water or another material),

b) speed at which the water is colliding (distance of drop),

c) quantity of water falling (drip, stream, or deluge),

d) the pulse of water,
Also important to the audible aspects of water are the position and distance in which the audience is located to the event. Are they across the lake or in the middle of the event? Are you using the elements in the environment to block or reflect sound? What other sound generators are in the immediate environment that compete with the event?

Water sound is a pleasant attribute to most environments. Its greatest value is in its use as white noise. It has the ability to drown out or muffle unwanted noise in the environment. It is more commonly used or applied in city plazas and shopping malls. It helps to disguise automobile traffic, child's play, and other conversational distractions. Water provides the opportunity and feeling for privacy in a non-private setting.

TACTILE EXPERIENCES WITH WATER

Interaction with water can be at times both pleasurable and undesirable. The climate conditions have much to do with ones willingness to get wet, as does providing opportunities to engage in water events at a variety of scales and intensities without feeling forced to interact. Everyone must be able to approach water at their own pace.

The key to successful tactile places, is to provide a variety of experiences in and away from the main event. Secondary events such as wading ponds contrast well with full emersion baths. Because it is unpleasant to sit around in damp clothes, the space must be bathed in sunlight and protected from harsh winds. This gives the participant an opportunity to dry out.
Water's relative temperature to our own body is a factor to deal with when designing water experiences. How do you warm it up to an acceptable level?

Children are more likely to engage in water events than are adults. However, the feature should accommodate for both groups remembering the limitations of elderly and handicapped as well. Exploratory as well as playful and intriguing water should work well to enliven all age groups. Participation without actually getting wet should be designed into these events, and making them accessible and yet a little unsettling provides for a broader range of experiences. Examples of this might be stepping stones close to the water's surface, passing under a waterfall, passing closely by a waterfall or spuratic, pulsating fountain.

Examples of physical interaction with water might be: standing under a waterfall, cooling ones feet in a pool or stream, running ones hand along a waterwall, or dipping your hands into a pool of water.

Activities involving water as a non "wet" way might be: skipping stones at the river's edge, sailing small toy boats, feeding ducks or other wild life attracted to the water area.

A large part of the reason for providing places and spaces for people to physically engage in water events is simply because it generates activity and conversation. People like to watch people get wet.

Water has no smell of its own, it is odorless. It does however have the ability to pick up odors that it comes in contact with. When designing water features, pay close attention to the materials which make up the environment.

Our least controlled and most pleasurable experiences are those brought to us by nature. For example, a cool breeze of salty ocean air or the spring fresh scents after a rainfall are courtesy of mother nature. The best we can do is to provide fragrant vegetation in our landscapes. Those which have a pleasant smell and don't lose their leaves, such as pine trees, are most appropriate to these environments.

Standing water is a no-no in water design. Don't provide opportunities for water to stagnate. Not only will the unpleasant smells of decay keep all the people away, but mosquito infestation will have a even farther impact on the immediate community.

TASTE

Taste has little to do with architecture. It must be addressed however in terms of providing amenities within the environment. Water is refreshing, and by designing sufficient facilities for drinking, especially in our parks and city spaces, we provide and meet basic human needs. There is nothing more frustrating than being thirsty and not be able to quench that thirst.

OLFACTORAL

Smell is the least designable of the sensory experiences and yet the most potentially detrimental to the success of the environment.
PHILOSOPHY OF AESTHETIC QUALITY
HUMAN NEEDS

Architecture is the creating and constructing of environments to meet human needs and desires. This thesis is recognizing the fulfillment of those needs and desires.

As a person, I desire to be stimulated and need to experience variety and change. These are three closely related ideas which are crucial to human development. Stimulation acts on the senses to excite to activity or growth. It animates, arouses, and provokes. Being challenged in the environment allows for the participant to become more easily involved and heightens their awareness and senses. When I’m stimulated, I grow. Physically, emotionally, mentally, spiritually, totally. I become more aware of myself as well as others. Without stimulation I would die. Stimulation of the senses causes growth!

 Variety insures a maximum opportunity for visual stimulus. It enables us to experience and perceive relational differences. Variety is an existing condition which deals with the option of choosing your relationship to the environment.

In architecture, that may mean having differing forms or types of the same general kind. Water’s role in the environment can be to introduce variety. The character of water is such that it will never appear the same. It can achieve a variety of expressions from active to placid.

Variety implies richness and diversity to the environment. The presence of

Change also needs to be experienced in the environment. It is an action or a motion. It can also be a transformation from one kind to another. Change assures against boredom and stagnation. It is to replace, shift, or switch, to give a different course or direction. Water has the ability to change its character, expression or even its physical state (ice, water, mist).
ENVIRONMENTAL NEEDS

I believe that if environments meet these three needs of stimulation, variety and change, they will benefit human behavior. Water is an component of the environment which can accomplish this task.

According to ....... a quality environment will consist of 3 main ideas:

- unity
- variety
- vividness

Water is capable of meeting those three criteria, both in our architecture and our landscape. Water can unify an environment because of its continuity. Water is seen as being continuous and as a whole because of its contrast to land and building forms. Water is characterized by its singleness of material, wholeness of surface, and "oneness of moving continuity." Charles Moore states, "so various are the characters which with water can assume that there is scarcely an idea in which it may not occur or an impression which it cannot enforce".

Water can also provide variety to our environments. The variety of water is more commonly expressed through its movement (slow or fast), its color (clear or merky), and the interaction that occurs at the edge of waters container (which depends on the composition of land elements). The capability and availability of unlimited variety is also made possible by waters response to weather, light, depth of container, and treatment of the bottom of container. "Quick to respond or slow, this some what mysterious, seemingly unpredictable behavior of water, seems to say something of its intrigue to the human observer. (Morisawa and Murie 1969)."

Vividness and contrast are probably the most powerful arguments for the intergration of water into building design. Water not only is in high contrast to the surrounding environment, but also within the
range of its own expression. Water can move quickly or slowly or not at all. Water can be active and alive or passive and calm. Water is loud or quiet; fierce and forbidding or gentle and inviting. "In the general human experience, The sight of water is relatively rare compared with the everyday view of land surface which surrounds us and that we move upon. (Moore 1957)

Waters presence in the environment has direct influences on the character of spaces. Water and its container establish the mood of the environment. The interaction of the water and its edge is of vital importance to the expression of water and its vividness. A constant dialogue occurs here, where the two either fight for dominance or reach a happy settlement. Differences in color and texture of materials to construct the containers edge also provides for a variety of conditions to be met.
PHYSICAL RELATIONSHIPS TO WATER

Peoples perception changes with proximity and accessibility to water. Water can be terrifying/threatening or relaxing/soothing depending on your relationship to water.

Size of the body of water, depth of the body of water, activeness of the body of water, the composition of the containers edge, and slope of the surrounding edge.

Shown are a few examples of relationships to water.
BUILDING RELATIONSHIPS TO WATER

Buildings can incorporate water into their design through three different techniques. One technique uses water within the structure, another uses water that transcends the barriers of the structure, and yet another uses water at the outside of the structure.

Shown are a few examples of buildings relationship to structure.
QUALITY EVALUATION
UNITY
VARIETY
VIVIDNESS

POLUTION — NOISE
AIR
HEAT

STATE OF WATER — LIQUID
GAS
SOLID

MATERIALS — COMPATIBLE
INCOMPATIBLE

THE FOUR ELEMENTS

PHILOSOPHY OF WATER — ACTIVE
PASSIVE

FEATURES — POSITIVE
NEGATIVE

SCALE

INFLUENCES BY ARRANGEMENT

CONSISTS OF
PUBLIC AND PRIVATE

CONTEXT OF PARTICIPANT

STATE OF MIND OF PARTICIPANT

SYMBOLOGY
AND ASSOCIATIONS

EFFECTS

RECALLS

SENSES — TASTE
TOUCH
SMELL
HEAR
SEE

INFLUENCES

INFLUENCES

INFLUENCES

RESPONSE OR REACTION

EXPERIENCE

HUMAN NEEDS
STIMULATION
VARIETY
CHANGE

MUST BE MAINTAINED IN THE
ENVIRONMENT

WATER AND NATURE
WATER AND NATURE
WATER AND MAN
WATER AND HUMAN INTERACTION
WATER AND HUMAN INTERACTION

BALANCE

MUST DESIGN INTO

COMPOSED OF

EXPERIENTIAL DIAGRAM