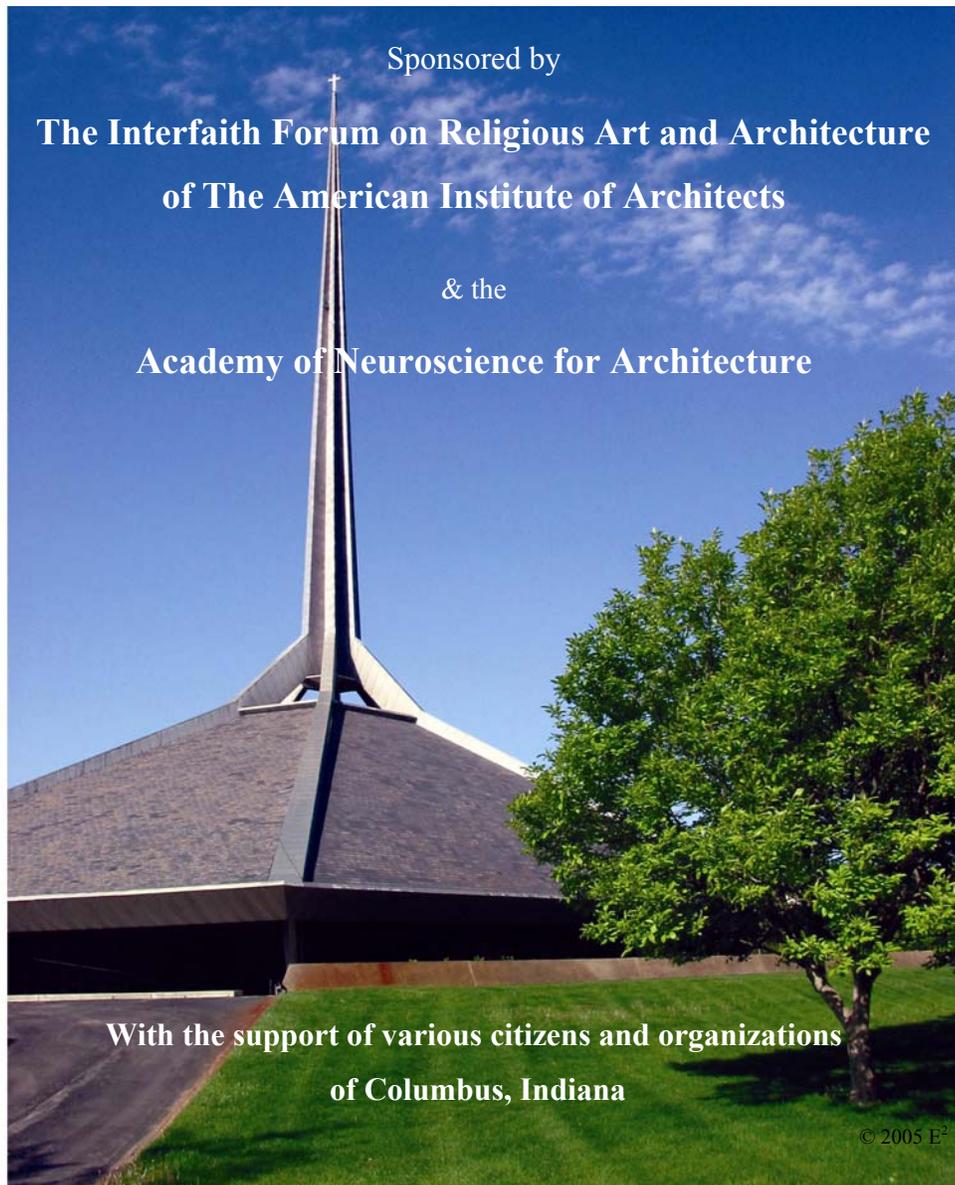


NEUROSCIENCE & THE ARCHITECTURE OF SPIRITUAL SPACES

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North Christian Church, Columbus Indiana, Eero Saarinen, 1965

Report by Eve A. Edelstein, Ph.D., Assoc. AIA © 2005 E²

THOUGHTS ABOUT SACRED PLACES AND NEUROSCIENCE

AN INTRODUCTION TO THE WORKSHOP

John P. Eberhard, FAIA, 2003-05 Latrobe Fellow of the AIA College of Fellows

Writing in the Journal of the Interfaith Forum on Religion, Art & Architecture of April, 2001, Claire Gallagher says: “Being transformed by a space is a powerful experience, especially when it is sacred space. It’s an architect’s dream to shape an environment that succeeds in allowing its participants to transcend the limitations of their quotidian lives and connect with a higher power. Designing such a space is one thing but, for the public, recognizing the power of such a space – where one’s contemplation becomes primary – can involve a lifetime search. What makes contemplative space work for its congregation? How does a design professional make that distinction evident to his or her clients? How can the designer help those without fluency in an architectural vocabulary to identify why a space makes one feel the way it does when it alters your state of mind? How can an architect help an individual to read the space and become more cognizant of the pallet used to shape it?”

While these are reasonable questions for an architect to ask, there are deeper issues lying below the surface of these questions – some of which could be explored by neuroscience. The issue of what makes “contemplative space” work for its congregation is the key issue for this workshop, if by contemplative we also include concepts such as “sacred”, “awe inspiring”, or “worshipful”. A congregation is an assembly of individuals. Each person will experience sacred places in different ways depending on a range of genetic endowments, cultural exposure, and previous experiences. What these individuals have in common is that their experiences are shaped inside their own head and then modified or reinforced by feedback from those with whom they are sharing the experience.

It’s not clear that the designer of a space can “help” those without fluency in architecture understand why they respond to a feeling of sacred. The response of each individual has been shaped first by their genes, then by their previous experiences, and to some extent by “training” they may have had in classroom discussions or lectures (or as Gallagher suggests by help in reading the space and becoming more aware of the pallet used to shape it). However, the fundamental response of humans to space is below the threshold of lectures. (See Fundamentals of Neuroscience and Architecture publication)

A VISIT TO COLUMBUS, INDIANA

Michael Crosbie, the editor of *Faith & Form*, in discussing some of the churches in Columbus, provides the following architectural ideas:

“At 60, First Christian still possesses a fresh and powerful spirituality. Eliel’s use of natural materials, light, asymmetry, and volume resulted in a space that is open to interpretation, a fresh canvas upon which the worshipper paints her own sense of the sacred.”

This notion of a worshipper “painting her own sense of the sacred” on a fresh canvas is a romantic one, but not possible in the sense implied. No one has an experience that is independent of the sensory information impinging on his or her brain at the moment of the experience. And, no one can create an entirely new “sense of the sacred” without dispositions from their past, controlling memories associated with the emotions generated by the limbic system, and the sub-conscious responses of the brain processes. This said, we do have the ability to creatively modify our perceptions in the process of having them by an act of will. In this sense, we do paint our own sense of the sacred on every sacred spiritual space we visit – not just the First Christian Church.

Later, Crosbie writes:

“At North Christian Church, Eero Saarinen brings us into the sacred inner sanctum by first inviting us to descend into the earth, below grade level, then slip under a levitating roof, and finally come up into the sanctuary as if rising from a tomb. We arrive at the very heart of this sacred space with seating radiating around it. The underside of the concrete roof seems to slide past the supporting walls and float above us... From a distance, this building is all about breaking the bonds with the earth. It sits within an sensitively landscaped field, with its roof-cum-spire floating above, an effect heightened by the roof’s deep shadow line.”

How does our visual system recognize this concept of the roof “floating” above us? Neuroscience knows a lot about the visual system and how the brain’s visual cortex is utilized in perception. We know that there are several separate areas of the visual system that process different aspects of the visual world. Visual area 4, for example, is largely utilized to recognize and identify color.

Crosbie’s intuitive notion is that the visual effect of the roof and spire floating above the sanctuary is heightened by the roof’s deep shadow line. As visitors to this building, we would all likely agree with this observation. But what would potentially be explained by research in neuroscience is “why this is so”. If architect’s intuitive understanding of design features like “deep shadow lines” could be explained in neuroscience terms, it would not remove the mystery of this experience, but provide an understanding for even more imaginative creations.

THE BRAIN'S PERCEPTION

At the level of architectural experiences, or more specifically the human response to places, it is clear that "space matters". The attributes of space from shapes, to color, thermal conditions, light (both natural and artificial), and sound are perceived by our sensory systems, processed through the thalamus and midbrain, and sent to the cortex to be recognized in a conscious way. All of this is done in microseconds.

The architect Frank Pitts has said, "If we truly knew what happens in the brain when humans experience space, and if we knew why they have these experiences, then we would be able (as architects) to approach design with a much deeper knowledge base, be creative at a another level, design something that really sings. Now, we make too many mistakes."

Dr. Andrew Newberg, M.D.,¹ of the University of Pennsylvania has asked:

Are we "hard-wired" for God?

The term "hard-wired" suggests that we were purposefully designed that way. Neuroscience cannot answer the question of purposeful design. However, what we can say is that the brain has two primary functions that can be considered from either a biological or evolutionary perspective. These two functions are self-maintenance and self-transcendence. The brain performs both of these functions throughout our lives. It turns out that religion also performs these two same functions. So, from the brain's perspective, religion is a wonderful tool because religion helps the brain perform its primary functions. Unless the human brain undergoes some fundamental change in its function, religion and God will be here for a very long time.

KEYNOTE ADDRESS

Reverend Dr. Robert Schuller

In the key note address, Reverend Schuller, suggested the possibility that bringing together science and religion offers potential for the development of understanding of our spiritual response to space. Robert Schuller's qualifications to speak on architecture, are reflected in his role as a former Public Director of the National Board of the American Institute of Architects, and as the recipient of the first AIA Special Award for Lifetime Achievement of Excellence as a patron of architecture. Three of the architects he engaged or commissioned to design prominent buildings on his campus at the Crystal Cathedral, later became AIA gold medalists, the highest award that an architect can receive in this country. Richard Neutra influenced Schuller with his concepts of bio-realism, which are related in a manner, to neuroscience. Phillip Johnson, designed for Schuller's glass Crystal Cathedral, and Richard Myer the International Center for Possibility Thinking. Koonce noted that all of these experiences enhanced Schuller's role in architecture, and he is now an honorary member of the American Institute of Architects.

¹ Newberg A, D'Aquili E, Rause V (2001). Why God Won't Go Away: Brain Science and Biology of Belief. Ballantine Books, New York.

Schuller recounted his discussions with Neutra, who questioned the nature of the ‘creature’ a structure is designed to accommodate. Human beings are designed “to communicate; to talk, listen, respond and share dialogue. To communicate well one must relax, even in tense environments, ... and we should look to the ... biological instruments that feed tranquility in a human” when considering spiritual architecture. Neutra considered the role of the senses, of sight and sounds that calm or create tension, and this played a dominant role in his designs.

Schuller’s key note speech at St. Peter’s Lutheran Church, was open to the Columbus public, and reflected on recent research in which advances in neuro-imaging demonstrate how the brain respond during spiritual experiences. “Now with neuroscience, I’m hopeful that ... we will uncover some of the secrets of the brain and the thinking patterns of humans that we have never understood before. Despite the complexity of the task to understand human behavior, Schuller encouraged the Academy and Workshop in their efforts to better understand spiritual responses to architecture.

Schuller quoted the words of Jonas Salk that are engraved at the entrance of the plaza that stretches to the horizon.

*“Hope lies in dreams, in imagination,
and in the courage of those who dare to make dreams into reality.”*



Salk Institute, La Jolla CA Louis Kahn, 1960

THE RESPONSE TO SPIRITUAL PLACES

Norman Koonce, FAIA, CEO-AIA 2004

We know that architectural settings can have profound effects on people. Most have felt a change in mood, contemplativeness, or even spirituality when encountering a particular place. Norman Koonce reminds us that for many, when we enter an inspiring space, “something inside us says God is here”. Similarly, Eberhard notes that secular spaces, such as the Lincoln Memorial or the Vietnam Memorial in Washington DC, can also impart intense spiritual feelings. The Academy workshop on spiritual architecture, challenged participants to consider the features and elements of architecture that create such effects.

Koonce charged the participants of the workshop to explore how all “of these important issues have effects on the nature of our worship experiences, one of the most valuable experiences that we have throughout our life.” Everyone has experience of architecture, they know its effect on the individual, and have opinions about what they like and do not like. However, knowledge of neuroscience is not so universal. “We must therefore achieve an understanding about the factors that are involved in creating spaces for worship, and as a result better inform the research that will take place in the future. We must relate research to the factors that are important for achieving this success in worship space.

*“The events of this workshop will one day have far-reaching effects
on our knowing ,our understanding, and our ability to achieve
the power of architecture to elevate and enrich the human experience.”*

*The purpose is not to derive a set of rules for the design of “better” buildings,
but to explore how the brain and mind respond to architectural spaces.*

INTERFAITH FORUM ON RELIGION, ART AND ARCHITECTURE

Michael Berkowicz, Assoc. AIA, President IFRAA 2004

The Interfaith Forum on Religious Art and Architecture (IFRAA), a knowledge community, of the American Institute of Architects, comprises approximately five thousand architects, designers, liturgical consultants, artists, and clergy, all involved in the design and creation of houses of worship or places of transcendence. The organization contributes to the publication of a quarterly magazine, and recognizes the best of religious art and architecture at their annual award programs.

Michael Berkowicz, President of IFRAA 2005, noted that “Experiencing Sacred Places” is not a new topic for his members. They “confront this issue with every new project”, and consider how sacred or spiritual space is experienced at annual conferences. However, the collaboration between IFRAA and “the Academy on

Neuroscience for Architecture in what we believe is a historically significant series of workshops”, is “exciting because we are indeed in the forefront of new frontiers.”

Upon hearing of the conference, some cautioned Berkowicz that this effort might be too reductionist, in trying to quantify what is perceived by many, as issues of faith. Berkowicz instead believes that, “indeed, the process of pursuit of knowledge, of inquiry, of discovery, is not and does not need to be reductionist.”

“On the contrary, it is in many ways an element in a continuum of a search, man’s search, for a clear understanding of the relationship with the world outside, and the Creator. I think that it is in this spirit that the workshops will take place.” He felt the workshop is significant on so many levels, by addressing the “constant struggle with the notion of how to define what is maybe not definable”, and by pursuing a greater understanding of what precipitates spiritual responses, and exploring common elements on a level that have not yet been addressed.”

ELEMENTS OF FAMILIARITY

Carol Frenning, President IFRAA 2005

Carol Frenning, posed the quest for a greater understanding of how symbolic elements affect one’s disposition toward a spiritual state, so that we acquire greater knowledge of our responses to “symbolic messages [that create] a very powerful tension in a worship space.”

The evaluation of space involves cognitive and emotional associations with memories and experiences. “Often, when a worship space is renovated, the congregants ask that it retains its existing image or feeling. It would be interesting to know how much one can take away, or what one can change, and still have it perceived as the same space. For instance, one could take all the chairs and tables out of this room, but when I come in this room I still know it’s this room, but there must be key features that one could change to change the nature of the place to appear different.

*I’ve worked on spaces where we’ve changed everything,
taken out pews, moved the alter, changed all the furnishings,
changed ceiling height and pillars,
and people still perceive that it is their same worship space.
They say “it’s our space, only better.”*

It would be interesting to explore which cues preserve the memory of a place; to understand the critical features that hippocampal place cell encode as the same place, so that the comfort with familiarity persists.

It would be of interest to architects to understand the key elements that define the threshold for a place, beyond which it is no longer considered the same.

SPIRITUAL ARCHITECTURE

Norman Koonce, FAIA, CEO-AIA 2004

Columbus is distinguished by its commitment to modern architecture. In 1942, Eliel Saarinen heralded the beginning of innovative design in Columbus with the First Christian Church, followed in 1954 by Eero Saarinen Irwin Union Bank (1954). The Cummins Foundation Architecture Program, other companies and church congregations, committed themselves to the enhancement of their community. They provided funds to pay architect fees for public buildings designed by an exclusive list of architects to be selected by the foundation. Many buildings now enhance the community including those designed by Harry Weese, Richard Meier, and I.M. Pei. The AIA ranked Columbus sixth in a list of cities (including Chicago, New York, San Francisco, Boston, and Washington DC) for their architectural innovation and design.

Koonce noted that the contemporary architectural approaches of the Columbus architectural program and the enthusiastic support from the Columbus Area Visitors Center and the town of Columbus, provided a rich legacy of spiritual architecture, from which the workshop could consider the nature of spiritual settings from the vantage points as architects, faith leaders, neuroscientists and educators.

*“I’m convinced that it is the wonderful laboratory of excellent architecture here
that has generated that spirit among you all.”*

“We think, as architects, that since we’ve been in churches, that we will know precisely how to design any church, any synagogue, any space for religious purpose... We’ve had experience.” However, in Koonce’s experience, every group for whom a religious space is designed is quite different. They each have their own personality. It is not the building that should constitute the personality, but the people for whom the design is being executed. The most difficult experience that I’ve had in designing buildings for religious purposes, is understanding what the perceived mission and the outcome for the particular group is to be... because many have never sat down to identify in specific terms what it is that they want to do. The mission must be understood and stated in a way brief enough to be remembered, clear enough to be written and shared with others, if it is to be the guideline throughout the design process. Critical issues concerning doctrines, rituals, and worship practices and aids must be accommodated in the design. We have an obligation to understand why we design as we do. It begins from an educational perspective, and hopefully from a spiritual perspective with those who are going to use that space. “

“The environment must express, define, accommodate, enrich and enhance the worship practices.”

FAITH PRACTICE

Reverend Ryan Hazen

A common vocabulary used in religion and the practice of faith was described to inform the Workshop's later discussions. In the broadest terms, it may be said that all who profess a faith have a deity or deities. In seeking a relationship with deity, a variety of worship practices, both individual and corporate are followed. In general, a vertical relationship exists with most deities, and a moral code guides the horizontal relationship with fellow human beings, which is part of faith practice in almost every religion. There is also a relationship to self, to achieve understand of one's own spirit or soul, and a great desire for inner peace, and self-realization.

"Let me close with something that I was taught in seminary. After spending four years there, I asked one of my professors if he could just tell me what I would be doing in ministry ... he told me that I should go out and comfort the afflicted and afflict the comfortable. Our buildings have similar roles that have to be constantly in tension. "Comforting the afflicted and afflicting the comfortable..."

"The architect's response to a theological premise seems to have great power to begin to shape the spiritual response."

DESIGNING SURPRISE

Michael Landau, AIA

Creation of an environment that is readily navigated can create feelings of comfort and a reduction in anxiety. On the other hand, the element of surprise can be a positive aspect of the design of worship spaces, and is often incorporated in architectural settings at great effort. For example, the North Christian Church creates a structured rational procession. The spire informs of the destination from a distance. The landscape is very regular and structured so that so that one proceeds to the main entry along a single path from the parking area. However, the design is orchestrated with the endpoint undiscovered. There is no indication of the experience inside of the building.

"Saarinen consciously made that a surprise."

On entry to the building, one comes into the lobby, and then moves down stairs before coming back up to the worship space. Thus, even though the form of the building, its symbolism, and its iconic classic presence are clear, the layout and structure of the middle space is unfamiliar. "I'm sure that was intentional, and wonder if it evokes a spiritual feel, resulting from the mystery or surprise of the arrival, that becomes a meaningful religious experience. I am curious if the positive response it evokes could be measured in some way."

THE HUMAN BRAIN

Reverend Patrick Russell, Ph.D.

Our brains comprise about one hundred billion cells, ten times the approximate population of the entire earth.

Perhaps the most complicated object in the universe, the anatomy of the human brain has been well studied over the years. Early in the 20th century, Brodman mapped the brain according to the different types of cells he observed, which varied from region to region. In modern neuroscience, we explore the manner in which these brain cells are networked together.

A deep question still explored by modern neuroscience, is to understand how and where the brain pieces together the basic perception of the world around us, without resulting in utter confusion from the vast detail collected by our sensory systems.

This is where our connection with architecture provides fascinating potential; in architecture we can control the environment. So in this day and age, science and religion can come together in some novel ways. It is an early point still, in the field of neuroscience, but clearly we have the tools necessary to begin to understand this fantastically complicated organ, and the beginnings of an underlying architecture for human consciousness.

*“The fact that the brain responds to God,
makes God no less real”*

IMAGING THE BRAIN’S RESPONSE TO ARCHITECTURE

James Olds, Ph.D.

Despite the many differences between subjects, and the individual differences in each brain, there may be enough similarity between people -- particularly between those who share a particular religious faith -- that it might be reasonable to hypothesize that the sequence of those brain activations might be similar as one processes a place of worship. Such findings might lead to knowledge that would enable spaced spaces to be designed in a rational way, to optimize such experience.

Neuroscience offers potential to inform about the cognitive process during a processional to a particular place, or possibly, the rhythm of feelings: familiarity, comfort, surprise, or awe, as one moves through architectural space. Imaging techniques may reveal the relationship of procession or higher cognitive experiences that are reported as transcendent religious experiences.

If exquisitely specific changes are made in the same environment, perhaps a change in dimensions of a narthex, that produce a change in brain activations, it could lead to some understanding of how the brain shapes its

activations in response to its environment. This would not lead neuroscientists to any deep understanding of religion, but might yield a useful tool for an architect seeking to optimize feelings, such as surprise or calmness, in a particular sequence, as a human walks into a place of worship.

Architects should be able to conduct very carefully designed experiments, that look at people's relative comfort or tension, within an environment, or most interestingly, to examine a syncopated rhythm of comfort and tension as one progresses through an environment.

“When considering the areas of the brain that respond, there is a tendency to think about the brain in terms similar to the 19th century practice of phrenology that assessed bumps on the head to define personality. There is a tendency in the brain imaging business to also use a kind of “neo-phrenology”. One imagines a pleasure center, a pain center, a God center, and perhaps a chocolate center. In fact, the way the brain works is very different from that.

“Our brain function is distributed, above all.”

We engage our entire brain, to think about something as simple as a red dot up on the ceiling, or something as complicated as the architectural environment in which we find ourselves. So we are not going to find a God center, or a center of the brain that is specific to North Christian Church. Instead, we will find a distributed set of brain activations across the whole brain, including the cerebral cortex, the midbrain, and the cerebellum which is important for movement, that together work like a symphony orchestra, to play a score that yields the music of our experience.”

THE APPLICATION OF SCIENCE TO ARCHITECTURE

Eve Edelstein, Ph.D.

There is a trend in church design which affords less attention to the entrance of the building. Instead, labyrinthine entries are created that evoked spiritual responses for some people. An interesting association might be observed with further exploration of the physiologic responses of the human labyrinths themselves, using techniques from neuroscience to explore our responses to architectural features.

Together, these studies indicate the complexity of brain processes that occur in response to spiritual states. Whether our brains create God, or whether God created our brains to respond in this way, is not the question here. What is under consideration is how architectural elements might dispose one to achieve a spiritual state. A profound observation arising from the ANFA workshop was that despite theological differences, the participants spoke of appreciation of *each other's* spiritual settings.

Spiritual experiences are consistent across cultures, time and faiths, suggesting a common core that may be reflected in the structures and processes of the human brain. Future studies should build larger samples and increase our understanding and interpretation of these fascinating experiments.

A great wealth of information exists in the medical and neuroscience literature that describes the multiple interactions of the brain when responding to the senses and memories. However, as our knowledge of the brain and mind is not comprehensive or complete, and given that each person is so different, generalization about brain processes seem daunting. However, our current medical knowledge reveals that careful science can lead to successful generalizations and hypotheses about how and why our bodies respond as they do. The scientific method, that prescribes careful experimental design, controlled testing, and rigorous analysis of results, has been a successful model for understanding a great number of complex physiologic processes. As a result, lives have been improved, and indeed saved, on the basis of these methods. In a similar way, the application of a scientific method, offers potential to create theories that increase our understanding of our responses to the elements of architectural settings.



Workshop discussions at North Christian Church, Columbus IN

WORKSHOP INSIGHTS

Participants (See Appendix)

The task of the workshop was to consider how differing perspectives could be brought together to determine key issues of relevance to the element of architectural design that predispose one to spiritual experiences. The participants were not as disparate in background as one might imagine. Architects included members who specialize in the creation of religious architecture and design. Scientists included those who had also undertaken careers in the study of theology or architecture. Clergy represented several religions including Christianity, Judaism, Buddhism, Hinduism and secular meditation. Discussions focused on common aspects of spiritual practice, though the participants brought their own experiences of spiritual architecture, and their individual spiritual convictions.

WORKSHOP DISCUSSIONS

Discussion began with several broad areas:

- 1) Elements relating to vision
 - Visual elements of the worship space
 - Individual parts that go into designing a space
 - Lighting, colors, symbolic and artistic elements
- 2) Elements relating to the acoustic environment
 - Auditory process of listening and hearing
- 3) All sensory elements including tactile & haptic stimuli
 - Comfort of sitting, standing, participating
- 4) Movement
 - Perception of movement through space
 - Movement during the worship experience
- 5) Orientation to space
 - The sense of being in a space
 - Harmony / unity of form, scale, proportion
 - Arrangement of elements and religious items
 - Entry that shapes the approach to worship
 - Wayfinding / spatial navigation
- 6) Cognitive & Emotional
 - Impact of comfort on the worship or meditation
 - Impact of literal and symbolic elements
 - Respect, reflection, awe, spiritual and sacred
- 7) Social and Cultural
 - Individual and corporate worship
 - Communication and community

SACRED & SPIRITUAL SPACES

*“Sacredness is more than just joy and awe.
It is an empathy, and sadness,
it is the human condition, with all of its emotions”
Reverend Ryan Hazen*

Is there an absolute sacred space? Is there a normal reaction that everybody has to a certain type of place, or space, that defines it as sacred, not that mankind made sacred, but humankind made with a sacred understanding?

The attendees of the workshop, having designed or participated in the design of what are consider to be sacred spaces, nonetheless found it difficult to define precisely what constitutes a sacred space. Definitions included places where people go to worship, or spaces associated with formal religions, or practice of religious rituals. In addition, spaces dedicated to the memory of an important individual within a community are often viewed as sacred. However, architecture is considered in the context of an individual’s experience and cultural history, and foreign visitor may not view the same place as sacred.

The distinction between sacred and spiritual spaces was also considered in discussion. In general, sacred was associated with a religious practice and spiritual with a feeling of transcendence or awe of a power greater than the self that may or may not be associated with formal religious practice. However, the definitions of sacred and spiritual spaces could be debated at length, yet would not address the question of architecture. Therefore, for the purposes of this paper, a sacred space can be defined as a place in which a religious import has been assigned. A spiritual space can be defined as any place (including sacred spaces) that evokes special transcendent feelings, or connection with something larger and deeper than oneself. In discussion, these terms were at times used interchangeably as they relate to the desire to design a place that predisposes the individual to achieve either state.

*“What we seek to understand is, in part, the sense of awe or emotion
that one is filled with upon entering a space that causes one to go quiet.
The “hush” that falls in sacred or spiritual settings.”*

The commonality, or perhaps universality of such sensations, begs whether such internal states reflect innate responses that humanity shares as a species. The emotional and physiological responses we recognize as awe, a quiet, or a transcendent feeling may indicate the common or innate cues that indicate that one is in a spiritual space. The workshop explored how neuroscience may be used to measure and understand such responses to architecture.

Reverend Hazen suggests that there are certain spaces, notably in Columbus, that seem to produce an almost universally response, independent of one's expectation upon walking into a building. "People walking in to North Christian, almost universally experience a sense of something transcendent, whether they're approaching it for an act of worship or not, and regardless of their religious convictions. The climb into the sanctuary space gives a sense of arrival, and being in the center of the building and under a large spire. There is such a sense of "place". It's the sacred cave. It doesn't happen in every building."

*"People cry when they enter North Christian Church,
even though they are not going to a service.
I took a Jewish lady into the church, and tears came into her eyes.
I wish to understand why."*

ENDING & BEGINNING

Buildings serve more than practical needs for space or comfort. The higher function of a place must be considered. The purpose of a classroom is to encourage learning. The purpose of a hospital room is to encourage healing. The purpose of a house of worship is to encourage spirituality. The interaction between architecture and neuroscience can lead us towards these higher functions and purposes.

*"Neuroscience doesn't have all of the answers,
but has matured to the point where we will be able to ask the right questions,
and perform meaningful experiments."*

EXPERIENCING SACRED SPACE

John Eberhard, FAIA

The workshop discussions considered the multiple cultural practices used across the world in the “deliberate act of seeking worship”, and the relationship of spiritual spaces to this experience. How does the web of consciousness spread across our existence, experienced by so many people with so many concepts of the divine, indicate that they are present in a sacred place? How can we measure this experience?

The measurement instrument I propose is not recognized by science, but neither was gravity able to be measured for thousands of years, or x-rays known to exist before Roentgen, or relativity able to be confirmed until the speed of light could be measured.

*You are the instrument,
and when tears well up in your eyes as you enter this space,
you are indicating that it is sacred.”*



Norman Koonce & John Eberhard

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