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EMERGENCE OF ARCHITECTURAL PHENOMENA IN THE HUMAN HABITATION OF SPACE

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Considering the impact on human beings and human activities of architectural decisions in the design of space for human habitation, this chapter discusses the increasingly evident and necessary confluence in contemporary times of many disciplines and human-oriented sciences, with architecture being the meeting ground to know emergent phenomena of human habitation. As both a general rubric and a specific phenomenon, architectural emergence is the chosen focus of discussion and other phenomena are related to it. Attention is given to the phenomena of architectural induction, emergence, and convergence as having strategic and explanatory value in understanding tensions between two competing mentalities, the global domineering nature-for-humans attitude, in opposition to the lesser practiced humans-for-nature attitude.

1. Introduction

What brought me to the subject of this chapter is my long-time interest in the occupancy and psychology of space. My approach to the subject is trans-disciplinary and systemic, in that I think in contemporary times, we have to converge many fields of study and understand their interrelations to know the subject. What I find particularly interesting and relevant are reciprocal influences between one dynamic body of disciplines associated with architecture, art, design, and engineering the construction of human dwellings on the one side, and another body of disciplines associated with psychological and philosophical thought, human creativity and productivity, and well-being on the other side.

Decades of research interest have transpired regarding the reciprocal influences between the two bodies of disciplines, but many would argue that the apparent marriage of architecture and psychology (to take one illustrative connection), through such a lens as environmental psychology[1] applied to architectural designs since the middle of the twentieth century, may have ended in divorce by appearances of our human settlements of the early twenty-first century.

From my reading of designers, architects and engineers, whose jobs are to design and construct the spaces we inhabit, in recent decades the development of our cities and living spaces constituting them have become subject to the same homogenizing and globalizing forces shaping our consumer products and human services. But for a minority of exceptions, overwhelmingly, the design and construction of human habitats have accompanied the industrialization, the standardization of the processes and products of production, and the blatant exploitation and disregard of the natural order and fabric of the physical world. From

our architectural decisions and following them, subsequent actions to organize and construct our living spaces, we have today the accumulation of the physical, psychological, and social effects of them.

Our intentions to live, collaborate, and perform in all kinds of human organizations do matter. We are subject to and at the effects of the spaces we occupy. This chapter is to discuss the relevance of trans-disciplinary and systemic approaches that may inform and three architectural phenomena that accompany the dwellings we occupy.

2. Two Attitudes

What we do to our surroundings and each other in the forms of architectural decisions have lasting effects. If we believe our surroundings are there only to serve us to fulfill our needs to live, communicate, work, and breed, we have what may be termed the *nature-for-humans* attitude. Following this mentality, we freely exploit and redesign the natural world to suit ourselves. This attitude is rampant and we see the results everywhere on the planet today. The opposite mentality is the minority view. Adopting this critical interpolation of consciousness, if we believe we are here to serve our surroundings in a sustainable fashion to fulfill our needs, we have the *humans-for-nature* attitude. It is a pragmatic attitude in which every action takes into conscious regard the consequences of the action on the environment. Unfortunately, only a small proportion of humankind appears to manifest this mentality at this time in human history.

We may increasingly question the dominant attitude, such that we may justifiably ask: What are we doing in the design and construction of our habitats to evidence that the humans-for-nature attitude underlies all that we do? Architectural phenomena and decision-making are foci to explore tensions between the two attitudes.

3. Human Activity Systems and Organized Spaces

I have been involved with systems research and sociocybernetics for three decades.[2] I have been particularly interested in what we may call human activity systems.[3] A group of persons forms this kind of system when we may emphasize as the most important defining quality of such a system to be the interactions among these persons. The interactions constitute the activity of the system. The system is not very visible much of the time, but only in our imagination. However, when the people meet in person, or communicate by means of technology for example, the system is activated, it comes alive. It is the communications among the persons that make the system visible. In sum, it is what we mean by a human activity system. It is common that we are members of many human activity systems simultaneously and during our lives.

The structures and places associated with human activity systems bring the subject matter of architecture to my research interest, because architecture I believe has a tremendous omnipresent influence on human activity systems.

Typically today, we are separated from the natural environments that were common for most of humanity several generations ago. Most of us live our lives in cities. We live and work in contained and well-defined spaces. Considering the longevity of human history, the change from agrarian and nomadic non-city ways of life to the industrialized,

consumer-oriented and modernized enclosed spaces of contemporary life has come fast. But an alternative way to think about it is to reflect upon the question: In what ways is the architecture of the life of a human being different today than two hundred years ago? This question is important, in that the architectural decisions of the past, as manifested in the dwellings we inhabit today, I submit have a profound influence on living, thinking, producing, and self-fulfillment.

The idea of organized spaces need not be confined to physical housing as we know them. Dwellings, such as schools, offices, and homes, and the physical meeting places within them, such as countertops, dining tables, and workstations, are but nodes of vast and complex networks of persons spanning the globe, made possible via our electronic media technology. Thus, we have various levels of complexity for human activity open to us to consider what organized spaces entail, namely both real and virtual spaces. In fact, such devices as the mobile phone have profoundly altered our idea of what an organized space is.

The interface between real and virtual space means that wherever we are in the physical world, there is increasingly present the potentiality of an invasive influential addition (radios, intercoms, cell phones, television and computer screens). These virtual avenues complicate our understanding of our inhabitation of that physical space, because activation of a medium can at any time compete as well as complement our activity in that place. Being paged or phoned may distract or facilitate respectively from current events. The interface has become extremely important to communication, so much so, virtual devices are aspects included in the architectural decisions to design and construct human habitats, for example, placements of recreation and media rooms, and electrical wiring. As a result, various technological media devices are evidence of extensions of human activity systems into virtual realms not immediately visible to us with the physical presence of a group of persons at the same time in the same physical location.

4. Architecture Designs and Organized Space

One form of expression of the design of space is architecture. To make a decision that organizes space is an essential element that creates architecture. To impose architecture in space is to organize the space for human habitation. Various organizations of space constitute architectural designs. This activity of ordering space, whether by design of the architect or the inhabitant, can lead to a range of consequences on human activity, from extreme control by others on the one hand to personal expression, happiness, and ornate displays on the other hand.[4,5]

Beyond the basics of the perceptual cognitive relations involved in constituting design, the art and innovation in architecture tend to embroider and enhance its minimalism. However, contemporary approaches tend to challenge this view as too limiting, as evidenced for example when inhabitants of modernist architecture remodel and innovate to make their dwellings their own. Such secondary effects illustrate that we cannot take sufficiently into account the emergent consequences of imposing a given architectural design on human beings. Defining architecture, from Vitruvius to present day, and keeping it relevant to human settlements are challenges informatively described in terms of urbanizing concentrations of humanity as complex systems.[6] Further, a provocative journey through the development of architecture

revisions the aesthetic of architecture and the primacy of beauty in contemporary terms of the pursuit of happiness that we can experience and manifest in the design and inhabitation of constructed spaces. [7]

5. Architectural Induction and Experiencing Space

It is a non-controversial fact, an existential given, that the space a living being inhabits has a profound influence on that living being. Where the biologist may point to primary examples of this fact by means of the phototropic and hydrotropic propensities in life forms, the anthropologist may cite the prevalence and placement of certain raw materials, infusing the artifacts of festivals, ceremonies and other cultural events, that are distinguishing markers among peoples. Interacting with the constituent make up of a living being, the environment is a determinant reality of that being. Arranging homes about a meeting place, limiting the heights for every urban dwelling, defining room sizes and their configuration to constitute the set of spaces of a dwelling are examples of architectural decisions. Architecture shapes and organizes the environment for human beings; *de facto*, architecture is a key environmental force.

As a human being, my principal point of reference for existence is my being. To survive, I think in this way and relate to all other persons, things, and places from my personal point of view, my vantage point. Thus, cognition, perception, psychology, and phenomenology are particularly relevant for me to explain, understand, create, design, construct, and change the spaces in which I live, work, and relate with other human beings.

At every moment, induction has much to do with my experiencing of the space I inhabit. What sights, sounds, smells, touches and tastes make my space of a place? The objects I perceive and my cognizance of their configuration about me constitute my ongoing experience. My experience is amplified because of my movement through space, which also means through time. My interactions with the objects are specific relations and my space a general relation, all of which are inductions. But those aspects of my experiencing of the space that may be attributed to decisions determining the overall design and organization of the space may be termed *architectural induction*.

By means of perception, cognition and action, we experience space in chiefly four ways: 1) in a fixed body position, we sense what is; 2) we senses what is, while the body is in motion; 3) we interact with persons and objects that are what is; and 4) we integrate senses and actions of what is from multiple separate body positions. This internal frame of experiencing is an artificial articulation of course, because we are doing all four simultaneously most of the time.

What becomes experience of a given space is determined in part by the internal frame and in part by the architecture of the space we occupy. The architecture induces and the frame influences. From the resultant confluence, experience emerges.

6. Framing and Architectural Phenomena

Framing is a natural inherent perceptual-cognitive process of being human (Fig. 1). To line out an area of space is to frame. It is to make separations in the space, to break the space into parts. What is included

and excluded in the frame is an act of profound importance having major consequences in regarding architectural induction and emergence.

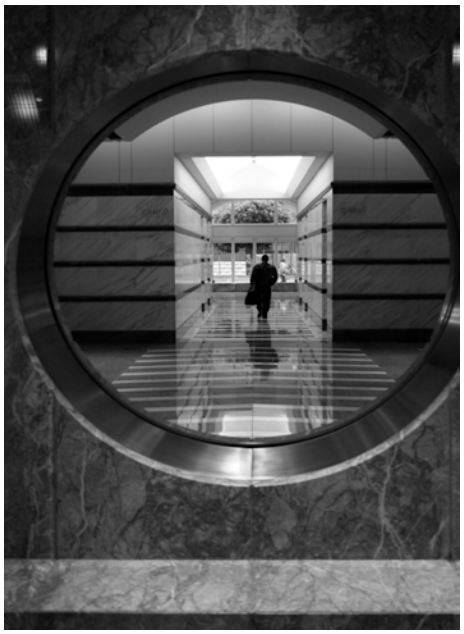

Fig 1. Framing reconnects separated spaces.

One excellent example of framing in architectural design is making the window. The window is an elementary frame, depicted as a square, rectangle, triangle, circle, oval, or other such intended opening in what is otherwise a pure division of space. Let us consider the square window. What does each square window of a building, seen from a given vantage point communicate? What is its inducement? When a square is made as a window, doorway, recess, or projection, what is induced? Consider some possible relations, not as facts, but only hypotheses: The open square is separation, openness, or possibility; the double square is solidity, stability, or strength; the black-and-white or colored square is separation; the square with crossbars is confinement, imprisonment, or control; the square of squares is separateness, security, or safety; and the square in a circle is fluctuation, alternation, tension, or creativity.

Consistent with a phenomenology of experiencing space, the examples above are to illustrate the relevance of the experience of the beholder and occupier of the space, regarding the induction of the frame, in this case the square (like the window frame) and the consequent emergent elements of experience.

7. Arena of Inquiry Influences Architecture

Inquiry is often discussed in terms of paradigm. We may also realize it is another example of framing. Philosophically, an arena of inquiry (paradigm) comes with an epistemology (knowing), ontology (being), axiology (set of values), and methodology (means of conducting inquiry). We want to know the space. There is knowledge of the place. We can experience the space by being in it and that is not the same as knowing about it. What we see, hear, touch, smell, and taste while in the

place naturally spawns meanings, that is, interpretations of what we feel and think about the place. We bring to the place prior experiences that can influence and bias the framing. There are many ways we may value the place or not. And there are ways to explore, alter, and work the place into what we want or need it to be. But there usually are important elements to respect, preserve, and honor in the place. Finally, there are means to redesign and reconstruct its spaces.

An arena of inquiry is comprised of the basic assumptions and ideas that define the decisions and practices leading to the architecture. As an arena, it influences the work and process of the inquirer, in this case, the architect who designs, the builder who constructs, and the human beings who occupy the space.

When the architect adopts and works within one arena (paradigm), it is a way (frame) of thinking that influences and guides, but also limits thinking. But it is necessary to have to enable the discipline to exist. For the disciplined inquirer, in this case the architect, the frame (paradigm, arena) provides the rules, conceptual relations, principles, and accepted practices to make the architectural decisions required to compose and present the organization of space for human habitation.

The paradigm scheme that I find informative is close to one published recently.[8] Paradigms are described to study effects of organized space, and I add a fifth (Systemic) to discuss paradigm for a more inclusive application to architecture. In brief, working within the Functional paradigm, we would be preoccupied with whether the architecture is useful, efficient, and organizes space as intended. Does it work? To design within the Interpretive paradigm, we emphasize how people feel in the space, how they experience it. Is it reflective and enlightening? In the Emancipatory paradigm, we organize space to empower or subdue, liberate or imprison. Does the architecture free or control its occupants? To work in the Postmodern paradigm means to replicate and mimic the diversity and creativity of human beings who are to occupy the space. We would have a major interest in whether the architecture is heuristic and pluralistic, or delimiting and homogenizing. Finally, working within the Systemic paradigm, we would look for ways to combine, balance, configure, and complement the best features of the other paradigms when applied to a particular space. The broadest paradigm would be multi-methodological rather than restricted to one paradigmatic frame. The Systemic paradigm would be most akin to trans-disciplinary architecture, discussed later in this chapter.

Given the variety of dwellings we see in our cities today, I find meaningful the following relations between paradigm and the kind of organized space: Functional affiliates with the factory to make a consumer product, Interpretive with the socializing place of a restaurant, Emancipatory with the health spa to promote human healing, Postmodern with the communal park square to support the social diversity of the community, and Systemic with combinations of the above. To illustrate this progression take the application of school architecture. During the industrialization of European and U.S. American continents, our public school systems rose for the populace as places to house our children while parents worked in factories. It is often argued that education then was more about control and socialization than learning and personal development. The design and construction of schools served former ends. Of course, these out-dated functionalistic ideas cannot serve our present conditions and needs, even though the idea of containment in a space

called school appears of enduring prevalence still. The architecture of schools has advanced extremely to explore the design and construction of more open environments,[9,10] in fact to the extreme of considering the community the learning laboratory that once was the classroom. Learning is continuous, life-long, and increasingly augmented by the Internet. Places of learning are confined no longer to metaphors of the one-room schoolhouse, bricks-and-mortar campus, and local geography.

To decide the inclusion and placement of a rectangular or oval window in a wall is a prime element and architectural decision. The decision is not divorced from the frames we bring to the act, but to the contrary, partly induced by them. To have familiarity with the arenas of inquiry in advance I contend invites more informed choices and a higher level of awareness to make the architectural decisions required to design, construct, and alter human habitats to fulfill the range of human interests represented in the arenas.

8. Architectural Emergence

The complexity of framing described in the two previous sections becomes even more profound when we take into consideration that the relations among the elements of the space we perceive changes continuously and multiple paradigms apply. Note the relations enrich and compound experience, for example, when we smell the changing odors walking through a garden (the passage of the body through space), and when sitting we see shadows moving on a wall through the day and feel rising and falling temperatures over days (occupying the same place through time). We are both instruments and recipients of change.

> As we move through spaces, the body moves in a constant state of essential incompletion. A determinate point of view necessarily gives way to an indeterminate flow of perspectives. The spectacle of spatial flow is continuously alive . . . It creates an exhilaration, which nourishes the emergence of tentative meanings from the inside. Perception cognition balance the volumetrics of architectural spaces with the understanding of time itself. An ecstatic architecture of the immeasurable emerges. It is precisely at the level of spatial perception that the most architectural meanings come to the fore.[11]

As every point of view gives way to the spatial flow of experience, an architecture emerges (Fig. 2). It is inherent in the existent manifest experience of the space occupied. It is a resultant architectural induction.

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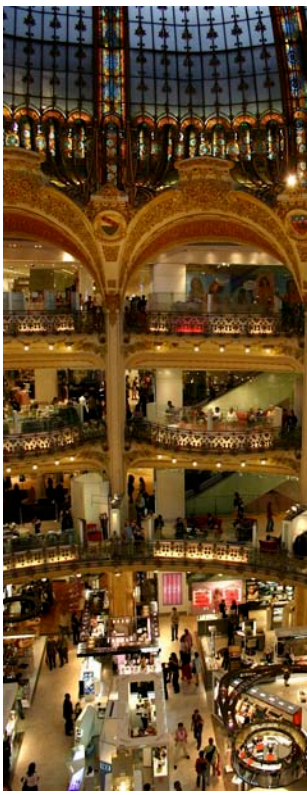
Fig 2. Multiple paradigms apply in organizing the spaces of this Parisian indoor emporium for the intended architectural induction to promote emergent behaviors expected in a haven of consumerism.

There will likely be an architecture associated with the place one occupies, whether an office, town square, restaurant, or home. But we can also state that the idea of architecture is emergent from the personal experience of the place. That emergent phenomenon from the person is a valid phenomenon. Furthermore, it is justifiably legitimate to name the architecture of one's experience and communicate it to others. This personal reference point and name of the experience are to be distinguished from the name architecture that is likely associated with the person and design used to construct and organize the space prior to human occupancy. The personal architecture has greatest relevance.

From a phenomenological point of view, the totality of organized space experienced personally constitutes the experiential manifestations of consciousness. When lights, sounds, odors, and objects pervade a space, the space, as we experience it, is as much about what is there as what is not. The following are illustrative paired qualities of experience that may become descriptors of our experience of a particular place: Empty-full, present-absent, visible-invisible, loud-quiet, black/white-colored, soft-hard, hot-cold, and strong-weak. They represent dimensions of experience, along which we use language to label and communicate experience to others. What is the sight, sound, smell, touch and taste of the space of the place? But descriptors need not be restricted to the sensorial. More complex constructions occupy our experience of space. Are the materials synthetic and artificial, or natural? What and who occupies the space? What interactions among the occupants of the space add to our experience of the place? Our perceptions and cognitions of



sounds, lines, shapes, colors, odors and contacts become forces of influence. One may read, reap, interpret, and make meanings--the essential structures and contents of consciousness of the place. But of great relevance is the relational nature of the space to our perceptions of the space and meaning attributions that constitute the experience we reflect upon, report, and discuss with others.

The particular qualities that describe our experience in the most rudimentary and essential respects are emergent phenomena constituting the experience. They are examples of emergence. Regarding those aspects that stem from decisions determining the overall design and organization of a given space, we may use the phrase *architectural emergence* to refer to them.

The phenomena of induction and emergence are complementary processes, like the two sides of the same coin. They are evocations of our existence in context. Which one to highlight is a matter of emphasis. We may focus on the inductive nature of experiencing space. The impact of the place is described in terms of induction. What flows from the habitat to the occupant, so to speak? What is the induction? Alternatively, we may focus on the emergent qualities of our experience of the place. When in the place, what comes forth to become the foreground of consciousness? What is emergent? Generally speaking, we may refer to the two phenomena as the architectural induction and architectural emergence of the organized space, respectively, when we can know the key architectural decisions involved to design and organize the space associated with the induction and emergence. To illustrate succinctly, placement of a stone arch at the entrance/exit joining two spaces (rooms, courts, passages) has an induction/emergence different from that of a heavy horizontal beam.

9. Systemics of Architecture, Emergence, and Attitude

Put people together in a place. Organize the space by means of architecture via the architect, the occupants, or both. After some time, their interactions will likely induce a human activity system. In other words, a social system of some kind emerges, a human activity system defined not simply by the collective beings per se, but more definitively by their interactions. The nature and qualities of the interactions make the system what it is. But it is important to include in our thinking: The architecture of the space is part of the system. It induces to influence human interaction, there by participating in the emergence of properties that come to characterize the system.

Given many interactive relations of the people with the environment and each other, concepts and principles applied to describe the designing and organizing of the space for the human beings who occupy it may be termed the *systemics* of its architecture, that is, those systemic concepts and principles applied to and active in that context.

To illustrate, we may imagine a particular dimension of our experience of place (hot-cold, small-large, still-windy). If we select one element too extremely and focus on it, the whole may go out of balance with the other elements. In other words, a strong force or energy from one element can go so far as to obliterate the presence of others in the space. One element may overshadow the others, like one large tree blocks the sunlight that would nourish the other trees. We witness this spectacle entering a city square or living room of a home to immediately

notice a towering building or large stoned floor-to-ceiling fireplace, respectively, with all others entities occupying the space organized around it. The size and intensity of the dominating entity (Fig. 3) tends to command and hold the attention, block out, or mask other entities. Whether the space is being organized in genesis, such as the design, plan, and construction of a new building, or the built space altered, such as remodeling the home, there are architectural decisions being made. The elements that dominant the space, the emergent qualities, may become particular inducements known to and characteristic of that architecture. The kiva (half egg-shaped oven-like fireplace), for example, has acquired this distinguishing status in the homes of Santa Fe, New Mexico.

Fig 3. The office building skyscraper dominates the cityscape.

As to the systemic nature of architecture, we may wonder what overriding principle influences our thinking to make the architectural decisions by which the prominent qualities emerge. Is ideal architecture balance? Once we have knowledge of the emergent elements of a given architecture, is the task to find the balance of the most favorable inducements for human habitation? Similarly, we may ask: Is ideal architecture integration of those elements known to promote well-being? Of particular relevance is that the emergence of any element to dominate the experience of the occupants of the place may lead further to concerns of human betterment at one extreme and human detriment at the other extreme. Which attitude (nature-for-humans or humans-for-nature) does the hallmark elements of an architecture support? What hallmarks a “green” ecologically sustainable architecture?

The thesis developed in this chapter is that the spatial organization we impose through architectural decisions is an inducement in the emergence of the human social systems inhabiting the space. It merits testing to seek evidence for and against it, and whether it might be applied in constructive ways for human betterment. Given current concerns over survivability, it would also support shifts in consciousness from the presently dominant to the advisedly sustainable attitude. Our understanding of this relation seems both obvious and critical to the best of what architecture has to contribute. It should be generally known what inducements favor sustainability, well-being, productivity, and peaceful cohabitation.

There is a powerful feedforward loop prominent in the systemics of architecture in its integral relation with design and technology.[2] Civilization progresses by accretion through novelty, diversity, and necessity.[12] We benefit from the discoveries and achievements of those who precede us. Through our immediate activities of design and construction involving feedback loops, we learn what works and what does not. The process is very pragmatic, requiring invention, innovation, and refinement; practical application; and extensive repetition by trial and error until efficacious action becomes reliable and sustainable. Thereby, we come up to the challenge of what is needed to solve the problems of our day. In the case of architecture, the performance, maintenance and endurance of the spaces we design and occupy come under our scrutiny. Ideally, our evaluations should lead over subsequent generations to increasingly superior dwellings in their construction,[13] and our healthy living and experience of them.[7,14] As applied to the systemics of architecture, the myriad of feedback loops of human activity systems, coupled with the more macro feedforward loop linking generations are at the heart of second order systemics.[15] It is from the latter that architectures should emerge to apply to the present challenges we face.

10. Emergence of Trans-disciplinary Architecture

One implication from the design, organization, and construction of the spaces we inhabit is that the emergent qualities bring preeminent importance to the trans-disciplinary nature of architecture. It follows naturally from the systemics of architecture applied to a given space, because making an architectural decision increasingly has become a more complex endeavor. Some areas to consider are cultural elements; recognition of the unique qualities of indigenous materials; imaginative perspectives; knowing physical, physiological, psychological, social, and economic effects of the architecture on living beings; familiarity with current environmental conditions and fauna; knowing the perceiver’s angle of vision; the history of the place; and preconceptions of the inhabitants. All of these areas have a potential for inclusion in a particular architectural decision. Bringing a set of them together to define in part a given architecture recommends consultation with a range of experts, disciplines, and knowledge domains beyond the principal training and experience of the architect. Thus, to ensure successful completion of a project, the situation commands a systemic approach to organizing the space involved. A confluence of disciplines becomes important to consider and likely necessary, in order to design both conscientiously and consciously with the humans-for-nature attitude. This means a trans-disciplinary approach to making architectural decisions.

This chapter has considered architectural phenomena and some aspects of architectural decision-making that would recommend organizing space for human habitation based on systemic and trans-disciplinary approaches. But articulation of the aspects often merely introduces key elements comprising the experience of those who made the original architectural decisions, and later those who occupy the place. From the relations among elements, specifically those that stem from various fields of study and disciplines of human experience and inquiry, we may see *trans-disciplinarity* emerge. Although matters of economics, physical design, perceptual cognitive relations, and engineering of

structure are critical to applications of architecture, there are also psychological, socio-cultural, historical, and contextual influences to be included. For a particular place of human habitation, too much weight given to one aspect may have adverse consequences on the other aspects specifically and the entire space generally. Again, we must question the main principles driving the architectural process, such as balance or integration, mentioned earlier in this chapter.

11. Summary and Conclusion

Our experience of space influences our state of being, relationships with others, home and work life, and connectedness to context. The name *induction* is given to label this phenomenon. Induction is a mediating construct to suggest critical relations between architectures and human activities. The importance of the consequence of induction is termed *emergence*, another phenomenon defined as a quality, feature or characteristic of human interaction with the environment and others associated with and intentionally attributed to its inductive influences. Once the influences are known, their intentional confluence in making architectural decisions is termed *convergence*. When applied to developing human habitats architectural induction, emergence, and convergence may become advantageous to promoting mutually beneficial humans-for-nature relations.

The three architectural phenomena can have strategic and explanatory value to detect and understand the consequences, respectively. The presumption is that our heightened awareness of these phenomena and the *framing* we apply to decision-making may better enable us to perceive acutely the influences of organized space on our well-being, human relations and activities; evidence the multiple systems of which we are part; and design more efficacious spaces for human beings and human activities.

This chapter has been written with *systemic* and *trans-disciplinary* importance being given to the imposition of architecture in a place. Sensitivity is imperative to the phenomena of induction, emergence, and convergence. Well worth studying are the architectural decisions having relations to architectural designs and consequential evocations. If we are to become more appreciative of and caring for our environments, and thereby have a quality of life, it is paramount we understand and apply as wisely as possible these relations.

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