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Evolution as Paradigm In

Architecture and Urbanism

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Introduction

A growing a number of architects and urbanists are conducting a careful re-examination of traditional design theories that were swept aside, at least for the most part, before the middle of the twentieth century. Those older, now deposed, theories of design were based on tradition and took as their starting point the long evolved practices and forms of architecture and urbanism that in turn served as a basis for subsequent invention. In other words, the older design theories regarded the history of architecture and urbanism as an organic process, one from today's point of view we may see as analogous to evolutionary processes in biology.

The architecture of American towns and cities that has come about primarily since the 1940s is based upon a set of theoretical premises known as modernist theory. Modernist theories, or "modernism in architecture and urbanism," reached maturity after the beginning of the twentieth century and achieved an apogee of application, at least for the most part, in the late 1950s. This is to say that there are two distinct sets of theories regarding design in architecture and urbanism: traditional design theories that prevailed until a time in the early twentieth century, and modernist theories thereafter. Of course there was a great deal of overlap in the two approaches to designing, but modernist theory today, in one form

or another, predominates our thinking about architecture and urbanism and by now has come to characterize much of the built environment, both in the U.S. and throughout the industrialized world.

At a fundamental level, the differences between the two ways of designing may be described as the differences between accepting tradition versus an ethos of re-invention each time a new building is designed. The modernist approach is based on an ideal derived, at least superficially, from science and technology, while the traditional approach looks to the incorporation of "natural" processes as well as innovation and invention. The current re-examination of traditional theories has come about in response to problems that have arisen in architecture and urbanism that are seen to have been caused in the first place by the abbreviated and abstract character of modernist theories and the design processes they fostered.

Comparison of the Two Approaches

The modernist approach is directed toward re-invention each time a new building is designed as a means to the integration of emergent, state of the art technologies, as well as to accommodate unprecedented programmatic (functional) requirements and changing social mores. The theoretical underpinnings of modernism came from a set of assumptions that presumed "true invention" could only take place after tradition had been effectively swept aside. In this sense, modernist design methods were established at the onset to effect a distinct and purposeful departure from tradition. Starting all over again with each new building was intended to insure that design criteria were as objective as possible, set in sharp contrast to what was regarded as the mythological and arbitrary criteria that guided traditional design. The moral rationale for modernism in architecture and urban design, according to its academic, theoretical underpinnings, had to do with providing a hygienically cleansed and spiritually as well as a politically egalitarian environment for human habitation. Some of the more obvious results were "social housing" as it is called in the U.K., or "project housing" in the U.S., characterized by sterile slab and tower apartment buildings set in an open park like setting, with each building conceived from the inside-out and placed as a free-standing object in the landscape, free of any direct association with other buildings. Buildings themselves were conceived as visual expressions of their own programs, purged of the historical and symbolic references to earlier architecture that characterized buildings based on traditional design theories. This produced an urban condition that stood in stark contrast to inherited traditional urbanism, where corridor like streets, defined by continuous party-wall buildings created clearly structured public space, as though carved out of a solid fabric of interconnected buildings that in turn formed a common façade to the public realm.

Other, less intentional manifestations of modernist theory may be seen in the suburban expansion of cities. The traditional neighborhood quickly gave way, especially in the U.S., to the suburb where commercial and institutional amenities (grocery stores, cafés, convenience shopping facilities, and institutional entities such as schools, libraries, churches and the like) were no longer within walking distance from anyone's residence, but instead became separate entities designed to be reachable only by private automobile. In addition, the mixed income and social class distribution of the traditional neighborhood gave way to one-income-class suburban tracts and, eventually, the exclusive "gated community" that excluded both commerce and variations in income class.

Because modernist theory encouraged that each building be designed from objective and often predominantly quantifiable criteria, with the resultant form in response to specific programmatic requirements, designs tend to preclude reference to setting, site, and broader geographical and sociological factors drawn from the common wisdom and ongoing customs of a given community. By contrast, traditional building design, because it evolves along with the city, region, society, and civilization of which it is a part, takes into consideration much that cannot be consciously accounted for by a single designer. Thus, traditional designs tend to be specific to place, especially in contrast to modernist designs that often appear indistinguishable as to location. The most obvious examples are high-rise buildings, for instance in Hong Kong, New York, London, Johannesburg etc. They seldom reflect any regionally inspired characteristics. This suits both the internationalization of the technologies responsible for their form, and the uniform nature of trans-national corporations that such buildings are designed to accommodate in an age of economic globalization. Traditional designs, by contrast, include what went on before by virtue of having been based on an existing model prior to the application of new programmatic and other criteria in the design process. The actual process of selecting a model or prototype and its subsequent translation to a new design has been referred to in traditional theory as "translation" and "transformation." Again, the difference between reinvention as encouraged by modernist theory, and translation as invention based on tradition, is at the core of the difference between the two ways of designing.

Nature as Paradigm

Traditional design methods, although they range from folk traditions passed on from father to son, to highly complex and intellectually challenging theoretical constructs based on Greco-Roman classicism, or long evolved regional expressions of architecture and styles of life, may be characterized in general as evolutionary in character. That is to say, they are either consciously or unconsciously supportive of a continuous evolutionary process, analogous to evolutionary processes in biology. Because architecture and urbanism are cultural artifacts as well as technological ones, truly comprehensive design requirements are necessarily more complex and subtle than a linear engineering-like process can possible take into consideration. Biology, of course, works similarly, effecting change through incremental processes while retaining that which remains successful among inherited traits from earlier environmental adaptations. The analogy with biology provides a conceptual framework for designing that recognizes change as a continuous process and assumes that when past invention is an integral part of new designs, this helps to ensures that the new accommodates traditional needs along with emergent and unprecedented ones.

Nature analogies have always been a part of traditional design theories. Examples are numerous, but I will cite only a few. Western classical architecture, inherited from Greco-Roman antiquity, included as integral to its theoretical precepts, numerous references to natural forms and natural processes. For instance, western classical architecture was based on anthropomorphic principles. Supporting elements such as columns, piers, and pilasters, in relation to that which they support, were likened to very tactile human experience of weight and lifting. Proportion, composition, and symmetry were all likened to human experience and proportions of the human body as well. The famous "Universal Man" or "Ideal Man" drawing by Leonardo daVinci was drawn in response to a description by the first century BC

Roman architect Vitruvius who offered it as an example of how human form, proportions, movement, and innate sensibilities are used to guide the design of buildings, thereby producing harmonious conditions among all the parts of any building, what ever its size, scale, or purpose. If one goes back far enough there are even more direct analogous relationships to be found in traditional building design. The houses of so called primitive cultures are rife with references to nature. For instance, in the lodges of the natives of the American Pacific Northwest, the four corner posts represented the four quarters of creation, while the smoke-hole at the center of the roof symbolized the shaman's access to the wisdom of the spirit world. The hearth beneath the smoke-hole provided a place where the axis of the world resided during certain religious rituals conducted within the confines of the lodge, and special geometric properties of the alignment of the lodge itself with ocean, beach, and forest were filled with symbolic significance.

Examples such as these fade from cultural memory, but the vestiges of their former critical presence tend to remain so long as the new follows faithfully on the heals of what went before. As the production of architecture and urban form becomes more abstract—through the medium of industrialized building techniques, bureaucratic governmental legislation such as building codes and zoning laws, and the complex economic and mechanized construction processes necessary to erect today's buildings, as well as the effectiveness of modern buildings in separating us from nature by providing us with perfectly balanced heating and cooling systems, artificial lighting and so on—all provide further separation from an awareness of the natural world upon which we ultimately depend whether our realization of it is a palpable one or not.

Evolution as a Conscious Guide for Designing

The movement to reintroduce classical and traditional architecture, and the associated movement to reintroduce traditional urbanism, are beginning to gain a strong foothold today in the U.S. and Europe. Reintroduction of traditional urbanism is largely associated with an organization known as The Congress for the New Urbanism, and with a movement known as Smart Growth. Each looks back to traditional neighborhood organization, then modifies existing models to suit contemporary circumstances, especially the automobile and mass communication, as well as current construction practices. As for the design of individual buildings, a growing number of architectural firms have begun to specialize in traditional building design, based largely on the use of models that preceded the Modern Movement. Most traditionalists are driven by the recognition that highly individualized, idiosyncratic, and abstract methods of designing necessarily preclude countless important characteristics of buildings and urbanism that are present in long evolved practices and reliant technologies. A further but no less important rationale has to do with the environmentally destructive character of most modern urbanism, which takes up enormous expanses of land for highways, parking lots, and large lot suburbs. For instance, New Urbanist neighborhoods built since 1993 tend to look very much like pre-World War II neighborhoods, that is, before the advent of big box shopping centers, connecting freeways and other post war planning practices that changed the face of American urbanism so radically.

Conclusion

Popular nature analogies are more often than not, nostalgic, irrationally romantic, or simply misleadingly imprecise in scientific terms. However, nature analogies developed under the scrutiny of disciplined theory, and always subject to critical examination, hold the potential for fruitful application. When it comes to understanding the human condition, precise prediction, one aim of theory in physics or chemistry, is out of the question. Evolutionary theory from biology, however, offers a general pattern, rigorous in its derivation, but open to interpretation as well as to challenge in the details of its operation.

The role of architecture and urban form—that is, the built environment—in the health of human communities, can only be reliably understood in retrospect in much the way evolutionary theory accounts for characteristics of species and the relationship of species to one another in a healthy ecosystem. Modernist theory, if compared to evolutionary theory in biology, would be like supposing one could reinvent an organism with the complexity of nature's own. On the other hand, while certain detailed aspects of an ecosystem, for instance, may well escape human accountability, their presence we understand to be integral to the pattern we seek to understand. Architectural critic for the Boston Post, Robert Campbell, has referred to systematic reinterpretation of the tradition-based approach to design as revealing an approach that involves "innovating on the edge of tradition." The analogy with evolution, I believe, can provide a guide to designing that incorporates scientific rigor without strangling the essential cultural and human priorities vital to successful design in architecture and urbanism.

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Author Biography

Norman Crowe is Director of Graduate Studies in Architecture in the School of Architecture at the University of Notre Dame. His research and writing is focused on environmental issues as they relate to architecture and urbanism, and recent in-the-field projects have included urban design studies and charrettes in the U.S., Portugal, and Lebanon. He is author of Nature and the Idea of a Man-made World (MIT Press, 1995) and co-editor of Building Cities: Toward a Civil Society and a Sustainable Environment (ArtMedia Press, 2000, with Richard Economakis and Michael Lykoudis). He is currently working on a book that explores the idea of permanence in the built environment, its social and psychological implications, and in relation to the sustainability of resources.

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