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THE BUILDING ENVIRONMENT

A Brief Study of Architecture's Influences on Human Survival

By: James Piacentini

If we view the progression of human history through the lens of technology, certain institutions immediately emerge: fire, language, agriculture, the wheel, the internet, and so on. The ability of humans to define and divide physical and ritual space through architectural intervention, however, has been a critical yet under recognized element of nearly all of our species' developments and engagements, including the creation and utilization of its major other technologies. Architecture, and the built environment at large, can be viewed as a developmental cocoon, within, and through which social, political, and cultural identities are expressed. Through an exploration of architectural activity within an historical and scientific framework, this paper examines the social, political, and cultural motivations which have defined the influence of environmental design, supporting the argument that the built environment has been not just a result of, but also a critical agent in the development and preservation of our species.

I. Introduction

“Architecture, of all the arts, is the one which acts the most slowly, but the most surely, on the soul.”¹ Nearly forgotten French author and thinker Ernest Dimnet was not an architect, but his words, perhaps better than any others, express those intangible qualities unique to built space: allowing for the expression of the human condition, the value of the human spirit, and the will of creative cultures in distinct and fantastic ways. Architecture’s weight, its ability to define and confine, construct and constrict, and frame and be framed by light, space, time, and humanity allow it to act as an agent of creation. Its ability to engage both passively and actively with an individual’s experience help to create and develop the social, political, and cultural contexts which define the world into which architecture and its inhabitants are born. The built environment, perhaps more so than any other tangible result of human creativity, possesses the ability to either disenfranchise or democratize through dismantling or erecting barriers to social interaction, political influence, and cultural expression, and through shaping the physical and emotional relationships between these contexts and those who inhabit them. In other words, architecture’s role in our world is not just a reflective expression of the human experience, but also a reflexive actor in the creation, development, and discussion of the human experience. Exploring this brand of interaction and understanding the agency of the built environment in the development and survival of our species are the primary subjects of this essay. In order to fully appreciate the value of these interactions, and in order to understand more accurately the influences architecture has on human society, we must investigate the historical evolution of architecture as an influence on the human condition and analyze the social, political, and cultural effects of the built environment.

II. The Social, the Cultural, and the Political

The primary conviction of this paper is that architecture and the built environment are not only products of, but also engagements with their contexts. Built spaces are agents in the creation of the social, political, and cultural contexts within which the physical forms of design exist. In other words, the built environment created us, just as we created it. By no means all-encompassing and neither mutually exclusive nor strictly finite, the social, political, and cultural are often intermingled and interdependent. In the context of the following discourse, we will define them as such:

A. Social

Using Allport’s definition, social psychology seeks “to understand and explain how the thought, feeling and behavior of individuals are influenced by the actual, imagined or implied presence of other human beings.”² Social elements incorporate relationships between individuals or groups of

1 Ernest Dimnet, *BrainyQuote.com, Xplore Inc*, accessed August 11, 2013, <http://www.brainyquote.com/quotes/quotes/e/ernestdimn161039.html>.

2 G. W. Allport, “The Historical Background of Social Psychology,” in *The Handbook of Social Psychology*, by Lindzey, G. Aronson, E. (New York: McGraw Hill, 1985).

individuals. With regard to architecture and the built environment, social issues specifically relate to how social interaction or social conditions (societal values, norms, class relations, etc.) are expressed, reflected, affected, connected, or ignored by the built space in which our society exists.

B. Political

Political issues tie to conditions related to the organization or government of the *polis*, and describe the organization of power structures. The *International Encyclopedia of the Social Sciences* defines political culture as:

The set of attitudes, beliefs and sentiments which give order and meaning to a political process and which provide the underlying assumptions and rules that govern behavior in the political system. It encompasses both the political ideals and operating norms of a polity. Political culture is thus the manifestation in aggregate form of the psychological and subjective dimensions of politics. A political culture is the product of both the collective history of a political system and the life histories of the members of the system and thus it is rooted equally in public events and private experience.³

In essence, political culture, and politics as a philosophy, reflects a broader societal context, encompassing the social order in place, and the conditions that create and govern said order. The history of a people and their place is entrenched in the political and manifested in the influence of politics on a society and a culture. Architecture can be seen to have a political agenda in the way it reflects, or chooses not to reflect, the values and virtues (or lack thereof) of the existing political conditions. Architecture that relates to its people or its setting inherently implies some political ideal, whether that is intentional or not.

C. Cultural

The cultural is the behavioral matrix that is constructed by, and simultaneously constructs, a social group and its identity in relation to the broader human experience. Culture is learned, grounded in our history, and ingrained in our upbringing. However, as the late American linguist and anthropologist Charles Frederick Voegelin argues, if culture is described only as “learned behavior,” then all species can be seen to have a culture.⁴ Perhaps this is an acceptable understanding of culture; just as a bird builds a nest, so too can her nest be part of her “culture.” Yet, more specifically, human culture is not just a set of learned behavioral traits. Culture itself evolves, both shifting in line with social and political changes and in constant conflict with them. And just as culture is a construct of unity, so too is it a tool of division. Architecture’s relationship to culture lies in its reflection of the vernacular. What are the specific conditions that describe a particular place and its people, architecture asks? What are the goals and values of these people?

³ *International Encyclopedia of the Social Sciences*, Vol. 12 (New York: Macmillan, 1968), 218, quoted in Jo Freedman, “The Political Culture of the Democratic and Republican Parties,” *Political Science Quarterly* 101, no. 3 (Fall 1986): 327-356.

⁴ C.F. Voegelin, “Culture, Language and the Human Organism,” *Southwestern Journal of Anthropology* 7 (1951): 370.

It is their culture that answers, and the architecture responds accordingly. By expressing both evolved long-term traits and localized vernacular traits, culture is both an active and passive dynamic descriptor of an individual or group.

Every building, whether its creators are conscious of it or not, reflects some understanding of the social, the political, and the cultural. In a way, all elements of society can be seen as being “reflexive” because they all can be seen as engaging with the conditions around them. Yet, there exists a certain denial of passivity embedded in the history of architecture. For, as I will argue, the built environment has always exerted a certain level of influence back onto its creators and has deeply affected the way humanity’s societal structures have developed.

III. A Brief History of Architecture and Its Influences

Architecture, and in a broader sense all things designed, are created to perform. Today we build houses to look pretty, feel comfortable, and to protect us from the rain and snow, the heat and cold. We design smart phones and tablets to digitally engage and connect with one another across distances both great and small. The late Steve Jobs noted, “Design is not just what it looks like and feels like. Design is how it works.”⁵ In other words, what matters most is how we use it. What gives design its true value and distinguishes it from the arts is the utility it provides. The built environment possesses certain technological abilities unique to its design, such as environmental protection; boundaries for social or survival activities; and definitions of ownership, community, identity, and growth. As architectural theorist Jonathan Hale declares, “A discussion of technology in architecture might usefully begin with a redefinition of ‘architecture as technology.’”⁶ Architecture and design, to Hale, are forms of technology, which he considers to be all things “we produce in the pursuit of a better life.”⁷ If we look to the earliest records of architecture, we find that it is born of this exact desire. Throughout human history, the ability to define and defend protective shelter has been tantamount to the survival of the species. In its early stages, humanity came to understand that where it lived, in what it lived, and how it lived were necessarily responsible for the fact that it lived. In other words, architecture was born not just as a consequence of the human condition or the human environment but as a determinant of it.

A. *The Technology of Design*

If we view the built environment as technology and as a toolset for human benefit, we also might view it as a form of social or technical intervention. Architecture is intervention in the sense that it is an agent of change and survival just as much as it is a result of change. Architecture is a part of the process of *becoming* just as much as it is a part of the process of *being*, and in this sense it acts to affect both of those states. Over its long and influential history, architecture has been about shifting physical paradigms for the creation of use. The intent of design has been for the invention of intervention. As the late architectural historian Spiro Kostof notes:

5 Steve Jobs, *BrainyQuote.com*, *Xplore Inc*, accessed August 11, 2013, <http://www.brainyquote.com/quotes/quotes/s/stevejobs169129.html>.

6 Jonathan Hale, “Architecture, Technology and the Body: From the Prehuman to the Posthuman,” in *Handbook of Architectural Theory*, eds. Greig Crysler, Stephen Cairns, and Hilde Heynen (London & Thousand Oaks: 2012), 513.

7 Ibid.

Human beings, in their own distinctive form, have been inhabiting the earth for more than one million years. For most of that time they were unaware of architecture, if by that term we want to understand the ambitious creation of an environment separate from the natural order. But if, as we suggested, architecture describes simply the act of making places for ritual use, it was one of the earliest human needs.⁸

Kostof's definition suggests that the earliest forms of architecture existed to serve cultural (ritual) uses, which he defines as "the transcendence of function to the level of a meaningful *act*."⁹ This may have been architecture's original purpose. Still, it is my belief that architecture emerged in early human society to fill specific and significant roles necessary for the development and preservation of the species, primarily through its ability to distinguish space, and to prescribe or provide the opportunity to ascribe meaning to these differentiated spaces. Analysis of architecture's earliest examples—a 500,000-year-old hearth found in the mighty cave of Escale in southern France, and the first free-standing, man-made structure dating to the 400,000-year-old encampment of Terra Amata, also in southern France—suggests that architectural sites provided a stage for our ancestors' other emerging technologies.¹⁰ While archaeological scholars such as Paola Villa and Steven James call into question the exact ages of these proto-human sites, they do agree that the evidence for the controlled use of fire, and the construction of hearths and other early structures, dates back at least 200,000 years.¹¹ Further, James asserts that "the manufacture of stone tools and the manipulation of fire are the most important extrasomatic milestones in our early evolutionary trajectory."¹²

Without these technologies, humanity may not have survived long enough to develop into the complex society we now live in. Yet, without the early architectural interventions of the hearth—in the open, in a man-made structure, or in a cave—and the advancing prevalence of architecture in later epochs, the early Homo species may not have had the opportunity to develop these technologies to the levels required for their survival. Early humans bore into existence the ritualized, meaningful acts of developing stone tools and harnessing the power of fire predicated on the intervention of ritualized, meaningful spaces. The increasing idiosyncratic abilities of the built environment for humans over the ages suggest that it acted as a type of developmental cocoon. The hearth, an architectural element (however rudimentary it may be), allowed for the control of fire, which "drove the wild beasts from the caves and kept them at bay . . . molded an ambience of companionship, a station for the hunter to pause, cook his game, harden his tools, and communicate with his band of fellows."¹³ More defined and permanent structures, whether wooden tents or a repurposed cavern, provided a space for one to safely manufacture and share stone tools and their spoils. The earliest architects were not only battling (boldly, or otherwise) their treacherous environments with stone, wood, and fire, they were using these materials as tools to support social development. As anthropologist Tim Ingold defines the term, a tool "in the most general sense, is an object that extends the capacity of an agent to operate within a given

8 Spiro Kostoff, *A History of Architecture: Settings and Rituals* (New York & Oxford: Oxford University Press, 1995), 21.

9 Ibid. 41.

10 Ibid. 21.

11 Paola Villa, *Terra Amata and the Middle Pleistocene Archaeological Record of Southern France* (Berkeley: University of California Press, 1983), 303.

12 Ibid.

13 Spiro Kostoff, *A History of Architecture: Settings and Rituals* (New York & Oxford: Oxford University Press, 1995), 21.

environment.”¹⁴ These Lower to Middle Paleolithic structures reveal that architecture has always been a tool in that it expanded the abilities of its user-creators to survive and thrive. In fact, architecture’s age further strengthens the idea that it played an integral role in the development of the species. These early examples predate nearly all forms of human technology, save for the discovery of fire (though not its containment) and sharpened stone objects. The built environment predates even complex spoken language. While complex linguistic skills developed sometime between 150,000 and 75,000 years ago, “our journey into full-blown humanity began with nothing but the primitive growls, grunts, and groans available to our primate cousins.”¹⁵ And just like speech, fire, and stone tools, architecture is not only an important element in the development of the human species, but is indeed an essential element of its very survival. As we will see, the role of the built environment is arguably more deeply ingrained in our history and our survival than previously thought.

B. *The Proto-Renaissance, Part 1: Neolithic Groundwork*

By the early Neolithic period, human-made structures had become significantly larger and more complex, developing in line with the shifting trends in lifestyle. With the advent of agriculture, the “Neolithic Revolution” (a term coined by the famed twentieth century archaeologist Vere Gordon Childe)¹⁶ allowed for unprecedented stability in both the production and accumulation of food and societal cohesion as far back as 10,000 BCE.¹⁷ The adoption of an agricultural lifestyle ushered in the sense of domestic permanence, providing for the first time a break from the unsure tribal state of the hunter-gatherer. This supplanting of the hunter-gatherer archetype, the primary lifestyle throughout much of the Paleolithic period (2.6 million years ago to 12,000 years ago), meant that for the first time in history, humans could establish permanent or semi-permanent settlements with vastly increased populations.¹⁸ Proto-townships blossomed across the Fertile Crescent, a swath of Middle Eastern land stretching from Western Asia through to the Nile Valley in northeastern Africa, including parts of modern day Iraq and the Levantine coast of the Mediterranean Sea. This area, often considered the “cradle of civilization,” was home to the Natufian Culture, the first sedentary or semi-sedentary people in recorded history. Settling permanently as early as 12,000 BCE, the Natufian developed stable “towns” a full 2,000 years before the rise of agriculture.¹⁹ At the Natufian site of Tell Abu Hureyra, located along the Euphrates River in present day Syria, there is evidence of the earliest known example of cereal cultivation, leading researchers to believe the Natufian people may have also been the first ever to farm, abandoning their hunter-gatherer lifestyle for good in around 10,000 BCE. Furthermore, they were most

14 Jonathan Hale, “Architecture, Technology and the Body: From the Prehuman to the Posthuman,” in *Handbook of Architectural Theory*, eds. Greig Crysler, Stephen Cairns, and Hilde Heynen (London & Thousand Oaks: 2012), 513.

15 V.S. Ramachandran, *The Tell-Tale Brain: A Neuroscientist’s Quest for What Makes Us Human* (New York: W. W. Norton & Company, 2011) 161.

16 Richard T. LeGates and Frederic Stout, *The City Reader: Fourth Edition* (New York: Routledge: Taylor & Francis Group, 2007), 27.

17 Graeme Barker, *The Agricultural Revolution in Prehistory: Why did Foragers become Farmers?* (London: Oxford University Press, March 2009).

18 Jean-Pierre Bocquet-Appel, “When the World’s Population Took Off: The Springboard of the Neolithic Demographic Transition,” *Science* 333, no. 6042 (July 2011): 560–561.

19 Ofer Bar-Yosef, “The Natufian Culture in the Levant, Threshold to the Origins of Agriculture,” *Evolutionary Anthropology* 6, no. 5 (1998): 159–177.

likely the ancestors of the builders of early Neolithic settlements, in which sedentism became the primary lifestyle.²⁰

The oldest Neolithic settlement of note is Jericho, which is located near the Jordan River in the West Bank. Described as “a well-organized community of about 3,000 people,” it may well have been the closest embodiment of the city ever created up to that time, and the first to grow to such a large size at a time when most communities contained only a few hundred individuals.²¹ Originally a camping ground for Natufian hunter-gatherers, environmental factors kept settlers from year-round habitation until the end of the Younger Dryas Stadial, after which permanent residency dates back to at least 9,600 BCE.²² By 9,400 BCE, the town had grown significantly and was surrounded by a wall almost twelve feet tall and six feet thick, with an additional tower rising higher than the wall. These architectural features were unprecedented in human history and were most likely built for both defensive and ceremonial purposes.²³ Fascinatingly, we may consider Jericho to be the first archaeological footprint of the post hunter-gatherer phase of human evolution because it is in Jericho that we witness something truly revolutionary: the distinct claim of ownership by a people of their natural resources and the development of physical interventions in the landscape clearly designed to foster and protect a growing society. Jericho today represents a site that over its 12,000-year journey has been sacked and sieged, abandoned and rebuilt, with at least 20 successive settlements built atop one another. As Kostof describes:

[The site] holds a series of Jerichos, each built on the ruins of its predecessor. This clinging to a place of birth will prove a durable habit for cities. Time and again until our own day, cities ravaged by conquest or natural disaster will elect to rebuild in their ashes, fully aware that they will be vulnerable anew. In large measure it is tradition, the genius of the place, that accounts for this stubbornness. The ground is hallowed. It has the imprint of time-honored cults and generations of inhabitants. Besides, there is invariably a tangible advantage to the site that prompted occupation the first time.²⁴

For Jericho, the fertile land along the Jordan River washed rich with springs, providing an ideal location for the birth of a settlement. As the Natufian people gathered and dispersed with the seasons year after year, their relationship with nature shifted from one of forage and fight to one of cultivate and conquer as a new cultural system emerged. And with their tilling of the land, came too their building of cities and civilizations. The gradual increases in cultivation and agricultural competency along with the abundance of local water supplies provided emerging peoples with strikingly newfound potential. Their ability to utilize natural resources in new and profound ways imbued those resources with immeasurable value, and thus prompted the need for suitable claim and protection against natural predators as well as warring tribes. The need to safeguard their

20 Andrew M. T. Moore and Gordon C Hillman, Anthony J. Legge, *Village on the Euphrates: From Foraging to Farming at Abu Hureyra* (Oxford: Oxford University Press, 2000).

21 Spiro Kostoff, *A History of Architecture: Settings and Rituals* (New York & Oxford: Oxford University Press, 1995), 44.

22 Steven Mithen, *After the Ice: A Global Human History, 20,000-5000 BC* (Cambridge, Mass.: Harvard University Press, 2006).

23 Peter M. M. Akkermans and Glenn M. Schwartz, *The Archaeology of Syria: From Complex Hunter-Gatherers to Early Urban Societies (c.16,000-300 BC)* (Cambridge: Cambridge University Press, 2004), 57.

24 Spiro Kostoff, *A History of Architecture: Settings and Rituals* (New York & Oxford: Oxford University Press, 1995), 46.

ability to reap the benefits of lands they claimed gave cause for these people to erect permanent villages.²⁵

As argued by archaeologist Kent Flannery, the development of agriculture, and the architecture that it required is predicated on demographic and climatic shifts, which made it necessary for Neolithic peoples to quickly diversify their diet to include a “broad spectrum” of plants and animals.²⁶ In this way, social structure and cultural practices found themselves responding to natural shifts in population and environment. Whether or not Flannery’s Broad Spectrum Revolution hypothesis is correct, the fact remains that shifts in diet and the rise of architecture seem to have developed in tandem. Indeed, “the development of architecture and the settlement is central to discussions concerning the Neolithic transformation as the very visible evidence for the changes in society that run parallel to the domestication of plants and animals.”²⁷ The analysis of architecture reveals insights into these early societies not possible through other archaeological evidence. Architecture, by way of its inherent size, material strength, and organizational properties, is a primary archaeological artifact that provides physical evidence for the construction of early human society. In their groundbreaking research of early Jordanian sites, Finlayson et al. conclude:

There is substantial evidence suggesting that the significant diversity of structures represents a wide diversity of functions. The small size of many structures would suggest that the nuclear family is not the predominant residential unit, and that the household has not become the organising principle in the PPNA. At both sites there is evidence that the repeated modification of architectural units happens fairly rapidly, indicating that no matter how solid some of the structures appear, the built environment is actually quite fluid and flexible, possibly revealing a degree of residential movement, changing social configurations, and an absence of the sort of permanent stability that we expect from a village . . . PPNA communities were not organised along household lines. Rather, our data suggest that society was constructed around the collective actions of larger community groups and that public communal action was the order of the day.²⁸

It seems that the sedentary lifestyle many archaeologists attribute to those living during the PPNA (Pre-Pottery Neolithic A, from 10,200-8,800 BCE)²⁹ was more focused around community building rather than individualistic family parcels. Revealed to us only through an analysis of architectural remains, early cultures thrived through communal interaction and gained strength through cooperative bonds. At sites such as Jericho and others, humanity survived by banding together, growing larger and larger communities, and setting aside small-scale tribal differences in the hopes of forging grand social organizations with even grander aspirations. The communal nature of these early peoples’ built space and their apparent affinity for modifications of their built environment suggest a state of social shift, a species in flux, in which communities are fluid and experimental in their makeup. The architecture suggests new cultures of community and interaction, and certain political frameworks which allow for and foster this type of communal

25 Jan Lichardus et al., *La protohistoire de l'Europe*, (Paris: Presses Universitaires de France, Paris, 1987).

26 Ehud Weiss et al., “The Broad Spectrum Revisited: Evidence from Plant Remains,” *PNAS* 101, no. 26 (2004): 9551-9555.

27 B. Finlayson and I. Kuijt, S. Mithen, S. Smith, “New Evidence from Southern Jordan: Rethinking the Role of Architecture in Changing Societies at the Beginning of the Neolithic Process,” *Paléorient* 37, no. 1 (2011):123-135.

28 Ibid.

29 Ibid.

system. That the built environment parallels social, cultural, and political structure should be no surprise, for it is this construction itself which affords certain societal systems to exist. Without architecture, these early globetrotters could not have claimed or defended their fields and springs. Without architecture, they could not have accommodated growing numbers safely and adequately. Without architecture, they could not have designed cultural functions and social strategies at the scale needed to maintain an ever-growing population. Without architecture, they could not have adapted to changing populations and social organizations while maintaining productivity, safety, and protection.

Architecture enables us to look back upon these prehistoric people because architecture enabled them to survive and create the lifestyle in which they lived. These newly formed agricultural societies flourished and built communities into the environment in order to protect and further develop their thriving lifestyle, utilizing their new technology. And so, we see architecture develop alongside agriculture, in some ways as a response to the technology of agriculture. Environmental design acted as a way to aid young societies in their quest for sustenance and self-preservation. Yet, in many ways, agriculture itself is a form of architecture. At least it is an early, if not specifically vegetational form of the built environment, perhaps the oldest form of landscape architecture. For, if we return to our original definition of architecture, we must say that agriculture—as in the planned manipulation of land and the tilling, sewing, growing, cultivating, and harvesting of vegetables, grains, and other earthly bounties—is certainly “the ambitious creation of an environment separate from the natural order” as well as “the act of making places for ritual use.”³⁰ Absolutely ambitious, agriculture afforded our ancestors a robustly adaptable technology: the calculated manipulation of their environment for the transformation of natural potential into self-sustaining products. And, through its requirement to distinguish and classify specific lands and structures for the creation of these products, agriculture bore its ritualized nature. Agriculture, as well as architecture, demands environmental intervention, and thus embodies the spirit of the built environment. Whereas some suggest agriculture begets architecture, it might not be so farfetched to suggest instead that *architecture* begets architecture. Or at least, with only a semantic twist, that environmental design begets both.

C. *The Proto-Renaissance, Part 2: The Urban Upswing*

At the end of the Neolithic Age, a second shift as momentous as the one from hunter-gatherer to village-based agricultural communities took place, ushering in what many today consider to be the Bronze Age. The “Urban Revolution,” as Vere Gordon Childe would come to call this second great paradigm shift in human civilization (in part as a rejection of the three age system of stone-bronze-iron),³¹ was the “movement from neolithic agriculture to complex, hierarchical systems of manufacturing and trade that began during the fourth and third millennia BCE”, in which Childe believed “the development of writing was a crucial cultural element of true urbanism.”³² Certainly, advancements in written language came with proficiency and confidence in spoken language. And, while literacy rates were surely quite low, the comfort of communication must have played an integral role in the strengthening of cultural resolve within a newly expanding city. Early

30 Spiro Kostoff, *A History of Architecture: Settings and Rituals* (New York & Oxford: Oxford University Press, 1995), 21.

31 Richard T. LeGates and Frederic Stout, *The City Reader: Fourth Edition* (New York: Routledge: Taylor & Francis Group, 2007), 27.

32 *Ibid.* 14.

empires, such as Mesopotamia, Egypt, Sumer, Babylon, and others rose and fell over centuries and millennia, leaving behind traces of their cultures in the form of temples and palaces, written records and artistic depictions, kitchenware, pottery, tools, and more. New forms of irrigation developed, dramatically advancing agriculture in both its sophistication and scale:

About 5,000 years ago irrigation cultivation (combined with stockbreeding and fishing) in the valleys of the Nile, the Tigris-Euphrates, and the Indus had begun to yield a social surplus, large enough to support a number of resident specialists who were themselves released from food-production . . . At the same time dependence on river water for the irrigation of the crops restricted the cultivable areas while the necessity of canalizing the waters and protecting habitation against annual floods encouraged the aggregation of population. Thus arose the first cities—unions of settlement ten times as great as any known neolithic village.³³

The advancement of agricultural technology enabled increased social wealth and size, allowing for the development of social and cultural roles that were taken on by individuals of varying skill. As with the Neolithic Revolution, here too we see the power of cultivation, and thus the security of a society's food supply, usher in grand changes in the way society operated. And, just as we may consider Neolithic agriculture a form of architectural intervention, so too can we make that claim for Bronze Age urbanizing agriculture. Indeed, the agricultural techniques and technologies of these newly urbanized peoples much more closely resemble what we consider today to be recognizable architecture (with structures built of wood, stone, brick, and metal). Canals, dams, granaries, and other devices brought with them security, and attracted people who tended to be inclined to favor security over its alternative. True urban forms arose, filled with citizenries—some over 20,000 strong—of peasants, craftsmen, merchants, traders, priests, and others. And, for each city, for each empire or dynasty, there came “truly monumental public buildings” that served not only to “distinguish each known city from any village but also symbolize the concentration of the social surplus.”³⁴ One such monument was located at Ur, a Sumerian city-state located in present day Iraq and founded as early as 3,800 BCE. It was one of Mesopotamia's grandest urban centers and was the largest and wealthiest of the Early Bronze Age.³⁵ By the rule of Ur-Nammu around the start of the 21st century BCE and sometime after the fall of the Akkadian Empire (which had sacked the city and defeated the Sumerians), Ur had developed a significant history, its location near the Persian Gulf making it the most important port in Mesopotamia. It is here where Ur-Nammu constructed the Great Ziggurat of Ur, a massive temple complex dedicated to the moon god Nanna, serving as both a religious and administrative center for the theocratic society.³⁶

In cities like Ur, with tens of thousands of inhabitants, massive structures like temples and ziggurats provided both a locus around which to plan the city, as well as a way to organize its inhabitants, define its social hierarchies, operate its culture, and institute its politics. The urbanized cultures of the Bronze Age, much like the civilizations that would follow them into the Common Era, were governed theocratically, or at least considered their respective deities essential

33 Ibid. 31.

34 Ibid. 32.

35 J Aruz (ed.), *Art of the First Cities: The Third Millennium B.C. from the Mediterranean to the Indus* (New York: The Metropolitan Museum of Art, 2003).

36 Helen Gardner, et al., *Art Through the Ages* (San Diego: Harcourt College Publishers, 1995).

to the structure of their political and social culture. At Babylon, the ziggurat was a house of worship literally handed down to King Gudea of Lagash by god himself, built for god's grace to descend unto his people and for his subjects to arise into his glory.³⁷ Similarly at Ur, the Great Ziggurat "had always been a ladder of humble reverence, a way to come into contact with the superhuman power that held the secret of their destiny."³⁸ These architectural monuments very literally brought forth societal theocracy to the people of Mesopotamia. To say that the ziggurat was a temple born of a religious people would be telling only half the truth, for it is the ziggurat which also brought religion to the people. These monumental pieces of architecture created a god-fearing people as much as they served them. The Ziggurat at Ur, massive and beautiful, instilled the type of mystifying awe necessary to generate faith. And as the temples grew and multiplied, so did the faithful. The rigor of ritual kept in check those hopeful for a happy god and fearful of an angry god.³⁹ The eminence of monument, indeed the influence of architectural grandeur, kept in check the rigor.

Throughout history, the temples and their peoples faded, growing and dying, converting and conquering until nothing remained but artifacts, chief among them architecture. The architectural monuments of Africa, Asia, and the Americas play similarly significant roles in our understanding of bygone cities and civilizations.⁴⁰ Indeed, it is often through the city that we form our understanding of a civilization. While the average person may not be familiar with the wall of Jericho or the Ziggurat of Ur, surely one's first thought of Egypt is the Pyramid, of Greece the Acropolis, and of Rome the Coliseum. The archeological fortitude of such relics as these often provides our strongest insights into ancient civilizations, while their grand and spectacular histories lay tinged with enigma and wonder. We as humans desire to know what we were and from where we came. To see the survival of structures so majestic and powerful, from such distant ages, provides more strongly than most anything else answers to our questions about the survival of our species, as well as fuel for our intrigue.

IV. The Neuroscience of Space

As we have seen, the technology of architecture has been integral to the survival of humankind and to the development of its early social, political, and cultural structures. Granted, the relationship between architecture and humanity's survival is not as singular as those of, say, water or air. However, it is not difficult to imagine the implications of a human history devoid of environmental design. If architecture allows for the creation of ritualized spaces, then without architecture there can be no ritual. At least, the forms and accessibility of human rituals must dramatically shift and our cultural development be left in the hands of nature's wilderness alone. Call it Providence, ingenuity, or evolution, the creation of architecture irreplaceably addressed humanity's needs for protection and social interaction. Architecture's earliest examples existed in

37 Spiro Kostoff, *A History of Architecture: Settings and Rituals* (New York & Oxford: Oxford University Press, 1995), 58.

38 Ibid. 61.

39 Ibid.

40 Richard T. LeGates and Frederic Stout, *The City Reader: Fourth Edition* (New York: Routledge: Taylor & Francis Group, 2007), 31.

the creation and designation of certain spaces for distinct purposes, separate from the spaces or purposes surrounding them. While we can understand these early forms of environmental design as the prescription of place and the attribution of spatial boundaries just as much, if not more than, the physical construction of those boundaries, the eventual physicality of designed space allowed it to take on a significantly larger role in our preservation and expansion.

A. *The Need for Empathy*

With architecture playing such an important part in our history, it may be wise also to consider human history in more fundamental terms. We can view the preservation and expansion of the human race as naturally essential to its survival. In the context of a living species, the expansion, development, evolution, or whatever we may choose to call the adaptations taken on by a group to maintain itself, are the very manifestations of its will for survival. When our contexts change, we often must change with them in order to preserve the beneficial relationships on which we depend. This is not unique to humankind; evolutionary adaptation is a fundamental concept in the biology of all species. We are but one possible eventuality, the tip of one ever-growing twig of the tree of life, happening to sprout from the edge of the bough *Animalia*, off of the branch *Hominoidea* (apes). As preeminent neuroscientist V. S. Ramachandran states, “Human mental abilities are merely elaborations of faculties that are ultimately of the same *kind* we see in other apes . . . We are anatomically, neurologically, genetically, physiologically apes.”⁴¹ With this biological grounding, we come to an important realization about our species: We are unique, but only because we have found unique ways to achieve the same goals for which other species have strived. We behave like all the rest: searching for food, water, shelter from the environment, protection from predators, and mates for reproduction. But we do it in a special way. “Any ape can reach for a banana, but only humans can reach for the stars.”⁴² Humanity, before architecture, before fire, and before stone tools—before even contemporary humanity—developed something that would allow it to stand apart, altering the capabilities of the species (or set of proto-human species) for all time to come. Ramachandran, among many others, believes that development was the evolution of a certain class of brain cells called mirror neurons:

[T]here is a special class of nerve cells called mirror neurons. These neurons fire not only when you perform an action, but also when you watch someone else perform the same action. This sounds so simple that its huge implications are easy to miss. What these cells do is effectively allow you to empathize with the other person and “read” her intentions—figuring out what she is really up to. You do this by running a simulation of her actions using your own body image . . . These abilities (and the underlying mirror-neuron circuitry) are also seen in apes, but only in humans do they seem to have developed to the point of being able to model aspects of others’ *minds* rather than merely their actions.⁴³

The ramifications of such circuitry are truly astounding. In essence, mirror neurons provide a biochemical structure for empathic emotion. They give humans (and apes) the ability to evaluate

41 V.S. Ramachandran, *The Tell-Tale Brain: A Neuroscientist’s Quest for What Makes Us Human* (New York: W. W. Norton & Company, 2011), 4.

42 *Ibid.*

43 *Ibid.* 32.

the actions of our friends and compatriots and implore us to “experience” their movements and their motivations. The capability to model another person’s mind as well as body essentially invents a human being’s desire for empathy and for community. Ramachandran concludes:

It is difficult to overstate the importance of understanding mirror neurons and their function. They may well be central to social learning, imitation, and the cultural transmission of skills and attitudes—perhaps even the pressed-together sound clusters called “words.” By hyper-developing the mirror-neuron system, evolution in effect turned culture into the new genome. Armed with culture, humans could adapt to hostile new environments and figure out how to exploit formerly inaccessible or poisonous food sources in just one or two generations . . . Thus culture became a significant new source of evolutionary pressure, which helped select for brains that had even better mirror-neuron systems and the imitative learning associated with them. The result was one of the many self-amplifying snowball effects that cumulated in *Homo sapiens*, the ape that looked into its own mind and saw the whole cosmos reflected inside.⁴⁴

The concept that empathy—and by way of it, culture—stems from biological systems present in the brain is a profound if not somewhat unsurprising notion. For we might expect that our actions and characteristics are the result of, or at least significantly affected by, a set of predetermined factors, be they internal or environmental, nature or nurture. The suggestion that the creation of an empathetic culture enabled in our ancestors the capability to adapt in ways unique to their species, and in essence brought about the entirety of what we might consider to be *human*, is a much deeper concept. If we think of these neurological systems as those that “unlocked” the potential for the type of successful expansion humanity has experienced, then the cultural and intellectual evolution of our history is largely a necessary result of biological evolution. In other terms, our culture, our history, as grand and magnificent as it has been, is in some ways biologically predetermined. We might see our grandest exploits, including architecture, as the inevitable results of a naturally pre-installed desire for survival. Indeed, if we consider what amounts to our most basic wants and needs, it is clear that early culture served as a means to that very end. Yet, it might not be as simple as that.

B. *Desires, Needs, and Instincts*

In a 1943 published paper, Abraham Maslow proposed the “theory of hierarchical needs,” in which he arranged humans’ basic needs into a hierarchy of “pre-potency.” As Maslow defined it, “The appearance of one need usually rests on the prior satisfaction of another, more pre-potent need.”⁴⁵ The most “pre-potent” needs, according to Maslow, were the physiological needs, generally relating to the assurance of continuance of the physical being or body. The most basic and essential needs, for example, the needs for air, food, water, sex, sleep, and overall homeostasis may be considered *physiological*. These are followed in descending order of “pre-potency” by the *safety needs* (security of the body, of one’s family and property, employment, etc.), the *love needs* (friendship, family, romantic intimacy), the *esteem needs* (confidence, achievement, respect, etc.),

⁴⁴ Ibid. 33.

⁴⁵ A.H. Maslow, “A theory of human motivation,” *Psychological Review* 50, no. 4 (1943): 370–96. Retrieved from: <http://psychclassics.yorku.ca/Maslow/motivation.htm>.

and the *self-actualization needs* (morality, creativity, reasoning, attainment of self-worth, etc.).⁴⁶ The purpose of this classification was to understand how human desires relate to one another, and Maslow's conclusions regarding "pre-potency" suggest that the more strongly a need affects one's ability to live, the more primal that need is. The needs of one layer are built upon the needs of the layer below; they are only addressed once the more basic needs have been satisfied.

Placing architecture into this system, we find it fits well into multiple categories. First, let us restate the general definitions of architecture we have used thus far. As Kostof defines, architecture can be "the ambitious creation of an environment separate from the natural order," but is more generally "the act of making places for ritual use."⁴⁷ We can simplify these to be the meaningful manipulation or creation of physical structures or landscape interventions, and the act of imbuing space with ritual use, essentially providing a function to the form. Additionally, we have seen that architecture is an agent in the creation and preservation of cultural actions and social organization, including religious actions and organization, as well as an agent of survival, acting very literally as the wall between human safety and the unforgiving dangers of the wild. Barring the needs of *self-actualization* and *esteem* for now (not because they are without worth, but because they are beyond the scope of this discussion), we are left with the three most primal and necessary: *love*, *safety*, and *physiological*.

The needs of *love* involve those of family, friendships, and sexual and romantic intimacies and securities. These are primarily built around social security—the condition of a healthy and happy set of relationships with one's peers. In essence, we seek an active and rewarding social circle, however large or small. Humans are naturally social creatures, in fact, and as infants develop they use familiar people (attachment figures) as guides to learn social behavior by mimicking those around them and adjusting their actions based upon the responses these figures give to the infants. These social bonds and cues set the basis for a child's behavior later in life and are thought to benefit the likelihood of survival of the child.⁴⁸ As we have seen already, architecture had an instrumental role in the progression of human culture from small tribes to large communities and ultimately to the mega-cities of today. Architecture then has certainly played a role (although somewhat indirectly) in advancing social interactions so highly in our society. Even today, architecture provides spaces for social interactions and bonding that otherwise would be impossible. At home, in stores, restaurants, parks, movie theaters, sports stadiums, everywhere, we act in certain ways to culturally fit into the architecture we inhabit. One might say that because the majority (for many of us the entirety) of our time is spent within this built environment, architecture is responsible for, or at least important to, all social interaction and development. While in an abstract sense it may not have to be, the fact remains that it is within the context of architectural space that we build our relationships and form our loves.

The second most basic set of needs, that of *safety*, encompasses the need for protection from negative health, the security of our family, loved ones, and our possessions, as well as employment or financial security to provide for ourselves and our families. It is clear that architecture, the very physical essence of what we might call "shelter," is a major element in the protection of the body from harm, and thus fits strongly into both the roles of protector of the self and of the family. Where else might a child feel most safe but in his or her own home? As Maslow himself describes,

46 Ibid.

47 Spiro Kostoff, *A History of Architecture: Settings and Rituals* (New York & Oxford: Oxford University Press, 1995), 21.

48 I. Bretherton and Munholland KA, "Internal Working Models in Attachment Relationships: A Construct Revisited," in *Handbook of Attachment: Theory, Research and Clinical Applications*, eds. Cassidy J, Shaver PR (New York: Guilford Press, 1999), 89-114.

“The average child in our society generally prefers a safe, orderly, predictable, organized world, which he can count on.”⁴⁹ Designers and engineers of the built environment (among others) are tasked with the creation of this exact organized world, complete with roads and building codes, traffic lights, city grids, and land use zones. The organization and order of the world is built by the constructors of our environments, our cities, and our homes. The home is also where we store our possessions, and is indeed itself the biggest, most expensive, and most significant possession most people ever own. And, save for a real estate market crash of unprecedented scale and effect, the ownership of land and real estate is as strong an indication of financial security as any other. It would not be going too far to say that the entire structure of the American Dream, white picket fence and all, revolves around the 30-year fixed mortgage. Furthermore, returning to the early urban centers of Mesopotamia, Egypt, and other Bronze Age cities, we might recall that the increased size and complexity of urban space ensured newly enlarged populations the freedom to seek employment in various trades and crafts. In general, the built environment, as both the physical framework of our society and the individualized protective boundaries that inhabit this framework, is essential to our safety, whether personal, familial, financial, or otherwise.

At the base of Maslow’s hierarchy, taking precedence over all other forms of human wants and desires, are the *physiological*. These include the needs most basic to the survival of the self: air, food, water, sex, sleep, and overall homeostasis. At the core of this set, Maslow identifies “hunger” as the single most dominant need:

If all the needs are unsatisfied, and the organism is then dominated by the physiological needs, all other needs may become simply non-existent or be pushed into the background. It is then fair to characterize the whole organism by saying simply that it is hungry, for consciousness is almost completely preempted by hunger. All capacities are put into the service of hunger-satisfaction, and the organization of these capacities is almost entirely determined by the one purpose of satisfying hunger. The receptors and effectors, the intelligence, memory, habits, all may now be defined simply as hunger-gratifying tools.⁵⁰

Hunger, being most essential to survival, dominates the purpose of an individual who lacks satisfaction of all his or her needs. Now, if architecture is invaluable to both the control of fire (which allowed for the cooking of meats) and the development of agriculture, then architecture is certainly a major factor in the satisfaction of hunger, both at the individual and community-wide levels. To this day, major agricultural efforts require specific and well-maintained landscape interventions. Additionally, the need for homeostasis—the maintenance of bodily functions and systems via healthy regulation of chemical contents—is achieved in part through consumption of food and water as well as the regulation of body temperature and sleep, both of which depend in large part on one’s ability to access shelter on a regular basis.

While Maslow’s theory is not the only interpretation of human needs, wants, and desires, it may be the most widely known, or at least the most accessible. Prominent scholars and psychologists, such as Francis Heylighen, sought to adjust Maslow’s system more rigorously.⁵¹ At the risk of oversimplifying the nuances of Heylighen’s analysis, the basic approach of classifying needs

49 A.H. Maslow, “A Theory of Human Motivation,” *Psychological Review* 50, no. 4 (1943): 370–96. Retrieved from: <http://psychclassics.yorku.ca/Maslow/motivation.htm>.

50 Ibid.

51 Francis Heylighen, “A Cognitive Systemic Reconstruction of Maslow’s Theory of Self Actualization,” *Behavioral Science* 37, no. 1 (1992): 39–58.

remains present.⁵² Others, such as Manfred Max-Neef, proposed entirely alternative frameworks for understanding our basic human needs.⁵³ And while these and other authors reject, refine, or reconstruct Maslow's system into various alternate frameworks, the overall concept of a set of distinct, yet interrelated and interdependent natural desires existing within each of us maintains itself. Further, that the success of, or goal of some—if not many—of these desires or sets of desires is linked to the presence of the built environment in some form or another remains conceptually and practically intact, as many categories remain similar or the same as Maslow's.⁵⁴ In other words, regardless of the methodology or framework within which we organize our natural desires, the presence of architecture remains an important element in fulfilling those desires. Perhaps it is too obvious to warrant mention, but the very extreme prevalence of the built environment in human society indicates its importance in maintaining the comfort of providing for our most basic wants and needs. It may appear that I am asserting the significance of architecture simply because it is all around us, that it necessarily affects everything happening within this environment; that, due to this prevalence, we might conclude that architecture is essential to nearly every aspect of today's society. In fact, this is exactly the logical conclusion. The existence of consciously designed spaces as the primary environment of human civilization only further articulates the notion that architecture is irreplaceably important to humanity and has been since its inception.

It is evident that architecture is an effective tool in many ways, providing in part for our most fundamental needs and desires. The built environment grants us the privilege of physiological security, ensures the safety of ourselves and our loved ones, and provides opportunities to develop the social relationships on which we depend. In line with Ramachandran's assertion that culture developed from specifically evolved neurological systems,⁵⁵ we can push the relationship between biology and architecture further still. As we have seen, architecture is strongly tied to our most basic wants and needs, first and foremost of those being safety and survival. And, as renowned neurologist Antonio Damasio points out:

An organism's survival depends on a collection of biological processes that maintain the integrity of cells and tissues throughout its structure . . . On another front, to avoid destruction by predators or adverse environmental conditions, there are neural circuits for drives and instincts that cause, for example, fight or flight behaviors.⁵⁶

Damasio delves one level deeper than Ramachandran by showing us that the very survival of our cells depends on biological processes and that survival of the person depends on the neurology of danger assessment. To protect oneself from a wild animal or harsh weather conditions, we exhibit instinctual decision-making, our conscious actions driven by neurologically hard-wired information. So, to pick up a stone and fight or flee to the safety of our shelter and our fire, we take advantage of our naturally evolved sense of self-preservation. In this sense, we use architecture because we are programmed to seek out that which will protect us, that which will shelter us from the storm. Damasio inherently agrees with Ramachandran that the physical manifestations of our

52 Ibid.

53 Manfred A. Max-Neef, with Antonio Elizalde, Martin Hopenhayn, *Human Scale Development: Conception, Application and Further Reflections* (New York: The Apex Press, 1991), 18.

54 Ibid.

55 V.S. Ramachandran, *The Tell-Tale Brain: A Neuroscientist's Quest for What Makes Us Human* (New York: W. W. Norton & Company, 2011), 33.

56 Antonio R. Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain* (New York: Avon Books, 1994), 114.

actions are driven by pre-existing neurological hardware, and further states that even our actions that indirectly relate to survival are driven by these same biochemical brain structures:

In general, drives and instincts operate either by generating a particular behavior directly or by inducing physiological states that lead individuals to behave in a particular way, mindlessly or not. Virtually all the behaviors ensuing from drives and instincts contribute to survival either directly, by performing a life-saving action, or indirectly, by propitiating conditions advantageous to survival or reducing the influence of potentially harmful conditions.⁵⁷

As such, not only are our direct responses to unfavorable conditions caused by biological instinct, but our indirect responses as well. So, the need for safety and security, fulfilled in part by the presence or creation of architecture, is caused by ingrained instincts. These instincts also compel particular behaviors we exhibit to appease our instinctual needs. In essence, the entire evolution of humanity and of its actions, its cultures, and its creations, have been in response to internal biological processes designed to promote through both conscious and subconscious urges the self-preservation of the individual and, in turn, the species. The frameworks of human needs explain the psychological manifestation of certain instincts, particularly those for survival, taking precedence over others. We might then view the built environment as the complex set of results of a natural desire for survival. Furthermore, we might also view it as a major influence on the continuing presence of this same will to survive in our biology, becoming the physical and societal environment by which those desires assess the safety of an individual and of a society. In this way, our engagement with architecture is both a reflection of our will to survive and a reflexive agent in our continuing survival. Within this framework, the social, political, and cultural are ingrained, and their effects as contexts for human interaction exist within a mutually-affective apparatus with the built environment and human nature.

C. *The Prehistory of Aesthetic*

Thus far, the discussion has focused primarily on architecture's critical role in the history of early human species development and on the evolutionary construct which defines our ability in architecture. This has served both to discern the importance of architecture on our civilizations' progressions throughout history as well as a basis for our continuing analysis of design interaction. The historical and scientific analyses discussed thus far highlight the notion that architecture has always been a reflexive activity in that its position relative to society has been one of subject and object—that is, a cyclical interaction of influencing and being influenced by its contexts. Indeed, from its most primitive forms, architecture has been an active part of the development of human culture and civilization. Its evolutionary significance places architecture within the pantheon of great human technologies, and its role as a piece of technology has had architecture responding to our environments, biology, and need for survival. As much as architecture has been a product, it has also been active in the creation of cultural and societal situations. Throughout history, architecture has enabled cultural and societal adaptation, engaging meaningfully with other technologies to accommodate the physical, environmental, and cultural milieu. The evolutionary adaptation of architecture, along with technologies such as stone tools, agriculture, control of fire, and speech as examples, have persevered through our species' history, aiding directly in the

⁵⁷ Ibid. 11.

preservation of the species itself.

So far we have neglected an aspect of architecture that is truly essential to its character. Architecture is, at its core, a deeply expressive form of creation. As Dimnet said, "Architecture, of all the *arts* [emphasis added], is the one which acts the most slowly, but the most surely, on the soul."⁵⁸ If architecture is evolutionary, if it is a survival trait, an expression of our biological desire to live, can it truly be considered art? Can architecture be a personal or emotional expression just as it is an evolutionary one? The *Oxford English Dictionary* defines *art* as "the expression or application of creative skill and imagination, typically in a visual form such as painting, drawing, or sculpture, producing works to be appreciated primarily for their beauty or emotional power."⁵⁹ Is architecture a part of this realm? The answer is "yes" for three reasons. First, architecture is a form of design, a tool that is unique in its combination of aesthetics and utility. As was discussed earlier, the core value of design lies in its use and in the effective application of that use (essentially, how enjoyable or effective the experience of using it is). Design is art that exists to serve a purpose beyond being art. Whereas a painting exists to be visualized as a painting, music to be played or heard, poetry to be read, design ultimately exists to be *used*. However, design is still art. It is a branch of art that has evolved to solve practical goals beyond the expression and consumption of beauty, while maintaining the emotional value of that same expression and consumption. Secondly, architecture undoubtedly requires creativity and imagination. Architects and designers must create imagined existences in their minds and express them with drawings, models, constructions, and other representations in order to understand the space and structure they desire to build. If an architect sought to forgo the process of drawing and modeling, the very construction of the architecture itself is still the result of a creative expression. Architecture is the act of making spaces, creating places, and building that which will define spaces and places. Architects have always been creating and imagining, re-inventing the physical context of human society for countless thousands of generations. Whether or not designers choose to consider Louis Sullivan's famous credo: "form ever follows function,"⁶⁰ there is no doubt that functional space is still created, imagined, formal, and artistic. Third, the practical application of architecture and the biological systems which produce our ability to create architecture do not inhibit architecture's ability to be beautiful, emotional, artistic, or magical. For just as the built environment enhanced the cultural progression and survival of its builders, so too may have the decorated environment and in fact artistic expression itself.

Some 35,000 years ago across the mountainous terrain of Southern France, tribes of proto-human wanderers began inhabiting caverns and fighting for space with cave bears and other beasts. Armed with fire and spears, they pressed inward into the darkness toward the unknown. There they settled, at least part time, and with flickering light in one hand and powdered paints in the other, they began to draw. In the caves of Chauvet, Lascaux, and hundreds of others, these Neanderthaloids laid down onto their earthen canvases an art the world had never known before. Archaeological data show that the ability to creatively express ideas through artistic image dates back at least 35,000 years, and that groups distinct from modern humans had that capability.⁶¹ These early men and women laid the foundation for all forms of art to come and imbued the space

58 Ernest Dimnet, *BrainyQuote.com, Xplore Inc*, accessed August 11, 2013, <http://www.brainyquote.com/quotes/quotes/e/ernestdimn161039.html>.

59 "art, n.1". OED Online. June 2013. Oxford University Press. <http://www.oed.com/view/Entry/11125?rskey=qjdbHw&result=1&isAdvanced=false> (accessed August 11, 2013).

60 Louis Sullivan, "The Tall Office Building Artistically Considered (1896)," In *Architectural Theory (1871-2005)*, by Harry Francis Mallgrave and Christina Contandriopoulos (Oxford: 2005), 126-127.

61 Robert G. Bednarik, "Antiquity and Authorship of the Chauvet Rock Art," *Rock Art Research* 24, no. 1 (2007): 22.

of the cave with an ethereality that would linger until this day. As *New Yorker* columnist Judith Thurman described her 2008 visit to the cave at Niaux:

Every encounter with a cave animal takes it and you by surprise. Your light has to rouse it, and your eye has to recognize it, because you tend to see creatures that aren't there, while missing ones that are. Halfway home to the mortal world, I ask Alard [Thurman's archaeologist guide] if we could pause and turn off our torches. The acoustics magnify every sound, and it takes the brain a few minutes to accept the totality of the darkness—your sight keeps grasping for a hold. Whatever the art means, you understand, at that moment, that its vessel is both a womb and a sepulchre.⁶²

While the early settlers may not have viewed their cave as a sepulchre, perhaps they understood that their markings did lie at the cusp of creative expression, the womb of artistry. Indeed, French archaeologist and historian Jean Clottes, an expert on Paleolithic cave paintings, described the paintings at Chauvet as “remarkable innovations,” citing their significance in linking earlier isolated images to a larger cultural context not seen previously.⁶³ As highlighted in Werner Herzog's illuminating 2010 documentary *Cave of Forgotten Dreams*, some of these profound innovations are on full display. Located on an elegantly hanging rock formation in the Chauvet cave, a drawing of the Venus figure—a common representation of the female vulva—rests, its lines following the curves of the stone. It is the earliest known example of Venus found inside a cave. Not too far away, the earliest attempt at “animation” lies painted and etched along a wall. Repetitive images of a rhinoceros sweep across the wall, blurred and intensified with white chalk lines drawn between the black ashen outlines of the animal.⁶⁴ At Peche Merle, a cave with 25,000 year old drawings, a painting of a horse is positioned on a limestone formation, the horse's head outlined with remarkable accuracy by the natural shape of the limestone. And, in every cave site, the wonderfully evocative forms of human hands, sometimes of a dozen or more distinct individuals, framed by black or red paint decorate the walls. These immortalized handprints, whether intentionally or otherwise, are really the first signatures on display, the artists' way of taking credit for their invention, or being remembered for what they have done.

Most remarkable of all is that the invention of these paintings, and indeed the entire spectrum of artistic creation, can be tied speculatively to similar biological developments, which allowed our ancestors to invent tools and techniques necessary for survival. Ramachandran states, “Our brains evolved this ability [visual imagery] to create an internal mental picture or model of the world in which we can rehearse forthcoming actions, without the risks or the penalties of doing them in the real world.”⁶⁵ The newfound force of artistic expression gave cave painters the ability to understand and analyze the dangerous world around them by re-creating it through image. The images these painters depicted were distorted versions of reality, aiding rather than supplanting the necessarily real experience of hunting for food. They were accurate enough, however, as Harvard psychologist Steve Kosslyn discovered in a study showing that “your

62 Judith Thurman, “First Impressions,” *The New Yorker*, June 23, 2008.

63 Jean Clottes, “Thematic Changes in Upper Paleolithic Art: A View From the Grotte Chauvet,” *Antiquity* 70, no. 268 (1996): 277-287.

64 Werner Herzog, *Cave of Forgotten Dreams*, film, directed by Werner Herzog (2010; New York: Werner Herzog Filmproduktion/IFC, Sundance), theater.

65 V.S. Ramachandran, *The Tell-Tale Brain: A Neuroscientist's Quest for What Makes Us Human* (New York: W. W. Norton & Company, 2011) 242.

brain uses the same regions to imagine a scene as when you actually view one.”⁶⁶ Furthermore, Ramachandran proposes the possibility that what we see as cave paintings today may have been a primitive form of training camp:

Imagine [our ancestors] wanted to rehearse a forthcoming bison or lion hunt. Perhaps it was easier to engage in realistic rehearsal if they had actual props, and perhaps these props are what we today call cave art. They may have used these painted scenes in much the way that a child enacts imaginary fight between his toy soldiers, as a form of play to educate his internal imagery. Cave art could also have been used for teaching hunting skills to novices. Over several millennia these skills would become assimilated into culture and acquired religious significance, Art, in short, may be nature’s own virtual reality.⁶⁷

This claim is certainly a bold one and is more of a hypothetical explanation than a historically-assured fact. For if this suggestion is true, that would mean art, like so many other grand old inventions, was a tool born of biological necessity, helping to preserve and develop the culture of those who invented it. At least, posterity sought to preserve the beauty of its ancestors. Evidence from Chauvet indicates that multiple tribes inhabited the cave over a span of many thousands of years. One rather striking specimen, the well-preserved footprint of a small child, was made over 5,000 years after the earliest paintings were put upon the walls.⁶⁸ This young boy, lost to the fabric of prehistory, inhabited the same space as, and gazed upon the perfectly preserved artwork of, a tribe older to him than the first kings of Egypt are to us. And those paintings are still pristine today. Undoubtedly, that artwork had long-lasting value. If we are to remain conservative in our assertions and reject Ramachandran’s training camp hypothesis, then what we are left with still represents a powerful paradigm shift. For architecture is not just the structure or the space, but the detail, ornament, the beauty, and the meaning, as well. These prehistoric paintings imbued natural space with ritual meaning. They dramatically altered the feeling of the space, and just as people today paint their walls or hang posters depicting their favorite bands, the images left by those trendsetting artists so many years ago served to express who they were and what they valued. While the true meanings of these works of art “will probably always elude us” as Jean Clottes wrote,⁶⁹ those meanings still exist somewhere, forever marked enigmatically into the stone with every line of paint and every etch. The prehistoric basis for aesthetic representation, whatever else it may do, holds on to its creators, representing their cultural and artistic expression.

It is this expression that I believe lays the foundation for the artistic value of architecture. Art is in many ways at the heart of culture. Clothes, music, cooking, literature, architecture—these are all art forms which divide and define the unique cultures around the world. As Darwin noted some 140 years ago, expression is an inherent part of the animal experience, and humans have a particularly developed sense of emotion.⁷⁰ It is clear that we, like other living creatures, are biologically programmed to express ourselves. Through our actions, thoughts, and histories, we express our experience as humans. Furthermore, one need only to look to the nearest bird’s

66 Ibid.

67 Ibid. 243.

68 Werner Herzog, *Cave of Forgotten Dreams*, film, directed by Werner Herzog (2010; New York: Werner Herzog Filmproduktion/IFC, Sundance), theater.

69 Jean Clottes, “Thematic Changes in Upper Paleolithic Art: A View From the Grotte Chauvet,” *Antiquity* 70, no. 268 (1996): 277-287.

70 Charles Darwin, *The Expression of the Emotions in Man and Animals* (London: John Murray, 1872).

nest or beehive to realize that creation is an essential part of this biological need to express for our species and others. Birds build nests and bees build hives to survive, but perhaps important to that survival is a sense of meaning and self-actualizing value, achieved through biological self-expression. Or, at least creative expression exists, even if birds or bees are unable to recognize the inherently expressive nature of their own actions. Further still, a look at the 2008 Beijing Olympic Stadium designed by the world renowned Herzog and De Meuron, dubbed the “Bird’s Nest” by the Chinese people,⁷¹ reveals that even today’s top-tier architecture reflects an appreciation for the “artistic” value and delicate nuances of a simple bird’s nest. This might suggest that building truly is creating, regardless of whether a human or a bird does it. To build is to create, to create is to express, and to express is to be an artist. So while a bird may build to survive, she reveals herself to be an artist, an individual who survives through her creation, through her art. In this same way, humanity drives its desire for creation with a will for survival. Architecture is an evolutionary development, a manifestation of biological instinct, a survival trait, but not *merely*.

V. Conclusions

It is evident from integrating a myriad of perspectives from architects, archeologists, historians, artists, and even neuroscientists, that architecture holds the powers to be not just of a culture, but to *be* culture, and to promote the adaptation and preservation of our species through the engagement of our social, political, and cultural motivations. The built environment holds a unique place in our society as both keeper of the past and seer of the future, revealing our histories and predicting our motivations and technologies for later generations. Inherent in its purpose, the built environment is both an expression of its creators as artists and an expression of its creators as living beings. Architecture is a literal description of a people, its society, and its species. Architecture, it seems, is capable of expressing something stronger than most any other art form. It expresses not just what we do or what we want, but what we are. Moreover, as the largest and most durable human creation, it becomes one of the most important tools for later generations to understand their pasts and their histories. Architecture, then, is not just a part of where it is built, but also of when it is built. We, as a species, survived through our ability to build, to shield ourselves from the harsh exterior conditions of the environment, and to utilize the built form to imbue space with ritual meaning, which came to define the human experience itself. In this way, we can see architecture as an inherently reflexive activity just as it is reflective.

To be reflexive is to look back onto oneself, to reference one’s own situation or influence on a given situation. Architecture is a language of reflection and acts upon that recognition. It does this through an interaction with its contexts and a mutual influencing of its conditions within the built environment and beyond. In a lecture to his undergraduate studio, UC Berkeley Architecture and Landscape Architecture professor Walter Hood declared, “Architecture is Landscape is Art.”⁷² He described environmental design as a way of expressing an understanding of the environment that already exists; that a site is not just a place to put architecture, but the site itself is architecture. While Professor Hood was referring most directly to spatial site conditions and the physical intervention of an existing site, the notion that architecture and its site are not

71 “226 NATIONAL STADIUM,” *Herzog & De Meuron*, accessed November 9, 2012, <http://www.herzogdemeuron.com/index/projects/complete-works/226-250/226-national-stadium.html>.

72 Walter Hood, “Architecture Is Landscape Is Art” (lecture, Environmental Design 11B, Wurster Hall, Berkeley, Fall 2011).

distinct allows for a much deeper reading of the built environment's relationship to its local and global contexts. We exist at the intersection of these contexts to grapple and engage with all that surrounds us.

Equally important to the active role of the built environment is the agency inherent in our interaction with these architectures. What a building tells me about my society, politics, or culture is certainly distinct from what it tells someone else. While studying at the Bauhaus, German-born American artist Josef Albers began an intensive study of color theory. Through his paintings, he explored the relationships colors have with one another and the way these relationships affect our perceptions of certain colors.⁷³ In the end, his studies led him to understand that color is both ultimate and relative. The properties of a dark green square remain intact whether it is placed against a light green background or a pink background, but our perception of the same square changes dramatically based upon the colors around it. In a similar vein, another "paradox" of color perception exhibits itself in our everyday experience. The argument is that since we cannot truly perceive what someone else is seeing through his or her own eyes, what two people both classify as blue might actually look different to each of them. While this may seem trivial, the ramifications are actually quite significant. As far as we are concerned, this demonstration of the potential inconsistencies between individuals' perceptions of the same entity suggests that two people, however similar, may have profoundly different experiences of the same idea, event, or building. Even if the two were to describe their experience in the same language, their own understanding of that description may differ. Simply put, our individual perceptions of our world necessarily alter the way we understand that world. In our approach to the built environment, we may find ourselves walking the bridge between the objective awareness of space and the subjective experience of it. The objective quality of an architectural work must be understood through the subjective quality of our experience of the work. Our own relationship to society, politics, and culture greatly influence how we view those aspects, and in turn how we may view architecture's relationship to them. In other words, we as human beings, as users of space and as members of society, exist in a realm between the contexts which define us and the environment which defines our experience. The user of architecture is connected to that architecture and connected to the space he or she inhabits. When this architecture is a reflection or an expression of its site, history, clientele, city, or society, then our experience of architecture is an experience of those expressions at play with our own understanding of those contextual frameworks. Thus, the contextual frameworks that inform our understanding of society also inform the architecture we inhabit, and by nature of this dual-influence, reinforce our exploration of meaning in the architecture and challenge us to re-contextualize our perceptions.

However we may choose to engage with the built environment, it is by virtue of its physical and historical impact our grandest form of expression. Herein lies its truest value, for if architecture is essential to our history and our survival, then it is essential to our very way of life. If architecture is essential to living, then how we create architecture and what our architecture means is essential to how and why we live. The qualities of built space are to be critical of and engage with the environment's effect (reflective), but also seek an awareness of itself as an agent and of its place within its contexts (reflexive). However, it is important not to define architecture as authority. The danger here is that architects abuse their influence, rather than allowing themselves to be influenced by their context and returning the favor. Haussman's grand vision for the "new" bourgeois Paris required an almost non-discretionary destruction of the city, and with that,

73 "Josef Albers: About This Artist," *The Collection. MoMa*, last modified 2009, http://www.moma.org/collection/artist.php?artist_id=97.

the demolition of its cultural and social history in favor of a new political agenda. The High Modernists, authoritarian in their visions, sought to replace social psychology with an overarching hierarchy of technically rational, authoritatively utilitarian, top-down infrastructure.⁷⁴ The International Style sought not to create architecture that fit into any city by being specific to that city, but rather by ignoring any specific value of that city.⁷⁵ In a way, these utopian visionaries viewed the world as something that must change to fit into their visions, rather than building their visions off of and into the world as it existed. The grand fallacy of this thinking is that by seeking to improve culture and remedy the faults of society, these visions would have in fact destroyed cultures by burying them in anonymity and ignoring the nuances unique to each one.

Instead, we ought to view the built environment through a more honest lens. It is not so much about having a specific approach to design, nor is it about particular styles, motifs, or techniques. Rather, architecture is about engagement. It is about the engagements structure and space have with style, motif, and technique, as well as function, concept, history, nature, and society. It is also about the engagements these elements have with the users of architecture, and the influences of these engagements. The power lies both in cause as it does effect, and equally with the subjective as with the objective. In other words, architecture and the built environment as a whole serve to engage us with ourselves. And yet, these engagements and the very ability of humans to define and divide physical and ritual space through architectural intervention have been severely under-recognized in the general discussion concerning technology, history, survival and design. For, as we have seen, architecture acted as the developmental cocoon within which the various technologies of humanity developed and thrived. Architecture enabled not only the literal technologies of controlled fire, agriculture, and so on to develop, but it has been the very physical manifestation of the biochemical technology of our own evolution. Further, it is the backbone of the social, political, and cultural contexts within and through which built space, and in turn the people who make it, thrive. The built environment has been nothing short of critical in the development and preservation of our species, from its humble beginnings to its contemporary conditions. In short, the built environment, architecture, and physical and ritual space have been both the result of, and also essential agents in, the creation of our species. And all the while, architecture is still as formal as it is functional, as beautiful as it is useful, and as artistic as it is intellectual. As the late Brazilian master Oscar Niemeyer once said, “Sometimes you have to put reason aside and make something beautiful.”⁷⁶

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⁷⁴ James Scott, “Authoritarian High Modernism,” in *Seeing Like a State. How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale UP, 1998), 87-102.

⁷⁵ Ibid.

⁷⁶ David Basulto, “Quotes from Oscar Niemeyer (1907-2012),” *ArchDaily*, December 5, 2012, accessed December 14, 2012, <http://www.archdaily.com/303376>.

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Spring 2014 Editors



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