STUDY ON FORMATION AND SPACES IN TROGLODYTE ARCHITECTURE BASED ON ROMANTICISM

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ABSTRACT
Natural concepts and their relevance to the lives of human beings has always been a matter of concern throughout the history as it is reflected in the beliefs and artworks of different times. Such notion is also found in architectural works which is indicative of perfection in mankind. The most organic type of architecture the principles of which follow the nature is the troglodyte architecture. Indeed, troglodyte architecture is in interaction with the nature as the natural motion in the environment both creates harmony as well as form and space. The framework of this balancing structure is the art of mankind and force of nature. Art and knowledge of humans have prevailed the natural elements as the concept of creating space out through materials both conceptualizes and forms the space in troglodyte architecture. It is the technical method of form and space analysis which is being analyzed in troglodyte architecture. The framework and form of troglodyte architecture is of mountain rock whereby mankind achieves form through material which is the main distinction between this technique and other types of architecture. While employing the concept of nature and architecture and their relevance to form, this research is an attempt to study the relationship between these two within the form of romanticism.

KEYWORDS: Form, nature, romanticism, space, troglodyte architecture.

INTRODUCTION
The essence of nature and natural elements has directly affected the live of humans through a variety of approaches ranging from the rise of religions, ethics and spiritual concepts to establishment of tangible spaces of different qualities. The relationship between architecture and nature is sought in spaces with pure and real qualities. In fact, the space in naturalistic architecture is deeply-rooted in the nature of humans which has an emotional approach. The objective of this research is to examine the significant effect of nature on the formation procedure of architectural spaces and their relevance to humans. The relationship between art and nature is explored within the form of a style that is directly linked to human emotions. Exploring of natural elements induces the inner feeling and essence of a human who seeks an architectural space. Taking into account the already discussed topics in terms of nature and architecture including their relationship within the framework of organic architecture, discussions on troglodyte architecture and ethics, climatology, analysis of forms in troglodyte architecture, history of troglodyte architecture in the world and Iran, and topics defined by vernacular architecture, here the romantic style is the main subject of study the relationship of which with architectural spaces and nature will be discussed.

This research suggests that affects the formation of architectural spaces in terms of appearance and concept and the relationship between nature and architecture may be brought up in those doctrines that recourse to romanticism and sentimentalism. The art of deciphering the secrets of troglodyte architecture embedded in the forms carved out of the cliffs represents some kind of relationship between mankind and elements of nature. This relationship may be sought through romantic approach.

NATURE AS MEANT BY CREATION
Nature and its components generally have a cosmic essence and whatever takes place in the universe originates from nature due to its creative power. The concept of nature in the past is identifiable through human perceptions which yields certain definitions at different times.

Nature had a dual character to the predecessors: terrestrial and cosmic. The former included everything that was visible, tangible and could be experienced. They would set up their buildings in places where they were ostensible and perceptible as they participated in this spectacle with their goddesses, thereby finding hilarity in them and praising them (Antoniades, 2002). It may be declared that the essence of human and nature is such that it may be traced in the
formation trend of art and building of shelters as Wright suggests:” I realized in the first place that a domicile is not essentially similar to a cave but it is a broad shelter in the open air in harmony with the view from inside and outside” (Antoniades, 2002).

"Civilization commenced with the efforts of mankind to establish relationship with and perceive nature, the type of nature that was not simple for humans to apprehend. One could assert that the entire process of human evolution and progress has been a result of his flirting with nature. A persistent effort to comprehend its rules and principles through which contacts could be established with other humans” (Antoniades, 2002). When studying other texts, we come across a term called "form" which is a meaningful expression of substance the main theme of which is the nature and essence of a work of art. "Akhavan has applied the concept of substance on four different occasions the second of which is the substance of natural creatures or the classical elements of earth, water, air and fire that constitute everything in the nature and whatever exits in the world under the moon including animals, plants and inanimate objects has been created out of these elements and will return to them once disintegrated. The subject of these creatures is nature which itself is a force from the powers of soul” (Nasr, 1980). “The concept of nature according to philosophers prior to Socrates and based on the views of Nietzsche and Heidegger which is summarized as “physis”, the term physis is a Greek word and the word “nature” in Latin means the current and inner growth of objects and the ever-present and dominant power in which man always finds himself. Oxford dictionary has defined nature as a force that controls the events in the physical and material world” (Falahat, 2010).

RELATIONSHIP BETWEEN ARCHITECTURE AND NATURE

Architecture is a means of demonstrating the forces of nature that objectively conceptualizes an environment through application of natural elements and materials. Man's contribution to nature happens through his approach toward architecture. As Aalto (1979) suggests:”The art of architecture enjoys interminable resources and means that directly originate from nature and inexplicable reactions”. An architect somewhat draws inspiration from the elements of nature in construction. Architecture and nature may be viewed from different perspectives in addition to the sustainable development in architecture and preservation of environment and earth's ecosystems "Nature is in contact with everything, blows the spirit of life into them, and facilitates required circumstances for the existence and genesis of creatures. Holding such a perceptible view of nature, a sentimental approach may be adopted in architecture to deal with its eternal, terrestrial and absolute spirit and seek its reflection in the surrounding environment such that the demonstration of nature is based on a tangible comprehension” (Antoniades, 2002).

Inspiration from nature as the origin of human emotions for creation of artworks has always been of interest to the artists throughout history. “Michelangelo believed that the form an artist creates in materials exists not only in his mind but also in the material in advance. Cognition of visible universe became possible through the existence of light and human interest in nature and as a consequence art were generated. Leonardo Da Vinci believed in nature and adored it. He maintained that art must be compatible with nature” (Antoniades, 2002).

Relationship between nature and architecture in different periods is interesting. It was once expressed in form of religion and building of temples during a certain period in history in which man considered himself dependent to the metaphysical forces which is indeed an ancient insight, but during the modern times and with the developments in technology and industry it was architecture that overcame the antique since human and its wisdom were the focal points. Following the post-modern times, Architecture and nature were merged and developed into ecotech and organich to preserve the natural ecosystems and it was during this period that preservation of environment and the relationship of architecture and nature became a major concern such that the forces of nature retained their position in architecture. “Ecosystem architecture will come to life in late 20th century, the kind of architecture that designates the fundamental, figurative and relational cycles of life or ecosystems as the initial point of research and the ultimate point of design. “There are architects in the final years of 20th century and earlier in this century who either have promoted and developed the applied-scientific knowledge of architecture in ecosystem discipline (i.e. ecologic-life cycle cognition) or have manifested their findings in this area in form of a constructed space. Manfred Nikolai, Thomas Herzog and Robert Harris may be mentioned from among the formers” (Falamaki, 2007).

Taking this into account, the concepts and relationship between architecture and nature has varied in different times. Each of these periods has utilized the nature, and natural forms and elements as expressed in architectural form. Nature
may be traced back to cave dwellers as in one place the use of natural forms, holistic patterns of nature and finally eco
tech and bionic architecture and in another nature, its mental concept and the relationship of man with nature appear in
another place through organic and romantic architecture.

**ROMANTICISM**

Considering the mental and spiritual approach of nature with respect to architecture and mankind, it concept may be
sought for in romanticism. Profound perception of holistic spirit of nature is conceivable for humans through
architecture which shows the sentimentalist attitude of this view toward nature.

"Romanticism has always been a real antidote for populisms and routines and indeed satisfies the feelings of those who
believe in a better, poetic and ideal world" (Antoniades, 408:2).

Humans and especially the primitives lived wisely with the nature. Some the greatest works of art, poetry, literature and
architecture are the result of man's adoration of and tendency for symbiotic relationship with the nature. This love for
nature evolved during some periods in form of art movements which subsequently led to development of romantic
trend in art and architecture” (Antoniades, 2002). Architects applying poetic feeling in architecture with romanticism
in the back of their minds create spaces of dynamic and lively quality. In fact, this style embodies a sensational and
semantic concept which is deeply-rooted in the nature of mankind and influences the architectural space.

"The first indication of romantic motives of right attitude is that the designer seeks exceptional natural environments as
his/her dwelling. All the creative individuals have enumerated living in nature as an inspirational factor. This verdict
applies to many architects and poets. Those who by any reason were not able to provide themselves with a cache in the
nature still endeavored to decipher the secrets of nature and unity.” (Antoniades, 2002). Architecture must beyond
everything satisfy the human emotions. In this sense, all the romanticists and romantic movements especially in
architecture play an extraordinary role in restoration of architecture back to poetry and help the architecture in taking a
step forward by avoiding the routine and trivial affairs” (Antoniades, 2002).

There are philosophers in this movement who have defined space as the innate potential of crafted nature. The most
prominent theorists and aestheticians of the past namely John Ruskin and Jeffrey Scott adopted proponent (Ruskin) and
opponent (Scott) positions with respect to romanticism phenomenon. Ruskin is more important to architects since he
sought methods through studies of landscapes, clouds, mountains or details such as flower petals, birds or vague
subjects such as an eagle's nest to observe the nature from all the possible angles. Ruskin's sketches are examples of the
working style that each artist should possess (Fig. 1). (Antoniades, 2002). "Romantic artistry is committed to constant
proximity of very opposite things. Nature and art, poetry and prose, solemnity and sarcasm, memory and prediction,
vague beliefs and dynamic feelings, whatever is either celestial or terrestrial, and finally life and death are all
amalgamated in the romantic style” (Seyyed Hosseini, 2010).
Fig. 2. Ruskin's formation of mountains like a number of adjacent books

Fig. 3. Cliffs: particles of separate edges (sheets) gently lying on the untouched backside of the book, often found in books of far-east. Ruskin has indicated the class on the way from Geneva to Chamonix.

Fig. 4. John Ruskin's studies on Nature
Architectural inferences of the exotic mountain (due to various sceneries) have induced artificial effects on the spectator. Ruskin has considered the mountain with a dilapidating fortress. Hypothetical integrity of mountain as a series of formation layers: Soft layers below and stiff layers on top. Soft layers above and stiff layers below. The effect of inspiration from mountains according to Ruskin: cliffs, uplifts, summit

**Fig.5.** Ruskin's sketches of mountain formation in terms of geology

**Fig.6.** "Sun Ray-Space-Green ", Holy Triangle of Le Corbusier. Reference: Antoniades. 2002. P409.

Organism is rooted in romanticism thoughts whereas this view has become pragmatic in the 20th century. Indeed, "the insight on organic architecture is rooted in romantic philosophy. Romanticism was a philosophical, artistic and literary movement in north-west Europe of 18th and 19th centuries which was transmitted to the rest of Europe and the U.S" (Ghobadian, 2009).

"No one is able to observe the nature in a more dynamic style than architects since they look at the nature from numerous perspectives. They pay attention to the techniques and principles of formation of natural elements and also consider the causes of changes and the dynamics of natural phenomena. The mutual relationship of architects with nature has occurred at both tangible and intangible levels" (Antoniades, 2002).

The tangible reaction of architecture to nature is through various approaches: Buildings merged with ground contours in the plan and cross-sections. Projecting the contours by creating contrast with the lines already existing at the site prior to the composition or through creating tension by natural uninspiring and neutral situations- direct man-made contrast with the ground either in plan or cross-section-thorough conformity with nature, undisturbed, illustrating the ground while immersing and embedding the building in the ground- mingling of interior and exterior spaces through amalgamation of elements in exterior space into the interior space- emphasis on materials.
Imitative reactions such as: formal inferences of nature or making substantial/existential inferences of features of nature rules- holistic reaction wherein all the aforementioned items amalgamate in form of a concrete system of mutual relationships as both tangible and intangible reflections become unified. "Study of these facilities was carried out through recourse to examples of vernacular and regional architecture. But we recommend more attention to the examples of prominent architects of current century than the vernacular patterns since we maintain that it is very important to study nature through examples the people of which are more knowledgeable, civilized and updated with state-of-the-art technologies whereby a framework would be provided for the vocational requirements of architects" (Antoniades, 2002)

TROGLODYTE ARCHITECTURE
Exploration of natural elements and exploitation of sheer inner truth of substances may be sought in troglodyte architecture that has a vernacular type of dynamic quality as reflection upon such spaces suggests that this is a sentimentalist and nostalgic architecture.

The origins of formation of this type of architecture may be explained from an ethical perspective in that station of deities was on top of the mountains Mithra or the deity of Mithraic (affection) would emerge as a cliff out of a mountain - followers of Mithra would set up temples for themselves either inside the mountains or within the crypts.

Fig.7. Investiture of Sassanid emperor Ardashir I or II (3rd century CE bas-relief at Taq-e Bostan, Iran.

On the left stands the yazata Mithra with raised barsom, sanctifying the investiture

Mithraic ceremonies were usually supposed to take place in caves. These caves were symbols for the vault of heavens. Flowing water either existed in adjacency of these natural temples or within them. But in towns or deltas where there were no caves, these temples used to be built in the basements just similar to the caves" (Bahar, 2008). "As Avesta reads, Mithraic is the first deity that would appear on top of the Hara mountain prior to the rise of eternal sun while mounted on a horse. Mithra is the first person that emerges from top of the mountain wearing adorned embellishments while looking at all Aryan dwellings with mightiness" (Bahar, 2008).

Geography and attention to nature have been influential in locating of such places. " They were sensitive about the view and direction of their domiciles relative to the holy places in the east and west as they would locate the important buildings and holy perimeters with scrutiny. Immediate establishment of a building was a way of respecting the natural construction rules while it also consecrated the sceneries and holiness of Athenian world" (Bahar, 2008). "It is highly possible that natural caves provided the primitives with the first imagination of architectural spaces. This was man's initial probable recognition of the power of a space restricted to natural walls which prepared his mind and soul for embracing of substantial evolution in life" (Javadi, 1984).
In addition to reflection upon the formation procedure of troglodyte architecture in terms of religion, beliefs and respect for the nature, the genesis of this type of architecture may also be studied with respect to framework and impression from geographical factors.

"Recognition of the first troglodyte architecture is as impossible as discerning the very first human dwellings. But it may be declared that troglodyte architecture initially took place in locations with lower strength of rocks. They would set up their domiciles on the hills and low-rise mountains consistent with the topography and by taking into account the social, economic styles and the consumption of energy. They would follow the rules of nature in minimum application of energy and prevention of its loss" (Javadi, 1984). The creation of space in troglodyte architecture differs from that of the independent architecture in that the formation of space by the architect or constructor in case of troglodyte architecture begins with the creation of substance while in case of independent architecture the creation is shaped as an idea or form in the mind of the architect. The natural substance determines the type of architecture in troglodyte architecturesince the space is born and shaped out of the cliffs.

"An sculpture may be cut out of an uplift or a cliff may be surfaced and reliefs may be carved on it and as a result a cliff sculpture or relief may be created. Now consider if we dig a cavity in a cliff and gradually widen the cavity such that the needed space for a dwelling or tomb may be created. This outcome of man's battle with the cliff in order to create a proper space is referred to as troglodyte architecture. In other words, troglodyte architecture is not formed of conventional construction materials but it is made of natural cliffs and functions in an opposite way compared to conventional architecture" (Javadi, 1984). "Conventional architecture creates the framework of a building as it achieves micro spaces through macro spaces i.e. the space in conventional and independent architecture is a result of constructed framework or building while it is the opposite in case of troglodyte architecture i.e. the architecture begins with the space through gradual creation of small spaces until achieving large spaces. This space is born out of the cliff and the natural rock forms its framework as it surrounds this interior space like a solid shell. Form in troglodyte architecture is a consequence of space which is the most organic type of architecture" (Javadi, 1984). From among of the unique features of this type of architecture are its eternity and perfection compared to other types of architecture as well as its profound regard for religious beliefs. Indeed, the mountain or cliff into which a cave or dwelling is embedded has the power to preserve culture and history.

"As a historical monument, troglodyte architecture is not only of great significance in terms of history and art, archeology and pre-historic sciences, but it is important for the study of the history of Thamoud, history of religions, and the cultural interactions of nations with this kind of architecture. Immortality and non-destruction of troglodyte architecture plays a major role in reproduction of the history of civilization of nations and the fact is that man owes it cultural history to the architecture. Numerous tombs and dwellings that are still stable in Iran are indebted to troglodyte architecture. There is only one adversary threatening the troglodyte architecture and that is a strong earthquake. However, earthquake may not even inflict great damages" (Javadi, 1984).

TROGLODYTE ARCHITECTURE IN THE REST OF THE WORLD

"Remnants of troglodyte architecture are found in Europe and Asia. Circular-shaped space in some mountains belonging to the bronze age of Europe. In Greece and near a fountain in Kastelli, in Italy and also in a region in the south of England we come accross cavities dug in the mountains. Numerous chapels have been cut out in the mountains during the twelfth century. There is more abundance in Asia in terms of troglodyte architecture. Jerusalem is referred to as the "daughter of troglodyte architecture" while the best sample of troglodyte architecture is located in Garmeh, Anatolia Eyalet where chapels and houses have been cut out of the cliffs. Troglodyte architecture comprises a major part of the Indian peninsula with the likes of Chai Tia cliff halls in Mumbai as a place of congregation for Buddhist clergymen during the first century B.C or the overall 27 cliff temples and dwellings in Ajanta which some of which were constructed in early centuries of Christianity with the rest in sixth and seventh centuries A.D. cliff temples of India initially appeared as a simple cave for religious rituals only to be later developed through imitation of form wooden temples. India's troglodyte architecture which served Buddhism was somehow affected by the troglodyte architecture of Iran. Buddhism was certainly associated with Mithraism and Zoroastrianism and it might have drawn influence from them in some case.
Giant cliffs were appropriate for such sanctuaries and shrines with a number of dwelling cut out in their vicinity. Residential dwellings and shrines were excavated gradually during the third and seventh centuries A.D when Buddhism was at its summit” (Javadi, 1984).

Troglodyte architecture in Iran has a long history as it is used for religious and residential purposes. A sort of architecture may be discovered in north and north-west of Iran and the mountainous areas of Kerman where the cliffs have been carved out. Troglodyte architecture with religious themes are found in Kurdistan dating back to the Medes era. Fakhrigahin West Azerbaijan North West Iran, Farhad and Shirin near Sahneh in Kermanshah, Dokan- Davood near Sar Pol-e-Zahabare examples of troglodyte architecture in Iran” (Javadi, 1984).

The structure of troglodyte architecture in the past was a derivative of thoughts and beliefs in those times as a result of which religious monuments such as tombs have been cut out in the mountains. Cliff tombs in Iran with no columns in their entrance facades may be found in numerous places such as in Kurdistan and near the village of Sorkhad or in west Azerbaijan and the territory of Urartu. There are remnants of a castle in Sangar which consists of a space with a large cavity used embedded for burial of corpse. Numerous castles and Args (ancient cities) are found in Bastam with cliff...
spaces while there are cliff chambers in Shahpoor. According to the head of Armani's Institute of Archeology, Dr. Wolfram Kleiss, troglodyte architecture in Tehran is situated within the territory of Urartus and the discovered potteries are some strong evidence confirming it. But it is still unknown whether this architecture was initiate due to Mithraism and that these space are the sanctuaries of Mithraism” (Javadi, 2002).

“Cliff tombs of Achaemenes dynasty such as Naqsh-e Rustam and Persepolis are at the culmination of evolution of troglodyte architecture, therefore this is the beginning for the troglodyte architecture of Medes. Achaemenid tombs are the prototypes for that in west of Iran and these tombs are related to the inhumation procedure of Zoroastrians on top of the mountains.

In most of the cliff tombs of western Iran which are more archaic the entrance columns decide the depth and spaciousness of the crypt. But in the following times, the "illusionistic" aspect was of high significance as the columns on both sides of the entrance are projected as half-embossed and thus such illusionism has been created which is a formal factor of architecture next to classical style resulting in a baroque. Cliff tombs in western Iran are actually among the first tombs demonstrating its classical style while Achaemenid tombs are of baroque type” (Javadi, 1984). Diakonoff, the Soviet Union Historian, who was inspired by professor Herzfeld, states that the analysis of regal architecture of Persepolis and cliff tombs in west and south of Iran suggests that "the foundation and basis of these monuments is an ordinary Iranian house the remnants of which may now be found in cottages of Iran, Caucasus, and Central Asia” (Javadi, 1984)

**CONCLUSION**

Considering the formation trend of naturalist architecture during different periods and the adaptation from natural elements in such places, the spirit of nature influences the physical and mental quality of space. Vernacular architecture is of high significance as it recourses to the romanticism philosophy.

Indeed, creation of space in troglodyte architecture represents the dominance of human over nature. But based on this idea, human supplements and defines the nature. Formation of space in troglodyte architecture takes place through
mass, substance and its exploration as this type of architecture is an adaptation of inner emotions of mankind that seeks the decoding and discovering of nature. Emotions of humans govern their performance and thus an art is generated as a result of the incentives of its creators the circumstances under which it is created is considerable. From digging aqueducts at depths of several hundred meters to troglodyte architecture that reflect the vernacular art and architecture of each region.

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