The Universe As a Source of Meaning in Architectural Design

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Abstract

To the extent that the universe is the context of life here on earth, the analysis of the universe as a source of meaning in architecture constitutes the first principle of its analysis. To underline the above statement it is important to develop a comparative preliminary review of a few cultures to demonstrate how the universe conferred meaning to their architecture in history. It is only possible to abstract fundamental mechanical components of the universe, understand them and their relationships with each other, explain how they impact on earth as a prelude to developing an understanding on how they impact on architecture.

Key words: meaning, architecture, design and universe

INTRODUCTION

Although this paper is largely literature review it brings together a body of knowledge which is diverse ranging from data from physics to philosophy and architecture. In this section on introduction, an attempt is made to show how some sections explain others and at the same time the connectedness of the entire body of the paper.

In the structure of the universe, an attempt is made to explain the shape and size of the universe as generally understood today. The point here is to demonstrate its vastness, understand our location within it as a point of departure in understanding how cosmological conceptions are transformed with the development of our understanding of the universe. Phenomenology is a branch of philosophy that studies consciousness. A brief explanation of phenomenology has been presented as a prelude to understanding aspects of the universe significant to our lives here on earth that we are both conscious and unconscious of. Mechanical nature of the universe discusses fundamental aspects of being within the universe. As opposed to the physical fact of the universe here the universe is discussed along basic classifications of space, time, motion and matter and phenomenology is relied upon to discuss each of the component and their relationships with each other.

Man and the universe. Here man is discussed as a component of the universe. The universe is the way it is because it is and also because it is known to be. It is known to be because mankind exist here on earth. It is therefore imperative to analyse the essential ingredient of this knowing without which the universe would not be inspite of its existence.

This knowing which is a property of man comes in four categories, essence of Nature life, intellect and spirit. Universal Nature and Architecture accepts that the main aspects of the universe are the mechanical aspects. This part therefore attempts to explain how the four main mechanical aspects of space, time, motion and matter affect architecture here on earth. This part is exploratory and predictive. It is the main thrust of the paper and reference to phenomenology and intellect, the universe and comological conceptions are relied upon to dissentangle complex theoretical positions.

PHENOMENOLOGY

Phenomenology is the study of how we can gain access to the inner reality of things by starting with their appearance. Its point of departure is therefore consciousness, it moves to sensuous consciousness, perception, intellect and finally understanding. We will here below explore these five stages in an effort to understand phenomenology which is the key to the understanding of mechanical aspects of the universe.

Consiousness: Our mind has the capacities to be aware of the world extended to it although at the same time realizes for its existence it is engaged in those things external to it. To discuss things external to the mind it is necessary for the mind to momentarily disengage itself from the external world to see it. The realization that these are objects external to the mind is what is called consciousness. The study of consciousness is phenomenology.

Sensuous Consciousness: The mind stands side by side with objects that it is aware of, that is conscious of, only in an abstractly constructed relationship as

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pointed above. In reality the mind and its objects relate in such a way that the object is not only inferred but the mind apprehend their presence. Such immediate apprehension of an individual object is sensuous consciousness. Here immediate mean there before you as opposed to mediate which is not there that is abstract.

Perception: When the mind becomes aware through sensuous consciousness of the properties of an object that is an object is white, when put together adequately describe the object because they stand together in positive unity and at the same time in negative exclusion then the object is perceived. The process through which properties are evolved from the object are distinguished from each other and then sensciously combined with one another so that the object is universally described is called perception.

Intellect : When the mind perceives the object, it arrives at thoughts or sensuous universals which are unconditional that is they stand alone. The question is how are these universals related and how do they hold together. The sensuous universals are related by the mind rising beyond perception to universals which are non sensuous that is, are not perceived. These non-sensuous universals although not perceived give laws which explain the connectedness of the perceived objects. Gravitation force and time are such non-sensuous universals. We can therefore conclude that intellect is the point at which the mind takes such pure universal as its speculative objects.

Understanding: Through intellect therefore the multiplicity of the sense world is thus conceived as a veil behind which the true world, a world of supersensible universals exists.

Intellect is the point at which the true object when it is really understood in its truth is the pure universal, that is, to say it regards universals as reality. Intellect is fundamentally the point of view of the category of essence, that is essence and appearance are set against each other as opposites. For intellect the realm of "laws", the super sensible world of universals, is essence, while the sense world is the appearance. In other words intellect is true understanding.

Spirit: We have seen how consciousness is transformed into intellect at individual level. Social consciousness is similarly transformed into social intellect or supersensible universals or laws that explain reality. These laws are quite often articulated by one of the luminaries in society. Because of the desire to co-exist the society articulates certain customs and laws which guide social life. It must be noted that customs and laws are only a portion of supersensible universals which renders reality understandable. Customs and laws are in turn extracted from a much bigger and infinite substance. This is what can be termed a spirit which in essence is the ethical substance that pervades all social life. The ethical substance or spirit is infinite self-dispensing benevolence on which every individual draws. On the other hand much as ethical substance is societal it is realized in and through distinct individuals.

UNIVERSAL NATURE

Universal nature is only perceptible through instruments such as telescope and only by specialists such as astronomers and astrophysicists. To the ordinary person universal nature is largely in the realm of thought. Universal nature starts its derivation from space, time, motion and matter these four constitute mechanical nature.

The Structure of the Universe: Before we develop phenomenal relationship between the four components of mechanical nature it is important to describe the nature of the universe as developed by physicists, astronomers and mathematicians to date and as summarized by Hawkings (1989).

In 1924 Edwin Hubble through astronomy demonstrated that the universe is made of many galaxies and our own galaxy, milk way is the only one of them. Hubble successfully worked the distances to nine different galaxies. He also demonstrated that there are vast empty spaces between the galaxies. Below is a summary of this conclusions.

That a hundred thousand million (100,000,000,000) galaxies can be seen using modern telescopes. That each galaxy contains about a hundred thousand million (100,000,000,000) stars. Figure 1 shows milky way a picture of one spiral galaxy. Our milky way galaxy is thought to look like the galaxy illustrated to someone living in another galaxy.

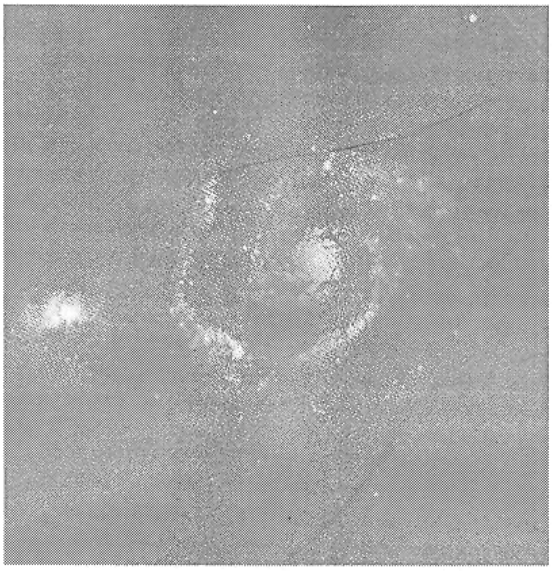

Figure 1: The structure of the Universe
Source: Author

That our galaxy is one hundred thousand (100,000) light years across. It is most probably rotating in a spiral like manner as illustrated in figure 1. The stars are in the spiral arms of our galaxy orbit around its centre once every several hundred million years. Our earth is a medium sized planet orbiting around our sun, an ordinary average sized yellow star. The earth and the sun are in the outer suburb of an ordinary spiral galaxy but near the inner edge of he spiral arm in which they occur.

That the distance between the galaxies is growing all the time for which reason the universe is expanding at the same rate in all direction all the time without any known outer boundaries.

That speculation abounds about the beginning and the end of the universe but it is not known whether the universe had a beginning or will have an end. This is nevertheless a very vexing question, which is uppermost in many scientists mind. We have to be contented with the fact that there is no conclusive answer for the moment.

That when the universe is observed in any direction (on a large scale) it looks so uniform and homogeneous never the less we see it the way it is because we exist.

MECHANICAL NATURE

Space: Let us review the concept of MATTER and FORM, within Hegelian logic to develop our understanding of universal space. Since universal space can only be described because it is filled, in the divide between MATTER and FORM, it can only be MATTER. If we start with universal space as matter we will observe a few qualities. Universal space has nothing external to it. Reflection into another is therefore not possible. If we take a football for example it is possible to describe it using characteristics and determinations external to it. Unlike universal space reflection into another is possible. Since there is nothing external you can use to determine the nature of universal space it is without determination. Universal space is therefore featureless, infinite and without boundaries. Since there is nothing external to universal space it must be seen as the ultimate in externality. The fact of being external is the first and basic determination of universal space.

Since universal space has nothing external to it, it can only be a reflection into self or self-identity. Since this self-identity has no reality, it can only be abstract identity that is in the realm of thought or pure abstraction. Conceptually, therefore universal space has no inner differentiation. It is homogeneous but interruptible at any point. This is the second determination of universal space.

The abstract form of external space can also be seen as the abstract reality of natural external; it is only described because it is filled. As a phenomenon, universal space is a non-sensuous sensibility and a sensuous insensibility. That is, you cannot feel it although you know it is there because it is the external context of nature. In other words you feel it as a negation of nature. On the other hand, you can feel it as the medium of other natural phenomenon without which it is non-sensuous.

Space is the foundation of nature because things of nature are in space. The relationship between nature and space is that things of nature must have an externality and this externality is universal space itself. We can therefore say that nature is subject to the condition of externality of universal space. The question is; how do things of nature fill up space? In the first instance, it is the nature of space to have no extension. The things of nature start as a point and then a line. A line becomes a surface and the surface becomes the whole space. Space as the foundation of nature is the third determination of universal space.

Time: We have seen that the externality of space is only perceived through interruption by nature. Yet this is not enough to harness the uniformity of universal space. We need another concept to develop our understanding of space. This is the concept of time. Time is a non-sensuous sensibility. That is you have enough signs of

passage of time but you cannot sense passage of time itself. Time and space are a unity and this unity is place. Place is what endures through the passage of time. Space and time although a unity are neither containers nor properties of things. They are conditions of things since they are the exteriors without which things would not be.

Time is the principle subjectivity. That is things of nature go through processes either organic or inorganic. These processes confer temporality to things. Temporality cannot be seen as the objective determination of things. It is therefore the processes of actual things that constitute time. Thus the rotation and revolution of the planet earth constitute the main derivation of quantum of time to man on earth.

Motion: Reality of time is perceived when something is changing. Things in motion mitigate this change. Space on the other hand is really differentiated when something moves from here to there. We can therefore see that motion gives reality to both time and space. Motion is time realizing itself and subsisting in space. At the same time it is space first differentiated through time. The essence of motion is therefore the immediate unity of space and time.

Matter: Space is external, homogenous, and is the foundation of nature. Matter on the other hand interrupts the externality and homogeneity of space. Matter is not simple self-identity in space. On the contrary it is the nature of matter to be in motion. Matter interrupts space because it is in motion. We can therefore say that matter is the negation of space through time. This is because time becomes real through matter in motion. Matter and motion are correlatives. Time is the external reality of matter particularly in external nature where motion is imperceptible. Motion is not only the immediate unity of space and time to constitute place but also it is the negation of both. Negation of both because it is what makes time lapse and at the same time give matter the capacity to interrupt space. In conclusion the relationship of space, time, motion is as follows: Matter in motion interrupts and differentiates space. Motion is the immediate unity of space and time and also the negation of both. Motion in other words cancels the externality of matter in space which time is always trying to be. Motion also cancels space because space and time are a unity that is place.

We have so far arrived at matter but only its exteriority. Matter is both attraction and repulsion. As the negative unity of these moments matter is a particular centre, which is a part of its exteriority. This is gravity, which is the foundation of subjectivity of matter. Gravity is the non-sensuous sensibility, which holds universal matter into systems of bodies. Our solar system is a good example of such systems.

We started with matter with just an exteriority but found exteriority cannot stand by itself. We arrive at gravity on the basis of which we conceive matter as homogeneous gravitational matter. From this we move to matter with specific substantial nature that is matter be differentiated. Matter has been resolved into form. In other words we arrive at qualified matter.

Essence of Nature: Qualified matter is in the form of different heavenly bodies such as the sun as the source of light, the moon, the comets and the planets. These heavenly bodies are differentiated by size and physical qualities of elements upon their surface such as air, fire, water, earth (crust). These physical elements have certain properties and conceptual affinities. The heavenly bodies interact as does elements and produce the meteorological process.

The unity of these heavenly bodies is a negative unity because each body has real individuality. These bodies have an inner unity and an inner process or life other than their relation to others in gravity. Each of these bodies has specific processes hence their differentiatiation. These processes in turn have a centre. One such process peculiar to earth is life.

Life: The world is an organism but not a living one. It is the corpse or context of some species of plant and animal life. The sea is the context of other species of plant and animal life. Birds fly both on land and in air. The earth as corpse of life demonstrates the fundamental relation between organic and inorganic. This is because the inorganic is the source of sustenance of the organic. Organic plants are lower forms of life. This is because they have no real differentiation of an inner kind. Without this differentiation and without the moments of unity they have no self-feelings and are related only to elements not to things. Animals on the other hand have a unity in articulation of their members for which reason they have self-movement. Animals have voice, which expresses their soul. They have warmth as the continuous dissolution - process of their own cohesion and new production of their members. Unlike plants they can break feeding. Animals have feeling,

which is the foundation of their individuality. They are related to objects and not to elements. Higher forms of animal life such as man have theoretical relation to things and a unity of theoretical and practical in the drive to change things. Animals are subjective and this subjectivity is defined in the form of consciousness, which is free ego in man. Animal organism is the final form of nature and constitutes the transition to spirit.

INTELLECT, THE UNIVERSE AND COSMOLOGICAL CONCEPTIONS

In discussion of life we have developed the distinction between plant and animals. The meaning of intellect emerge when we compare animals and man. Animals are unable to separate themselves from nature. Their relationship with nature is instinct or in the realm of feeling. Man on the contrary has a separation between himself and nature. This is because man has intellect which is the capacity to engage in notional (conceptual) or speculation through which allows him to speculate and exploit nature.

The relationship between the universe and intellect is dialectical and proceeds from the fact that the universe must contain life that has intellect which reconstitutes what is observed into conceptual frame work which renders intelligible what is observed.

We can therefore say that intellect is a component of man's existence on earth not in terms of experience but rather conceptual determination of universal fact. It is man's incessant desire to pierce deeper and deeper into the universe conceptual determination for change. When this happens man changes because the universe is the framework of his existence. This point will be illustrated by the following six examples in their chlonological sequence.

Aristotle's View of the Universe: Aristotle's (340 B.C) idea of the universe was that the earth is stationary. The sun, the moon, the planets moved in circular orbits around the earth. For Aristotle and ancient Greek world view was consistent with their conceptual determination of the universe and everything had a first course which was derived from circumstances or forces on earth. This as can be understood was because the earth was the centre of their universe. These forces which were the source of first courses were ascribed to specific gods which in turn guided all their activities, such as architecture, drama, harvest, art, love and wars among many others.

Ptolemy's View of the Universe: Ptolemy in the second Century A.D elaborates Aristotle's idea into a complete cosmological model. The earth stood at the centre surrounded by eight spheres that carried the moon, the sun, the stars and the five planets, Mercury, Mars, Jupiter and Saturn. This was adopted by the Christian church as the picture of the universe acceptable in accordance with the scriptures. Ptolemy's theories were very complicated for laity, and since they were not at dramatic variation with the scriptures to the laity the biblical cosmological view of the universe, that is, the earth is the centre of the universe and the sun orbited the earth along the dome of heaven where the first cause also resided was sustained. As it can be observed this new conceptual determination of the universe did not change man but rather affirmed his earlier position.

Galileo Galilei: Galileo Galilei in 1609, having observed the night sky through a telescope which had just been invented continued Copernicus theory that the sun was stationary at the centre and the earth and other planets moved in circular orbits around the sun. This confirmation of a new conceptual determination of the universe empirically was disallowed by the Catholic Church. This new conceptual determination of the universe although resisted by the church was the birth of modern physics because of the new technical capability (the telescope) of observing the universe. Galileo Galilei's conception of universal facts changed man in that although covertly these facts were widely circulated and accepted. The overwhelming influence of church on secular life was seriously challenged. This led to eventual separation of religion and science.

Edwin Hubble: In 1924 Edwin Hubble presented the structure of the universe which according to Hawkings (1989) is the most modern conceptual determination of the universe. The critical conceptual determinations of the universe were, its unimaginable vastness, that it is forever expanding and that it is very orderly. These determinations had a tremendous impact on man here on earth because they shattered man's security in terms of existential and spiritual foothold and left him adrift. Since these determinations represent an intellectual leap, it now means that man's existential and spiritual foothold can only be secured again through intellect. This is so because it is only in the realm of intellect that man can be in tandem with new universal conceptual determinations and therefore explain his place in the universe.

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Penrose and Hawkings: One of Alexander Friedman (1922) theory was the big-bang, big-crunch theory which postulated that at the beginning, the universe was very small but it exploded into a kind of a big-bang and that it will expand until at one time it will collapse on its own, that is, there will be a big-crunch. Hubble (1924) partially proved this theory when he conclusively proved that the universe is expanding. It was Penrose and Hawkings who in 1970 set out to prove big-bang, big-crunch theory. They wrote a joint paper using their singularity theorem and proved that there must have been a big-bang provided Einstein classical general relativity is correct and the universe contains as much matter as has been observed. The big-bang, big-crunch theory of the universe is the most popular theory within the scientific and lay community. On further research the two scientists proved that relativity theory can only be a partial theory and while it can explain big-crunch, it cannot explain big-bang or the beginning of the universe. They also concluded that their singularity theorem was inconclusive in explaining the big-bang.

It was for this reason that in the 1970's they continued to search for a theory that would explain the universe better than the theories at hand. They tuned to their theory of extraordinary vast and their theory of extraordinarily tiny or theory of quantum mechanics. They were in other words looking for the unified field theory which to date remains elusive. From the search of Penrose and Hawkings we can observe the following.

The big-bang, big-crunch theory had earlier been accepted by the church because it tended to conside with the scriptures. The work of Penrose and Hawkings (1970) in the first instance was seen as a verification of an earlier scientifically derived cosmological conception. There was however no conclusive prove of big-bang, big-crunch theory of the universe. Religion and science as a result have yet to find common ground.

In summary Penrose and Hawkings universal determination is that the universe had a beginning but we do not know the nature of this beginning. We know that the universe is very vast and it is expanding. We also know that it will end but have a better idea of how it will end than how it began. Similary the beginning of human civilization is hazy in comparison with its probable end while its current structure is relative clear. We can therefore conclude that Penrose and Hawkings conceptual universal determination is a model for today's human existence here on earth.

From the above observations we can say that it is possible to live with an inconclusive conception of the universe. In other words the uncertainty which pavades the universe also pavades our lives. The only thing which is certain between them is thought or intellect which continuously unfolds each independently and also explores them simultaneously thereby explaining one in terms of the other.

EXISTENCE AND MECHANICAL COMPONENTS OF THE UNIVERSE

The five examples given above on the relationship of universal conceptual determinations and existence of man on earth are in the realm of mediation. That is, although the universal conceptual determination can empirically be proved man can only deal with them in the realm of the mind. That is they are not senscuously accessible. On the other hand the four mechanical components of the universe, space, motion, time and matter are aspects of universal nature that we have immediate or sensual relationship whether direct or indirect. They therefore constitute the first principle in developing the relationship between existence of man on earth and the universe. It is for this reason they have been analysed to some detail through the philosophical methodology called phenomenology whose presentation preceded their analysis.

UNIVERSAL NATURE AND ARCHITECTURE

Whereas other branches of knowledge have explored universal nature extensively this is hardly the case in architecture. Architects seem to be content with the constancy of processes on earth and immediate environments as their points of departure. It is my contention however that universal nature is an important component of the language of architecture and requires some in-depth analysis. We will analyze universal nature as a component of the language of architecture along the four main components of universal nature; that is space, motion, matter and time.

Perceptible Universal Space: The visually perceptible universal space consisting of the sun, the moon and the stars have been shown to be the foundation of cosmological construction of many cultures and in turn ecclesiastical architecture. We nevertheless do know that the perceptible universal space is a visual illusion albeit a stable one. It is for this reason it works for cultures that have developed their cosmology on its basis. For architecture in general perceptible universal space

together with our existential surrounding constitute the outside against which we derive architectural inside.

Imperceptible Universal Space: Imperceptible universal space is abstract so far as architecture is concerned. It is so vast that it can only be in the realm of pure thought. As we have seen imperceptible universal space is the ultimate in externality. It follows therefore that perceptible universal space has been superseded and the ultimate in externality that is imperceptible universal space must form the first principle in any discourse into architecture. Put more simply what we term as our architectural external has an unfathomable external to it. This principle breaks our conception of space as finite and forces us to start our conception of space from the infinite. Infinite conception of space must come in its wake with abstractions such as eternity of time. All these must take us to speculative thought on architecture such as phenomenology.

It has been demonstrated that by extending perceptible universal space into imperceptible universal space cosmological conception of medieval times has been altered and in turn church architecture. Infinity of space as a concept I believe could have many ramifications in architecture, which wait to be discovered.

Interruption of Universal Space by Matter: When we discussed interruption of universal space by matter, the primary matter that interrupts universal space to man is planet earth. Because it is earth that interrupts universal space, universal space is the context of earth and not earth the context of universal space. Since we now know that universal space is the context of earth metaphors borrowed from perceptible universal space should be consigned to history. Architects should open themselves to the wonders of the universe for metaphoric borrowing. It is probable that the universe could yield fascinating formations of stars and other heavenly matter that could be of aesthetic value. Today's cosmology based on universal space as the context of earth requires fresh architectural interpretation.

Universal Matter and Architecture: The first principle of universal matter is that it is an interruption to the homogeneity of universal space. Although we have discussed this point let us develop it further in respect to earth itself.

As planet earth interrupts universal space it creates a subspace around it. This space is defined by the limit of our visual extension. Although it is a visual illusion, this is the space that gives us a feeling of being in the world. In universal terms this space is an inside but to architecture it is external. The second principle of universal matter is that universal matter has specific and substantial nature. That is, matter is differentiated and resolved into form. In our case the earth is spherical. The impact of this principle is that the edge of our perceptible portion of earth is circular and immediately perceptible universal space is hemispherical. Hence the earth gives us the geometry of our existential space. This geometry has been borrowed for metaphors in architecture such as the domes of some renaissance churches and the predominant circular plans of traditional African architecture.

The third principle of universal matter is that it is the context of life. Not all universal matter has life and the only one known to have life is planet earth. As the context or corpse of life processes, the earth is the most important universal matter to man. The earth and the atmosphere are the foundation of life and all other man made processes are undertaken to make life more comfortable. Architecture is an example of such processes.

Universal Motion And Architecture: Motion is the external reality of gravity. Whereas motion is sensible, gravity is supersensible or non-sensuous. This is a relation of two existents which are not only correlatives but reciprocally depend on each other.

In the abstract, two heavenly bodies can attract each other to the extent that they collapse into each other. The fact that they do not mean that there must be a third or fourth force that restrain them from collapsing and at the same time do not cancel their attraction to each other, it is for this reason that they are sustained in motion. This multiple attraction is graphically presented in the Figure 2. B_1, B_2, B_3, B_4 are heavenly bodies sustained in motion due to their mutual attraction and possible attraction of each one to the sun. Motion and in turn gravity and in turn motion in a yet undetermined way holds bodies in our solar system, in their position and velocity relative to each other. These bodies interact due to their position, gravity and motion to produce processes on their surfaces. Such a process is the meteorological process on earth. The meteorological process in turn produces climate, which in turn demands a certain architectural response depending on how hash or moderate.

Universal motion is only sensible to us with the use of visual aids. To man on earth it is in the realm of the supersensible. Because it is imperceptible to us we can only develop its impact to architecture by analyzing its external manifestation that is time.

Universal Time and Architecture: The unity of time and space is place. Place is what endures through the passage of time.

Passage of time also brings new spatial experiences. A certain spatial experience at a certain time can only be experienced at a certain place. This relationship can be graphically expressed in figure 3. As the world revolves around its axis place P_1 stays the same through time change T_1, T_2, T_3 and T_4. The spatial experience changes with time from Sp1 to Sp4. That is the unity of time and space is place, which can be graphically illustrated in figure 3. We will now attempt at developing the significance of the unity of space and time into place as far as architecture is concerned.

Time Change within the Day and Architecture

We must at this point reiterate that we are dealing with universal nature. In the first instance architecture must be anchored in a place whose quality among others is determined by universal space and time. That is spatial experience changes from dusk to dawn and from dawn to dusk. In other words, as time changes within the day, allocation of space in the architecture of many cultures closely follow time change within the day.

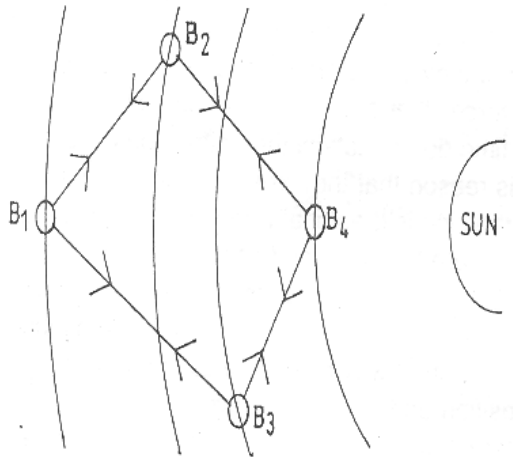

FIGURE 2: Universal Motion and Architecture
Source: Author

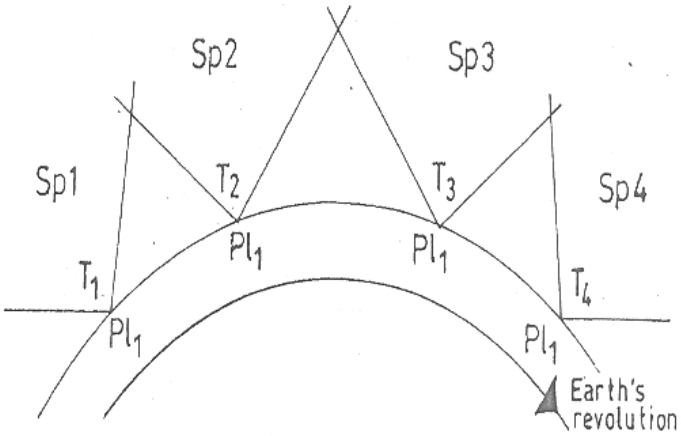

FIGURE 3: Universal Time and Architecture
Sources: Author

The unity of time and space that is place is given one of its external abstract expressions in respect to planet earth by longitudes. Longitudes are supersensible universals, which locate all places within the same time from North Pole to South Pole. For obvious reasons there has to be a reference longitude, which is the Greenwich meantime. Universally therefore place is given one of its abstract coordinate through time.

This coordinate is not sufficient in elaborating the influence of universal time on architecture and we now turn to the earth's rotation around the sun for a more complete picture.

Time Change within the Year and Architecture: The tilt of the earth about its axis and its rotation around the sun creates seasons of varying differentiation in terms of climate and time duration. The coldest parts are at the North and South poles while the warmest are at or close to the equator. Between the two extremes are the temperate zones. Seasonal changes are within the year, which roughly correspond to one earth rotation around the sun.

Latitudes are supersensible universals, which give the abstract external connection to all places at the same angular distance from the equator. The equator is the reference latitude. Latitude is the second co-ordinate and gives the final unity between time and space. That is whereas the longitude is a co-ordinate based on dunal time change, latitude although a measure of distance roughly corresponds to time change within the year. Latitude therefore have a connotation of time (although a larger quantum). To the extent that latitudes do seem to connect places within the same climate, we can also conclude that they are also climatic co-ordinates. To elaborate this point, the equator for instance connects

places with relatively high daytime temperatures most of the year. The tropics, cancer, and capricorn are latitudes with more temperate climates while the poles are very cold. The latitude as a distance, time, and climatic co-ordinate help to define zones with similar architectural response save modifications due to local micro-climate and culture. This is particularly so with traditional and vernacular architecture which are devoid of mechanical environmental controls.

CULTURE, UNIVERSE AND ARCHITECTURE

The ancient Egyptians architecture for instance designed their pyramids, temples and other communal buildings using orthorgonal coordinates which were derived from the longitudinal North-south axis of the river Nile and the East-West axis of the path of the sun. The Ancient Greek on the other hand were influenced by what they considered their universe described by the heaven or celestial dome and earth as the base. Within their universe they sought to build their main buildings on sites which had not only an articulate sense of place (such as hills and valleys) but were phenomenally endowed (ample sunshine across the day). Within their universe therefore they were able to gain spiritual foothold. The Roman Castra or City was also inspired from the universe, the main axis cardo were the North-South axis of the world. The documents were the East-West axis which represented the axis of the sun. The main streets which led to the main triumphal gates signified departures and return thus conquering the environment. This conquering was supposed to be in agreement with Roman gods. It was therefore in realm of cosmic order.

The Ojibwa, an indigenous Canadian tribe used a circle in their dance ceremonies, seating in formal arrangements, and in community dwelling where the circle had symbolic significance. This was because according to the Ojibwa everything that the power of the world does is done in a circle. The sky is round like a ball. The sun comes forth and goes down in the circle. The moon does the same. The seasons also form a great circle in their changing and always coming back to where they were. The Ojibwa therefore abstracted the circle from the universe and used it as a metaphor in their daily life including planning their communal buildings.

The Maasai of Kenya abstracted the circle at the meeting point of the ground place and celestial dome, the horizon and used it to design the *emanyatta* a community dwelling for male initiates. The above example of how various cultures derived meaning in their architecture from the universe was based on their understanding of the universe. Our understanding of the universe has revealed that less tremendous transformation has taken place hence the today derivation of measuring from the universe cannot be based on history but has to be explored and established on the basis of today's understanding of the universe. Derivation of meaning in architecture from our universe will be based on two important facts. One, that unlike in history the universe is the context of our planet earth and not vise versa. Two, given our understanding today, the universe is so large that unlike in history we cannot model meaning in our architecture from its physical fact. It is therefore only possible to abstract fundamental mechanical components of the universe, understand them and their relationships with each other, to explain how they impact on earth as a prelude to developing an understanding on how they impact on architecture.

CONCLUSION

This paper attempts to demonstrate that the universe is a logical point of departure in development of a theory of meaning in architecture. Topics which touch on the universe are complex and hard to exhaust. We have nevertheless established that the universe is the context of the earth and not vice-versa. We have also grasped the relationship between elements of mechanical universal nature as developed through phenomenology. These two fundamental points are important in developing a theory of how the universe affects our existential space.

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