

## A COMPARATIVE ANALYSIS OF NOTIONS OF SPACE AND TIME IN ARISTOTLE, HUME, AND KANT

**Peter. D. Edeh**

Department of Philosophy, University of Abuja, Abuja, Nigeria

### ***ABSTRACT***

This paper assumes a comparative stance and, as such, aims at exposing the similarities and differences in Aristotelian, Kantian, and Humean conceptualizations of Space and Time. The oft dual concepts of space and time constitute one ontological problem of philosophy that has over the years been given serious attentions through all epistemic and logical analyses. Studies have also shown that there are various views of scholars on this philosophical concept through all epoch of philosophical analysis. Some have given it an ontological and epistemological explanation. The analytic philosophers have also viewed it logically. Nevertheless, this paper utilizes critical expository method of philosophizing to compare the views of the three philosophers mentioned. As one of the fundamental issues in Philosophy, variations in conception has not rendered their existence void as essential part of existence rather, an epistemic exposition of them adds more knowledge to Scientists, Mathematicians and Philosophers alike.

*Keywords: Space, Time, Ontology, Epistemic, Comparison.*

### **INTRODUCTION**

The concepts of Space and Time have been dominant in almost all the epochs of philosophy. This is because they are central in the understanding of the mobile finite universe. Because things in the world are in motion, they occupy space and this motion always takes place within a given time.

The reality of space and time is clear to everybody, but when it comes to logical exposition, of them. There are divergences in opinions. This was aptly depicted in St Augustine's (1982, Bk XI, Chapt. 14) musing on time: "What is time...? If no one asks me I know, If I want to explain it to a questioner, I do not know"

This musing of Augustine on time is applicable to space. With these differences in opinions, there seem not to have been a consensus as to what actually space and time are, for this reason the concepts seem to be left as open question. This paper is therefore an attempt to logically explain what is meant

by space and time especially as it pertains to Aristotle, David Hume and Emmanuel Kant.

## CONCEPTUAL ANALYSIS

The term space and time has been given various definitions as there are many scholars in different fields of life Endeavour. We shall adopt some of these views as well as do our paper justice by examining our philosophers in question.

Hornby, A. S., & Co., *Oxford Advanced Learners Dictionary* (1986, 841) defined space as; "That in which all objects exists and moves.., interval or distance between two objects."

Time is defined in *The New Caxton Encyclopedia*, Vol. 18, 571 "A fundamental concept by which perceive the sequence of events . . ."

The above definitions are lexical explanation of space and time. However, we shall take to a philosophical explanation of the terms as it is in this sense that philosophers have the task of explaining these two concepts. Thus they tried over the years to explain whether space and time are limited or unlimited, absolute or relational etc.

It has been observed that over the years, Ancient philosophers dealt mainly with the problem of whether space and time were limited or unlimited. Plato for one accepted the limitation of space. For Plato space is a receptacle containing no activity of matter and also restraining this activity by the provision of structures and limitations of this activity. Even Aristotle conceived space in terms of place, which he defined as adjacent in boundary of a containing body so the philosophers who accepted the limitation of space defined it in terms of place and motion. On the contrary, other philosophers, like Parmenides and the Milesians denied that there could not be truly empty space. Space for them was therefore unlimited and infinite; it is not possible to think of empty space or void.

During the modern era the concepts of space and time was identified more with physics and mathematics. Here, the discussion was centered on whether space and time were absolute or relational. Among the holdings of the Newtonian are, the conception of infinite absolute space as uniform and unchangeable. For them the absolute space is beyond sensory perception and it can exist without the existence of matter. They contend also that absolute time exists independent of any material relations. Space and time in Newtonian conception are metaphysically absolute, static and in-separable.

But Leibniz denied the Newtonian stand. He posited space as a continuously ordered manifold element. With laws of "sufficient a son and identity of indiscernible" Leibniz rejected absolute space. Space and time in Leibniz notion are logical constructs, impressing relations on experiences. They are therefore relational.

Worthy of note is the fact that it is during this period that Hume and Kant lived. And inevitably they were drawn into the conflict of absolute or relational concepts of space and time. We shall examine their views one after the other.

## ARISTOTLE'S VIEW OF SPACE AND TIME

In the views of Aristotle, both concepts involve the case of motion. In his theory he holds that motion is never anything apart from bodies and that moving bodies are, never apart from space and time.

**Space:** The term "space", as used by Aristotle has a variety of meanings. It can signify distance or length between two places (points). It can as well signify temporal duration or internal and other types of dimensionality. Aristotle viewed space as something physical, a container for all bodies. By physical space is meant the first, fundamental dimensional quantity which enables one to describe the location and motion of bodies. By this concept it is possible to determine and locate the position of external bodies. However, it poses two major difficulties: (1) Does physical space have an existence distinct from the bodies that fill it? i.e. can there be space without matter? (2) What are the properties of such conceived being?

**Time:** For Aristotle; time is the measurement of motion or change with reference to "before" and "after". Therefore the key to the nature of time is our experience of it. As an experience, it involves personal observation in relation to change. It involves a contrast between the permanent and the changing. It is the measurement of notion as successive. Hence it has both subjective aspects, but at a time either completely objective or completely subjective?

Aristotle first considers the assumption that time is completely extra mental, a purely physical thing. If that is the case it means is bodily and, being so, it must have parts. If it exists eternally independent of the mind, then its parts exist as well. Observably, this is not the case. Consequently, it is not completely objective. It has subjective aspects as well. This does not rule out objectively completely, otherwise we would not be able to agree hours, days, months and even years. Furthermore, after a period of unconsciousness, we have the tendency to connect the first period resumed consciousness. We then become aware of the passage of time by discovering that changes have occurred during our unconsciousness.

Clearly then time is both objective and subjective in Aristotle's notion. Its objective basis is motion, its subjective interpretation of past and future as subdivided by the "now", i.e. the present. Time is not a distinct entity. It is a conceptual being with adaptation in nature. Our conception of it is based on motion and change both in ourselves and other bodies. In so far as actual movements the changes occur in nature, the time involves in them is real time. Time then, as Aristotle conceived it extends "without limit" from the past through the present and into the future. In a nutshell, space and time in Aristotle are conceptual beings having their basis and foundation in nature.

## HUME'S NOTION OF SPACE AND TIME

David Hume as an absolute empiricist streamlined his thought on space and time, in an empirical manner, Hume treated space and time as a challenge against metaphysical arguments about the universe. Thus in his unpublished lectures, Ihejiofor, I. (1986) quoted Hume as saying:

...space and time are nothing but manners in which our impressions occur, alongside one another, if they are impressions of sight and touch and one after another in all case.

Hume contends that time cannot be divided *ad infinitum*. For, to do, this is to relegate succession, hence only an infinite number of co-existent moments of time will exist. Space is conveyed to the mind by the two senses of sight and touch. For this then, Hume rejected the existence of void. If there is no space, there is no time existing, for the infinite divisibility of space implies that of time.

The idea of time is derived from the succession of perception of every kind of ideas as well as impressions and of sensation. This will afford us with an instance of abstract idea, which comprehends a still greater variety than that of space. Thus Hume in his *A Treatise of Human Nature* Vol.1 (1968, 9) avers:

As it is from the disposition for visible and, tangible objects we receive the idea of space, so from the succession of ideas and impressions we form the Idea of time...

Hume's concept of space and time are not separate ideas. They exist together as successions in the object. Space and time are empirical realities. The idea of space is nothing but the idea of visible and tangible points, distributed in a certain order, and the ideas of time is derived from the succession of our perception of every kind. Because the idea of space is visible and tangible, Hume concluded that we can form no idea of a vacuum or space which is neither visible nor tangible. Humean time is that which makes our perceptions be successive. Example there is a succession of time in the case of a seed becoming a plant and at last a fire-wood.

## KANTIAN NOTION OF SPACE AND TIME:

In his book, *The Critique of Pure Reason*, Kant dealt with a subject called Transcendental Aesthetics, in. which we found Space and Time. According to Kant, we perceive things in space and time continuum which are ideas found in intuitions, that is, they are *a priori*. Thus Stumpf, S. E. (1986, 313) had it that Kant put it that space and time; "are lenses through which we always see objects of experience." They are non-empirical but are two essential sources of knowledge, from which bodies of *a priori* synthetic knowledge could be reached.

Kant, in his *Critique of Pure Reason* (43) contended that space is a necessary representation, *a priori*, which is the sure foundation of all external

intuitions. There can be no object without space, but one can imagine a space void of objects. The apodictic certainty of geometrical principles and the possibility of their a priori construction, rest on space. Although space is one, it has three dimensions and exists simultaneously. To this Kant held that it is limitation that is the cause of the multiplicity and general concept of space. Thus he writes in Turner, W., *History of Philosophy* (1982, 53): " We can imagine one space only, and if we speak of many spaces, we mean parts only of one and the same space"

In what he called 'Transcendental Exposition of the concept of space, space is the form of external phenomena, that is, it is the subjective condition of our sensibility, under which alone, external intuition is possible to us. On the other hand, Kant saw time as that on which the reality of all phenomena depends. With a priori representation of time, we are able to Judge that something happens simultaneously or successively. Time is a necessary representation which is the foundation of pure Intuition. It does not subsist or inhere in itself or in things as objective determination, instead as subjective conditions, under which all our operations take place.

We cannot have phenomena out of time, so time underlies the possibility of all our reality of phenomena. Phenomena may disappear but time is ever present. Time is unlimited and has only a single dimension. The Reality of notion is possible by the existence of time. Time is the form of the internal senses. It is subjective for if peculiar condition of our sensibility is removed, the idea of time vanishes. Time is inherent in the subject perceiver and not in the object.

In Kantian concept, space and time are mental presupposition of sense experience, they refer to objects viewed as appearances. They do not represent things as they are in themselves (for Kant denied things in themselves). Furthermore, for Kant (24) space and time are a priori forms through which all external experiences are rendered possible. They are

Necessary representations a priori forming the very foundation of all external intuitions...They are the conditions of the possibility of phenomena.

The representations of space and time therefore necessarily "precede all external phenomena These "apriori" forms are not determined by external phenomena but the phenomena is rendered known because of these forms.

Contrary to Aristotle's opinion, space and time are not got from experience by means of abstraction from given space and time relation. They are the original presupposition for the apprehension of things as spatial and temporal. Kant avers:

space and time are not empirical concepts which have been derived from external experience . . . The representation of space and time cannot be borrowed through experience from relations of external phenomena, but on', the contrary, external experience

becomes possible only by means of the representations of space and time.

Space and time, therefore, necessarily belong to the knowing subject as forms of its sense perception. They belong to the subject as a possession that is. "a priori" engendered, and not as ".a posteriori" given. They are pure intuitions without any element of experience.

Kant (26) brings this out more clearly when he opines that "space and time are subjective conditions of our sensibility without which no external intuition is possible for this." Space and time then, form the basis of thoughts. Consequently they cannot be thought away, i.e. one cannot think of space and time, in some way.. Besides, bodies can be thought away out of space and time, but the space and time themselves thought away. They form part and parcel of the thinking subjects. The result of this is that which Paulsen, F. (1963, 162) wrote on Kant:

All objects that are presented to our sense-perception necessarily assume the forms of space and time. And everything therefore that can be made out about the nature of time and space as such, holds true for them also as e.g. The law of continuity of all changes.

In our sensible knowledge there emerge two distinct elements, viz the constant and the variables represent external bodies with all their dynamism. There is then only one uniform space and time always remaining constant while the many seeming changes form the accident modes of these interior necessary bases. On this base rest the principles of all the empirical sciences. Kant (25) saw the validity of the sciences when he said: "On the necessity of space and time rests the certainty of all geometrical principles and the possibility of their construction a priori." We can then attain a necessary basis for mathematical physics as a system of universal and necessary propositions with objective validity.

## COMPARATIVE ANALYSIS

In Kant the conception of space and time are not gotten empirically. Rather they are the basis of empirical realities. While Aristotle asserts that space and time originate from experiences by reason of the abstraction obtained from concrete things, for Kant they are given "a priori". In short, they are "posteriori" for Aristotle "a priori" for Kant.

Furthermore space in Kant is given as subjective and transcendental. This he tried to concretize. On the other hand, Aristotle saw space as related to place. He referred to space as an attribute rather than a substance. Kant, in his further analysis asserts that space and time are possessed by subjectivity. This emphasis has been found lacking in Aristotle. Nevertheless both Kant and Aristotle have a meeting point. Taking note about time, they saw its parts: past, present and future. However these parts of time are purely dependent on the one and the same time.

From the exposition of space and time concepts, it clearly shows that they do not share in total each person's view on these concepts. There have come divergent groups which can be discussed in the light of this distinction.

For Hume (40) space is "the extension which is nothing but the idea of visible and tangible points distributed in a certain order." Space and time are manners in which our impressions occur alongside one another. They are according to Hume, empirical realities which are tangible and visible, meaning that they are a posteriori concepts. For Hume, space is the derivation of visible and tangible phenomena distributed in a certain sense, while time is the descended of perceptible succession of changeable objects. It is the abstract which reaches the mind as in the same way impressions do.

For Kant in contradistinction to Humean concept, Space originates from the a priori intuitions of particular thing. Thus Scruton, R, (1982, 29-36)

Space he defined as the form of outer sense that is of those intuitions which we referred to as independent world and which we therefore regard as appearances of object in things

For Kant, space and time are not empirical concepts, but mental realities which are not outside the mind. For Kant, space and time are intuitions found a. priori. Their essences are priori to experience and they make manifest the objects, of experience. Space, for Kant, is not a determination produced by phenomena according to Hume. It is a very necessary condition for phenomena to be. Time is a priori, all phenomena depends on it, as it is the form of all the internal senses. Time, for Kant, is the structural pattern of our inner consciousness, while space is the structural pattern of our visual mechanism. They are not identical with matter receptacle of the real objects. By means of space and time, experiences are organized for knowledge, by means of projection of these concepts upon pure experiences.

Although Hume understands the time as a follow-up of experience, as succession of impressions, for Kant, there is no question of succession of things perceived as that form which the knowledge of space and time is got. They are a priori forms which serve as conditions of experience. Kantian space is that by which the mind organizes and orders its pure experiences. And for Hume, space reduction of extension to something which an object occupies.

## EVALUATION AND CONCLUSION

In fact Kant and Aristotle are two important philosophers in this treatment. This is because both stand as, mediators of ancient and modern periods respectively. But one thing is certain, that is, though they have exposed the concepts of space and time adequately to their own degrees, they have not given the last and final word to them.

These divergent conceptions put a cross by some earlier philosophers lie alongside with the views put forward by Kant and Hume, on this issue of space and Time,, Hence as a fore mentioned these concepts are universally

controversial and open to many interpretations. And moreover they bring to light the inconsistency of philosophical thinking.

Thus Kant's notion of space and time is simply nothing other than that objects can be intuited a priori to the existence of things to which they belong,, Surely for Kant time' is not something which subsists in itself, a quantifiable entity. Yet, both Philosophers (Kant and Hume) share some common conception of the issue - space and time. As modern philosophers they used these representations and relations in Mathematical terms. Both Hume and Kant denied absolute reality of space and time. They all reject the existence of void which the, Atomist, stoics, Newtonian and others propounded. Besides, Kant sees space as the form of all phenomena of the external senses and the subjective condition of the sensibility under which alone external intuition is possible. Both Philosophers representation of our material body gives a clear concept of space and time. Our body (ies) is (are) occupying space in the whole space of the world at a given period.

Space and time are realities necessary for all existence. They are orders of succession and co-existence of things and are in fact solidly inseparable except through abstraction. Finally, we can say that space and time is a condition-*sine qua non* for as authentic existence is concerned.

## REFERENCES

1. St. Augustine, *Confessions* Bk XI, 1966 Chapt. 14.
2. Hornby, A. S., & Co. , *Oxford Advanced Learners Dictionary*
3. *The New Caxton Encyclopedia*. Vol. 18.
4. Ihejiofor, I. Unpublished Lectures in *Modern History of Philosophy* B. M. S. , Ikot Ekpene, 1986.
5. Hume, D. *A Treatise of Human Nature* Vol. 1. London: 1968.
6. Stumpf, S. E., *Philosophy: History & Problem*. New York, Mac GrawHill. 1986
7. Kant, I. , *Critique of Pure Reason*. New York, Mac GrawHill. 1966.
8. Paulsen, F. *Immanuel Kant*, New York, Mac GrawHill. 1963.
9. Turner, W., *History of Philosophy* .New York, Mac GrawHill .1965.
10. Scruton, R., *Kant: Past Masters Series*. N. Y. Mac GrawHill 1982.