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The Implications of Africa-Centered Conceptions of Time and Space for Quantitative Theorizing: Limitations of Paradigmatically-Bound Philosophical Meta-Assumptions

by

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Abstract

“The Implications of Africa-centered Conceptions of Time and Space for Quantitative Theorizing,” looks at Eurocentric scientific conceptions of time and space, how they effect theorizing concerned with these matters, and how they are altered as one considers non-Eurocentric conceptions. For example, one might look at the assertion of circularity, holism, and continuity in contrast to linearity, disjunction, and discontinuity. The example focused on is a scholarly article focusing on constraints associated with time travel. The article deconstructs the piece as Eurocentric and re-conceptualizes it from an African-centered cultural and social perspective.

The premise of Africa-centered scholarship is not merely that it emphasizes the importance of studying Africana phenomena, but also that it attempts to engage that study beginning from Africana philosophical perspectives. This is a critical challenge for the Africa-centered scholar because they often have to do “double duty,” both developing the theoretical and methodological context for analysis AND conducting the analysis. They are simultaneously engaged in scientific investigation of “what is” and also constructing a redefinition of “what is” and “what’s possible” and “from what perspective should variables be examined.” Time and space are no exception. The Eurocentric world, that is, the scientific normed largely on the meta-assumptions of ancient Greco-Roman philosophy, Plato in particular, coupled with the presumptions of the intellectual movement within modern European nationalism referred to as “The Enlightenment,” presents us with a linear conception of time and a three dimensional conception of space. In the linear conception of time, time is analogous to a “number line” in which one begins at a point of origin or birth or “zero time” and moves inextricably towards an “end time.” Movement back is possible only conceptually through memory. And what is past influences what is present largely through the institutionalization of collective memory in a project we call history. Space is three dimensional, having length, width, and height and space is situated on the matrix of linear time. Yet, theoretical Eurocentric theory, particularly that body of theory known as theoretical physics, has a strong technological bent and believes that it can, via ingenuity, transcend the static boundaries of what is considered physically and/or mathematically possible. It therefore perennially speculates on alternative universes where the static presumptions concerning time and space, either do not apply or are “relaxed.”

In this piece I argue that Africans collectively, and certainly historically before the advent of the Western science narrative and discourse, did not live in the conceptual world of Eurocentric time and space. I suggest that the speculative universe of the Eurocentric physicists with respect to time and space possibilities have long been the cultural realities within African traditional societies. To the extent that I am successful in establishing the point, I also necessarily argue that would-be Africa-centered scholars must consider both the limitations and “boundaries” imposed by Eurocentric traditional conceptions of space and time, which have the effect of subverting proper comprehension of Africana worldviews, as well as alternate African definitions associated with those variables, which might have the effect of illuminating heretofore hidden passages of scholarly understanding. I use in this context the example of the scholarly debate over time travel. First, there is the issue of is it possible theoretically and if so, under what constraints. My argument is that the constraints always taken for granted in these formulations are actually constraints of the worldview and epistemology of Eurocentrism itself, rather than artifacts of universal time and that therefore Africa-centered scholars, applying a perspective external to that limited framework can say much more in terms of the potential for traversing presumed barriers of the space-time matrix.

There are many Eurocentric natural science articles that grapple with the philosophies, methodologies, and implications of time travel. Central to many of these discussions have been the implications of alteration of the past by the prospective traveler. For example, one could be

transported back to a distant past and bring about a sequence of events which would lead to the death of an ancestor. In such a case, one is confronted with a logical paradox. The elimination of that ancestor could terminate the biological lineage that results in the traveler, which would negate the existence of the traveler in the future from whence they have come and in turn, the precipitating events themselves. One possible theoretical conclusion from this probability is that the time travel is existentially prohibited or should be to prevent precisely such a temporal catastrophe. The mere *presence* of an individual in a past, they were not previously part of would change time. One can imagine even more complications if an individual traveled to a part of the past where an earlier incarnation of them existed.¹

Two physicists Daniel Greenberger of the City College of the City University of New York and Karl Svozil of the Institute of Theoretical Physics at the Vienna University of Technology in Vienna, Austria trumpeted a potential solution to this philosophical paradox in their article “Quantum Theory Looks at Time Travel” published in *Quo Vadis Quantum Mechanics* edited by A. Elitzur, S. Dolev, and N. Kolenda (Svozil, 2005).

One might wonder why a sociologist would have more than a passing interest in what appears to be a niche debate in another discipline, and natural science in particular. My own interest is in postcolonial theory and particularly in the project of deconstructing Eurocentric philosophies. These philosophies are central to a myriad of intellectual activities in the project known as “Western science.” Theoretical physics is of special note in this regard because of its increasing concerns with metaphysics and ontological and epistemological inquiries that traditionally were the foci of scholars in the social sciences and the humanities. Among these questions are what is “time”? What is “space”? What is the relationship between them? These questions bear heavily on the discussions about the possibility of traveling through temporal space. Greenberger and Svozil propose a solution to a “problem.” Their quest drew my theoretical attention because much of the “problem” they are addressing is less a problem with time or space themselves than with the particular construction of time and space and their relationship within the unified field of Eurocentric philosophy. So the first question I sought to examine was to what extent was this “problem” an objective reality or merely an artifact of Eurocentric thinking about those variables?

They begin their exploration by arguing that there is a fundamental incompatibility between time travel and free will. That because of the parameters we delineated, that the individual who engages in time travel cannot alter the historical reality. From a non-Eurocentric perspective we have our first challenge in this definition of “free will.” In Euro-centric thought, “free will” is the capacity to act unfettered on the basis of one’s own individual choices. Thus the individual time traveler who cannot act in this past, but only observe, suffers a perceived lack of “free will” in that constraint. Inherent in this theoretical construction is also the idea that they have an implicit propensity to breach the past as a consequence of their personhood. Contrast this with say, the Akan perception of personhood, where the capacity for “free will” is connected to

the degree of personal regard for ethical action, the latter of which directed is inextricably connected to the social identity, to collective as opposed to personal individuality (Wiredu, *The African Concept of Personhood*, 1992). An Akan time traveler would likely not experience the mere capacity to perceive the past without intervening as an onerous psychic burden. Even more, without a clear delineation of what the empirical consequences may be for one's community they would be disinclined to seek or advocate for such intervention. In short the very idea that time travel is incompatible with "free will" hinges on a very culturally and paradigmatically bound definition of that latter concept.

Another aspect of the problem is rooted in the conception of the past, present, and future as related to each other in a mutually exclusive, linear and sequential manner. This may be contrasted even more in the role and characterization of the sangoma or basangoma, traditional healers in Southern Africa. The Sangomas or basangoma are understood to possess their power over illness as a direct consequence of being able to incarnate or be possessed by ancestral spirits. This concept is indicative of the notion of a "past" that is not only not completely differentiated from or disconnected from the "present," but in fact of an invasive past ever impinging on the present to the point where the past under proper conditions can enter the present. This possession is critical because illness itself is seen as rooted in spiritual-temporal disequilibrium. Illnesses are caused by disrespect or disease among historical spiritual agents or energies and these can only be reconciled by communion with those spirits, explaining the role of the sangomas. Not only is the past the source of illness, but the ancestral forces also are in charge of the supernatural election of those who will be their voices or vehicles for communication with their descendants in the present. As an example of this continuity in the conception of time, sangomas in a trance state, possessed of the ancestors, are often confronted with mothers who desire their physical contact with their newborn infants. Somehow the mere touch of eternity is a positive socio-cultural omen for those so anointed (Binsbergen, 1998).²

The Eurocentric view of space and time might be described as analogous to the "people movers" in airports where there is a distinct point of origin where the individual (gets on). This entry is an individual act, autonomously of most others outside of the general social facility and direction that leads on towards entry. Once upon the people mover, the individual will move forward inevitably towards a point of destination. There is also, obviously, the passage of time as one moves. One can either ambulate upon the people mover or just stand still, but either way the passage of space and time towards the conclusion is inexorable. If there is any human agency, it is merely to ambulate further towards the inevitable objective. One can only speed up time in the forward direction and minimize the space between themselves and the future. This is the progressivism, the "positivism" of Euro-centrism. One can certainly try to go back on the people mover, but they are unlikely to make any ultimate physical progress since the forces arrayed towards the future are so daunting. They will also encounter those previously invisible "others" who are going to be offended and annoyed that one is not "going with the flow." Like this "people mover" analogy though, movement back is not really impossible, but improbable,

and theoretical and social opposed. So the one who steps outside of the Eurocentric view of time and space with respect to these questions and in fact, out of the Eurocentric intellectual system generally, is like that hapless pedestrian who decides to go backwards on the people mover. There is an element of ethno-methodological “breaching,” ala Harold Garfinkel, in pursuing the methodological path of Eurocentric deconstruction where the expectations and meta-assumptions, long held to be “reality” itself are questioned and exposed as paradigmatic constructs of a particular worldview.

Greenberger and Svozil next juxtapose their Eurocentric definition of “free will” with its supposed antagonistic opposite, “determinism.” Either human beings have complete freedom to decide for themselves or the universe is completely determinist. This a consequence of Eurocentric philosophy and particularly of Platonic epistemology³ which produces a world of antagonistic oppositional principles related to each other only by hierarchical relationships. This is in contrast to many alternative views of the world which emphasize holisms and continuities such that most phenomena are understood as differences in degree rather than nature. Again, Akan philosophy is useful. The Akan believe in an omnipotent deity who is in charge of all affairs much like Eurocentric monotheisms. This deity is also seen as associated with those qualities that are “good” and “positive.” Yet this omnipotence is parallel with the acknowledged existence of various intermediary spiritual entities that might be understood in Western terms of angels or demons or ghosts that are capable of acting within the moral universe and also capable of influencing human actions and perceptions. Evil, illness or corruption can and does arise from this intermediary realm within the spiritual universe, thus necessitating the ecclesiastical imperative to design a system among humans for training specialists who can communicate and negotiate with these entities for the collective benefit of the community. This whole construct is symbolic of the African traditional spiritual and social universe (which, incidentally, are intertwined and permeate one another) in which the root logic is “both, and” rather than “this or that.” African cosmogonies⁴ (Kim, 2008), were aware long before Western quantum theory that hot and cold represented differences of degree and positions on a continuum of motion and speed as opposed to mutual exclusive oppositional states of matter (Wiredu, *Toward Decolonizing African Philosophy and Religion*, 2009).

Greenberger and Svozil present the existence of their own article as evidence of the reality of “free will.” Thus that side of the artificial dichotomy is rejected psychologically. They make an allusion to various theories for grappling with issues related to time travel from the standpoint of relativity theory, which involves changing the topographical properties of space-time. While these were not the focus of their analysis, they note that these are not incompatible with their ideas and might conceivably be combined with them.

$$\Psi(t_2)=U(t_2,t_1)\Psi(t_1), t_2>t_1$$

This is presented as a general formula for the propagation of a physical system from a

point in time t_1 to a later point in time t_2 where U is calculated by summing over all of the potential paths from the initial state to the final state, restricting these paths to the forward direction of time. This equation seems sufficiently adequate and is in a Eurocentric linear, sequential view of time. However, going back to a more African traditional understanding yields a fundamentally different structure in the equation.

$$\Psi(t_2)=U(t_2,t_1)\Psi(t_1)+U(t_1,t_2)\Psi(t_1), t_2>t_1$$

In this reformulation, the propagation of the physical system from time t_1 to time t_2 is also dependent on the paths from the present back to the past. Greenberger and Svozil suggest that in quantum mechanics the traditional Eurocentric notions of causality, based on the linear, sequential meta-assumptions we alluded to earlier must be suspended. Whereas they see this as a unique aspect of quantum mechanics, in the African worldview, it is merely evidence of the limitations of Eurocentric causality itself. Whereas the Eurocentric equation above is complete, one who examines the revised equation we have formulated realizes that it immediately suggests a necessary logical corollary.

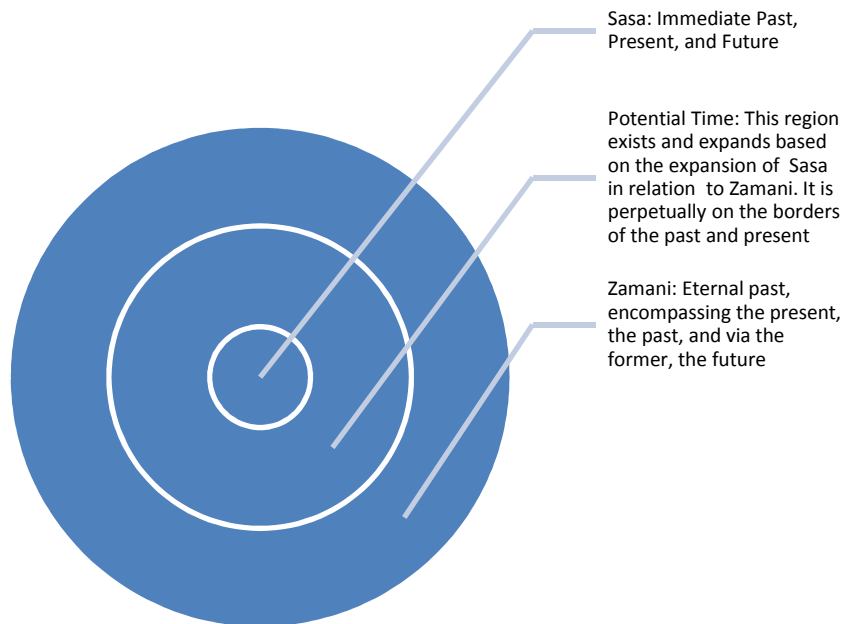
$$\Psi(t_1)=U(t_2,t_1)\Psi(t_2)+U(t_1,t_2)\Psi(t_2), t_1<t_2$$

Inherently the present is determined in part by the paths from the past from which it emerged and vice versa, the meaning of the past and its character is partially constructed and reconstructed from the interaction between that past and the present. In Eurocentric thinking this entire structure of time is not present and so this creates a particular dilemma for the concept of time travel even in quantum physics because you have to posit something illogical and that is some form of contact into the past affecting the future, a “feedback loop” if you will. As you can see from our reconfigured equations, the need to consider mechanisms for constructing such a “feedback loop” is not existential, but a function of the way in which the relationship between space and time has been philosophically conceived. In short, the “problem” is an artifact of linear, sequential time as opposed to a more sympathetic cyclical time conception.

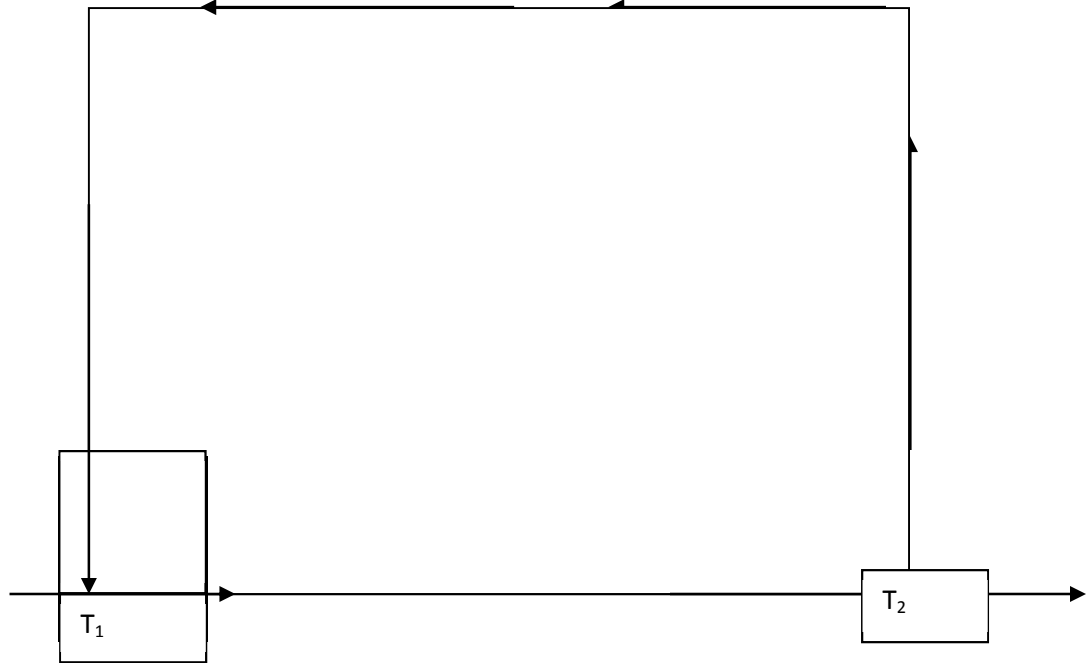
In this regard, it might be worth looking at the Sasa and Zamani conceptions of time among the Swahili. Sasa time is roughly analogous to what Eurocentric thought calls the present, but much more nuanced including the immediate past, and the immediately impinging future (just around the corner reality). Zamani time wholly overlaps Sasa time, but unlike it extends into the distant, if not eternal past. Again, it may be rendered in the West as the past, except it differs in that in overlapping Sasa time, Zamani time also includes the present and some small portion of that which is understood as the future. The third dimension of time is potential time which is actually much closer to what Euro-centrism calls the future. Unlike in that latter intellectual construct though, it is speculative and its character and existence is prefigured and determined by the actions that individuals and collectives take within the working realms of

Zamani and Sasa. One can note here that there is no need for a “feedback” loop since there is no “back” there to feed to. Even the eternal past is understood as immediately and presently accessible.⁵

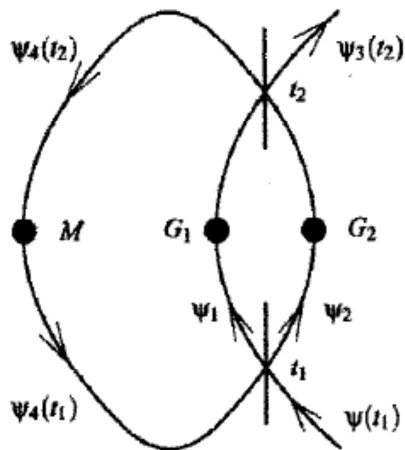
Swahili Conception of Time and Space 1



So now we turn our attention to how Greenberger and Svozil seek to resolve this problem. They reject the classic feedback circuit because such a loop, going merely from a later to an earlier time would have two entry ports and only one exit port and could not be reversed, violating the quantum principle of unitarity. Unitarity requires that the sum of all probabilities of a particular outcome be one.



They instead devise a quantum time evolution scheme. In this scheme, they employ two particle beam splitters which couple ingoing and outgoing channels.



(Svozil, 2005)

Greenberger and Svozil then grapple with the great paradox we began with, where a time traveler could potentially render the future time line from whence he came impossible. Their conclusion is that if one were to travel back in time, one would only see alternatives consistent with the present (then-future) as you left it. So though you would have a consciousness of the past, you would not be able to alter it. Their notion is that the events which led up to your circumstances in the present cannot be changed. What you would find in the past are resonances to the future as it has unfolded. In their model, “free will” again defined Euro-centrally exists until a choice is made and then it is retrospectively constructed as inevitable. The argument is that the past is deterministic, but the future is probabilistic. Alternative worlds are rendered nonexistent as soon as measures are made confirming the present “reality.”

What’s interesting is how close this revised “solution” merely replicates in a microscopic form the version of the time space relationships that the Swahili and other traditional Africans had posited in the first place. If one looks at the Greenberger-Svozil diagram, the path G_1 is understood as Sasa, the present commingled with the immediate past and the immediate future. The paths G_2 -M and M- G_2 collectively constitute Zamani time, the eternal past. The only variance is the notion of an intermediate zone for “potential time,” however, it can be extrapolated mathematically and logically from the continued progression of the path G_1 within the context of a time and space order which bends back upon itself. Thus G_1 can be conceived of as part of an undrawn circle formed by the present and by interaction of the present with the eternal past. Thus has Eurocentric physics created a problem for itself and solved it adequately, never realizing that had they been rooted in Africentric theosophical thought in the beginning, the problem would not have existed conceptually and the solution would have been superfluous. Yet, I am sure as in most of Eurocentric history this conception and the proposed theoretical solution are going to be trumpeted as a “finding” or “discovery.” So much of what is being “found” is merely being discovered again.

Perhaps then, since this is more a “rediscovery” than a “finding,” those who conscientiously engage African conceptions of time and space can uncover the future. They have the potential for doing so by rigorously examining the pasts of Africana thought with respect to these variables. African-centered scholars then should be and would then be positioned at the forefront of the global human debate in this area (as they were before in ancient times) and perhaps as technology catches up to theory, as it inevitably does, play a vital role in the process of traversing time and space and in defining how that mechanism when it comes to be can be a humanitarian aid to humanity, rather than a danger or a tool of control.

Now as I beheld the living creatures, behold one wheel upon the earth by the living creatures, with his four faces. The appearance of the wheels and their work was like unto the color of a beryl [bright gold/yellow]: and they four had one likeness: and their appearance and their work was as it were a wheel in the middle of a wheel. When they went, they went upon their four sides: and they turned not when they went. As for their

rings [rims], they were so high that they were dreadful; and their rings were full of eyes round about them four. And when the living creatures went, the wheels went by them: and when the living creatures were lifted up from the earth, the wheels were lifted up. Whithersoever the spirit was to go, they went, thither was their spirit to go; and the wheels were lifted up over against them: for the spirit of the living creature was in the wheels (McGough, 1995-2010).



(McGough, 1995-2010)

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¹ For reference here one might examine a number of texts, including: *Enchanted Paths and Magic Words: The Quantum Mind and Time Travel in Science and in Literary Myth* by E.C. Barksdale (Peter Lang: 1998); *A Briefer History of Time* by Stephen Hawking and Leonard Mlodinow (Bantam Books, 2005); *Hyperspace: A Scientific Odyssey through Parallel Universes, Time Warps, and the Tenth Dimension* by Michio Kaku (Oxford Press: 1994); *Time, Reality, and Experience* edited by Craig Callendar (Cambridge Press: 2002); *Unveiling the Edge of Time: Black Holes, White Holes, Worm Holes* by John Gribbin (Harmony Books: 1992); *Suspended Animation: The Research Possibility That May Allow Man to Conquer the Limiting Chains of Time* by Robert Prehoda (Chilton Co.: 1969); and *Predictions in the Brain: Using Our Past to Generate A Future* edited by Moshe Bar (Oxford: 2011).

² A couple of references, that might be used to broaden ones basic understanding of sangoma and basabgoma include: *Sangoma: An Odyssey into the Spiritual World of Africa* by James Hall (Putnam: 1994) and *The Spirits Speak: One Woman's Journey into the African Spirit World of the Sangomas* by Nicky Arden (Holt and Co.: 1996)

³ I have in mind the view of the Africa-centered critique of Platonic epistemology laid out, I believe authoritatively and with erudition by Marimba Ani in Chapter one of her book *Yurugu: An African-Centered Critique of European Cultural Thought and Behavior*, where she argues that Platonic epistemology bifurcated humanity into two competing entities, one a creature of reason and rationality, the other of desire and pleasure and the great human quest then is to sublimate emotion with pure reason. The human being is made to be at "war," if you will, with themselves, and therefore at war with the universe. Desire and emotion impinge necessarily, at every side, upon their existential life as a human being. The human being, in conceptually and schizophrenically splitting the "psyche" of the mind and physical brain from the body and the spirit in this way, becomes "soulless." As Ani states "A theory of the human being has already been implied in our discussion of Platonic conceptions. We, as humans, are not whole beings, but rather made up of parts that are in continual conflict with one another. We are made up of "reason," "intellect," and our "better natures," which are constantly seeking to control our desires, appetites, emotions and to put our "senses" to proper use. The better part must control the "baser." According to Eric Havelock, Plato "discovered" the "psyche" that came to refer to the "isolated, thinking of self." The self was no longer conceived as a cosmic being, that is, a being that experienced itself as intimately involved with other beings in the cosmos" (Ani, 1994).

⁴ In his article "Cosmogony as Political Philosophy," Youngmin Kim described cosmogony in its most inclusive sense, as including both a theory of the origins and character of the world. He goes on to note that "cosmogony is the best medium through which we can discuss what we might call a worldview for it most effectively epitomizes the way that one thinks the world is."

⁵ A relatively accessible account of Sasa and Zamani time concepts is given in *African Religions and Philosophy* by John Mbiti (Heinemann: 1990).