THERE’S MORE TO TIME THAN TICKING AWAY

by Varadaraja V. Raman

Abstract. Time is an element that each of us experiences in the core of our being. Yet it also is one of the great mysteries in our conceptual grasp of reality. The notion of time has therefore been reflected upon and explored by thinkers and scientists since ancient times. In this essay I relate the multiple ways in which Antje’s Jackelén’s scholarly and stimulating work Time and Eternity analyzes the historical, philosophical, theological, and scientific perspectives on the notion of time lived and its relation to the conceptual endless time that we call eternity, and offer some of my own contextual reflections on the topic.

Keywords: arrow of time; complex numbers; death; eschatology; Galilean and Lorentz transformations; narration; NOMA; relativity; reversibility and irreversibility; static and dynamic time; theology; thermodynamics; time

O, wer weiss Was in der Zeiten Hintergrunde schlummert.
(Who knows what is slumbering in the background of time!)
—Friedrich von Schiller (1998, I:1)
THOUGHTS ON TIME

Time is a deeply experienced insubstantial element in human consciousness. It seems to be with us all through our waking hours, apparently drifting ceaselessly in the external world as well. Each of us tastes a slice of time and then suddenly drops out or strays away from its course.

The notion and nature of time have fascinated people since ancient times, if only because time is a feature of the world that has a deeply subjective as well as a remarkably objective aspect. Time is present in our intuition, in our description of happenings in the physical world, in planetary orbits, and in biological evolution. Each of us is thrown, as it were, into the stream of time on which we float for a while, and then we are taken away from it, as it were, while the stream continues indefinitely.

Poets have commented on time, philosophers have pondered it, theologians have reflected on it, and scientists have explored its nature. As Marcus Aurelius expressed it, “Time is a river of passing events, aye, a rushing torrent” (Aurelius 2006, Book iv. sec 43). The Svestasvatara Upanishad describes God as the architect of time: kālakāro (vi.2), and the Mandukya Upanishad declares that the sacred syllable om embodies the past, the present, and the future, and whatever else there is beyond the threefold time (Nikhilananda 2000). It has been recorded that once when Pythagoras was asked what time was, he replied it was “the soul of the world” (Plutarch 1874, 440). Saint Augustine famously said, speaking not about God but about time: “What, then, is time? If no one ask of me, I know; if I wish to explain to him who asks, I know not” (2003, Book XII, 495). Among those who have written about time, at one extreme we have thinkers who have questioned the reality of time: “Our time is a very shadow that passes away” (Wisdom of Solomon, ii, 5). Some contend that time is a mere illusion (Nesbitt 2002). Others insist that time is as much an entity in the external world as the sun and the moon, which help us measure it. No matter what, time is an ever-present feature of perceived reality, powerful and useful in our grasp of the world.

Slow or fast, as the poet Charles Cowden Clarke wrote in his poem The Course of Time, “there is no arresting the wheel of time” (Mann 1880, 418). Historians have referred to chunks of time as stagnant or tumultuous. Time has been called a robber of our possessions, a poison, the dissolver and destroyer of all, for it seems to gobble up every thing and event and episode. Shakespeare described time as “the king of men, he’s their parent, and he is their grave” (Shakespeare 2005, Act ii, scene 3, l. 45). Yet time also has been called precious, and praised as a healer of heartaches, a consoler in grief. Cicero described time as the best medicine: Temporis ars medicina fere est, Remediorum Amoris (Cicero 1927, l. 131).

We feel intuitively that it is time that keeps the world going, that it makes things happen, because a world in which time did not move would
be static and lifeless, more still than a painted scene on canvas, more frozen than a sculptured bust.

Our minds cannot picture a moment beyond which there will be no time or one before which no time existed. Unending time seems to have had no beginning and cannot conceivably have an end. Such at least is what the reflecting mind leads us to believe. Time, we are inclined to think, is eternal. Like expansive space and never-ending numbers, time is another baffling infinity.

All of the philosophers and scientists who have pondered the nature and mystery of time have contributed in their different ways to our understanding and appreciation of this entity we call time. Adding to the vast corpus of literature on time is Antje Jackelén, a former pastor in the Church of Sweden and now a Bishop, who served also as a professor of systematic theology and science at the Lutheran School of Theology at Chicago. In *Time and Eternity: The Question of Time in Church, Science, and Theology* (2005) she examines various aspects of time from multiple perspectives. She also analyzes in depth a wide spectrum of the literature on the subject, enriching the reader’s apprehension of time in many ways.

Jackelén begins by explicitly rejecting Stephen Jay Gould’s NOMA (Non-Overlapping Magisteria) approach to theology and science, stating categorically that she regards as unacceptable “an uninvolved side-by-side existence” of theology and science (2005, 5). Her writings reveal that she is eminently qualified to undertake the project to build bridges of understanding and respect between the scientific and the theological approaches to an understanding of time.

NARRATED TIME

Paul Ricoeur stated that “the world is the whole set of references opened up by every sort of descriptive or poetic text I have read, interpreted and loved” (1984, 2). The opening chapter of Jackelén’s book is presented as an exemplification of Ricoeur’s narrative thesis in the context of time. This chapter also treats us to some fine hymns from the Christian tradition that relate to time and eternity. Some of these are presented in their original Swedish, some are in German, and others in English. (Perhaps it would have been easier for the only-English-knowing reader if the translations had been given right away, with or without the original, and the original non-English texts had been included in the endnotes.)

The intertwining of transient time with unshakable eternity is an important aspect of classical traditional insights. Jackelén points out how the notion of eternity adds hope to time itself. Indeed, if time were finite, there would be a terminus sooner or later. The idea of an end is incompatible with hope, which is the conviction that there will be a benign continuity, a return, sooner or later, of a pleasant state that will persist. And yet, we
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should remember that eternity will be pleasant only for those who have lived a good life, a point that is made in the Old Testament: “The righteous hath hope in his death” (Proverbs 14:32). Jackelén reminds us that in most earlier hymns in the narrative mode the concern was with the past for the most part and that the “future is primarily a theme of the twentieth century” (p. 55). This was the case with most hymns, and yet we may recall Tennyson’s nineteenth-century hymn *Not in Vain the Distance Beacons* (Unitarian Universalist Association 1993, 143) where the future is very much the theme:

Not in vain the distance beacons, forward, forward, let us range.  
Let the great world spin for ever down the ringing groves of change;  
Through the shadow of the globe we sweep ahead to heights sublime,  
We, the heirs of all the ages, in the foremost files of time.

Also, in traditional theology, eschatology was, by definition, about the future. In this context, Jackelén refers to the Divine as “the lord of dance” (p. 56), without perhaps realizing—or at least not stating—that she is rendering into English the Hindu vision of *Nataraja: The Lord of Dance* who is immortalized in the inspiring classic icon in Chidambaram (Swamy 1979). In the Hindu vision, Nataraja is the personification of five cardinal principles: Creation, Preservation, Re-mergence, Occultation, and Divine Grace. All of these are the essences of time. Creation occurs in time; what is created is preserved in time; the created is reabsorbed in time; ultimate reality is obscured in time; and the human spirit achieves grace in time.

Human time, transitory as it is, needs support, as it were, through the grasp of eternity. Terrestrial experience is like a long-lived dream that comes to an end sooner or later. It would be frightening if we woke up to utter darkness, which is what terminal time would imply. That is why the conviction of eternity is soothing to the psyche, that is why eternity is linked to hope, and that is why it played a central role in classical religious thought and continues to do so.

However, a blurring has occurred between eternity and time in modern thinking. Indeed, in our current worldview, flowing time and eternity have been totally separated. This bifurcation of the notions of eternity and time, explains Jackelén, referring us to the work of Marianne Gronemeyer, has resulted in some serious consequences, such as violence and incapacitating us in our attempts to cope with that which is not familiar (p. 59).

Although the central concern of this book is with time in the Christian tradition, other and pre-Christian traditions also have pondered these questions. For example, Cicero wrote: “Whatever it is that feels, has knowledge, wills, has the power to grow, it is heavenly and divine, and for that reason it must necessarily be eternal” (Cicero 1927, 1:27.66).
Then follows a discussion of time as conveyed in the Bible and in theology. We are reminded that in the Bible, which is largely a record of cosmic occurrences and human events, there is no explicit reflection on the nature of time. And yet, one can see in the narratives a distinction between linear and cyclical time, although the linear concept seems to have emerged from the cyclical. This is an interesting observation in that it is generally stated that linear time is in Western thought whereas circular time is in the Eastern (Hindu) framework. This oft-repeated contrast may be traced to Augustine, who devoted an entire chapter of a book to talking about “those who suppose that this world indeed is not eternal, but that either there are numberless worlds, or that one and the same world is perpetually resolved into its elements, and renewed at the conclusion of fixed cycles” (2003, XII, 495). In fact, both perspectives are there, both in the East and in the West. What is different is that the Hindu worldview implies that cosmic history itself is subject to cyclic time (the yuga).

Jackelén shows that in the Old Testament eternity is not contrasted with ordinary time. The Book of Genesis, that is, the epic of creation, specifies holy time rather than holy space that one finds in Babylonian myths. She draws attention to an important aspect of Jewish civilization, that “following the destruction of Jerusalem, Jews had a common calendar for almost two thousand years, although they did not have a common land” (pp. 65–66). This is a matter of much significance to Jewish history.

Then there is an analysis of the various shades of meaning associated with the notion of time in the New Testament, which has no interest in the notion of a timeless eternity. Jackelén refers to the number of times in which each nuanced meaning is mentioned in the Bible. There is an extensive discussion on Jesus’ understanding of time. Here, as elsewhere, Jackelén refers to some important theologians, mostly German, who have written on these matters. She talks about Ernst Fuchs’s notion of Christ as “the end of history and the Law”; indeed that Christ on the cross was that end (p. 77). The notion of time implicit in biblical eschatology is presented here. She points out that the concepts of the past and the future in the New Testament may be seen in the many references to the already and the not yet. Indeed, as Horace observed, “The wise god covers with the obscurity of night matters of the future” (Horace 2002, iii.20.30). Scriptures may not say much about time in the abstract, but those who comment on the contents of scriptures (namely theologians) do reflect a good deal on time and God, time and death, and related matters. Jackelén presents critical commentaries on some of these. She does not shy away from expressing her view that “Upon closer examination, one sees that several of [Wolf-hart] Pannenberg’s key concepts are clouded by ambivalences that do not appear to have particularly bothered him” (p. 108). In her analysis of death,
she points out perceptively that “Every interpretation of death is simultaneously an interpretation of the relation of time and eternity” (p. 110). As Seneca had said, “This day [of your death] which you fear as being your last, is the birthday of your eternity” [Seneca 1925, cii.26). It reminds me of the Tamil euphemism for a person who has just died: “He has become Time.”

**TIME IN SCIENCE**

Rejecting the position of thinkers such as Edwin Schneider (1958) who contend that it is not theology’s business to talk about time in philosophical, scientific, or historical terms, Jackelén devotes a solid and serious chapter of her book to the role of time in scientific theories. This chapter presents clear commentaries and reflections on several aspects of time in the scientific framework and reminds theologians that if they ignore the findings and insights of science on the matter they will be led to awkward and anachronistic predicaments. She analyzes Newtonian absolute time and the associated equations for the Galilean transformation. She does this from informed science history, referring to the works of Isaac Newton and Samuel Clarke, Gottfried Leibniz and Leonhard Euler, Immanuel Kant, and more. She suggests that whereas Christian theology is time-oriented, classical physics was primarily space-oriented, and sees in this dichotomy a possible seed for the antagonism between religion and science (p. 137).

She discusses the notion of relative time in Albert Einstein’s theory, referring to the Lorentz transformation on which the special theory of relativity rests, and gives a clear exposition of Hermann Minkowski’s Raum-Zeit (space-time) continuum which expresses the intertwining of space and time in elegant mathematical language. It is rare to encounter these equations in a work by a theologian.

In her exploration of time in the context of quantum theory, Jackelén refers to Einstein’s reluctance to accept its epistemology. (It may be said, contrary to what is stated on page 109, that Einstein did not propound the light-quantum hypothesis in 1905. Rather, as Jackelén herself states later, he applied Planck’s 1900 hypothesis to explain the details of the photo-electric effect.) In her discussion of the insights that quantum mechanics has provided regarding the role of the observer in our grasp of physical reality, Jackelén refers to the way-out extrapolations of individuals such as Frank J. Tipler and Andej A. Grib, showing us how easy it is to slide into a world of fantasy by imaginative interpretations of quantum mechanics (p. 154). At the same time, she also explains succinctly the views of Werner Heisenberg and Niels Bohr on the role of language in our appraisal of physical reality (pp. 155–59).

Jackelén discusses the role of time in cosmology, where there is an apparent terminal point of time at the beginning, which means that the no-
tion of *before* is simply untenable at the zero-point of cosmic birth (pp. 162ff.). Time also becomes a difficult concept within a Black Hole. All of these matters have implications on theological perspectives on God. This chapter does a very fine job of explaining the connections.

The thermodynamic notion of reversible and irreversible processes emerged in the middle of the nineteenth century, and this led to important insights on the nature of time. In the context of tracing the history of the subject, it may be pointed out that initially (1850) Rudolf Clausius simply referred to the Carnot principle as the Second Law of Thermodynamics. It was only four years later that he reformulated the law in terms of entropy. Moreover, not everyone may agree with Jackelén’s statement that “the irreversibility of the increase in entropy was interpreted as proof for the existence of a time arrow” (p. 174). Perhaps a more accurate statement would be that the intuitively experienced arrow of time was scientifically explained by relating it to universally irreversible processes in closed systems. There is a brief summary of this topic leading to the work of Ilya Prigogine. It may be recalled here that it was Arthur Eddington who coined the phrase “time’s arrow” (1928, 68).

Next follows a brief review of chaos theory and its relationship to time. Jackelén refers to the work of Friedrich Cramer, which sees deeper connections between reversible and irreversible processes, and relates transitions between reversible and irreversible times to the strange attractors of chaos theory. She points to the conceptual dilemma arising from the requirement of an isolated system for the arrow of time to exist and the possibility of complex structures only in open systems far from equilibrium, as per chaos theory. She notes that complexity and transformation, rather than uniformity, are what characterize the cosmos. As she poetically phrases it, “time does not march; it prefers to dance” (p. 172). She explains how in chaos theory the notion of time gets more sophisticated, as the idea of time flowing as a single stream along one direction is transformed into one of temporal multiplicity. This chapter discusses with clarity the variety of views on time in the framework of science and the subtle transformations they have undergone over the centuries as well as the unspoken ways in which some of these are tied to age-old theological positions. Portions of this chapter may not be intelligible to those unfamiliar with the language of mathematics or the subtle concepts of physics.

All through the book Jackelén intersperses the wealth of scholarly resources she presents with graceful, almost poetic, commentaries. Here is one such passage:

In Newton, space and time are the permanent stage for the cosmic drama. Visible to everyone and in absolute symmetry, every plank is arranged precisely and every position of the actors can be determined objectively. Although it is the scene for the most diverse plays, the stage remains basically untouched by what happens on it. Its solidity is unquestionable. God is its guarantor. Thus the task of the physicist is only to explain the action of the drama. This point of view dominated two
and a half centuries with singular majesty—and for good reason: Its practical applicability in the sphere of daily life gave it an indestructible vitality. Its defects became obvious only when physicists began to deal with the very small, the very large, and the very fast. (p. 173)

**Time in Theology**

The last chapter of the book considers aspects of a theology of time. It begins by distinguishing the static and the dynamic notions of the universe and their relationship to time. If the universe is regarded as a giant machine, in the static view one considers the unchanging laws to which it is subject. This perspective would restrict itself to uniform motion and to reversible processes. The dynamic aspect consists of changes, irreversibility, and accelerated/decelerated motion. The view of time as an arrow now comes into play, of time flowing along a direction. Jackelén sees this dynamic view as approximating Christian theology, “which would be inconceivable without the dynamics of creation—covenant, incarnation, eschatology” (p. 184). I want to mention here that there are corresponding categories in Hindu religious vision, conveyed through the terms *dharma,* *avatara,* and *yuga.*

Jackelén is very specific in her biblical reference when she explains that the dynamic aspect is in harmony with a theology that wishes to relate both categories to God, that wishes to speak of both the God of the philosophers and the God of Abraham, Sarah and Hagar, . . . and of Jesus Christ. This basic understanding speaks neither of a God of pure being, which leads to deism, nor of a God that is exclusively thought to be evolving, which would dissolve everything into process. (p. 184)

The notions of *being* and *becoming* have been analyzed by philosophers since ancient times. As I see it, from an experiential standpoint, perceived reality is characterized by *things* and *changes.* We may refer to everything there is as *beings,* and the changes themselves as *becomings.* For something to be out there, space is essential. Space is thus the receptacle for every entity in the universe. It is the static receptacle for the things in perceived reality. But in order for something to happen (more exactly, when something happens), time comes into play. If there is no flow of time, all will be frozen indefinitely, as when the pause button on a video player is pressed. For the *becoming* aspect of the world, time is essential. Thus time may be looked upon as the receptacle for what is happening out there. It is the dynamic root of perceived reality.

Next Jackelén reflects on the relational understanding of time, especially in the Thomas Torrance version of it. In a work first published in 1969 Torrance elaborated on the idea that (Protestant) theology severs the gospel from the structure of space and time (Torrance [1969] 1972).

In various forms of the relational perspective, God, who is beyond space and time, is also in permanent relationship with what God has created. In
this context Jackelén introduces the mathematically fruitful notion of complex numbers and their representation on the complex plane (p. 188). The horizontal (real) axis would correspond to the real world and the vertical (imaginary) axis would represent the spiritual world. Any vector in the complex plane (any complex number) would thus be a point in complex reality. Its modulus (square root of the sum of the squares of the components) would always be real. This idea is certainly pictorially attractive and conceptually suggestive, but I want to point out that it is impossible to assign a metric to this representation, as one would normally do in mathematics. That is to say, these theological complex numbers have no measure and thus are very different from numbers in the theory of complex variables. Then again, only points in the first quadrant of the theological complex plane can be ascribed meaning, because the other quadrants involve negative (real and/or imaginary) numbers. Nevertheless, like the Minkowski space, it is interesting in its representational mode.

In her discussion of some current theological perspectives on trinitarian models, which includes an analysis of the notion of alterity, Jackelén points out that “Trinity does not merely mean that three persons enter into relationships with one another, but rather that the persons mutually constitute one another within the relationships” (p. 192). (The word alterity, meaning the state or quality of being other, is a philosophical term introduced by Emmanuel Levinas [1995]. It has not yet found a place in most English dictionaries.) Even granting that these matters may be interesting in the context of modernism and postmodernism, Jackelén reminds us that one should be careful not to mistake analogies with the scientific framework for identities with them.

In her discussion of eschatology from theological as well as scientific perspectives, Jackelén gives brief reviews of the ideas of Sigurd Hjelde, Johann Gerhard, and Heinz Ratschow (theology) as well as of Tipler and Freeman J. Dyson (science). She wisely alerts the reader that the eschatological speculations of physicists are not taken seriously by the majority of physicists. Indeed, she asserts, “There cannot be any scientific justification for theological eschatology” (p. 208). Then follows an interesting discussion of the three phases of time: past, present, and future, with reference to their parallels with necessity, reality, and possibility, respectively. She discusses at length various aspects of the notion of the future in all their subtleties, in both scientific and theological frameworks. She clarifies the distinction between future understood “as that which results from the past to the present” and “as that which comes towards me ‘from what is ahead’” (p. 210), and analyzes the implications of this distinction.

There is an important difference between spatial extension and temporal evolution. Given a spatial line and direction, one may move forward or backward with respect to the direction. This is impossible on the temporal
axis. We always move from the present into the future (or the future always transforms itself into the past, whichever metaphor one chooses), but the opposite is never true. There is an asymmetry in the flow of time. We cannot move back in time. Whatever has transpired has left its relics, legacies, and records. No one can bring back yesteryear, or even the second that has just elapsed. As Aristotle quoted Agathon, “This is denied even to God: the power to undo the past” (Aristotle 1999, VI. II.6).

In her discussion of eschatology with reference to the immortality of the soul, Jackelén questions some of the currently accepted views, and offers her own interpretation: “The preserved identity does not lie in a static conservation of one’s own sameness along an infinite timeline, but is rather found in relation to the Other” (p. 218). In other words, it is the intangible relationship that matters, not the individuality.

Concluding Note

In her concluding section, Jackelén notes, “There is no such thing as one single generally valid concept of time. One can view time as a convention or a construction and consider it an aid for structuring and organizing life, but one can come close to it only as lived time and narrated time” (p. 226). Her own study of time is a rich illustration of this thesis. It treats the reader to a wide range of the variety and scope of the notion and experience of time, and to the many insights on time that have been expressed by thinkers through the ages. However, in this very mode of presentation lie both the strength and the weakness of the book. It is its strength because the reader is made aware of significant sections of the huge volume of writings on time—especially its Germanic sources with which the average English reader may not be familiar. It is the book’s weakness because so many quotes and references sometimes push to the background the author’s own interesting reflections and insights on time and its interpretations, which are interspersed throughout the book.

Time and Eternity is by no means an easy read. It takes time (if not eternity) to read the book from cover to cover. But whoever reads through it with care and attention will find it to be a rich and rewarding experience. There is little doubt that this work will become a classic in the literature devoted to the subject of time.

Notes

1. In Tamil, avar kaalmaagivittaar—He has become one with time: He has died.
2. The photoelectric effect was discovered by Wilhelm Hallwachs in 1890 on the basis of work done by Heinrich Hertz.
3. Clausius formulated the Carnot principle as that heat cannot of itself pass from a colder to a hotter body.
4. An example of a perfectly reversible process would be a frictionless swinging pendulum. Such a system is for all practical purposes static in that there is no change in its overall pattern.
5. In the Hindu framework, dharma refers to divinely sanctioned moral framework, avatara is incarnation of the Divine, and yuga is the cosmic time-cycle. The universe emerges (has a birth), grows (evolves as it exists), and then dissolves (dies). Each yuga lasts several billion years. This process is repeated endlessly. Thus, in every yuga there is a flow of a time toward a terminus.

6. A complex number consists of two real numbers, $a, b$: one of them is multiplied by the imaginary unit (square root of -1). The length of the vector Jackelén alludes to cannot be calculated unless these two numbers are specified.

**REFERENCES**


