

# Time and Eternity: *Antje Jackelén's Theological Study*

with James M. Byrne, "Theological Methodology, Classical Theism, and 'Lived Time' in Antje Jackelén's Time and Eternity"; Varadaraja V. Raman, "There's More to Time than Ticking Away"; Hubert Meisinger, "The Rhythm of God's Eternal Music: On Antje Jackelén's Time and Eternity"; John R. Albright, "Time and Eternity: Hymnic, Biblical, Scientific, and Theological Views"

## THEOLOGICAL METHODOLOGY, CLASSICAL THEISM, AND "LIVED TIME" IN ANTJE JACKELÉN'S *TIME AND ETERNITY*

by James M. Byrne

*Abstract.* Antje Jackelén's *Time and Eternity* successfully employs the method of correlation and a close study of the question of time to enter the dialogue between science and theology. Hermeneutical attention to language is a central element of this dialogue, but we must be aware that much science is untranslatable into ordinary language; it is when we get to the bigger metaphysical assumptions of science that true dialogue begins to happen. Thus, although the method of correlation is a useful way to approach this dialogue, there is not a strict equivalence in this relationship. Theology needs science more than science needs theology. In speaking of time and God we must keep in mind the relational nature of classical Christian theism, even in its most austere forms. We should not read Enlightenment ideas of God back into the classical Christian tradition or neglect the apophatic emphasis in Christian theism, which warned against assuming knowledge of the divine nature. God's relation to time always lies beyond our understanding. Studying the effects of either the Newtonian or Einsteinian concepts of time on our theological concepts should not detract our attention from the "lived time" that characterizes human experience. Consideration of the notion of time in the Madhyamaka Buddhist tradition reminds us that we cannot control the inner reality of time and that for humans time is something to be considered pragmatically.

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Stephen Hawking thinks that physics may be on the brink of a more complete understanding of time, but he also recognizes time's deeply puzzling character. In *A Briefer History of Time*<sup>1</sup> he writes:

What is the nature of time? Will it ever come to an end? Can we go backward in time? Recent breakthroughs in physics, made possible in part by new technology, suggest answers to some of these long standing questions. Someday these answers may seem as obvious to us as the earth orbiting the sun. . . . Only time (whatever that may be) will tell. (Hawking and Mlodinow 2008, 5)

"Whatever that may be." This intriguing comment echoes Augustine of Hippo's famous remark, which Antje Jackelén mentions on the first page of *Time and Eternity*: "What then is time? I know what it is if no one asks me what it is; but if I want to explain it to someone who has asked me, I find that I do not know" (*Confessions* XI:14). After the breakthrough in physics initiated by Albert Einstein more than a century ago, we have come to understand that both time and space are more extraordinary than anyone previously thought or imagined. Yet, despite the achievements of modern physics, there is a mysteriousness to time that may defy our best scientific attempts to fully understand it. As Jürgen Neffe puts it in his biography of Einstein, even after the revolution brought about by the special theory of relativity "No-one knows what light and time really are. We are not told *what* something is. The special theory of relativity merely provides a new rule for measuring the world" (Neffe 2007, 143). Deep down, "reality" remains mysterious.

Moreover, for anyone interested not only in what modern physics tells us about the nature of time and space but also in the existential and theological questions raised by our experience of the world, the mysterious nature of time takes on another level of significance. It touches directly on the question of God and God's relation to the world. Is God in time or affected by time? Was time created? How will time end, if at all, and how is that to be understood in relation to the Christian belief that everything in the end returns to God? How is time as we experience it to be understood in relation to God's time?

These questions are not new, but, as Jackelén argues, they must considered afresh in light of new scientific knowledge. Jackelén believes that the "question of time is important for theology because the conception of time has consequences for a large number of theological topics" and that "up until now, theological reflection has not dealt very explicitly with twentieth-century theories of physics" (Jackelén 2005, 2). In this she is surely correct, but it does not necessarily follow that the new scientific under-

standing of time has any significant direct theological or existential implications. That remains to be shown, and it is this issue that engages Jackelén throughout this comprehensive work. She studies time under three headings: time in the context of church, specifically in selected German, Swedish, and Australian hymns; time as understood in the Bible and by selected theologians; and time as revealed by modern physics. In a final chapter she attempts to construct a theology of time that would do justice to a revised notion of time drawing on the three previous chapters.

In this review I comment primarily on three aspects of the study: first, some of the methodological challenges associated with any attempt to bring together notions of time from church, theology, and science; second, the relationship between scientific ideas of time and concepts of classical theism; and third, the human experience of what Jackelén calls “lived time.”

#### METHODOLOGY

*Time and Eternity* is an ambitious work. The question of time is, to say the least, a complex one, and the relationship between theology and the natural sciences has been and is open to a wide range of interpretations. Jackelén is clear that she does not want to take what we might call the high road, “the path of principled discourse, in which the presuppositions and methods of science and theology are compared to each other and brought into dialogue—preferably with the mediation of philosophy” (Jackelén 2005, 1). Rather she begins with the low road, allowing theology and science to enter into dialogue on a specific topic, in this case time. However, as we shall see, it is not possible to stay on the low road for long without returning to the high road to better see the way ahead and draw some general conclusions about the direction the dialogue is taking. This approach is further complicated by the fact that not only formal academic theologies are her concern but also the more informal, less systematized theologies of church hymns from different countries and Christian traditions. Jackelén’s hermeneutical approach, following that of Paul Tillich and David Tracy, is the method of correlation, which seeks after a public discourse, a truth that can be shared, and thus rejects reductionism and the isolation of the disciplines from each other. Her aim is a revised theology of time that learns from the natural sciences but that also is true to the “concentrated life experience” reflected in the hymns.

With this approach, two methodological questions arise. First, how do the parts of the study fit together? That is, how does the less formal theology of the hymns relate to the formal academic theology, and how do both contribute to the correlational dialogue with the natural sciences? Second, what view of the relationship between theology and the natural sciences emerges from the study? What overall conclusions can we reach from the methodological option of beginning with this specific problem of time?

Jackelén's study of Roman Catholic and Protestant hymns from Sweden, Germany, and Australia is methodical, thorough, and detailed.<sup>2</sup> It is a labor of love. She is guided by the hermeneutical principle of Paul Ricoeur that our discourse on time cannot be a direct, descriptive discourse but must be narrated: "narrative understanding deserves precedence over narratological rationality" (Jackelén 2005, 11). Jackelén further justifies her study of the hymns by claiming that hymns often offer "a better understanding of the thoughts and feelings of the Church than the study of the writings of its theologians"; the hymns, she argues, "are concentrated experience, and they therefore also achieve a kind of universality" (p. 12).

This is a persuasive argument, but I want to enter an important caveat. Hymns do not necessarily arise spontaneously from Christian communities and thus may not always reflect well the experiences of those communities. Many of us can recall singing hymns that said nothing at all to our experience but instead seemed to come from the musty cellars of the church's past. The production of hymns that become part of the standard repertoire of any particular church often is subject to the control of clerics or church bureaucrats, and the people in the pews who sing them may have had no influence at all in their selection. Hymns can, of course, *create* experiences and become part of the fabric of a church's identity—just think of the importance of "A Mighty Fortress Is Our God" for Lutherans, "Amazing Grace" for Anglicans, and "Faith of Our Fathers" for many Roman Catholics—but we should remember that they may not reflect experience and, as they become outdated and stale, can fail to make any meaningful contact with the lives of the persons who are asked to sing them.

That said, this caveat need not undermine the primary conclusion that Jackelén draws from her exhaustive study of hymns old and new, namely, that over the centuries "talk of eternity has receded into the background, while narration about everyday affairs and time has gained in importance" (p. 55). On the face of it, this is not a surprising conclusion; literalist understandings of heaven and hell clearly have lost their grasp on the imagination of many modern Christians as this-worldly concerns take center stage. But this is not Jackelén's only concern. She believes that because hymns offer a fluid and dynamic approach to Christian experiences of time, her insight into the dynamic nature of language can become a gateway to the understanding of time in the natural sciences also. In this she finds support in the thoughts of Werner Heisenberg on the role that language plays in the natural sciences. She agrees with him that poetry in particular can perform the function of mediating between the static and the dynamic, between explanation and interpretation: "Poetry as the interface between static and dynamic uses of language once again appears to be a perfect starting point for the more precise and productive understanding of time" (p. 156). Both theology (whether expressed in hymns or in a more formal academic way) and the natural sciences must draw on a fluid and

dynamic language to help us understand something of “the infinite richness of reality” (Heisenberg, quoted in Jackelén 2005, 156).

Jackelén is surely correct when she says that the hymns are “guardians of rich treasures” and that they “open up a wider spectrum than many theological models can provide” (pp. 230, 231). Indeed, she reveals that there is a liveliness and a spirit to the hymns that often is markedly absent in the dry dust bowl of theology. Thus, she is justified in her treatment of the hymns in *Time and Eternity*. What at first may seem a forced connection between notions of time and eternity in Christian hymns and modern science is brought into mutual correlation through attention to language and metaphor, particularly in Jackelén’s favored metaphor of the dance: “time and eternity could be seen as a pair in a cosmic dance, who, turning and pulsing, move with and against each other” (p. 56). She is well aware that all metaphors have their limit, and this one is sometimes stretched in *Time and Eternity*. Jackelén acknowledges that the dance might just as easily be the Nietzschean dance of the self-glorification of the strong as a liturgical dance of joy. The metaphor is helpful but essentially empty until we know what kind of dance we are engaged in.

What picture of the relationship between theology and the natural sciences emerges from *Time and Eternity*? At the end of Chapter 3, “Time in the Formulation of Scientific Theory,” Jackelén asks what has been learned in this chapter. She means what we have learned not just scientifically but also about the relationship between scientific theories and theology. Well aware that many would see such a question as meaningless, she asks: “Was it much ado about nothing?” (p. 176) Of course her answer to her own question is “No,” but it is worth exploring her rationale. She offers three reasons why such an encounter is worthwhile. First, it is the duty of theology to stay informed about developments in the sciences. Second, as both theology and the natural sciences tell stories of the world, there is “a struggle for language”—for which stories of the world are told, and how language is used in the telling of these stories. Realizing this, we see that the boundaries between scientific and religious understanding are not clear-cut. Third, in dialogue with theology the natural sciences can deepen their own self-understanding by, for example, seeing how “an unshakeable belief in the unity and harmony of nature has driven scientific research” (p. 178).

Here we have essentially a correlational harmony. Theology must learn from the sciences; both theology and the sciences should remain aware that they are engaged in language games, in telling stories about the world (Jackelén correctly comments that this assertion need not open the gates to an irrational relativism); and the sciences can learn something about themselves by listening to theology. This idealized tripartite schema seems to be a good example of correlational theology at work. Does it stand up under scrutiny?

The first point is incontrovertible: Theology must learn from modern science or risk becoming obsolete. The third point certainly has some truth to it, especially with regard to the study of the history of science and to the much-needed critique of so-called scientism, the attempt to reduce all knowledge and understanding to the methods and discoveries of pure empirical science. However, Jackelén sometimes overstates her case. For example: “Science can become religion. The factors and processes that become effective in such developments require critical reflection. For this, natural sciences are also dependent upon theological expertise” (p. 179). Surely this claim is exaggerated, not only because most science is carried on in practice with no need for any theological connection but also because there are many tools other than theology that can play this role, not least the self-correcting qualities of the scientific method itself. This is not to deny that the natural sciences have a hermeneutical character of which scientists are often unaware, or that science often engages in quasi-religious quests, but it should not be overstated to imply that the sciences are necessarily in need of theological guidance or that there is a strict equivalence between theology’s need for science and science’s need for theology.

However, it is the second point in Jackelén’s correlational schema that perhaps goes to the heart of *Time and Eternity*. Jackelén explains:

Neither in the natural sciences nor in theology can one ignore the facts that, despite their relative difference, subject and object also constantly permeate each other and that theoretical knowledge and practical knowledge interact. Natural scientific discoveries tend to create their own ideologies, and in terms of their consequences, they strongly call for ethical reflection. Theological knowledge, by contrast, pushes towards the building of relationships between the content of faith, the worldview, and the organization of life. Because of these dynamics inherent to their disciplines, natural scientists and theologians are equally challenged to enter into a fruitful dialogue. (pp. 177–78)

There are dangers in any such approach where quite different sets of categories and concepts are brought into dialogue, for example when scientific concepts are forced into inappropriate theological service. However, Jackelén avoids such mistakes, and is clear from the beginning that her choice of the topic of time is a means to an end, a way to enter the broader question of how we interpret our world and our experience both scientifically and theologically. In this book the more general questions emerge from the methodological approach of beginning with the specific.

This hermeneutical awareness, and attention to the complexity of interpretation in both theology and science, is a noteworthy feature of *Time and Eternity*. Indeed, one could describe it as a book about language, about the shifting and elusive metaphors, images, and concepts that we use to capture something of “reality” in all its dimensions. This attention to language—to the stories we tell and to the hermeneutical character of all human insight, whether literary, philosophical, musical, artistic, theological, or scientific—is the key to Jackelén’s revised theology of time. When we

understand just how fundamental language is to how we describe “reality,” we see that we must narrate through language to give meaning and sense to our world. Understanding that the power and beauty of these myriad and diverse narratives can wax and wane through both history and the individual human life, we can come to perceive that the detailed scientific paper, the sometimes stumbling efforts of theology, and the beautiful hymn are in their complementary yet different ways part of that greater human story. However, we should not forget that a great deal of science is rigidly empirical and is expressed in mathematical formulas or highly technical language that is inaccessible to the lay person.<sup>3</sup> The possibility for dialogue emerges when we move from the strictly empirical level to the level of the bigger questions, be they ethical, philosophical, or religious, prompted by specific scientific work or by the whole scientific endeavor.<sup>4</sup> Therefore, even recognizing that the language of mathematics and scientific formulas may sometimes be untranslatable into a common idiom, we can nevertheless hold out the hope with Jackelén that productive dialogue between science and religion can take place.

#### GOD AND TIME

For Isaac Newton, whose *Principia Mathematica* (1686) initiated modern physics, time was an independent entity, unrelated to space and to the universe as a whole: “Absolute, true, and mathematical time of itself and of its own nature . . . flows equably without relation to anything external” (quoted in Fagg 2003, 30). Such absolute time for Newton was consistent with the absolute nature of God. Indeed, as Hawking observes, Newton was reluctant to follow the implications of his own theories (which allowed for absolute time but not absolute space) because he believed that absolute space was inconsistent with the traditional understanding of God (see Hawking and Mlodinow 2008, 19–25). Despite his heterodox views on the divinity of Christ, when it came to the monotheistic idea of God Newton saw himself as adhering to the classical tradition, which believed God to be both timeless and changeless.

But the Newtonian understanding of time underwent a revolutionary change in the early twentieth century with Einstein’s remarkable achievement of reconciling Newton’s laws of motion with James Clerk Maxwell’s equations on electromagnetism. Einstein realized that if the laws of science—in this case the speed of light—are to remain the same for all observers, in the case of moving bodies time itself is relative for observers in different states of motion (at our “earthly” speeds the effects are virtually negligible but become more pronounced the closer we get to the speed of light).<sup>5</sup> Time, therefore, is not universal but local. This conclusion is counterintuitive and appears strange to most of us even after we understand the science. After all, we do not live at speeds close to the speed of light where such effects are most prominent.



This new understanding of space, time, and motion raises interesting questions about how we are now to understand time theologically. Jackelén believes that the Newtonian model of absolute time has had negative theological effects that can be overcome in light of the new physics. She is severely critical of an absolute concept of time and what she perceives as its negative consequences for theology, but she also acknowledges throughout the book that the idea of space and time as “the permanent stage for the cosmic drama” (p. 173) works rather well in everyday life. However, in her view the functional Newtonian notion of time is not appropriately applied to God: “in much theology, there is still the uncritical assumption that God is at home in Newton’s time . . . since Newtonian mechanics functions perfectly in our everyday life. Consequently, what is known and what has proved itself to work is universalized and also carried over into conceptions of God” (p. 228).

The Newtonian model of time, Jackelén argues, “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). She thinks that the new science allows us to speak of a relative or, more correctly, relational concept of time that is also more attuned to biblical notions of time and to our human experience. It also requires us to think of God in less absolutist terms. “One can speak dynamically and relationally of time and eternity only if one also starts from a dynamic and relational concept of God” (p. 139). In her view the “temporal openness” of God avoids both determinism and relativism and “opens up the possibility of understanding eternity indeed as temporal, but nevertheless as incommensurate with chronological time” (p. 229).

In Jackelén’s reading of the implications of the revision of time in physics, the possibility emerges to understand time relationally, both in terms of how time is understood by us and how we explain God’s relation to time. In line with Ilya Prigogine’s (admittedly controversial) views, she argues that “a relational concept of time comes the closest to being an accurate description of reality” (p. 171). If time is understood relationally, we must move away from absolutist concepts of God that in her view have characterized classical theism and revise our understanding of God’s relation to time and eternity. Following Ingolf U. Dalferth, Jackelén argues that a revised, relational notion of time leads us to correct

the view of eternity that has been common since Augustine. First, God should not be viewed as merely timeless; and, second, the ontological difference between eternity and time should be interpreted in light of the eschatological difference between old and new times, and not vice versa. In light of the eschatological difference, the timeless and temporal eternities of God are no longer mutually exclusive. Rather, the two should be considered together. (pp. 98–99)



She argues that eternity is “the Other of time” but also acknowledges that although this more dynamic understanding may help to avoid the “ontological statics” she deplors, a “lack of clarity in the concept of the Other” is the price to be paid for this dynamism (p. 117). Nevertheless, she believes that this relationality is validly sustained insofar as time is understood, in conjunction with Emmanuel Levinas, as an “aspiration and an awaiting” for the absolute Other (Levinas is quoted on p. 118). Time is relation, but always understood eschatologically.

Oddly, however, Jackelén often speaks as if theism itself is the problem. For example, she writes that “the theistic concept of a God who is absolute and static in divine majesty contributed to this process [of a God/world dualism]” (p. 138). She goes on to say that in searching for a dynamic and relational concept of God the “theistic concept of God proves to be unsuitable” and argues that “the reason for the dead end of deism should be sought less in the concept of absolute or relative time than in the absoluteness of the theistic concept of God, which effectively suppresses the idea of true relationality” (p. 139). This strikes me as curious because in the tradition of Christian theism God is not thought of as lacking in relationality; the doctrine of the Trinity is grounded in relationality. Jackelén does speculate about the possible effects if Newton had included a Christology in his overall notion of God—of course, this would have been rather difficult for Newton to do given his heterodox beliefs about Christ.

Perhaps I misunderstand Jackelén here, but she does seem to imply that the dominant trend in postbiblical theistic tradition is to perceive God as absolute and nonrelational. As we shall see, this is not the case. In my view, this criticism of theism would be more accurately focused on ideas of God in early modernity that, by separating philosophical speculation on God (the famous “God of the philosophers”) from the Christian tradition’s theological idea of God as personal, trinitarian, and in relation to the world, opened the door to both deism and atheism. Michael Buckley’s *At the Origins of Modern Atheism* contends that seventeenth-century theologians such as Leonard Lessius and Marin Mersenne, wary of special pleading to revelation, argued against atheism on purely philosophical grounds, “as though religion had to become philosophy to remain religion” (Buckley 1987, 359), thus inadvertently removing what is distinctive about the Christian message from the debate and ceding the basis of the argument to the philosophers. Indeed, the same tendency is evident today, and there is a danger in our contemporary debates for even some Christian theologians to misread this Enlightenment “God of the philosophers” back into pre-Enlightenment theology, forgetting that even the most austere forms of theism in the Christian tradition did not fully abandon the personal and relational characteristics of the divine nature.<sup>6</sup>

Therefore, although the classical theistic tradition did emphasize timelessness and changelessness in the divine nature, the crucial matter is how

these ideas are to be understood. Keith Ward points out that for the classical theological tradition, perhaps best represented by Aquinas, the key issue to be grasped is its concern with the simplicity of God (Ward 2008, 107–33). Aquinas, following Hilary of Poitiers, argued that God is in no way composite. In God there is no distinction between matter and form, essence and existence, subject and accident. Such distinctions imply prior and posterior states, and this requires change over time. Because God is simple, and not composite in any way, God is also changeless and timeless. But, as Ward emphasizes, in the classical theological tradition this stress on the timeless and changeless nature of God was balanced by the view that while God may be nontemporal or nonchanging, God is also ineffable. We can add that, for Aquinas, we speak only analogously of the divine nature, which cannot be grasped by human language and concepts. We may speak of the perfections (or “names”) of God but can never fully understand what this says about God’s being. The forgetting of this divine ineffability and the analogous, therefore limited, nature of all language about God has led to the situation in which historically “change and time have often been excluded altogether from the Divine Being” (Ward 2008, 113).

Thus we can speak of temporality in God without diminishing divine perfection. It is not only the new physics that enables us to say this. As Ward argues elsewhere (2006), if human beings have freedom, this entails temporality in God; there will always be some contingent states not determined by God, and therefore God’s knowledge of this will come “after” the events precipitated by that freedom. Also, Jackelén would surely agree with Ward that God’s temporality is not bound to time as we understand it, not least because, as Ward points out, “Such a thought would raise in a very acute form a problem with the special theory of relativity. The problem is that in our space-time simultaneity is relative. . . . There is no such thing as absolute simultaneity throughout the universe. Where, then, is God’s ‘now’ if there is no absolute flow of time which God could observe or share in?” (2006, 215) If Ward is correct, we can legitimately speak of God both as temporal and as timeless, in the sense of not being constrained by any particular time.

In sum, what holds for more absolutist understandings of God also holds for this revised notion of God’s temporality. A revised notion of God’s relationship to time, even if it seems to bring theology more in line with the new physics, should recognize that relationality has always been part of Christian theism and that our understanding of God must always be read in the context of the apophatic theology (running from the Cappadocians through Pseudo-Dionysius, Aquinas, Eckhart, Nicholas of Cusa, and beyond), which warns against the danger of thinking that language somehow captures the essence or being of God. The divine nature always eludes what can be said about it.<sup>7</sup> “God’s essential trans-temporal nature is wholly unimaginable by us” (Ward 2006, 216).

## LIVED TIME

Focus on the temporality of God is one of the central themes of *Time and Eternity*. But we also have to ask whether the rescue of the temporality of God via the new physics of time comes at the expense of an adequate engagement with the existential experience of “lived time.” Strictly speaking, we humans do not experience time directly in either a Newtonian or an Einsteinian way. Rather, we experience it in variable ways and at different “speeds” depending on the particular circumstances of our lives. What is time to a prisoner or a hostage, or to someone who has just lost his job, or to a small child, or to someone with a terminal illness, or to a lover waiting anxiously for her loved one? As far as we are aware, we humans are alone among animals in knowing that we will die. We know that there was a time when we were not and there will again be a time when we shall not be. This fact, at least in cultures lacking belief in the transmigration of souls, lends a deep poignancy to the brevity and tragedy of each single existence and has been a rich source of inspiration for artists and poets through history.<sup>8</sup> For the poet the mystery of time is revealed in the pathos of human existence, and it seems that only love and its memory, durable works of art or literature, and the production of progeny can defy the cruelties of time. Like the poet we all experience time passing, as if moving like an arrow, and as we grow older we feel even more acutely its loss. We also experience cyclical time in the routines of daily life, the succession of the seasons, small and large anniversaries that mark our personal lives, and sacred times of worship that enrich the spirit or renew the earth. Human life embraces time experienced as linear and time experienced as cyclical, so we can agree with Jackelén’s assertion that the “polarization of cyclical and linear time leads to a flawed description of reality” (p. 172).

So, although humans may know about time as understood by Newton and by post-Einsteinian physics and may even know that some physicists think that we may have to abandon the very category of time altogether, these are not the concepts of time that concern us existentially. Jackelén is conscious of this and, following Ricoeur, continually emphasizes that time must be narrated for it to be truly meaningful. But a deep understanding of time as narrated, as “lived time,” would take us not only, or even primarily, into modern physics but rather into literature and poetry (think of the profound and disquieting treatment of time in Samuel Beckett’s *Waiting for Godot*), into the study of sacred and liturgical ideas of time, even into psychology and the social and biological sciences for a better grasp of how humans deal with the effects of the inexorable passing of time on our bodies and our minds. This approach is reflected to some extent in the analysis of the hymns in Chapter 1 and in the final sentences of *Time and Eternity*. Jackelén hints at broadening such an approach, but it is not made as explicit as it might have been.

It is also worth observing that, given the puzzling nature of our experience of time, Christian theology could learn a great deal from other religious traditions. Consider a recent online reflection on the Madhyamaka Buddhist view of time by theologian Joseph S. O’Leary (2009), for whom

the slipperiness of temporal categories is due not to alienation from the phenomenon of time but to the very nature of that phenomenon—or one might even say to the absence of that phenomenon, for it appears that we have temporal experiences but no experience of a single phenomenon called time. . . . [Our notions of time are] a cultural construction, in which imagination plays a major role. From a Madhyamaka Buddhist point of view the various efforts to revise and clarify discourse on time may claim the status of valid clarifications of conventional reality. But their failure to establish foolproof definitions of time, either at the level of physics or at the level of human temporality, is indicative of the non-ultimacy of any reality we can conceive or articulate.

O’Leary comments that “time is offering us a constant apprenticeship in impermanence and emptiness,” echoing Augustine’s view that thinking about time is a “bad state indeed to be in, not even to know what it is that I do not know” (*Confessions* XI:25). If we agree with O’Leary that an “immense, irreducible plurality of ways of experiencing time seems to be the basic phenomenological datum,” a single theology of time becomes an impossibility, for no conceptual framework could grasp the enormity and diversity of that experience. This concurs with and yet goes farther than Jackelén’s assertion that “an abstraction of time is not possible. There is no such thing as one single generally valid concept of time” (2005, 226). Conceptually time slips from our grasp, but we must still cope with its day-to-day ravages. The Buddhist view that “time is an inherently cloudy matter that is to be dealt with pragmatically,” says O’Leary, should encourage us to dismantle any “grandiose claim to master the inner reality of time,” including our theologies.<sup>9</sup>

Of course to deal with time *very* pragmatically, Westerners developed the mechanical clock. In *Revolution in Time*, his outstanding study of the role of the clock in the advance of the modern world, David S. Landes comments on just how unnatural are our modern habits of timekeeping. Modern notions of time are quite different from a more “natural” or primordial experience of time. After all, nature is the great *Zeitgeber*, the time-giver, and the cycles of day, night, season, and year are imprinted on living things by the circadian and circannual biological rhythms that are “stamped in our flesh and blood . . . [and] mark us as earthlings” (Landes [1983] 2000, 13). Our modern clocks, by contrast, track time minutely and measure it out in parcels. Clocks are

a man-made device with no model in nature—the kind of invention that needed planning, thinking, trying, and then more of each. No one could have stumbled on it or dreamed it up. But someone or, rather, some people, very much wanted to track the time—not merely to know it but to use it. Where and how did so strange, so *unnatural* a need develop? (p. 14)

Landes's notion of what is "natural" may be open to question, but his treatment of the desire to measure time is revealing. He emphasizes that among those who wanted to track time were medieval monks, especially the Cistercians, who wanted accurate timekeeping to perform the Divine Office correctly. "This religious concern for punctuality," observes Landes, "may seem foolish to rationalists . . . but it was no small matter to a monk of the Middle Ages" (p. 59), for a monk's salvation and the salvation of those for whom he prayed was tied to strict observance of his duty of prayer. The medieval monks were interested not only in calendar problems such as the dating of Easter but also in the division of the day down to individual minutes, and thus did the monastic schedule of the Divine Office give an impetus to the development of more and more accurate clocks in the late medieval and early modern periods.<sup>10</sup> The monk at Cîteaux, worried about waking in time for lauds, has much in common with the Swiss patent clerk in his office in Bern, concerned with the accurate running of the trains, and thinking in his spare time about the relation of time, light, and motion.

#### NOTES

I am grateful to John Kenney and John O'Meara for conversations on the subjects of classical theism and the physics of time respectively and to Edward Mahoney for his comments on the text.

1. This is an updated and less technical version of Hawking's *A Brief History of Time* (1988), prepared in collaboration with Leonard Mlodinow.

2. It would be interesting to see a similar exercise done with different churches, particularly those in which theologies of the end times play a prominent role, as in some recent Evangelical and Pentecostal theology.

3. One theoretical physicist described his work to a seminar on science and religion as "a secret joke in a language you can't understand."

4. I agree with Philip Clayton that "scientific results are rarely the direct building blocks of theology; seldom are theological explanations constructed, directly or indirectly, using the language of scientific results and explanations. . . . Instead, the results of science must first be metaphysically interpreted and their underlying assumptions brought to the surface before they can tell for or against theological assertions" (Clayton 1999). For a fuller treatment of the question of God in modern thought see also Clayton 2000.

5. In the classic example, a person on a fast-moving train who bounces a ball on a table will say that to her the ball appeared to hit virtually the same spot again a second later without any lateral movement; however, to someone on the platform the ball appears to travel quite a distance along the track with the moving train before it bounces again. Hawking explains succinctly the consequence of this difference in viewpoint between the two observers: "Since speed is distance divided by time, if they disagree on the distance [the ball travels] . . . the only way for them to agree on the speed of light is to also disagree on the time the trip has taken. In other words the theory of relativity requires us to put an end to the idea of absolute time!" (Hawking and Mlodinow 2008, 33)

6. Buckley comments that the ordering of the questions in Thomas Aquinas's *Summa Theologiae*, in which the question of God is treated first, led later commentators to read this as a purely philosophical treatment of the question of God, an approach that Aquinas did not intend. Pavel Gavrilyuk (2006) argues in part against too neat a division between the impassible God of the Greek philosophers and the more passionate God of the Bible.

7. I discuss this question in Byrne 2001, chap. 7. For a recent challenge to the coherence of the very idea of God's relationship to time see Steele 2008, chap. 16. For a view of God's time and our time as distinct but compatible see Bracken 2007.

8. Nowhere is the human experience of the transitory nature of time more beautifully and exquisitely expressed than in some of the sonnets of William Shakespeare: "Like as the waves make towards the pebbled shore, / So do our minutes hasten to their end; / Each changing place with that which goes before, / In sequent toil all forwards do contend" (Shakespeare, Sonnet 60).

9. These comments are intended not to reproach Jackelén for not writing a different book but rather to suggest that the dialogue between Christian theology and modern physics is only one part, and sometimes a rather abstract part, of any deep engagement with the mysteries of time.

10. Landes believes that although the historical record is scant on mechanical clocks before the late thirteenth century, these clocks were developed from at least several previous generations (see Landes [1983] 2000, 51–53).

## REFERENCES

- Augustine of Hippo. 1963. *Confessions*. Trans. Rex Warner. New York and Scarborough, Ontario: Mentor.
- Bracken, Joseph A. 2007. "Space and Time from a Neo-Whiteheadian Perspective." *Zygon: Journal of Religion and Science* 42:41–47.
- Buckley, Michael J. 1987. *At the Origins of Modern Atheism*. New Haven and London: Yale Univ. Press.
- Byrne, James M. 2001. *God: Thoughts in an Age of Uncertainty*. London and New York: Continuum.
- Clayton, Philip. 1999. "Neuroscience, the Person and God: An Emergentist Account." In *Neuroscience and the Person: Scientific Perspectives on Divine Action*, ed. Robert John Russell, Nancy Murphy, Theo C. Meyering, and Michael Arbib. Vatican City State: Vatican Observatory Publications, and Berkeley, Calif.: Center for Theology and the Natural Sciences. <http://clayton.ctr4process.org/files/papers/NeuroscienceThePersonAndGod.pdf>.
- . 2000. *The Problem of God in Modern Thought*. Grand Rapids, Mich., and Cambridge, U.K.: Wm. B. Eerdmans.
- Fagg, Lawrence W. 2003. *The Becoming of Time: Integrating Physical and Religious Time*. Durham, N.C., and London: Duke Univ. Press.
- Gavrilyuk, Pavel. 2006. *The Suffering of the Impassible God: The Dialectics of Patristic Thought*. Oxford: Oxford Univ. Press.
- Hawking, Stephen W. 1988. *A Brief History of Time: From the Big Bang to Black Holes*. New York: Bantam.
- Hawking, Stephen W., with Leonard Mlodinow. 2008. *A Briefer History of Time*. New York: Bantam.
- Jackelén, Antje. 2005. *Time and Eternity: The Question of Time in Church, Science, and Theology*. Philadelphia and London: Templeton Foundation Press.
- Landes, David S. [1983] 2000. *Revolution in Time*. Cambridge: Harvard Univ. Press, Belknap Press.
- Neffe, Jürgen. 2007. *Einstein: A Biography*. Trans. Shelley Frisch. New York: Farrar, Straus and Giroux.
- O'Leary, Joseph S. 2009. "Time and Emptiness." [http://josephsoleary.typepad.com/my\\_weblog/2009/04/time-and-emptiness.html](http://josephsoleary.typepad.com/my_weblog/2009/04/time-and-emptiness.html).
- Steele, David Ramsay. 2008. *Atheism Explained: From Folly to Philosophy*. Chicago and La Salle, Ill.: Open Court.
- Ward, Keith. 2006. *Pascal's Fire: Scientific Faith and Religious Understanding*. Oxford: Oneworld.
- . 2008. *The Big Questions in Science and Religion*. West Conshohocken, Pa.: Templeton Foundation Press.