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2014

Myth and Modern Physics: On the Power of Nothing

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Available at: https://works.bepress.com/mary_jane_rubenstein/39/

THEOLOGIES OF CREATION

Creatio Ex Nihilo and Its New Rivals

Edited by Thomas Jay Oord

 **Routledge**
Taylor & Francis Group
NEW YORK AND LONDON

First published 2015
by Routledge
711 Third Avenue, New York, NY 10017

and by Routledge
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

Routledge is an imprint of the Taylor & Francis Group, an informa business
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Library of Congress Cataloging-in-Publication Data
Theologies of creation : creatio ex nihilo and its new rivals / edited by Thomas Jay Oord. — 1st edition.
pages cm

Includes bibliographical references and index.
1. Creation—History of doctrines. I. Oord, Thomas Jay.
BT695.T44 2014
231.7'65—dc23
2014006255

ISBN: 978-0-415-71214-9 (hbk)
ISBN: 978-0-415-71215-6 (pbk)
ISBN: 978-1-315-88424-0 (ebk)

Typeset in Bembo
by Apex CoVantage, LLC

Printed and bound in the United States of America by Publishers Graphics,
LLC on sustainably sourced paper.

To David Ray Griffin
for his inspiration to think anew about God's creating

- Theology* 44 (1991): 139–51; John H. Walton, *The Lost World of Genesis One: Ancient Cosmology and the Origins Debate* (Downers Grove, IL: IVP, 2009).
3. Some cite 2 Maccabees 7:28 as a biblical source of creation from nothing, but the verb used in this passage is also used to talk about the sexual activity required to create children. Procreation is not creation from nothing.
 4. Paul Gavriluyk, “Creation in Early Christian Polemical Literature,” *Modern Theology* 29, no. 2 (2013): 27.
 5. See, for example, Paul Copan and William Lane Craig, *Creation out of Nothing: A Biblical, Philosophical, and Scientific Exploration* (Grand Rapids, MI: Baker, 2004).
 6. The leading authority on this historical question is Gerhard May and his book *Creatio Ex Nihilo: The Doctrine of “Creation out of Nothing” in Early Thought*, trans. A. S. Worral (Edinburgh: T & T Clark, 1994). See also Blake T. Ostler, “Out of Nothing: A History of Creation *ex Nihilo* in Early Christian Thought,” *FARMS Review* 17, no. 2 (2005): 253–320.
 7. For example, see books and writers such as *The Wisdom of Solomon*, Philo Judaeus, 1 *Clement*, Justin Martyr, *Joseph and Aseneth*, 2 *Enoch*, *Odes of Solomon*, *Shepherd of Hermas*, Athenagoras of Athens, and Hermogenes. Ostler analyzes these books and writers in “Out of Nothing.”
 8. May, *Creatio Ex Nihilo*, 179.
 9. Paul Davies offers a nice summary of the six main theories in his essay “Eternity: Who Needs It?” in *The Far-Future Universe: Eschatology from a Cosmic Perspective*, ed. George F. R. Ellis, 41–52 (Philadelphia, PA: Templeton Foundation, 2002).

1

MYTH AND MODERN PHYSICS

On the Power of Nothing

Mary-Jane Rubenstein

In the Beginning

Traditionally, creation stories have occupied the realm of what we tend to call “religion.” In the beginning,” the stories will tell us, “there was a vast, unbroken egg,” or an androgynous giant, or an ancient god and goddess, or an undifferentiated material mass. Religious-studies scholars tend to call this part of the story the “primordial scene”: a picture of the world before the world, the stuff out of which all that is is about to emerge. As the story continues, something then *happens* to this primordial stuff: The egg breaks; the giant is dismembered; the parents fight, reproduce, or both; the material is stirred up, shaped, or breathed on by a divine agent—and out of this moment of rupture, a set of oppositions begins to emerge. Day and night, male and female, earth and sky, here and there, land and sea, us and them. These oppositions give structure to the world-in-formation; they make order out of disorder, cosmos out of chaos.

With the world thus established, the story will go on to prescribe a set of values and behaviors for the community: Humans should rule over (or care for) the earth, this class should rule over that class, the gods like *us* better than *them*, and we should never (or always) eat this plant, sacrifice that way, or gather on this day. In short, a creation story carries remarkable social power. It says that things must be this way because they have been this way since the dawn of time—that the very order of the universe depends upon our adhering to a particular social configuration. We might think here of that popular objection to same-sex relationships: “God made Adam and Eve; not Adam and Steve.” In the logic of this retort, the pairing of two men or two women is legally and socially inadmissible because it is (allegedly) cosmically inadmissible. The fabric of the cosmos is stitched heterosexually. And so a creation story or “cosmogony” (from the Greek words *kosmos* and

genesis), is, among other things, a way of reinforcing particular social arrangements and behaviors—usually those that benefit the group telling the story.

Because cosmogony had always been the business of religion (or in other idioms, culture, philosophy, or mythology), modern science spent its first few centuries staying as far away from creation stories as possible. From the time of Copernicus through the first half of Einstein's life, astronomers and physicists simply assumed that the universe was eternal—that there was no need for anyone or anything to set it in motion because it had always existed. So when a young physicist and priest named Georges Lemaître suggested to Einstein that the universe might have *begun*—that the whole thing, in fact, might have burst forth once upon a time from a single point—Einstein is said to have replied, “No, *not that*; that sounds too much like Creation.”¹ In the decades that followed, comparably troubled physicists tried to find alternative models that might save modern cosmology from positing a beginning. But with the discovery of the Cosmic Microwave Background in the mid-1960s, the anti-cosmogonists relented, and “the big bang hypothesis” became the unrivaled creation myth of the late twentieth century.²

It may seem strange to call the big bang hypothesis a myth. We modern secularists tend to think of this story as the first properly scientific account of the birth of the cosmos—the account, in fact, that finally delivered cosmogony from the murky realms of religion and established it as *truth*. For scholars of religion, however, to call a story “myth” is not to call it untrue; it is to mark the story as foundational for a particular community, insofar as it encodes and reflects the values and norms of that community. In this sense, the big bang is “our” creation myth: We learned it as children from communal leaders; it establishes a class of people (namely scientists) as having privileged access to a universal truth, and it reflects collective values. These include observability, cosmic autonomy, and truth itself—after all, this is *the* story of the way things *are*.

The big bang does not, therefore, occupy a completely different realm from “religious” cosmogonies. If it did, it would not have caused Einstein and his colleagues such alarm when it was first posited. Not only does the big bang function as a myth, but it bears an uncanny resemblance to a *particular* myth—that is, the Abrahamic doctrine of *creatio ex nihilo*, which first appeared in Christian thought and was later incorporated into Jewish and Muslim theologies.³ Once upon a time, the big bang hypothesis seems to tell us, the whole universe burst forth in a flash of *light from nothing*.

Well, maybe not “nothing.” Lemaître himself thought the cosmic starting-point was something more like a hyperdense nugget of space-time (which he called the Primal Atom), and the decades that followed witnessed intense debates over the somethingness or nothingness of the big bang's primordial scene. For orthodox theologians, however, the matter was settled; as early as 1951, Pope Pius XII exclaimed that “modern science” had confirmed the church's doctrine of a light-filled creation from nothing.⁴ Even physicists conceded the remarkable similarities of the two stories. One particularly colorful account comes from the astronomer

Robert Jastrow, who describes the frustration and incomprehension physicists experienced when, having struggled for years to climb the final mountain of scientific mystery, they reached the peak only “to be greeted by a band of theologians who had been there for centuries.”⁵ The big bang, Jastrow concedes, was more or less the old “biblical” story with enhanced data.

Now one way to make sense of this remarkable confluence would be to say that the big bang looks like the *ex nihilo* because they are both true. This might well be the case, but then we would be left without much more to say. In particular, we would not be inclined to investigate how these stories have been produced or why they have been so compelling. Another approach to this confluence, then, would be to bracket both stories' truth-claims and consider that their resemblance might be the result of their having emerged from common metaphorical-narrative stock. Along this strategy, it would be important to come to terms with the conditions that produced the *ex nihilo*, and to consider how similar arrangements of power might be replaying themselves in modern cosmology.

Troubling the Waters

Whenever I teach the book of Genesis, I ask my students what the book's first character creates the world *out of*. “Nothing,” they dutifully reply. They say this even if they have had no religious upbringing and even if we have just read the Bible's opening lines aloud in class. These lines say that in the beginning, the spirit of God was breathing over dark, deep, unformed waters, which Genesis 1:2 calls *tehom*. God, breath, and deep compose the Bible's primordial scene. Yet my students will consistently overwrite the story, convinced that the “correct” primordial scene must be nothing. What is it about nothing that seems to overwrite everything else?

Contemporary theologians—many of whom have contributed essays to this volume—tend to be deeply divided on the issue of *ex nihilo*. Some of them uphold it as the only consistent doctrine of creation, whereas others criticize it as misinformed and ethically dangerous. Remarkably, however, nearly all of these scholars agree that *ex nihilo* isn't exactly “in the Bible.” Some supporters of the doctrine go to great lengths to point out biblical hints toward it, but others simply admit that it took early Christian theologians a few centuries to figure out the truth, with the help of the Holy Spirit. Critics of *ex nihilo* counter that far from being a divine revelation, the doctrine is the product of a series of power plays among early church communities vying for dominance over Christian teachings, practice, and posterity.

In *Face of the Deep*, Catherine Keller offers an unparalleled account of these ecclesiastical power plays. She grounds the saga of the *ex nihilo* doctrine in the *Enuma Elish*, a Babylonian myth familiar to the authors of the later biblical narrative.⁶ The story opens with Tiamat and Apsu, “salt water” and “sweet water,” dwelling eternally within one another. The couple produces children and

grandchildren, all of whom live peacefully within the precosmic parental waters. Then one day (here comes the rupture), the grandkids are making too much noise. Apsu gets cranky, and a series of plots and counterplots leave Apsu dead. Enraged, Tiamat breeds an army of sea monsters to destroy the offspring who murdered her husband; meanwhile, the grandchildren prepare for war. Their best hope in the face of Tiamat's oceanic throng seems to be one of *their* children, Marduk, a radiant boy with four eyes and four ears who vows to annihilate Tiamat, along with her fearsome cadre of dragons, monster-serpents, and sea-hags.

Calling the elements to his side, Marduk wages a lengthy battle against his great-grandmother, eventually sending a torrent of "evil wind" down her throat:

As the fierce winds charged her belly, her body was distended and her mouth was wide open. [Marduk] released the arrow, it cut through [Tiamat's] insides, splitting the heart. Having thus subdued her, he extinguished her life. He cast down her carcass to stand upon it. . . . With his unsparing mace he crushed her skull.⁷

This type of cosmogony is known as *theomachy*: creation by divine battle. Marduk, whom the narrative begins to call "the Lord" after his conquest of Tiamat, creates the world by destroying a primal chaos-monster, who happens to be the matriarch of all the gods and goddesses. Having "extinguished" Tiamat (and crushing her skull for good measure), Marduk goes on to split her body laterally, insulating half of her "as sky" and the other half as earth and sea.

Biblical scholars have long pointed out the resonance between Marduk's division of Tiamat and God's separating "the waters from the waters" in Genesis 1:6. And, as Keller reminds us, the name "Tiamat" is etymologically related to the Hebrew word *tehom*, the "deep" over which God breathes in Genesis 1:2. Keller's suggestion is that just as the *Enûma Elish* establishes the lordship of Marduk (and his lineage) by destroying the primal waters of Tiamat, the early church theologians established the supremacy of God (and his representatives) by annihilating *tehom*, replacing the "deep" of Genesis 1:2 with the *nothing* of orthodox creation theology. Especially considering that *tehom* is a feminine noun, both of these efforts establish the order of the universe *and* the power of a male creator-God upon the destruction of a feminized chaos.

As a number of this volume's contributors show, the specific formulation of *creatio ex nihilo* emerged as the church theologians of the second and third centuries sought to stamp out rival teachings among rival Christian communities in order to locate themselves as the keepers of *orthodoxy* ("right doctrine"). Early Christians branded as "heretical" are often grouped under the rubric of "Gnosticism," a highly contested term that has traditionally served more as a form of name-calling than as a positive term of self-identification. So the anti-Gnostic treatises of the church theologians reveal more to us about the authors themselves than about the people they charge with heresy. Chief among the teachings that were particularly

troubling to the early church theologians were "Gnostic" cosmogonies. While these stories vary from text to text, most figure the God of Genesis 1 as an inferior, often confused, and occasionally evil subdeity, who thinks he is alone in the universe. From time to time his mother, Sophia, calls down from her higher heaven to remind her son where he came from, but he never quite understands.⁸ Sophia is the source of the material out of which her son molds his little world. She is, moreover, one of a multitude of "aeons," or emanations from an even higher, *supreme* God, whom the texts render variously as a dyad, triad, or pentad and as androgynous, bisexual, female, male, or all or none of these.⁹

According to antihetical treatises, the errors of Gnostic theology were mirrored in Gnostic ecclesiology (that is, the structure of their churches). Just as Gnostic divinity was said to be plural and multigendered rather than single and male, Gnostic communities were allegedly guided by numerous men and women, rather than a single male bishop.¹⁰ Against all this plurality and gender insubordination, on the divine and human planes alike, church theologians like Tertullian and Irenaeus asserted the absolute supremacy of a single God—presumably gendersless, yet the subject of exclusively male pronouns. And the theological linchpin of this anxiously guarded supremacy was *creatio ex nihilo*.

Ironically, the idea that a supreme God must create out of nothing seems to have originated with a "Gnostic" teacher. Having heard the "heretical" Basilides proclaim *creatio ex nihilo*, Tertullian adopted the teaching while excoriating the teacher, appropriating the creation story of the very community he was trying to do away with. "Nothing," in fact, seemed the perfect solution to the Gnostic problem of a deadbeat creator struggling to shape his mother's effluvia into something substantial. Whoever that shady character is, the logic goes, he is not God, because God must create out of nothing. In short, then, Tertullian deployed one Gnostic teaching against another to dismantle the whole system.

Thus, then, was how the tehomnic "something" of Genesis 1:2 became nothing: In their struggle with the Gnostics, proto-orthodox theologians realized that there was no way to reconcile the existence of precosmic material with the absolute sovereignty of God. After all, if God creates out of something, then God is not the only creative force; in fact, God *relies* upon something else in order to create the world. But, the fathers reasoned, coexistence and reliance are not the marks of an omnipotent God. A truly sovereign God would rely on nothing, and nothing would exist alongside him; therefore, a truly sovereign God must create out of nothing.

More Nothing than Nothing

What, then, does this have to do with the big bang? As we will recall, many twentieth-century physicists were alarmed by the notion that the universe might have begun at all. In the meantime, their theological counterparts rejoiced at what seemed a scientific confirmation of orthodox doctrine. For physicists, the danger

of posing a beginning to the universe was that it invited the question of what began the beginning, in other words, of what “caused” the big bang to bang. The problem was that in its standard form, the big bang hypothesis could explain in exquisite detail the emergence of the early universe from about 1/100th of a second onward. But there remained what Steven Weinberg has called “an embarrassing vagueness about the very beginning”—an uncertainty as to what set the universe hurtling outward to begin with—and for most physicists, “God” was not a satisfying answer.

Then one day in 1969, another answer burst forth from the American physicist Edward Tryon during a seminar on cosmology. Tryon had been contemplating a peculiar phenomenon within quantum mechanics: Below the Planck scale (that is, the smallest unit of measurement), particles can flash into and out of existence—appearing for one moment and then disappearing again. The “empty” space within which all these fluctuations blip and unblip is what physicists call a vacuum. With all this in mind, Tryon is said to have interrupted the speaker by blurring out, “Maybe the universe is a vacuum fluctuation!”¹¹ The room is said to have “roared with laughter,”¹² yet Tryon’s weird idea eventually became the basis for a plausible cosmic scenario: Maybe once upon a time, a quantum fluctuation flickered into existence, failed to flicker out, and inflated instead into full-fledged space-time filled with stars, planets, dark matter, and us.

It has therefore become common among cosmologists to call our universe “the ultimate free lunch.”¹³ If the universe tunneled out of the vacuum spontaneously, they reason, then not only do we get something for nothing, we get *everything* for nothing—and everything *from* nothing. Dramatically, then, and often with intentional provocation, a growing number of physicists like to announce to their specialist and popular audiences alike that the universe was created . . . *from nothing*.¹⁴

A number of things are startling about this proclamation. First, “creation from nothing” is hardly a revolutionary idea: It has been around at least since the second century and has become the theological backbone of most Christian, Jewish, and Muslim theologies. So it is not clear whom these scientists are shocking by saying the universe comes out of nothing. Second, the physicists who most boldly celebrate the *ex nihilo* doctrine declare that they are thereby unseating “religion” (taken uncritically to mean something like “belief in a creator-god”). Throughout their recent best seller, for example, Stephen Hawking and Leonard Mlodinow argue that insofar as the universe appears “out of nothing,” it “doesn’t need to be set in motion by some god.”¹⁵ Similarly, Lawrence Krauss offers his “universe from nothing” as a way of finally rendering God “unnecessary—or at best redundant.”¹⁶ Turning up the volume even further, Richard Dawkins asks in an afterword to Krauss’s book,

Do you think some agent must have caused everything to start? . . . Now we can read Lawrence Krauss for what looks to me like the knockout blow. . . . If

On the Origin of Species was biology’s deadliest blow to supernaturalism, we may come to see *A Universe from Nothing* as the equivalent from cosmology. The title means exactly what it says. And what it says is devastating.¹⁷

In short, now that Krauss can prove the universe comes from nothing, there is no remaining reason to believe in God.

Now, on the one hand, it is ironic that Hawking, Mlodinow, Krauss, and Dawkins believe they can free the world from the Abrahamic God by means of the Abrahamic creation story. But on the other hand, this strategy itself is a familiar story: Just as Tertullian appropriated the Gnostics’ *ex nihilo* to unseat the Gnostics, Hawking and others appropriated it to unseat “religion” altogether. It is the same game: Take the opponent’s story and turn it against them. In effect, the physicist–ex nihilists are suggesting that the theologians’ primordial scene isn’t really nothing; it’s God-and-nothing. Only the quantum vacuum is *truly* nothing; therefore, their story is the only true story.

But this opens onto the third and perhaps most perplexing feature about the physicists’ *ex nihilo*: To put it bluntly, the vacuum isn’t nothing. Rather, it is what Leonard Susskind calls a “fluctuating sea of virtual particles”—a chaotic plenium of energy.¹⁸ Even a fervent ex nihilist like Alexander Vilenkin admits in passing that his “nothing” isn’t exactly nothing, yet he goes on to use the language anyway.¹⁹ Thinking back to the theological battles of the early church, we might therefore detect another familiar strategy here: Just as the church fathers encountered the chaotic sea of Genesis and called it nothing, these contemporary physicists posit a tehomic “foamlike” sea at the beginning and call it nothing. The question is, why? What is it about nothing?

Unlike any other primordial, “nothing” promises an absolute beginning. If your creation story starts with an egg or a giant or a goddess or a cow, then a child (or a rival theologian) can always ask where that “something” came from, trying to push the story back to a more original origin. And so the reason that nothing is so compelling is that it overrides every other story, making all other explanations seem derivative and incomplete. If it is the case, as I have argued, that any origin story encodes relations of power, then *ex nihilo* encodes supreme power, claiming to be the first cosmogony—which is to say the only cosmogony. With or without God, *ex nihilo* confers immense power upon the community that tells the story. As it turns out, however, this immense power is highly unstable, retaining its coherence only until someone stirs up the tehomic waters or quantum seas that intone the ancient dictum “*nothing* comes from nothing.”²⁰

Creatio ex Multitudine

While the rhetorical force of *ex nihilo* tends to help its authors onto the best-seller list, there are a host of other stories currently vying for cosmogonic dominance, none of which needs to start from nothing.²¹ In one model, what looks like a

black hole from our universe is said to be the big bang of another universe. "We," in turn, are sitting inside a black hole within someone else's universe, and as time goes on, the most prolific universes make more and more of themselves by generating stars that become black holes.²² In another model, our universe exists on a three-dimensional membrane that periodically collides with another membrane to ignite a big bang and re-create the cosmos.²³ In another, the vacuum out of which a universe tunnels is the hollowed-out remnant of a previous universe.²⁴ In still other models, the universe is said to be a simulation run by genius scientists in another dimension.²⁵

The models vary according to the diverse theoretical commitments and experimental processes of the physicists in question, and it will take some time for the scientific community to reach anything like a cosmogonic consensus.²⁶ That having been said, there is one model that I find particularly compelling, not because it seems to me the "truest," but because it tells such a good story. More importantly, it tells a *consistent* story—one that doesn't call upon "nothing" to cover up the seething flux of beginning. Posited by Laura Mersini-Houghton at the University of North Carolina, this model accounts for the "birth" of our universe, and a host of others, out of a precosmic "multiversal bath." Two forces vie for dominance in this bath: gravity, which pulls patches of proto-space-time back into the primordial; and a repulsive force (λ), which tries to push the patches out into their own universe.²⁷

According to Mersini-Houghton, if this is the way our universe was born, then it should still bear the marks of its entanglements with the primordial bath and every other proto-universe within it. Such marks would take the form of inhomogeneities on the Cosmic Microwave Background—a bit like cosmic birthmarks—and in fact, the most recent data from the Planck satellite confirm that a number of these inhomogeneities have been found.²⁸ Along this particular model, then, our universe is entangled with a multitude of other universes and with the place they all came from. To be sure, the evidence of this entanglement is remote and difficult to discern; in fact, the life of the universe progresses more or less as if it were the only thing in existence. But while the universe might forget where it came from, while it might think of itself as alone and independent, "where it came from" remains indelibly inscribed upon it, for those who have eyes to see.

Meanwhile, those who have ears to hear might pick up echoes in this multiversal bath of Tamara, *tethon*, even Sophia—those disavowed and feminized cosmic primordia. In the push and pull of the cosmic bath, can we hear the breathing out and in of a spirit over the waters? Of the generative commingling of fluid forces? Of a world bound up with invisible others? And if so, what are we to make of these mythic connections?

To be sure, one could argue that such intercultural, cross-temporal resonances demonstrate the truth of the composite story they tell: In the beginning was an eternal, feminized liquidity whose pushes and pulls produced a world that has

forgotten the realms before and beyond it. But making such a truth-claim ("this is the way the world began") risks reduplicating the strategies of mythic competition we have seen among theologians and physicists alike. In other words, it risks becoming yet another effort to secure the earliest beginning—the most original origin—for the sake of shoring up particular values and social arrangements and undermining others. And whatever our origin story, there is no escaping values and social arrangements. However refined our scientific apparatuses may have become, we modern thinkers are just as far (a bit farther, in fact) from having *witnessed* the birth of our universe as our Babylonian and biblical forebears; we are always in the position of reconstructing a plausible beginning from the middle of things.

The task, then, is not to proclaim the truth of any particular cosmogony, but rather to unearth the particular values it encodes—to ask whom it serves to account for the birth of the universe in this or that way, and toward what ends. In this spirit, one might suggest that while the orthodox *creatio ex nihilo* reflects the values of oneness, independence, and unilateral power, the quantum-rehomic *creatio ex multitudine* reflects multiplicity, interdependence, and negotiation. One might, in fact, venture that the fundamental plurality and cooperation affirmed in such a story are more ethically and theologically promising than the singular "dominology" of the nothing.²⁹ But there are always other stories.

Notes

1. Lemaître recounts the conversation as follows: "Comme je lui parlais de mes idées sur l'origine des rayons cosmiques, Il réagissait vivement . . . mais lorsque je lui parlais de l'atome primitif, il m'arrêtait. 'Non, pas cela, cela suggère trop la création.'" Georges Lemaître, "Rencounter avec A. Einstein," *Revue des Questions Scientifiques* 129 (1958): 130.
2. For a fuller account of the debates surrounding the big bang hypothesis, see Mary-Jane Rubenstein, "Cosmic Singularities: On the Nothing and the Sovereign," *Journal of the American Association of Religion* 80, no. 2 (2012): 485–517.
3. For a rundown of these histories, see David D. Burrell, Carlo Cognati, Janet Soskice, and William R. Stoeger, eds., *Creation and the God of Abraham* (Cambridge: Cambridge University Press, 2010).
4. Pius XII, "Modern Science and the Existence of God," *The Catholic Mind* 49 (1952): 182–92.
5. Robert Jastrow, *God and the Astronomers* (New York: W. W. Norton & Co., 1978), 116.
6. Catherine Keller, *Face of the Deep: A Theology of Becoming* (New York: Routledge, 2003), 25ff.
7. "The Epic of Creation (*Enuma Elish*)," in *Myths from Mesopotamia: Creation, the Flood, Gilgamesh, and Others*, trans. and ed. Stephanie Dalley, 228–77. Oxford World's Classics (New York: Oxford University Press, 2008).
8. See, for example, "On the Origin of the World" and "The Nature of the Rulers (Hypostasis of the Archons)," in *The Nag Hammadi Scriptures: International Edition*, ed. Marvin Meyer, 187–222. (New York: HarperCollins, 2007).
9. See Pheme Perkins, "Sophia as Goddess in the Nag Hammadi Codices," in *Images of the Feminine in Gnosticism*, ed. Karen I. King, 96–112. (Philadelphia, PA: Fortress Press, 1988); "Thunder" and "Three Forms of First Thought" in *The Nag Hammadi Scriptures: International Edition*, ed. Marvin Meyer, 367–78, 715–36. (New York: HarperCollins, 2007).

10. See Elaine Pagels, *The Gnostic Gospels* (New York: Random House, 1979), chapter 2.
11. The resulting paper can be found in E. P. Tryon, "Is the Universe a Vacuum Fluctuation?," *Nature* 246 (1973): 396–97.
12. Alex Vilenkin, *Many Worlds in One: The Search for Other Universes* (New York: Hill and Wang, 2006), 183.
13. This phrase can be found in the writings of Alan Guth, Paul Steinhardt, Stephen Hawking, Mario Livio, Jay Pasachoff, Victor Stenger, and a host of other technical and popular writers.
14. See, for example, Vilenkin, *Many Worlds in One*; Stephen Hawking and Leonard Mlodinow, *The Grand Design* (New York: Bantam, 2010); Lawrence Krauss, *A Universe from Nothing: Why There Is Something Rather than Nothing* (New York: Free Press, 2012).
15. Hawking and Mlodinow, *The Grand Design*, 8.
16. Krauss, *A Universe from Nothing*, 185.
17. Richard Dawkins, "Afterword," in Krauss, *A Universe from Nothing*, 191.
18. Leonard Susskind, *The Cosmic Landscape: String Theory and the Illusion of Intelligent Design* (Boston: Back Bay Books, 2006), 74.
19. Vilenkin, *Many Worlds in One*, 181.
20. For a rundown of ancient sources of this teaching, see Edward Adams, "Graeco-Roman and Ancient Jewish Cosmology," in *Cosmology and New Testament Theology*, ed. Jonathan T. Pennington and Sean M. McDonald (New York: T & T Clark, 2008), 11.
21. Many of these physicists will say that their models *could* start from nothing but that they might just take place eternally.
22. Lee Smolin, *The Life of the Cosmos* (New York: Oxford University Press, 1997).
23. Paul J. Steinhardt and Neil Turok, *Endless Universe: Beyond the Big Bang—Rewriting Cosmic History* (New York: Broadway, 2008). For a theologically inflected reflection on this model, please see Mary-Jane Rubenstein, "The Fire Each Time: Dark Energy and the Breath of Creation," in *Cosmology, Ecology, and the Energy of God*, ed. Donna Bowman and Clayton Crockett, 25–41. (New York: Fordham University Press, 2011).
24. Paul Frampton, *Did Time Begin? Will Time End? Maybe the Big Bang Never Occurred* (Hackensack, NJ: World Scientific Publishing, 2009).
25. A helpful introduction to this idea can be found in Brian Greene, *The Hidden Reality: Parallel Universes and the Deep Laws of the Cosmos* (New York: Alfred A. Knopf, 2011), 274–306. See also Jad Abumrad and Robert Krulwich, "DIR Universe," in *WNYC's Radiolab* (2009): Geek's Guide to the Galaxy, "Theoretical Physicist Brian Greene Thinks You Might Be a Hologram," *Wired.com*, May 16, 2012, <http://www.wired.com/2012/05/geeks-guide-brian-greene> (accessed April 21, 2014).
26. For extended treatments of multiverse cosmologies, see Greene, *Hidden Reality*; John Gribbin, *In Search of the Multiverse* (London: Allen Lane, 2009); Mary-Jane Rubenstein, *Worlds without End: The Many Lives of the Multiverse* (New York: Columbia University Press, 2014).
27. Laura Mersini-Houghton, "Birth of the Universe from the Multiverse," arXiv:0809.3623, September 22, 2008, <http://arxiv.org/abs/0809.3623> (accessed April 21, 2014).
28. For an accessible roundup of these findings, see the interview with the director of the Kavli Institute for Cosmology at <http://www.youtube.com/watch?v=YcdtybMbyU> (accessed April 24, 2014).
29. The term "dominology" is Kellers', *Face of the Deep*, xvii, 6, 54.

2

CREATION EX NIHILO AND INTENSIFYING THE VULNERABILITY OF GOD

Philipp Clayton

It's a pleasure to argue the pros and cons of creation *ex nihilo* with my esteemed colleagues. After all, I share so much in common with my friends across the metaphorical aisle represented by this collection of essays. In one sense, if you think about it nothing separates us. Nothing. But what a nothing it is.

Let's not go immediately to the differences. Think of the commonalities first. From the moment that you take God and world as given, our positions are deeply intertwined. Like many other "open and relational" theologians, I owe an immense amount to the sparkling gifts of process thought. Through the deeply relational God of process theology I have come to understand more of the mysterious biblical God . . . more of the history of philosophy . . . more (speaking now as a comparative theologian) of other traditions, such as Hindu thought.

There is another "tie that binds" us: We share many of the same criteria for what should be affirmed about God—what we need to affirm, and what we should be careful *not* to affirm. For example, if affirming *creatio ex nihilo* should really turn out to be a root cause of hierarchy—if *this* is what produces the subordination of women and of people of color, or if it really lies at the root of colonialism—then I would abandon that doctrine.

What then divides us? One answer would be that my colleagues across this metaphorical aisle (across this "nothing" aisle that separates us) think that the question of ultimate origins can't be answered—that this is one of those topics where nothing can really be said—whereas proponents of creation *ex nihilo* have no such reservations about what can and cannot be known about God prior to creation. Is it true that ex nihilists rush in where fools fear to tread? But this difference is again . . . nothing. Process thinkers are just as willing to speak of the primordial nature of God as ex nihilogians are willing to speak of, say, the immanent trinity. And *both* groups, when we are at our best, know how to stand in silence before