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Chapter 7

Astrobiology, Astrotheology, and Cosmic Consciousness

Ted Peters

As a science, astrobiology—accompanied by sister disciplines such as astronomy, astrophysics, and cosmology—is almost inherently religious. Looking at the stars, said Plato, "compels the soul to look upwards and leads us from this world to another."¹ Two and a half millennia after Plato, Harvard astronomer Owen Gingerich adds, "Cosmology is a voyage of the human spirit."²

Why is the science of astrobiology almost religious? Because it plucks the strings of spiritual sensibilities. More specifically, our built-in psychological and cultural sense of *the Beyond* begins to vibrate at thoughts of astronomical distances and the possibility of meeting extraterrestrial neighbors.

For our archaic ancestors, it was the sky that attuned itself to our innate sense of the Beyond. Power comes from the sky. The life-giving sun is in the sky. Shooting stars bring the sky down to earth. Thunderbolts in the sky dazzle and even destroy. The sky became personalized as Aman-Re in Egypt, Indra in India, Thor in Scandinavia, Zeus in Greece, and Jupiter in Rome.

Phenomenologist of religion Mircea Eliade recovers our primal experience with the sky. "It is a total awareness on man's part: beholding the sky, he simultaneously discovers the divine incommensurability and his own situation in the cosmos. For the sky, *by its own mode of being*, reveals transcendence, force, eternity. It *exists absolutely*, because it is *high, infinite, eternal, powerful*."³ The sky's transcendence calls to the quest for transcendence within the human soul.

But our human awe for the sky disappeared in the modern world when we secularized the sky, when we rid the sky of Jupiter and all the other sky-gods. Our sky loses its enchantment when scientized, technologized, and

demythical. The sky loses its awe when we daily consult weather reports on our Apple Watch.

But right behind the secularized sky we discovered a second Beyond. That second Beyond is outer space. Outer space is deep, dark, unfathomable. Be there gods there? Our spiritual sensibilities are struggling to attune themselves to every new scientific discovery about that Beyond. Might we ask our astrobiologists to dazzle us with prophecies, revelations, and awe?

No. Why not? Because subjectivity has been expunged. Awe has been expunged. Reverence has been expunged. Transcendence has been expunged.

The excitement and meaning and sense of grandeur has been expunged in order to limit science to the data. Like other scientists, astrobiologists gather data about exoplanets, habitability, and biota. Data gathering is objective. Strictly objective. There is no room in this science or any other science for attunement to spiritual sensibilities.

What an astrobiologist knows about the planet Jupiter today must be denuded of the sky-god Jupiter known and worshipped by our Roman ancestors. To discover and store data about the largest planet in our solar system, the astrobiologist is obligated to rid Jupiter of any and all spiritual resonance.

Jupiter is religious. Astrobiology, which studies Jupiter, is not. This makes the science of astrobiology almost, but not quite, religious.

This observation should interest the astrotheologian. On the one hand, we have so much to learn about outer space from the astrobiologist's discoveries. On the other hand, the scientific denudation of Jupiter's previous religious meaning must be taken into account. Astrobiological knowledge cannot count as theological knowledge without considerable interpretation.

In what follows we will look at the mission of astrobiology, the almost but not quite religious science. We will look also at the task of astrotheology, namely, to bridge the gulf dividing the strictly objectivist epistemology of astrobiology from our human experience with built-in spiritual sensibilities.

We will then ask: might this bridge be built from materials drawn from cosmology, ontology, physics, and metaphysics? Might the physics of David Bohm or the metaphysics of Alfred North Whitehead help in bridge construction? The Whiteheadian and Bohmian cosmological schemes include both objective science and subjective human experience in their respective world-views. Might the astrotheologian take advantage of one or both?

ASTROBIOLOGY: THE ALMOST RELIGIOUS SCIENCE

In the 1990s, the term *astrobiology* quickly replaced the term previously used by Carl Sagan, Frank Drake, SETI, NASA, and others, *exobiology*. SETI's former director, Jill Tarter, provides a definition shared today with

NASA: "Astrobiology is the science that deals with the origin, evolution, distribution, and future of life in the Universe."⁴ Hybrid astrobiologist-theologian Lucas Mix expands this slightly. "Astrobiology is the scientific study of life in space. It happens when you put together what astronomy, physics, planetary science, geology, chemistry, biology, and a host of other disciplines have to say about life and try to make a single narrative."⁵

Within our solar system, astrobiologists are looking for biota, for chemical processes that suggest biological processes. They expect to find microbial life on Mars and the moons of Saturn. Beyond our solar system yet still within the Milky Way Galaxy, astrobiologists are looking at exoplanets in the habitable zone (H_2) for techno-signatures. They expect to find signs of intelligent civilizations, especially more technologically advanced civilizations.

This research carries a spiritual valence, despite the sober objectivity of the research methods employed. Questions such as meaning or purpose cling to astrobiology like barnacles to a ship's hull. But, for methodological reasons, the astrobiologist is obligated to scrape off those barnacles of meaning. Meaning dare not contaminate the raw data that researchers log in their computers. Regardless, the published data incite questions of meaning to those of us in the extrascientific culture who watch the astrobiologists with crossed fingers and hopeful prayers.

The astrotheologian asks: but what counts as explanatory adequacy? Is materialist reductionism enough? No. "The issue is precisely," says process theologian David Ray Griffin, "*which* set of concepts and principles is most adequate for interpreting all events."⁶ When a science such as astrobiology at the level of method-eliminates all subjectivity, then the results of its research can be only partial, devoid of meaning, and incomplete.

Astrobiologists, like Big Bang astrophysicists, find it difficult to avoid questions of origin, destiny, and meaning.⁷ NASA's percipient astrophilosopher Mark Lupisella tries to pave a road to maximum comprehensiveness. But, alas, he runs out of road and hits a dead end.

If our worldviews need to be comprehensive and include specific guidance for human behavior and address most of our complex subjective needs, then the universe is probably not enough for most people most of the time . . . there are broader questions such as why the universe exists at all, or more generally, why there is something rather than nothing, that modern cosmology arguably does not provide satisfying answers for.⁸

On the one hand, astrobiology invites us to a comprehensive worldview replete with ultimate meaning. On the other hand, crippled by a restrictive scientific epistemology, the space sciences are unable on their own to do the work only a theologian can.⁹

What is important here is that the natural world interpreted by astrobiology cannot help but emit vibrations of ultimacy that are attuned to our spiritual sensibilities. This leads Unitarian Universalist theologian Dawn Cooley to make an observation. "It is our human imperative to look for and make meaning—this is the foundation for the establishment of religions. It is also the impetus behind the creation of the field of astrobiology."¹⁰ Whether the astrobiologist admits it or not, this branch of science sprays spiritual meaning like a lawn sprinkler sprays water.

ASTROTHEROLOGY: A SCIENTIFICALLY INFORMED THEOLOGY OF NATURE

The attunement between the subjective and the objective—especially the attunement of the soul with the Beyond—belongs inherently to human experience. It belongs as well to theological reflection on that experience. Michael Fishbane makes this clear. "Theology is . . . situated at the border of the known and unknown, of the manifest and the concealed. It is at this nexus that the self seeks God . . . [Seeking God extends] to the utmost depths of Being and beyond (beyond the Beyond of all conception)."¹¹

The systematic theologian relies upon this attunement of our spiritual sensibilities when conceptualizing the divine. "God," according to Katherine Sonderegger, "is the Shattering Object, the Uncontained and Unconstrained Reality, the One Who Is There. God is not coordinated with our salvation or our hunger to know Him because He is Beyond, always Beyond such pairing."¹² With this in mind, the theologian will be drawn to astrobiology like filings drawn to a magnet.

Astrotheology, then, is the systematic theologian's response to astrobiology. *Christian Astrotheology* is that branch of theology which provides a critical analysis of the contemporary space sciences combined with an explication of classic doctrines such as creation and Christology for the purpose of constructing a comprehensive and meaningful understanding of our human situation within an astonishingly immense cosmos.¹³

Astrotheology fits within a slightly more inclusive category, namely, *Theology of Nature*. A theology of nature, according to Ian G. Barbour, "must take the findings of science into account when it considers the relation of God and [humanity] to nature, even though it derives its fundamental ideas elsewhere."¹⁴ Elsewhere? Yes, special revelation. This indicates that what we learn from science about nature contributes to our understanding of God's creation, even though what we know about God is extrascientific in origin. A theology of nature requires an epistemology that includes science yet more than science.¹⁵

In both its classical and contemporary form, systematic theology is a field encompassing field. The theologian attempts to draw the most comprehensive picture of reality that can be conceived. St. Thomas Aquinas describes theology as a "sacred science" with God as the object of this science, along with all other things. "But in sacred science, all things are treated under the aspect of God: either because they are God Himself or because they refer to God as their beginning and end. Hence it follows that God is in very truth the object of this science."¹⁶

I put it this way: a theology of nature tries to comprehend all things in reality in relationship to the one God of grace. In astrotheology, this includes the galaxies, the stars, the planets, and perhaps our future space neighbors.¹⁷ And, according to Lewis Ford, it most assuredly includes our extraterrestrial neighbors. "God is necessarily operative in the development of every life and in every culture, whether terrestrial or extraterrestrial."¹⁸

LOSS OF THE BEYOND SENSIBILITY IN CARTESIAN DUALISM

Medieval and Reformation Europeans lived in one world, a single world that included both the objective and the subjective.¹⁹ The human mind, it was assumed, was attuned by reason to both physics and metaphysics. The founders of modern empirical science—Copernicus, Kepler, Galileo, and Newton—marveled in gratitude that God had graced the human mind with the same rational principles that guided the stars in their courses.

The sundering of subject from object began inadvertently with René Descartes (1596–1650). Descartes engaged in a devastating thought experiment about truth. He asked: how can I be certain that the image in my subjectivity corresponds accurately to what I perceive objectively? With this question the inner soul and the outer world became sharply distinguished, defined as separate substances. Despite the substantial difference, Descartes was confident that God would maintain the attunement between mind and matter. What terrorizes us is this question: what might happen if we eliminate God's binding work? Might subject and object undergo a permanent divorce? History tells us that this is just what happened in the late Enlightenment period.

Pierre-Simon LaPlace (1749–1827), while writing his five-volume *Celestial Mechanics*, told Emperor Napoleon that he no longer needed the God hypothesis to hold things together. Nature sufficed on its own. This process of materializing science is referred to as disenchantment or *Entgotterung* by David Ray Griffin. "God was at first stripped of all causal power beyond that of the original creation of the world; later thinkers turned this deism into a complete

atheism. . . . The ironic conclusion is that modern science, in disenchanting [*Entgotterung*] nature, began a trajectory that ended by disenchanting science itself. If all human life is meaningless, then science, as one of its activities, must share in this meaninglessness."²⁰

Once God became eliminated from the equation, the bridge between mind and matter crumbled and fell into a chasm. A continental divide opened up between the inner world of meaningful subjectivity and meaningless objective knowing. Modern science would now march to the drumbeat of objectivity alone.

But the objective realm is only part of reality! Right? Ouch! The epistemological surgery—the subjectectomy—left the objective scientific researcher only half alive.

Philosophers of science such as Thomas Nagel have filed a wrongful malpractice suit against modern science. The mind is just as real as the objects the mind perceives, Nagel observes. “The great advances in the physical and biological sciences were made possible by excluding the mind from the physical world. This has permitted a quantitative understanding of that world, expressed in timeless, mathematically formulated physical laws. But at some point it will be necessary to make a new start on a more comprehensive understanding that includes the mind.”²¹ Objective scientific data excludes the human mind, but the human mind is the only place where this objective data is collected, monitored, and cared for. We need a new start, a start that reconnects the mind with what the mind knows.

That new start—where we work from within a “more comprehensive understanding that includes the mind”—should tempt the astrotheologian like an ice cream cone tempts a child running home after school.

No purchase on reality can be comprehensive if it includes the stars but not the eyes that watch those stars. No purchase on reality can be comprehensive if it points to the physical beyond denuded of the spiritual sensibility that appreciates the Beyond.²²

Whether the astrobiologist admits it or not, this branch of science exudes spiritual meaning while it excludes spiritual meaning.

RETRIEVING SUBJECTIVITY IN WHITEHEADIAN HOLISM

In this field encompassing field, the astrotheologian will want to incorporate scientific knowledge without necessarily repudiating that knowledge. Scientific knowledge is genuine knowledge, to be sure. But its scope is limited to the natural causal nexus as objectively reported.

In my own methodological musings, I have been attracted to holistic hypotheses that retrieve the connection between subjectivity and objective data and meaning, the mundane and the divine. Alfred North Whitehead's metaphysics and David Bohm's physics have drawn my attention.

Whitehead's speculative philosophy attempts to understand all things real at the highest level of abstraction. But before he abstracts, Whitehead attends to what is concrete, namely, experience. "Speculative philosophy is the endeavour to frame a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted."²³ More importantly, this speculative philosophy includes human subjectivity, objective knowing, and the divine. "But what ever else God is," contend Herman Daly and John Cobb, "God is also the inclusive whole."²⁴

If our fundamental datum is experience, then we should note that experience unavoidably includes both the objective and subjective poles. Objective data, in effect, is data abstracted from the more primary experience that includes the subjectivity of the scientist gathering the objective data. For the scientist to claim that the abstracted data is more primary than our subjective interpretation of it is to commit the fallacy of misplaced concreteness. "The fallacy of misplaced concreteness" Whitehead states, "consists in neglecting the degrees of abstraction involved when an actual entity is considered merely so far as it exemplifies certain categories of thought."²⁵ In sum, the domain of natural science will shortchange its purchase on reality if it fails to incorporate the subjective pole. Experience, upon which empirical knowledge is based, includes a primordial bond between subject and object. The process of metaphysician never suspends this holistic insight.

RETRIEVING SUBJECTIVITY IN BOHMIAN HOLISM

Switching from Whitehead's metaphysics to Bohm's physics, we see a second variant of holism at work. Physicist David Bohm proposes that all of reality, both objective and subjective, is best described as undivided wholeness. Inseparable quantum interconnectedness of all things in the universe is the fundamental reality.

The more comprehensive, deeper, and more inward actuality is neither mind nor body but rather a yet higher-dimensional actuality, which is their common ground and which is of a nature beyond both . . . so we do not say that mind and body causally affect each other, but rather that the movements of both are the outcome of related projections of a common higher-dimensional ground.²⁶

A prior higher dimensional ground unites the substances sundered by substance dualism.²⁷ But this is a dynamic wholeness, not a static one. Bohm's term is *holomovement*.

I propose a view that I have called *unbroken wholeness*. Relativity and quantum physics agree in suggesting unbroken wholeness, although they disagree on everything else. That is, relativity requires strict continuity, strict determinism, and strict locality, while quantum mechanics requires just the opposite—discontinuity, indeterminism, and nonlocality. . . . They both agree, however, on the unbroken wholeness of the universe.²⁸

In a manner not unlike Whitehead, Bohm would allow us to attend to our primary experience with the sky and with outer space, an experience with the spiritual sense of awe at the beyond already built in at the concrete level. Once this level of experience is acknowledged, then the astrobiologist is free to measure and mathematize at the level of abstraction.

Might one think of Bohm's holomovement as divine? It looks like something divine. Could it be the divine component to pantheistic metaphysics?

Bohm himself describes the implicate order as *holy*, but not *sacred*. The idea of the sacred makes Bohm nervous because it reminds him of organized religion. The idea of the holy, however, connotes the whole of reality. So, that keeps Bohm in his comfort zone. "All we can say," comments Renée Weber, "is that this view is consistent with the notion that there's a truth, an actuality, a being beyond what can be grasped in thought, and that is intelligence, the sacred, the holy."²⁹

Jesuit David Toolan perceives divinity within the holomovement. "A post-Einsteinian universe is unimaginably vast and ancient, is blessed with steadfast stability; still more remarkably it is also graced with process, self-organization, interconnection, communication, fluctuation, and openness," Toolan writes. "This is a universe whose fullness, diversity, promise, and risk simply dazzle. Given all that, it has to make a difference to our conception of God, our prayer life, our work and action."³⁰

What Whitehead and Bohm offer the astrotheologian is a more comprehensive comprehensiveness that includes objective astrobiological data along with subjective spiritual sensibilities. Whether the systematic theologian adopts either Whiteheadian holism or Bohmian holism, the holistic principle has been articulated and made available to the theologian.

ASTROBIOLOGY, ASTROCULTURE, AND ASTROTHEOLOGY

“Hello, Universe!” Douglas Vakoch along with METI International (Messaging Extraterrestrial Intelligence International) foster “multidisciplinary research on the design and transmission of interstellar messages, building a global community of scholars from the natural sciences, social sciences, humanities, and arts.”³¹ Outer space has become local space, culturally speaking.

Numerous scholarly projects are emerging to study the societal impact of the space sciences with special attention to the likelihood of contact with extraterrestrial life. These projects are not merely descriptive. Fears and hopes bleed into the studies. The chief hope is that astrobiology could unite a divided earth into a single planetary society. Here is Ian Crawford.

To my mind, the principal societal benefits arising from the study of astrobiology, and from its popularization to a wider public, are a consequence of the cosmic and evolutionary perspectives on human affairs that it naturally engenders . . . At a time when the Earth is faced with global challenges that can only be met by increased international cooperation (and arguably by developing institutions of global governance); yet tribal nationalistic and religious ideologies are acting to fragment humanity, the promulgation of a unifying cosmic perspective on human affairs is potentially of enormous importance.³²

For Crawford, the stars could promulgate “a unifying cosmic perspective on human affairs.”

Former holder of the Baruch Chair in Astrobiology at the US Library of Congress, Steven Dick, forecasts and invites an astroculture.

Astroculture is a relatively new umbrella concept used to describe the array of images, events, and media reactions that “ascribe meaning to outer space while stirring both the individual and the collective imagination.” The concept may be expanded to argue that, while different perspectives on space may exist in different cultures, humanity as a whole is increasingly creating and immersed in an overarching astroculture that transcends national boundaries, a kind of global astroculture.³³

Our evolving astroculture vibrates with a cosmic consciousness that both transcends and unites the human divisions we have come to take for granted. Might we contextualize the science of astrobiology within this wider astroculture?

SHOULD WE DE-TRANSCENDENTALIZE COSMIC CONSCIOUSNESS?

If so, then might we be misled by anti-astrotheologians such as Paul Davies and Jill Tarter who expunge the transcendental dimensions from the human experience with space?

Astrobiologist and astrophysicist Davies asserts that Earth's religions are fragile, breakable. "The existence of extra-terrestrial intelligences would have a profound impact on religion, shattering completely the traditional perspective of God's special relationship with man."³⁴ In his haste to discourage terrestrial myopia, Davies underestimates the power of the Beyond sensibility at work in terrestrial subjectivity.

Tarter more aggressively de-transcendentalizes religious sensibilities. "Detected, long-lived extraterrestrials either never had, or have outgrown, organized religion."³⁵ Smart people either outgrow religion or never indulge in it at all, she assumes. Tarter's own antipathy toward religion is projected on the more advanced and hence more intelligent space aliens she imagines. Does this count as a reliable scientific speculation? No.

To the contrary, based upon the history of human experience on Earth, one might better posit a similar sense of transcendence occupying the minds of our future extraterrestrial friends. It is far more likely that future extraterrestrial friends will similarly report awe in the face of the Beyond.

In contradistinction to Davies and Tarter, the transcendent impulse alive in human subjectivity has become excited at the prospect of meeting extraterrestrial neighbors. Vatican Observatory astronomer Guy Consolmagno, S.J., spouts cosmic optimism. "Christians believe that the God of all things, the God of the entire universe, is in love with us humans. And when you're in love, you show a kind of special interest. That doesn't mean God can't also be in love with other intelligent beings on other planets."³⁶

TEILHARDIAN PROMISE AND CAUTION

Many decades ago, another Jesuit, Pierre Teilhard de Chardin, forecasted a grand convergence. "Religion and science are the two conjugated faces or phases of one and the same act of complete knowledge—the only one that can embrace the past and the future of evolution so as to contemplate, measure, and fulfill them."³⁷ What a grand promise!

Teilhard also alerted us to three speculative pitfalls: (a) we should not assume that our planet is the only inhabited one in the universe; (b) we ought not assume that our earth is the only world which has fallen into sin; and

(c) we should not assume that God's saving work in Jesus Christ would be unknown to residents living anywhere other than earth.

The idea that only one planet might be populated in the entire Universe has become just as unthinkable for us (insofar as we think about it at all) as the idea of a humankind appearing on earth with no genetic connection to the other creatures of the earth.³⁸

Outer space vibrates with transcendence. Might we enjoy new kinships with extraterrestrial neighbors in our future? Might God be speaking to us through the twinkles of the stars?

CONCLUSION

The feeble attempt to denude objective science from subjective clothing has failed to eliminate the spiritual power of outer space. Space beyond earth is inherently religious in its valence.

The science of astrobiology is almost religious because it plucks the strings of our spiritual sensibilities. More specifically, our built-in psychological and cultural sense of *the Beyond* begins to vibrate with thoughts of astronomical distances and the prospect of extraterrestrial neighbors.

Astrobiology, like all other sciences, gathers objective data. But the data of astrobiology are abstracted from a more concrete experience with outer space as a spiritual stimulus. Astrobiological data vibrate with spiritual resonance. With the human soul now excited, the astrotheologian should enter the discourse.

The astrotheologian learns from astrobiological data while trying to account for its inspiring implications. Earthlings are growing in cosmic consciousness, at least in the minimal sense of being aware of possible intelligent consciousness living on exoplanets in the Milky Way.³⁹

When contact with an extraterrestrial civilization is eventually established, will the interchange of human and alien consciousness lead to a fusing of horizons? Can we rightfully expect an expansion if not a deepening of human understanding, knowledge, and awareness? Might we test giving voice to a more intense cosmic consciousness with the physics of David Bohm or the metaphysics of Whiteheadian process philosophy?

With such holism in mind, theologian Junghyung Kim gives us an assignment. "The theological task remains to construct a Christian theology embracing the genuinely cosmic horizon as contemporary science presents us."⁴⁰

Like Mary after a visit from the angel, Gabriel, the astrotheologian should ponder all these things in her heart.

NOTES

1. Plato, *Republic*, VII: 529.
2. Gingerich, "Mankind's Place in the Universe," 29.
3. Eliade, *The Sacred and the Profane*, 119, Eliade's italics.
4. Tarter, "The Evolution of Life in the Universe: Are We Alone?," 20.
5. Mix, *Life in Space*, 4.
6. Griffin, *A Process Christology*, 65, Griffin's italics.
7. Astrobiology as a field finds it difficult to shed extrascientific meaning. "The methodologies of science may be reductionist, but the output, especially in the case of the current scientific thinking about our cosmic origins and the emergence, evolution, and diversity of life on Earth, is systemic, holistic, and relational in nature." Scalice, "Astrobiology-as-Origin-Story," 52.
8. Lupisella, "Is the Universe Enough?," 134.
9. Is value real? Yes, to be sure. "*Meaning and value are as much integral aspects of the world as they are of us*," answers physicist David Bohm. Bohm, "Postmodern Science and a Postmodern World," 67, Bohm's italics. Yet, there is no room for value let alone God in the astrobiological framework. "Worthiness of worship is only to be assigned to that God whose reason for being is found in the creative supremacy of its own Value. Value thus also reasons the existence of the world, human beings, and human purpose as worshipful beings. The axiological foundations of God and the world constitute worship as 'ontological gratitude'—a gratefulness for existence—which manifests itself in a value-creative life." Davis, "God, Value and Ontological Gratitude," 33.
10. Cooley, "Astrobiology as Contemporary Theology," 3.
11. Fishbane, *Sacred Attunement*, 34.
12. Sonderegger, *Systematic Theology*, 89.
13. See Peters, "Astrotheology" and "Astrotheology: A Constructive Proposal."
14. Barbour, *Issues in Science and Religion*, 415. See Peters, "Theology of Nature," 651–52.
15. "If we hold that God is the Creator of *this* universe, we are claiming something very special indeed, much more special and precise than we dreamed of before. We humans are not just tied to one particularly providential star with a propitious set of planets. Rather, we are somehow tied in with the entire cosmic scope of nature, for all of nature is governed by these 'anthropic' constants." Russell, *Cosmology from Alpha to Omega*, 287–89.
16. Thomas Aquinas, *Summa Theologica*, I.Q1.7.
17. "As a Christian, I think of astrobiology as a way to better understand how God created the world." Mix, *Life in Space*, 6. According to theologian John Hart, contact with ETI would lead us human beings to realize that we "are not the single, extraordinary *image of God* in a divine creation now known to evolve, diversify, and complexify; not the only intelligent life that exists cosmically; and, perhaps, not even related evolutionarily to some or all other living beings. Other life might not only have evolved independently but had become more complex and intelligent than humans." Hart, "Cosmic Commons," 374.

18. Ford, *The Lure of God*, 54.

19. Long before the invention of the telescope, medieval theologians searched the stars and speculated about other worlds. See Dick, *Plurality of Worlds*.

20. Griffin, "Introduction: the Reenchantment of Science," 3.

21. Nagel, *Mind and Cosmos*, 8. Retrieval of the subjective or mental dimension of experience will be necessary if we are ever able to make sense of the UFO or UAP (Unidentified Aerial Phenomena) experience, argues Jensine Andresen. "The cartography of human knowledge reflected in the current map of academic disciplines is obsolete," she states. Andresen, "Mind of the Matter, Matter of the Mind," 317. Andresen asks scientific researchers of UAP to include the phenomena on a spectrum that includes craft-like objects on one end plus the impact of ETI presence on human consciousness on the other end. Like Carl Peterson mentioned below, she believes the integrative physics of David Bohm will permit scientific methodology to get beyond the Cartesian subject-object split. *Ibid.*, 295–300.

22. What is denied yet experienced is the mental pole present in experience. "Every actual entity has both a mental and a physical pole," claims Marjorie Hewett Suchocki, *God, Christ, Church*, 226. As a science, astrobiology extracts and eliminates the mental pole in the name of objectivity. This is as misleading as it is unnecessary according to the process philosopher or theologian.

23. Whitehead, *Process and Reality*, 3.

24. Daly and Cobb, Jr., *For the Common Good*, 387.

25. Whitehead, *Process and Reality*, 7–8.

26. Bohm, *Wholeness and the Implicate Order*, 85. Physicist Carl Peterson, "an undeniable Bohmian," follows up. "The holomovement gives viability to and carries the implicate order, since all entities found in it come from the undivided totality of its movement." Peterson, "Relativity and Quantum Theory," 279.

27. Whiteheadian metaphysics overcomes substance dualism right along with subject-object dualism. "God's creative activity is then at work, so to speak, from inside the organism. . . . Hence, there is no special divine intervention in the cosmic process so as to create the human soul as a strictly immaterial reality. Metaphysical dualism is thereby avoided, and emergent monism instead affirmed." Bracken, "Emergent Monism and the Classic Doctrine of the Soul," 201.

28. Bohm, "Postmodern Science and a Postmodern World," 65.

29. Renée Weber, "The Enfolding-Unfolding Universe," 70. Catherine Keller foresees a coming together of science and theology due not to what is known in common but rather in what is unknown. "The physics of quantum nonseparability will not produce empirical proof of any kind of God . . . No. It may, however, be offering material evidence of a universe apophatically entangled as to escape the rival classicisms that pit science and theology against each other." Keller, *Cloud of the Impossible*, 132.

30. Toolan, S.J., "Praying in a Post-Einsteinian Universe."

31. METI International, <http://meti.org/missiona> (accessed 1/28/2022).

32. Crawford, "Widening Perspectives," 58.

33. Dick, "Humanistic Implications of Discovering Life Beyond Earth," 752.

34. Davies, *God and the New Physics*, 71. Davies believes Christianity among the religions will confront the most severe crisis because the doctrine of the incarnation

would lead to a planet-hopping Christ. This would be an absurd idea, thinks Davies. Not so for theologian Ilia Delio. "Incarnation on an extra-terrestrial-level could conceivably take place, as long as there is some type of intelligence within the extra-terrestrial species to grasp the Word of God through knowledge of the divine embodied Word. . . . many incarnations but one Christ." Ilia Delio, *Christ in Evolution*, 169.

35. Tarter, "SETI and the Religions of the Universe," 146.

36. Guy Consolagno, S.J., and Paul Mueller, S.J., *Would You Baptize an Extraterrestrial?*, 274.

37. Teilhard de Chardin, *The Phenomenon of Man*, 284–85.

38. Pierre Teilhard de Chardin, Pierre, "Une suite au problème des origines humaines," 277.

39. Jensine Andresen believes we all share consciousness with ETI, with one another, and with the whole of reality. What she has learned is that ETI are worried that terrestrial society could destroy itself through a nuclear conflagration. Further, ETI want to prevent exporting any of Earth's weapons arsenal to space. Andresen, "Mind of the Matter, Matter of the Mind."

40. Kim, "The ETI Hypothesis and the Scandal of Particularity," 341.

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