

Three Big Bangs: Matter-Energy, Life, Mind

Holmes Rolston III

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In this new book, Holmes Rolston III, long-time leader and dominant voice in the interdisciplinary field of science and religion, has found a creative way for integrating three of the most enduring, most complex, and most intriguing problems in the sciences today: the origin of the universe, the origin of life, and the origin of consciousness. Rolston accomplishes this by linking together these three major issues in a narrative that metaphorically develops the idea of the “Three Big Bangs” that generated the origin of matter-energy, the origin of life, and the origin of consciousness/the human mind. Rolston, a former Gifford Lecturer, writes with his signature interdisciplinary style and the conviction that good philosophers and theologians can look over the shoulders of scientists and the work they are doing, and spot what is metaphysically interesting.

In the first chapter on the primordial Big Bang and the origin of matter-energy, Rolston writes with great accessibility and unfolds an in-depth picture of the history and current status of cosmology and physics. In this section, not only various perspectives on the origin of the universe are discussed, but also the defining structural role of mathematics, order, information-processing, various quests for a Theory of Everything, the controversial ideas surrounding multiverse theories and theories of complexity, and finally, a truly excellent, detailed section on the anthropic principle.

As Rolston weaves these ideas together, he already prepares his readers for the idea that the primordial Big Bang in fact launched natural history. This, of course, has important implications for the status of the laws of nature: are the laws of physics and chemistry true and unchanging all over the universe, while there may be no universal laws in the biological sciences at all, only generalizations in an earthbound natural history? If this were the case, any physical theory of everything would be a “thousand orders of magnitude away from any philosophical theory of everything” and also severely limited in that it would only explain the fundamental processes in the primordial Big Bang, and as such would not begin to reach into the complexity of the questions on the origins of life and mind.

Reading this first chapter gives the reader a remarkably clear and in-depth survey of the state of current discussions on the origin of the universe, as the author critically weighs options and draws in the reader to make his or her own decisions. This is especially true of the final section of the chapter where Rolston asks whether or not the great potentiality that the universe had at the Big Bang implies that the history of the universe is a development of fixed possibilities, or possibly new potentialities arising via the emergence of the universe. The latter, for Rolston, may imply the realization of “possibility spaces” where the outcome of the history of the universe is not inevitable: in this sense, the outcome of the first big bang would be necessary, but not sufficient for the emergence of the second and third big bangs. And if this means that the intrinsically new can emerge from the

first big bang, it opens up the broader metaphysical question of the presence of the divine in this contingent process. In Rolston's words, "The startup looks like a setup."

In the second chapter on the biological big bang, Rolston is very much at home in the material that he knows so well. With great clarity he develops the idea that the novelty of this second big bang is exactly the fact that matter-energy enters into information states. The mystery of life's beginning is discussed at length, as well as various salient ideas developed by leaders in the field. The arrival of life with such informational capacities also leads to an explosion of possibilities through DNA, and of course, evolution. Remarkably, the first big bang continues as an expanding universe, a thirteen-billion years' explosion. The second big bang has continued expanding life on earth, a three-billion years' explosion, and some of the best reading in the chapter is on "biological explosions" like the Cambrian explosion, which has confirmed the emergence of a truly rich and diverse fauna.

Rolston also provides an excellent comparison on questions of fine-tuning in the first big bang, as opposed to amazing biological achievements over time where fine-tuning no longer seems fine-tuned, but rather a random struggle for life driven by selfish genes. Incorporating his earlier idea of "possibility spaces," Rolston can now argue that the *results* of the evolutionary epic can still be "fine-tuned," even if the process of evolution itself cannot be. Directly addressing the issues of biodiversity and biocomplexity, Rolston now also gives a critical evaluation of theories of "convergent evolution". This is paralleled with a fascinating discussion of the emergence of expanding neuro-sentience and felt-experience, the stunning evolution of ears and sound, and finally the first steps towards the evolution of subjectivity.

In the final chapter, Holmes Rolston moves into the "third big bang": as life starts up, on many of its trajectories, it also "smarts up". In humans this emerges explosively with the development of neurons and brains, powers of acquired learning, and of true cultural formation. In this sense the human being is the most sophisticated of known natural products, and the human brain, built by DNA, is the most complex entity known in the universe. Rolston's "third big bang," then, is the explosive growth of the human brain, sponsoring the human mind. Rolston develops this idea of human uniqueness in a very balanced, species-specific way, to make the important point that the human brain is actually a massive singularity from which consciousness, and more importantly, self-consciousness, developed. This culminates in the "key threshold" in the remarkable capacity to pass ideas from mind to mind. Rolston argues this forcibly and along the way gives a very insightful interpretation of various approaches to the Theory of Mind. These important issues from cognitive science and primatology are now enhanced by bringing neuroscience into the discussion with a full development of the importance of neuroplasticity, where relationships shape the mind, and our minds shape our brains. Thus genes make the kind of human brains possible that facilitate an open mind. But this "bottom up" process also works the other way around as in

“top down” causation in which an emergent phenomenon reshapes and controls its precedents. On this view, minds employ and reshape their brains to facilitate their chosen ideologies and lifestyles.

Central to these views is not only the unique role of human culture, but deeper than that the “symbolic explosion” as represented in human language. Rolston gives a fair overview of theories on the evolution of language, ultimately connecting symbolic behavior to theories of convergent evolution, claiming with Simon Conway Morris and others that “hominization,” the arrival of humans on this planet, is not as random and unique a process as many may think. The evolution of intelligence was bound to occur in different ways, with the human mind as its most dramatic example.

In the final paragraphs of the book, Rolston speculates on a more philosophical level on the possible theological implications of the saga of “three big bangs”. Is it possible that the fact that we have rational minds that can comprehend the three big bangs may actually suggest that we inhabit a “spirited” universe, a universe where Mind supervenes, and where we humans may be icons of a deeper Presence, some form of Transcendence? With this controversial challenge Rolston ends a very stimulating, very readable book. He has given us a broad philosophical framework, a narrative for understanding the dramatic stages of cosmic, natural, and human evolution; in this process he has carefully balanced academic information with accessibility. This book is, therefore, a major addition to the current science and religion dialogue and will be stimulating and helpful for teachers, students, and everyone who cares enough about the place of us humans in cosmic and natural history.

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