

Science, Technology, and Religion V

Implicit Science in Hindu Thought

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One can find apologists from all the major religions who aim to bolster the standings of their faith by proclaiming its confluence with science. Some have even gone so far as to argue that their ancient scriptures and doctrines presage specific ideas and findings of modern science. As Imad-ad-Dean Ahmad and Martin J. Verhoeven show elsewhere in this symposium, this is a growing trend among some scholars of Islam and Buddhism. But it is also a perennial presence in the great religious traditions of Judaism, Christianity, and Hinduism.

From a scientific point of view these claims are untenable, as the findings of modern science spring from observations, insights, instruments, philosophical outlooks, and knowledge that were absent in the ancient world. But the defenders of these claims contend that the philosophers and prophets of distant ages had other means of knowing than logic, differential equations, and the spectrometer—that the scientific insights in scripture are a testament to their divine origin. Though perhaps well-meaning, such claims essentially belong to pseudoscience, not least because they are typically based more on parochialism and questionable hermeneutics than on serious scholarship.

But this does not mean that the search for areas of genuine harmony between science and scripture is always misguided. There is no solid evidence that ancient prophets or religious thinkers were privy to any revealed knowledge of scientific findings in advance of their peers. But ancient thinkers did articulate many of the broad possibilities for answers to major questions that have since been, in a sense, adjudicated by science. Many of the metaphysical, philosophical, and scientific ideas that are so often trumpeted as entirely novel and recent discoveries of modern science were in fact subjects of discussion by ancient Hindu thinkers.

Perhaps the most famous discovery of modern science, the one that launched it as a revolution, was the Copernican insight that shifted the Earth's coordinates from a defining $(0, 0, 0)$ in a vast, three-dimensional Euclidean space to an insignificant (x, y, z) in a coordinate system whose

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center is altogether indeterminate. This was followed by the Galilean-Newtonian revolution, which developed the view of a universe governed by inexorable laws written in the language of mathematics, graspable primarily with the aid of instruments of ever-increasing precision. Notwithstanding the considerable achievements of that science, whose methods soon expanded well beyond the realms of astronomy and physics, it took nearly four centuries after Copernicus before the notion of the birth of the universe through purely physical processes at a determinable time was developed and regarded as a scientific finding.

Yet long before modern science, practically every religion had its own version of cosmogenesis, a notion of the origin of the universe at some definite time. Most are based on the idea that an all-powerful god created a world of matter and man. These doctrines cohered with the view of a God or gods who should be invoked and thanked. At another level, they were widely accepted because there was no better hypothesis to explain the existence of the world.

Hinduism has its own idea of a God-created universe. Hindu lore offers a mythic vision of the world emerging from a cosmic egg (*Brahmanda*), a seed from which the whole universe emerged, not unlike the idea of the Big Bang. In the Hindu picture, the current phase of the universe will dissolve, only to be reborn again. Like in some modern scientific theories of cosmology, this process continues ceaselessly, like a frictionless oscillating pendulum.

This kind of mythical and metaphysical account is not the only aspect of Hindu thought that touches on the origins of the universe. Consider, for example, a passage from the Nasadiya Sukta, or Hymn of Creation, from the Vedas. In a chapter written more than three millennia ago, the author presents various possibilities as to how the universe might have come about, and concludes by rhetorically exclaiming:

... Who really knows, and who can swear,
How creation came, when or where!
Even gods came after creation's day,
Who really knows, who can truly say

When and how did creation start?
Did He do it? Or did He not?
Only He, up there, knows, maybe;
Or perhaps, not even He.

[Rigveda X: 129]

While raising the question of how the world might have arisen, the poem also expresses a modest skepticism about where one might find an answer. This could be interpreted as a lack of certainty that is uncommon in religious literature, but we should notice the extraordinary leap, not of faith, nor into agnosticism, but into humility. The sage poet in these lines is moved from a mystical meditation on cosmogenesis to the sudden realization that our visions of how it all started are constrained by our finitude. This lack of certainty about explanations of natural events beyond our immediate grasp foreshadows the epistemic doubt often described as a requirement for modern scientific thinking.

Below and Beyond

In the early days of modern science, scientists recognized two levels of reality: the physical world we experience on our everyday scale, and the astronomical world, up there, where every entity is of stupendous proportions. Both levels, scientists thought, had a material basis, a substantial concreteness that make them part of the same palpable reality.

As the scientific revolution advanced, physicists discovered a reality smaller even than the microscopic scale, and eventually began to identify the roots of the physical world. They had uncovered entities that are invisible, undetectable to our normal senses. As they continued probing, these entities became ever more evanescent, fading away into mere mathematical probabilities. Beneath the atomic and subatomic particles that undergird the material world to which we are accustomed, there is a sea of intangibles that emerge and disappear in unimaginably small time frames. This is what constitutes and sustains the physical world. If physics before the twentieth century dealt with nature as we commonly experience it, and religion postulated a supernature that caused nature to arise, then the twentieth century brought to light a sort of subnature, a realm that we know thus far mainly in theory but that seems sure in some way or another to account for our tangible world in essentially non-tangible terms.

Ancient Hindu thinkers too postulated an immaterial, intangible, and all-pervasive cosmic realm, called *Nirguna Brahman*. Its material manifestation is the physical reality we experience and study scientifically. But the realm also has a spiritual dimension, which was regarded as the source of all consciousness. *Nirguna Brahman* is thus the abstract impersonal cosmic consciousness pervading the universe, the transcendental equivalent of the personal God of other religions.

The Hindu writings known as the Upanishads talk about *Nirguna Brahman* in esoteric terms. We find in this literature terse statements like, “Brahman is real; the world is unreal.” It suggests that the physical reality we take for granted is not quite what it seems, and its deeper nature is veiled from our normal perception.

One needn’t dwell overmuch on the details of *Nirguna Brahman*, which clearly could not have anticipated the specific subatomic theories of modern physics. Rather, it is striking to note how this ancient metaphysical concept of an omnipresent, intangible reality that gives rise to the physical world of experience anticipates the metaphysics of the most promising current theories about the fundamental nature of the universe. Even more striking is a growing strain of philosophical thought, led by David Chalmers, arguing that consciousness too is a fundamental aspect of this universe, something that is present in all of it, and not just in obviously thinking beings such as ourselves. These understandings about the basic nature of reality may not now enjoy the status of confirmed scientific theories, but it is fascinating to consider that the basic metaphysical structure of these ideas has much in common with ancient Hindu thought and related traditions.

Unveiling Reality

Philosophers have long argued about whether there is a separate reality behind the one we perceive. From the scientific perspective, there is such a reality. In fact, the very goal of science, one could say, is to derive from perceived reality what the objective, non-perceived reality is all about. For example, sound is an aspect of perceived reality that science has shown arises from compression waves in an elastic medium such as air.

Classical Hindu thinkers stated that perceived reality, which they called *maya*, is in many ways a deception. Practically every finding of modern science in some way or another is taken to suggest a similar view. Whether the motion of the sun, or of the seemingly fixed star we call Polaris; whether the apparent substantiality of a rainbow or solidity of hard steel; whether the visible break in a stick immersed in water, or the intrinsic sparkle of the diamond—seemingly every aspect of perceived reality is in some sense an illusion. What we take to be substantial properties of the material world have, in fact, underlying features that are altogether different. Science may well be described as an effort to see beyond the *maya*, to unveil the world’s concealed reality.

Hindu thinkers also proclaimed that perceived reality is transient. While the ephemeral nature of experiences and of life itself had been

recognized by ancient thinkers in many cultures, Hindus asserted something more: that not just human life, but the physical world itself is transitory, and will eventually fade away. This, too, is an idea that seems to presage certain strains of today's theoretical physics and cosmology. According to one line of thought, not only radioactive elements but all of the basic constituents of physical matter are unstable. Even the proton may have a half-life. This would mean that eventually, albeit after an unimaginably long time, all tangible matter in the universe will vanish. This is another theoretical picture of the universe that, at least in its rough outlines, was articulated by ancient Hindu thinkers.

Ways of Knowing

Beyond the broad outlines of scientific theories about the universe, ancient Hindu thought also presaged some of the contours of the modern debate over the nature of science itself, particularly its seemingly never-ending conflict with religion. For example, Stephen Jay Gould's notion of "non-overlapping magisteria," by which science and religion should each concede that the other is a powerful and important mode of inquiry but that they do not attend the same questions and problems, echoes an epistemic view of Hindu thinkers that was posited not as a strategy for peace but a fundamental truth.

Ancient Hindu thinkers of course did not talk about science as we use the term today, or about religion as a set of doctrines and practices. Rather, they said that human beings can acquire two kinds of knowledge. One pertains to the world of everyday experience or perceived reality. This kind of knowledge, called *apara vidya*—"not-beyond," or worldly knowledge—can be obtained through experiment, analysis, and logical reasoning. The other kind of knowledge relates to the transcendental, the realm beyond the physical. It was called *para vidya*, or "beyond" knowledge.

It is fair to say that conflicts often arise when, in pursuit of transcendental knowledge, people attempt to explain matters pertaining to this world. When they do this without having peered through a telescope or a microscope, read a seismogram, handled a Bunsen burner, or made sophisticated calculations, and they expound on the workings of matter and energy, biological evolution, or other natural phenomena, they are bound to provoke practicing scientists. Likewise, when people governed solely by knowledge of perceived reality summarily deny the existence or the possibility of transcendental knowledge without going through the

rigorous disciplines demanded for getting a glimpse of it, they too appear naïve and epistemically hubristic.

Yet it is undeniable that these two realms of knowledge are interrelated, and that the study of one may have bearing on the other. We see in the areas briefly discussed here that at least the spirit of modern science, if not always its specific substance, was implicit in a number of contexts among ancient Hindu thinkers. That these thinkers foresaw the broad outlines of many modern theories is a testament to the harmony between Hinduism and science, both of which are a part of the collective human effort to appreciate the world of experience and describe the nature of reality.