

Talking to the Gods: Neurobiology, Auditory-Visual Hallucinations, and the Evolution of Premodern Mythologies, Religions, and Philosophies

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Steve Farmer, Ph.D.

Abstract

Over the last two decades, my collaborators and I have published a series of studies that argue that joint research in neurobiology, philology, and studies of complex systems allows the construction of the first unified and fully testable models of the evolution of premodern mythologies, religions, and philosophies — extending from the earliest anthropomorphic views of the world (Farmer 2010) to the collapse of traditional cosmologies in the modern era. The dynamics of those models was first suggested by the discovery in the 1990s of emergent mathematical structures in premodern traditions, expressed in beautiful self-similar (or fractal) shapes that became more extreme whenever populations rose and literacy expanded — in modeling terms, altering the scale and typologies of brain-culture networks in predicable cross-cultural ways (Farmer and Henderson 1997; Farmer 1998; Farmer, Henderson, and Witzel 2002; Farmer 2006). Exploring these modeling ideas has led to a number of concrete historical predictions, including one — involving the non-literate nature of India's first urban society — whose successful tests have already triggered major reappraisals of Indus civilization and adjacent cultures (Farmer, Sproat, and Witzel 2004).

Our original models focused on evolutionary growths in the relatively "closed" (and often intellectually bizarre) world of premodern manuscript traditions, resulting in the familiar hierarchical or correlative forms of so-called scholastic systems. On the model, the main "engine" behind such growths was the repeated application to "authoritative" traditions of small sets of exegetical methods, aimed at reconciling conflicts that piled up in those traditions over long periods. This iterative process resulted in the appearance in all premodern literate societies over time of exaggerated correlative models of the world, which in later forms increasingly mirrored the fractal structures of the topographic or analogical "maps" the brain uses to effect such reconciliations. The union of these ideas in historical models quickly explains long-puzzling cross-cultural parallels in the evolution of premodern traditions, including the global appearance of the familiar man-the-microcosm motif (Farmer 1998: 91-6). Using standard models of fractal growth first introduced by Mandelbrot (1982), the model also allows the construction of the first credible computer simulations of the growth and decay of major world traditions (Farmer, Henderson, Witzel, and Robinson 2002; Farmer et al. 2009).

There were major omissions in our early models. By focusing initially on processes of structural growth, those models ignored important social and experiential sides of premodern myths and religions. The aim of this paper is to enlarge those models by examining the interaction of brains and cultures involved in auditory-visual hallucinations, which played key roles in premodern traditions world-wide by enabling direct communications with ancestors, spirits, and deities.

The paper discusses five origins of hallucinatory states pertinent not only to early myth and religion but to the kinds of exegetical transformations dealt with in our broader models as well.

The sources of religious visions often overlap in practice, but they can be distinguished in five classes for analytic purposes:

1. Neuropathologies including schizophrenia and other psychoses long tied (e.g. by William James 1902) to extreme "religious" experiences, e.g. in prophecies and magical ideation;
2. Drug-induced hallucinations, including the kinds of auditory hallucinations especially critical to the construction of early Vedic traditions;
3. Conventional dreaming, generated most prominently in paradoxical or REM sleep, arguably the main channel in most premodern societies for daily communications with gods, demons, and ancestors;
4. Pathological dreaming, including the kinds experienced in "permanent state border control disturbances" (Broughton et al. 1986) like those seen in narcolepsy, in which subjects remain suspended for long periods between wakefulness and dream sleep; and in similar visions experienced by larger populations on initiating or waking from sleep (hypnagogic or hypnopompic visions respectively) linked to "sleep paralysis"; the role of the latter in contacting divine forces in premodern cultures is suggested by the fact in modern Asia, sleep paralysis is still often known as "ghost oppression";
5. Behaviorally induced hallucinations triggered by extreme fasting or extended sleep deprivation in solitary initiation ceremonies or communal rituals involving extended chanting, singing, and ecstatic dancing, often combined with drug ingestion.

One implication of recent brain-imaging research is that despite their diverse behavioral origins, all these sources of visions share profound similarities on the neurobiological level. The most important includes distortions in normal transitions between semi-stable or "metastable" brain states critical to all conscious experience. The implication is that similar neural processes lie beneath all visionary experiences, no matter what their origins. And this in turn provides clues as to one cause behind the striking similarities often found in mythological and religious thought in distant civilizations, even in the absence of past or present contact (cf. Farmer 2007, 2010).

After exploring theoretical models of neural "metastability," the paper reviews new brain-imaging studies of the insular and cingulate cortices and linked prefrontal circuits, which appear to play key roles in the aberrant switching of brain states seen in visionary experience.

The paper finally examines ethnographic evidence that throws light on the role cultural expectations play in molding the contents of hallucinations, which figured largely in premodern acculturation processes. This section concludes with a review of the similarly large role played by visions in the exegetical transformations of ideas that lay at the center of our original models.

The paper ends with a few comments of ways that our models can be extended to build powerful probabilistic simulations of future as well as past traditions — and on the role that study of the instabilities of "metastable" brain states found in hallucinations can be expected to play in future research on the physics of consciousness, the ultimate holy grail of brain-culture research.