

Religion and Science

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In Western discursive frameworks, religion and science are two realms considered to be qualitatively and functionally separate. One popular understanding of these two domains sets them in binary opposition as between superstitious tradition and rational modernity, seemingly threatening to pit one against the other in a battle for dominance, as though the findings of modern science will “disprove” old-fashioned religious beliefs. Others do not see them as mutually exclusive but still accept their entrenchment in separate spheres of life. Social scientists more commonly take them to be folk models of knowledge production that apply in varying degrees to a particular community’s social practice.

Throughout the history of anthropology and allied disciplines, the intersection of religion and science has been approached from multiple angles. The earliest anthropological engagements with religion and science sought to place both on a grand evolutionary scheme, although scholars disagreed on the developmental role each played. These initial forays set the stage for later scholarship, both theoretical and ethnographic. Recently the question of religion’s function has been transposed to the cognitive level in the scientific study of religion, while the overlap of traditionally “religious” and “scientific” ways of thinking and acting embedded within actual communities indicates a degree of confluence between modes of cultural expression thought to be isolated from one another.

Although prompting myriad definitions, the concept of religion is rooted in a Western classification scheme. Its history traces back to the polysemic Roman term *religio*, in some contexts expressing a solemn obligation toward something, elsewhere accruing the sense of a subjective emotional attitude (Saler [1993] 2000). Only later did it give rise to what is today considered religion as a tangible social institution. Attempts to adopt this shifting “folk category,” as anthropologist Benson Saler puts it, into an operative analytic category within social science have focused on belief in supernatural beings and powers or, in more general terms, a transcendent world, classically designated the “sacred” removed from the “profane” of everyday sensory experience.

Some anthropologists have expressed skepticism toward religion’s applicability cross-culturally owing to its Western bias, for instance in contexts in which interlocutors do not recognize any of their social institutions as “religious.” Nevertheless, the term endures as a legacy of Western thought within anthropology and some have moved to justify its continued use by treating the concept not as many have done through requiring a set of strict criteria (more traditional “monothetic” definitions) or broadening the definition to ever less meaningful extents, but as a set of criteria to qualify a particular phenomenon as “religious” without requiring any single one to be

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essential (known as a “polythetic” definition). Saler, for example, encourages replacing monothetic definitions with a form of Wittgensteinian “family resemblances.” A working definition of religion, he suggests, should measure the *degree* to which a system more or less closely resembles the Western “prototype” of religion. This nuanced definition acknowledges the irreducibly Western historical roots of religion as a concept yet envisions constructive input from non-Western categories to be likewise applied cross-culturally to illuminate social phenomena from alternative perspectives.

Definitions of science, too, vary widely in their criteria and preciseness. Like religion, it is a category with deep roots in the Western intellectual tradition, having developed in ancient Greece in contrast to the emerging categories of magic and philosophy—but not incompatible with the Greeks’ notion of a “pervasive divinity” (Tambiah 1990, 9–11). Modern definitions tend to emphasize certain methodological commonalities: reliance on replicable observations of the natural world, logical deduction and induction, and testable hypotheses subject to falsification (and, thus, openness to modification over time). What anthropologists have insisted on pointing out is that science is just as much a commonly used, increasingly globalized discursive category as is religion: That is, the role of “science” within popular discourse is just as much a force to be reckoned with as any description of how scientists actually operate, given the relatively small size of the professional scientific community. It is these culturally based and ever-shifting definitions of religion and science whose intersection anthropologists have investigated in various forms.

Classic anthropological theories: Religion and science (and magic)

From the discipline’s beginnings in the nineteenth century, the apparently bizarre religious and supernatural beliefs of non-Western peoples—and how they fitted within a broad scheme of human development—captivated the research inquiries of early anthropologists. To the categories of religion and science they routinely juxtaposed a third, magic, with its roots again traced back to ancient Greece (see Tambiah 1990). Magic generally has been taken to be a method of influencing practical matters through the careful performance of spells (i.e., specialized utterances) and objects with special powers. This domain was seen as separate from religion and usually associated with “primitive” peoples, although writers disagreed on its relation vis-à-vis religion. While many of these early scholars would be maligned today as “armchair” anthropologists who theorize grandiosely without conducting original fieldwork, their thinking on how to incorporate foreign cultural practices within a common, albeit excessively universal, analytic framework remains a key part of the discipline’s intellectual heritage.

Of these scholars, two stand out as having a significant influence on later thinkers. The first of these, James G. Frazer (1854–1941), hypothesizes that human societies pass through three stages of evolution in how they acquire knowledge: from magic to religion and then on to science. This kind of linear, hierarchical progression toward an idealized end point resembles a “teleology,” after the Greek word *telos* for “end” or “purpose.” Under a teleological perspective an entire history becomes read a posteriori

as designed to fulfill a specific purpose, in this case the apex being Frazer's own European civilization. He argues that magic, present only in the least developed societies, functioned to meet practical goals according to a set of fixed rules and processes. In this sense, "its fundamental conception is identical with that of modern science; underlying the whole system is a faith, implicit but real and firm, in the order and uniformity of nature," even if the magical notion of nature's uniformity was ultimately erroneous (Frazer [1890] 1922, 49). Before magic gave way to modern science, however, it had to pass through the stage of religion, whose central characteristic according to Frazer is the propitiation of supernatural beings, *not* reliance on the sure operation of the natural world as with magic and science. By his deduction, when primitive humans gradually discovered magical rites not to have their desired effects, they must have reasoned that some agentive beings had interceded, hence the transition to supplication to the gods. Only when this illusion was finally unveiled could true science take its place as the dominant mode of knowledge production.

The other late nineteenth-century figure whose work set the foundation for modern understandings of science and religion was Edward Burnett Tylor (1832–1917), the first modern anthropologist to be so called. In his two-volume *magnum opus* (1871), he traces a teleological scheme not to magic but to the early origins of religion in animism, in which animals and inanimate objects are thought to contain souls. In building a "theory of mind," he contends that animism developed out of early humans' mistaking dreams—in which they seemingly departed from their bodies—for reality, with the conclusion that souls and bodies were not inalienable. Supposedly more complex religious traditions evolved out of these temporally prior forms, culminating in Victorian-era Christianity. Without directly comparing the two, Tylor posits a separate form of *scientific* development as a complement to this religious evolution. In common with Frazer, magic as opposed to religion is seen as a primeval form whence emerged modern scientific thinking, characterized by reliance on empirical observation to achieve practical goals. However, Tylor treats magic/science as though on a distinct but parallel developmental track: the evolution of the profane as opposed to the sacred realm of religion.

Providing an inverted alternative to this sequence, the French sociologist Émile Durkheim (1858–1917) takes religion as the fundamental expression of human sociality, from which science and magic only later derived. Based on a review of nineteenth-century Australian Aboriginal ethnography and travel accounts, he understands religion to be a consequence of the collective emotional expression that results from social ritual—what he labels "collective effervescence." This exuberant sense of something greater than the individual (i.e., the social) becomes interpreted as a realm of experience and beings (the sacred) separate from the everyday, tedious world of the profane. It is this distinction between a perfected, ideal world and empirical reality that, he argues, indicates "that the fundamental categories of thought, and consequently of science, are of religious origin" (Durkheim [1912] 1954, 418). If science emerged from religion, Durkheim does not subscribe to the notion that religion, as an archaic form, will necessarily be replaced, a point on which his peers vacillate. While what he calls the twentieth-century "conflict between science and religion" may be rooted in the "speculative function" of religion—that it seeks to make knowledge claims about human beings and the physical world and, thus, comes into competition with science,

which makes similar claims—he predicts that religion will likely continue to exist alongside science because it serves the ongoing function of bringing coherence to human societies ([1912] 1954, 430–31). Although Durkheim’s main thesis has been challenged on a number of fronts, not the least of which being his reliance on limited data to extrapolate general claims, his work advances the important finding that science and religion have common roots in social life, even if he adopts an evolutionary trajectory of their origins.

Not all anthropologists shared these early preoccupations with a teleological path. The British Polish anthropologist Bronisław Malinowski (1884–1942), in an influential 1925 essay titled “Magic, Science, and Religion,” uses his renowned ethnographic work in Melanesia as a point of departure for a grand theory that challenges previous interpretations of “primitive” knowledge. Like his contemporaries, he treats religion and science as two fundamentally distinct cultural adaptations. However, he differs from existing models in two regards. First, he classifies magic and religion as being more closely related to one another than either is to science. Even though magic is directed toward practical goals apart from religious ones, having to perform magical rites in an unadulterated way every time mirrors a similar ritual quality of religious practices. For this reason Malinowski classifies magic and religion together as part of the sacred realm as opposed to the profane category of science. In other words, the *performance* of magic and religion is what gives them their power and distinction. Second, he consequently comes to a conclusion distinct from Tylor or Frazer: rather than attributing magic to small-scale societies as an early form of science, he suggests that the societies he studied use all three simultaneously. Magic, religion, and science all function to satisfy human needs but do so in different ways: science as a method for directly meeting a host of immediate physical needs (e.g., canoe building); magical rites when all practical means of achieving these ends have been exhausted, yet people still need to feel a sense of control over their environment (e.g., casting spells for crop success); and religion as a reaffirmation of social values and commitments in a Durkheimian way (e.g., rituals reinforcing collective morality). While Malinowski’s typology is not accepted wholesale by anthropologists, he succeeds in substituting a unilinear model (in which religion and magic were replaced by higher forms of knowledge) with a nexus between scientific and religious modes of thought and behavior as contemporaneous within societies. He reminds Westerners that science is not a domain exclusive to them but is an element appearing in all cultures to a greater or lesser extent.

The science of religion

A recurrent approach to these themes has been an attempt to understand religion *from* a scientific perspective. Even Durkheim ([1912] 1954) explicitly argues that science must acknowledge the reality of religious experience as itself a scientific object, although not necessarily according it the same reality as believers would. More recently, contributions from the cross-disciplinary cognitive study of religion have suggested to anthropologists new ways to understand not only possible origins of religious and scientific modes of thought but also, more importantly for an understanding

of their present-day operation, how they are distinguished as capacities within the human mind. These scholars draw on findings from psychology, neuroscience, evolutionary anthropology, and other scientific disciplines to consider the functional role of religion in social life—the explanatory question besetting students of religion for centuries. Starting from the premise that religion must have contributed to the survival fitness of hominin species, or at least was a relatively benign side effect of some other adaptation, they point toward the possible benefit of attributing agency to inanimate and unseen objects, often, although not always, tested through experimental methods focusing on the individual rather than the social unit. For example, in a dangerous environment with unknown objects, the risk of falsely identifying something as an agentive being is substantially smaller than the risk of misidentifying a genuinely dangerous creature as inanimate; hence religious tendencies develop as a by-product of an adaptive form of cognition that allows people to imagine gods with ease.

Robert McCauley takes these studies a step further by juxtaposing the cognitive bases of religion with those of science, boldly concluding that “religion is natural and science is not.” He comes to this conclusion by comparing the effort with which people adopt religious and scientific forms of thought. Belief in gods and other supernatural beings fits within people’s “maturationally natural cognition,” meaning they align intuitively with how the mind tends to mature irrespective of cultural variation. Thus, he concludes along with other cognitive scientists that it is little surprise religion has persisted even with the advent of modern science, a striking phenomenon that anthropologists before Malinowski had difficulty explaining according to their unilinear models. Science, on the other hand, in terms of the distributed labor required for its often nonintuitive findings (e.g., heliocentricity), does not come as “naturally” to human cognition. It requires significant effort, even for the best-trained of scientists, to approach the natural world in such a systematic way. McCauley suggests that it is not religion but *science* whose “continued existence is fragile” (2011, 230). As a mode of cognition that challenges the naturally selected mental predispositions of human beings, scientific rationality must be granted social protections if it is to survive, a discursively bold statement given the dominance of science on the Western discursive landscape.

Not all recent attempts to reconcile religion and human evolution have come from a strictly cognitivist perspective. More humanistic writers, such as the sociologist Robert Bellah (2011), consider the historical processes of cultural evolution as conditions that may have allowed religion to flourish. His work focuses on what develops when survival is *not* immediately at stake, as occurred at times for ancestral human populations. As they experienced an increase in the length of adolescence and the obligation to identify themselves with needy offspring, they also became more socially empathic, a change that allowed deeper social interaction during periods of leisure. These increases in down time and sociality afforded people the opportunity to create alternative worlds—in traditional parlance, the sacred apart from the profane—permitting an escape from the drudgery of everyday life, the same social and imaginative capacities that gave rise to daydream, art, and play. This symbolic ability to engender forms of enchanted communal life outside ordinary experience, he argues, evolved bioculturally

into the social practices that constitute religion, at least as it exists outside formal theology. In contrast, he calls the capacity on which modern science is founded “conceptual representation,” in which concepts are decontextualized, independent of subjective performance, and which only became dominant comparatively recently (Bellah 2011, 38, 42). Ironically, whether methodologically experimental or historical, what is old in the anthropology of religion—the evolution of religion and science—is made new again across academia.

A religion of science?

Despite this analytic separation between religion and science at the developmental level, ethnographers who have directed attention toward the everyday *practice* of scientific communities have revealed certain religious—or at least belief-based, nonempirical—elements within scientific cultures. In the 1970s, just as anthropologists were beginning to consider seriously the ethnographic study of scientific researchers, philosopher Bruno Latour and sociologist Steve Woolgar wrote of the networks of relationships and the discursive elements that constructed scientific facts at the Salk Institute in California. “Scientific activity,” they insist in their conclusion, “is not ‘about nature,’ it is a fierce fight to *construct* reality. The *laboratory* is the workplace and the set of productive forces, which makes construction possible” (Latour and Woolgar 1979, 243). That is, this construction of scientific reality is a project in actively creating order out of disorder, not merely uncovering objective facts beyond the realm of culture. In this sense, Latour and Woolgar, along with the scholars who followed their lead in founding the interdisciplinary science and technology studies (STS) movement, reveal scientific inquiry to be governed by culturally constructed rules and rituals. Just as religion involves the construction of worlds apart from everyday experience, so too does science function as a creative enterprise of meaning making beyond its superficial reliance on utilitarian postulates. These studies constitute the first steps toward appreciating religion and science as cultural forms more closely aligned than often thought.

Even the impetus for pursuing scientific discovery has, throughout the Western tradition, been inextricably wedded to religious motives, especially Christian ones. As early as the first decade of the twentieth century, Max Weber (1864–1920), a formative sociologist, traced the emergence of certain forms of instrumental economic rationality to Protestant values, while later scholars have extended this idea to the expansion of scientific rationality more broadly (for further discussion, see Tambiah 1990, 12–13). Even more precisely, historian David Noble’s examination of the religious roots of the Western impulse toward technological and scientific development reveals just how close the two have been over the past four centuries since the dawn of the purportedly secular “Age of Reason.” Canonical figures in this move toward science, such as Francis Bacon in the seventeenth century, were often as concerned with Christian themes as they were with the development of science and technology for practical ends. In fact, the results they hoped to bring about through the application of burgeoning scientific

knowledge were no less than salvation from original sin and restoration of the world to divine perfection (Noble 1997, 49–50).

These strains of religious motivation did not die out over time but extended well into the twentieth century. Scientists working on some of the most ambitious technological ventures in recent memory, both in Europe and the Americas, including the wartime Manhattan Project and the contemporary push for artificial intelligence, have adopted at times more or less explicitly the discourse of religious transcendence inherited from Christian philosophers of centuries past. Noble shows that, far from objectively distanced from religious impulses, the actual operation of science in modern Western history blossoms out of and, indeed, still rests on a foundation of religious teleology, in spite of overt efforts to divorce science from its religious pedigree. Thus, at the level of everyday practices, underlying motivations, and even the language used to describe scientific advancements, the boundary between religion and science blurs much more than is commonly acknowledged, particularly by the nonscientific public.

The anthropologist Stanley Tambiah (1929–2014), in his published *Lewis H. Morgan Lectures* (1990), adduces the concept of rationality to the matrix of religion and science as a means of bringing to the fore the stakes these academic debates carry for people's lives. He criticizes a tendency to equate the methods and logic of Western science with the entire scope of rationality, so that people whose cultural practices do not follow these models are labeled irrational and therefore nonmodern or backward. Instead, he suggests that rationality may be more inclusive than often recognized, encompassing not only the dominant scientific mode of reasoning—what he glosses as “causality”—but also “participation,” a mode of interaction with the world in which the action itself (e.g., performing a ritual, paying homage to deceased ancestors) predominates over its resulting physical causation (i.e., by instrumental, means-to-ends thinking). Practices traditionally considered religious or (in Malinowski's sense) magical have their own sense and rationality but these ought not to be judged by the standards of a narrowly interpreted vision of scientific rationality. Nevertheless, the power of the discourse of science—evident in the degree to which it has infiltrated virtually all other dimensions of life (Tambiah 1990, 150)—ensures that people and knowledge claims must accept its epistemology or resign themselves to a lower position on a global hierarchy. It is the modern West's apotheosis of science as a governing societal ideal that threatens to exclude alternative “orderings of reality,” to use Tambiah's words.

This emphasis on the hegemony of science at the turn of the century appears in more recent literature and from other sectors as well, although it does not necessarily signify the total exclusion of religion. Philosopher Charles Taylor, for example, writes of some of the characteristics of the present “secular age,” pushing back against critics who advocate a version of the secularization hypothesis according to which modernity is obliterating religion in all its forms to create a truly secular (i.e., areligious) society. Instead, Taylor draws attention to what he calls “new conditions of belief” (2007, 20), by which he means a proliferation of religious and nonreligious *options*, so that belief in a single system is no longer inevitable. Science may hold great sway but it does not foreclose the possibility for creative refashioning of existing material in an effort to give meaning to people's lives. One possibility is for religious groups to adopt strategies to

align their philosophies with science. As a visibly contentious example, recent Christian and Muslim creationists—those who reject Darwinian evolution and believe the earth and the first human being were created in six days according to literal scriptural accounts—have directed their efforts less toward asserting a religious epistemology over scientific authority and more toward constructing an alternative scientific approach, often parsed as “creation science,” which they claim to be the heir of legitimate scientific inquiry (e.g., Toumey 1994). Although different groups from diverse Abrahamic traditions illustrate multiple possible discursive paths this adaptation can take, they and other “folk” attempts to reconcile religion with science in psychologically and socially satisfying ways reinforce the notion that science, despite contestation over its definition, plays a hegemonic role in Western and, increasingly, global discourse. The ongoing contestation over the scope and definition of religion and science also throws into sharp relief the social constructedness of those categories as evolving products of the Western tradition.

Moreover, what might be called, to modify Noble’s (1997) title, a “religion of science” finds credence in the idea that all systems of thought rely at some level on “nonrational” postulates, regardless of their purported objectivity. Taking a cue from Weber, Tambiah argues that all supposedly wholly rational Western institutions, including science and economics, are “ultimately grounded in subjective values, whose sources and wellsprings [are] non-rational, charismatic, affective and intuitive,” that is, a different way of making meaning removed from instrumental rationality (1990, 153). Indeed, as historians and social scientists confirm, close study of the actual operations of science reveals motivations and patterns associated with religion (Latour and Woolgar 1979; Noble 1997), an affective domain not aligned with the valorized empirical logic that is, moreover, not necessarily a “natural” form of human cognition at all (cf. McCauley 2011). What might be termed more religious or “performative” elements remain an integral part of science.

Nevertheless, a question remains as to whether religion and science are fundamentally distinct or qualitatively indistinguishable. The social–scientific work that threatens to narrow the gap between science and religion has not managed to eliminate it entirely. Any discussion of religion *and* science is predicated on at least an implicit acceptance of their separation. Even the notion of “hybrids,” popular in postmodern literature, presupposes the integration of distinct phenomena; otherwise it would make little sense to talk about hybrids as an *integration* of two or more discrete elements. One solution is to posit an idealized separation of religion and science yet acknowledge their real intermingling in social practice. After all, even analysts with such rigid taxonomies as Frazer ([1890] 1922, 52–53) have difficulty disentangling their categories in practice but they manage to claim them as separable entities at the conceptual level. Another approach would be to abandon treating religion and science as separate conceptual categories and consider them variable “cosmologies,” or generic ways of ordering and making sense of the world. Bellah (2011, 4), for example, despite treating science separately from religion, concedes to view both as creative orderings of the world that depart from everyday experience. In either case, the practical question for anthropologists becomes not how to precisely identify any essentialized “religion” or “science” but

rather how particular configurations thereof will lead to more or less clear understandings of how they operate in various cultural environments. Regardless of which labels are attributed to social phenomena, a key path toward further exploration of this fruitful field of knowledge production will be a continued adoption of the method on which anthropologists rely most closely for their data: intensive ethnographic description of lived worlds in cross-cultural perspective.

SEE ALSO: Animism; Anthropology: Scope of the Discipline; Assisted Reproductive Technologies; Buddhism; Cosmologies; Creationism; Durkheim, Émile (1858–1917); *Elementary Forms of Religious Life, The / Les formes élémentaires de la vie religieuse*; Magic; Malinowski, Bronisław (1884–1942); Medical Science and Technological Studies; Rationality and Belief; Religion and Cognition; Sacred Ecology; Tylor, Edward (1832–1917); Weber, Max (1864–1920); Witchcraft, Sorcery, and Magic

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