Evolutionary Processes in the Natural History of Religion

Abstracts (mit freundlicher Genehmigung des Springer-Verlags)

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Religion Through the Eyes of a Biologist

Evolution in All Its Facets

Evolution is both a theoretical term in the sciences, and the pivotal idea of philosophical systems, visions and ideologies. The grand narrative, the comprehensive tableau of evolution, provides meaning and interprets scientific theories, but is not in itself science. It is a worldview which can be described as *developmentalism*. It should be distinguished from evolutionary theories in cosmology, geology and biology. This distinction is of particular importance for the scientific study of religious evolution. Scientific knowledge is reflexive, because the subject of research is also its object. So, for example, the evolution of the religious mind is also the evolution of the scientist's mind. We will call this aspect of scientific knowledge the "reflexive-phenomenon". Therefore, the mutual influence of scientific results and world views is worthy of consideration. The epistemology of science demands that human religion be regarded as a natural phenomenon: as part of the *res naturalia*. Its scientific analysis provides *substantive definitions* and explains causal interactions by *theoretical concepts*. However, the immense complexity of the hominin behavior system which evolved towards a propensity of religion limits the possibilities of scientific modeling.

The Scientific Approach to Religion

The evolution of religion can be studied by biological methods phenomenologically as a natural history of religion, and causally by modeling the interactions of behavioral innovations with the environment. The evolution of religiosity as a human capacity has to be distinguished from the evolution of historic religions. Similarly, the capacity (a theoretical term) should be differentiated from religious performances and experiences. They have a "physical" form and an abstract function. The function has to be understood teleonomically, not teleologically, from a biological perspective. The terms religion and religiosity are projective concepts (in theoretical biology injunctions) which have to be identified by describing the transitions to adjacent areas. The religious impulse of humans, in this description, comprises a sense of the transcendent, identification with a religious tradition, and the idea of the sacred. The experience of the sacred subsists in a tension between the mysterium tremendum and the mysterium fascinosum, integrated as an experience of

numinosity. Animism, animalism and taboos are discussed as possible initial forms of prehistoric religion.

What Do We Know? What Can Be Known?

Scientific research into the evolution of religion depends upon two sources of descriptive knowledge: traces of prehistoric religion and information about historic religions. The asymmetry between the two bodies of knowledge results in a prevalence of retrospective hypotheses based upon analogies with historic religions. Sometimes they consist of several mutually dependent assumptions. An example is the proposal that the Neanderthals used a special form of proto-music instead of the conceptual language typical for Homo sapiens.

Knowledge of human origins inevitably becomes part of the ongoing political and cultural discourse about human nature and social value systems. Identity-building narratives depict the rise of humanity from its natural roots to emphasize specific worldview perspectives. Science, the “art of doubting”, clashes inevitably with the urge to create consent in a community by shared narratives. An example is the genetic bottleneck early Homo sapiens lived through in Africa, which was discovered by genomic methods. In popular accounts, the result is turned into a heroic survival story. Yet scientific research has to be based upon a realistic outline of prehistoric religious phenomena, including difficulties of interpretation.

Understanding Religion from the Inside

The scientific study of religious evolution should include a hermeneutic dimension. Information gained by understanding religion from the inside balances systematic, generalized, and descriptive knowledge obtained by objective methods. Without a hermeneutic approach, there is a danger of “systemic blindness”: Hypotheses are constructed without taking the actual complexity of religious systems and experiences into account. Biology deals methodically with the complexity of life forms by specialization and by the choice of appropriate examples to study. Religious studies are obliged to proceed in an analogical manner. In addition, scientific knowledge concerning religion is a reflexive phenomenon. There is a wealth of extra-scientific, trivial knowledge to consider, and straightforward communication with believers is in principle possible. These epistemic aspects support the hermeneutic dimension of the pertinent methodology. Hermeneutics provide, at first sight, proximate causes for religious phenomena. Modeling ultimate causes, however, depends upon a systemic perception of proximate causations and

interactions. The “philosophy of understanding” by Jean Paul G. Ricœur is discussed as background or scaffolding for the study of religious evolution.

About Evolutionary Biology and the Evolution of Religion

Evolution: The Modern Synthesis

A Darwinian model of the evolution of religion is obliged to use biological analogies on higher system levels. Such models suggest a synergy between processes literally driven by biological evolution, and others which are Darwinian by analogy. To provide a biological background for a proposed synthesis, this chapter charts the biological theory of evolution in a concise form. Successive historic stages are designated by version numbers, from Darwinism to Modern Evolutionary Synthesis. This overview demonstrates that explanations of religious evolution which comprise selectionist analogies with biological evolution are not consistently supported by the modern synthesis of evolutionary biology: At least, neutral evolution, evolutionary constraints and drift effects should be taken into account. Especially, the drift barrier hypothesis has surprising applications. As an example for “loaded” evolution, human eusociality—a disputed description of the social behavior of humans—is discussed.

Extended Evolutionary Synthesis, Epigenetics and the Contingency of Evolution

The Extended Evolutionary Synthesis (EES) includes Evolutionary Developmental biology (EvoDevo), epigenetics, the concept of niche construction, a new understanding of non-genetic plasticity and group selection. Niche construction and ecological engineering are concepts necessary for modeling human cultural and religious evolution. In popular understanding, epigenetic effects are heritable variations which are not coded by DNA sequences. Some voices proclaim that they establish a revolutionary, quasi-Lamarckian mechanism of evolution. The discussion of this proposal involves the famous Överkalix study. The result is sobering: Epigenetic effects are an important module of the EES, but do not revolutionize the biological theory of evolution. It will be argued that epigenetic phenomena do not form a sufficient basis for returning to a teleological view of natural evolution. On the contrary, EES eliminates residual teleological elements in evolutionary biology. However, neither EES nor other recent theoretical developments explain the evolutionary trajectory of a species, or of the entire biosphere, on a large scale.

Gene-Culture Coevolution

G*ene-culture coevolution*, in the study of religious evolution, stands for circular, recurrent, adaptive interactions between genetic and cultural innovations. In evolutionary biology, adaptive interactions of subsystems are usually regarded as *co-adaptations* within an evolving system. They are one aspect of evolutionary change; adaptations to external selection pressures are another. *Coevolution*, in biology, mostly designates the phylogenetic interaction between taxonomically distant species. It signifies a special case of ecological inter-species dependency: a common phenomenon, but by no means a principal aspect of evolution in general. The difference between internal co-adaptation and coevolution is that subsystems of one organism follow a joint evolutionary path, despite different selection pressures on specific sub-systems. Genetically isolated species, while co-evolving, do not have to develop a systemic compromise. If religious evolution is regarded as driven by gene-culture coevolution, the term coevolution gains an extended meaning, compared with biology. The designated processes are analogical at best; their dynamics differ. The term gene-culture co-adaptation would avoid this difficulty. Co-adaptive processes which drive the evolution of religion ought to be depicted by multilevel or multi-dimensional models. The reasons are summarized in this chapter.

Phenomenology of Paleolithic Religion

A Story Told Backwards

Archeological and paleoanthropological evidence which might relate to prehistoric religion is outlined in exemplary form and sorted by age. The earliest plausible examples are ritual burials from archaic *Homo sapiens*, and from Neanderthals. Later, figurative art (paintings, Venus figurines, animal figurines) can be interpreted as expressions of religious concepts analogical with historic animalism. Handprints (positive images) and stencils (negative images) are of comparable age and are interpreted as traces of shamanistic rituals. Among extant indigenous cultures, animism is the most widespread religious concept. This might hint at its synapomorphic (primal) position in religious evolution. However, the scant evidence allows for widely different hypotheses: ranging from the proposal that religion started with concepts of survival after death around 90,000 BCE, to the suggestion that, at that time, religious performances were already similar to those of extant hunter-gatherer societies.

The Beginning and the End: Pre-Human and Neolithic Religion

The last steps of religious evolution before the emergence of historic religions occurred in the late Mesolithic and early Neolithic. Central places of worship appeared, then agricultural, socially stratified communities (Neolithic revolution) and urban societies. Archeological discoveries document various prehistoric funeral cultures from this period. The first evolutionary steps toward human religion, on the other hand, could already have occurred (according to several authors) during the history of the chronospecies *Homo erectus*. Some propose that even the extant *Hominidae* show traces of proto-religious behavior. Yet the most plausible indications of religious concepts outside *Homo sapiens* issue from the classical Neanderthals. In any case, hominin evolution towards behavioral *modernity* gave rise to religious behavior, either as a functional part, or as a nonfunctional epiphenomenon, or both at different stages of evolution. Modernization was an overarching adaptation to (almost) any social or environmental challenge. If religion evolved as its integral result, its evolution was not driven by one, or even by a few, adaptive functions, but by its co-adaptive role in modernization in general.

Hominin Pre-Adaptations: Background to the Evolution of Religion

Hominisation began with upright walking, dependency on fabricated tools, and with the gradual adoption of an ecological role as apex predator. The most important pre-adaptation on the way to religion was the increase of the neocortex, the mentalization of social behavior, and innovative social structures and skills leading to a specific hominin form of eusociality. A Theory of mind (ToM) developed and became part of the cognitive space. Human eusociality is based on intersubjectivity, which is made possible by the symbolic human language which transfers information from mind to mind. The many-layered symbolic representation of knowledge in the cognitive space has a much higher adaptive value than a system of specific adaptations. It develops by a hermeneutic circle between the symbolic representations of separate things, and their relations to the whole. A world concept is created from the particular experiences of individuals and communities. Thus, the inner world transcends knowledge of the outer world. The sense of transcendence generates a holistic world concept which qualifies its parts as “spiritual”. Meaning, a general purpose or aim, is attributed to life, death and the world.

CSR: The Cognitive Science of Religion

Evolutionary Psychology and Religion

The Cognitive Science of Religion (CSR) applies evolutionary psychology (EP) to the study of religious beliefs. "Narrow" EP proposes massive modularity of brain functions, and that cognitive modules evolved as adaptations to past selective pressures. Consequently, religion is regarded as a by-product of specific modules, e.g., hyper-agency detection (HAD) and detection of minimally counterintuitive concepts (MCI). "Broad" EP, however, takes into account that modular cognitive functions are sequestered units on a basic level of the cognitive space. On meta-levels which produce conscious thoughts and actions modular functions are present with their bottom-up effects, but not as distinct modules. Religion evolved as an integral feature of behavioral modernization and promoted its profound impact upon the ecological success of *Homo sapiens*. Therefore, "narrow" CSR explanations of religious evolution sometimes conflict with descriptive knowledge about historic religions. As an example, a central role of HAD is inconsistent with the primal position of animism in prehistoric religion. In a number of historic religions, otherworldly agents are not pivotal elements. The concept of a cosmic order or the idea of an inescapable fate, are as prevalent in religious systems as the idea of supernatural agents.

Religious Fanaticism

Some belief systems seem to corroborate a direct causation of convictions by basic cognitive modules: religious fanaticism, among others fits into this category. An analysis of religious fanaticism, however, suggests that it depends on religious modernity and features of post-axial religions. Compared to earlier religions, post-axial ones are characterized by the objectification of world views, the moralizing of the sacred and redemptive righteousness. If the ultimate nature inherent in universal religions is interpreted as absolutism, fanaticism becomes possible. This analysis cannot be directly applied to indigenous religions, nor to the evolution of human religiosity. The loss of transcendence caused by modern-day fanaticism, however, leads to the surmise that the evolutionary trajectories of the religious capacity as such, and that of culturally implemented religious systems, should be distinguished. They should be regarded as separate, co-adapting subsystems. Types of fanaticism can be described by their different psychodynamics. Their common feature is a dysfunctional imbalance between self and non-self, between their

own religious identity and that of others. The retrospective conclusion is that the evolution of religiosity was closely connected with the representation of one's own mental state and that of others in the cognitive space.

Practical Religion and Spirituality

Religion was, and is, beside other functions a coping system. It deals with existential fear and with contingent experiences of groups and individuals. In traditional religions, enemies of the people must be fought, but harmony with the cosmos must also be maintained. Modern fanaticism concentrates upon the perception of evils and loses sight of the entirety of existence. The enemy way, a traditional Navajo ritual, is compared with twentieth century Creationism. Aspects of fundamentalism, dogmatism, rigorism, religious extremism and terrorism are discussed according to classic psychological hypotheses from recent decades. They concentrate upon the mental and social "added values" which a conversion to dogmatic, deviant forms of religion might produce, and disregard the spiritual aspects of these forms. Their approach should be augmented by a hermeneutic dimension. By regarding dogmatic, deviant religion from an evolutionary perspective, surmises are possible relating to the early phylogeny of religiosity and organized religion.

Magic, Religion and Evolutionary Ethics

Hypotheses proposed from an evolutionary perspective partly explain why every universal religion, including secular substitutes, encompasses so-called magical and superstitious elements. Aspects described as "magical" are performances which are believed to cause immanent effects, although their mode of operation cannot be analyzed outside the framework of religious convictions. The differentiation between beliefs of high standing and popular, trivial beliefs cannot be applied to indigenous, pre-axial religions. The latter ones, as well as prehistoric religions, are integral parts of the symbol system which provided existential meaning and practical support in various ways: magical, mythological, narrative etc. Early evolutionary stages of religion probably had a simpler structure on all levels but were equally holistic and autopoietic. Human ethics evolved together with religion by successive co-adaptations. Ethic norms are always connected with religion, but in different ways. The hypothesis that belief in morally concerned, supernatural agents evolved to facilitate cooperation in large-scale societies occasions theoretical problems. The distinctions between natural and supernatural retribution, and between offences against the gods and against society, are

difficult to maintain outside the framework of modern, secular thought. Alternative hypotheses are tentatively proposed.

Modeling the Evolutionary Path to Culture and Religion

Multi-Level Models of Religious Evolution

Any step of religious evolution on any system level might influence other levels strongly, moderately, adversely or not at all. The characteristics of such a system cannot be reduced to the characteristic of its parts. The principle is one of strong emergence. Concepts like coevolution, as well as Darwinian or Lamarckian analogies, are of limited use to describe the system's properties. A thought experiment analyzing the competition between populations with different, or equal cultures and genotypes shows that new concepts are needed for modeling the evolution of religion. The project of a unified science of cultural evolution which closely follows evolutionary biology has to be abandoned. An alternative option is the EECC model (evolution and expansion of human cultural capacities) which proposes a three-dimensional space for cultural evolution: an evolutionary-biological dimension, a historic-social dimension and an ontogenetic-individual dimension. Within the three-dimensional space, culture evolves according to an eight-grade scheme. The evolution of religion can be tentatively integrated.

Conclusion and Outlook

Like religion and life, culture is a theoretical term which comprehensively categorizes a wide variety of behavioral performances. The transition between social learning in general and enculturation is a gradual one. Quasi-static models of cultural and religious evolution which suppose a continuity of conditions and processes are insufficient, whether they propose continuity of mental mechanisms or of adaptive causes. The human behavioral system and its emergent high-level features ought to be modeled according to the theory of complex dynamic systems. While adapting, such a complex and dynamic system organizes itself into intricate, functional patterns of interactivity. The necessity of modeling the evolution of religion according to the theory of complex dynamic systems appears self-evident, once it is expressed at all. A satisfactory model does not yet exist and will have to be developed by interdisciplinary research. What is known about the general features of a future model is summarized in the final paragraphs of this chapter.