

## Is God an Adaptation?

Robert Wright's, *The Evolution of God*, Little Brown, 2009.

Hugo Viciano · Pierrick Bourrat

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**Abstract** In this critical notice to Robert Wright's *The Evolution of God*, we focus on the question of whether Wright's God is one which can be said to be an adaptation in a well defined sense. Thus we evaluate the likelihood of different models of adaptive evolution of cultural ideas in their different levels of selection. Our result is an emphasis on the plurality of mechanisms that may lead to adaptation. By way of conclusion we assess epistemologically some of Wright's more controversial claims concerning the directionality of evolution and moral progress.

**Keywords** Cultural evolution · Religion · Moral progress · Group selection · Teleology

*“There is religious fear, religious love, religious awe, religious joy, and so forth. But religious love is only man's natural emotion of love directed to a religious object; religious fear is only the ordinary fear of commerce, so to speak, the common quaking of the human breast, in so far as the notion of divine retribution may arouse it; religious awe is the same organic thrill which we feel in a forest at twilight, or in a mountain gorge; only this time it comes over us at the thought of our supernatural relations”.* (William James, *The Varieties of Religious Experience*)

Robert Wright's *The Evolution of God*<sup>1</sup> acknowledges William James' assumption that human cognition and emotions linked to divine attributes need not be adaptations in the same way that our organs or other biological characteristics are.

<sup>1</sup>Page references are to *The Evolution of God* unless otherwise stated. We are grateful to Gabiola Lipede, Claude Loverdo, Daniel Darg, Hugo Mercier and an anonymous reviewer of *Philosophia* for their comments and suggestions concerning many of the ideas presented in this essay.

H. Viciano (✉)

Institute d'Histoire et Philosophie des sciences et des techniques, Université de Paris-1/ENS/CNRS,  
Paris, France

e-mail: Hugo.Viciano@normalesup.org

P. Bourrat

Institute of Cognitive and Evolutionary Anthropology, University of Oxford, Paris, France

This would appear to render the quest for the “God gene”, or the “innate module of God” in the brain, ill-founded. This does not, however, render an evolutionary contribution futile. Indeed, the study of the evolved characteristics of these emotions and cognitive systems could inform us about how they work in religious contexts.

In this critical notice on Wright’s new book, we maintain that religious forms related to the belief in God can also be considered adaptations within certain specified limits and hence they can be fruitfully studied under the aegis of a cultural adaptationist program. Indeed, beyond its focus on religion as a “by-product” at the level of biological evolution *The Evolution of God* goes on to construe a case for the role of natural selection in the evolution of religious forms at the level of “cultural evolution”. Furthermore, while some scholars in the humanities fear a kind of theoretical imperialism from the natural sciences, Wright’s approach serves to illustrate that an evolutionary framework is not necessarily anhistorical in thrust.

### Religion as a Population Phenomenon

The book mainly details the step-by-step emergence of state religions<sup>2</sup> and monotheism as artefactual devices—i.e., created by many generations of individual shamans, prophets, believers and politicians—used to solve the problem of cooperation for populations increasing in numbers. According to Wright’s 500 page account this occurs only ever infrequently as the consequence of pure and unique theological innovation. Rather, the supernatural entities invoked are variational entities that tend to be modified by countless individuals in relation to certain human needs and aspirations. In a nutshell, these variations can be represented as strategies in an evolving population. As in his previous book, *Nonzero*, Wright focuses on the evolved rationale of enlarging the spectrum of possibilities of non-zero-sum interactions. In current evolutionary game theory, non-zero-sum games are defined by payoff structures in which the gain of a participant does not necessarily correspond to the loss of another participant. *The Evolution of God* is thus an attempt to understand religious forms as a population phenomenon.

Wright’s thesis is that historically religion happened to play a central role in bringing to light opportunities for cooperation. Although religion can sometimes act to legitimate the most horrendous crimes, as the author unflinchingly describes, the book traces the changing interpretation of religious teachings of the type “Love thy

<sup>2</sup> It should be noted that attempting to account for the evolution of God and religions presupposes not only that these entities change but also that there is a certain commonality between their distinctive and separate manifestations, something that links, for example, the hunter-gatherer’s belief in spirits with the organized religions of theologians, the castes of priests, or the New-Age spiritualities. Suffice it to say that this is a controversial matter. Anthropologist Maurice Bloch once said that explaining religion as a natural property of the human psyche amounts to something similar to explaining the British House of Lords as a natural property of our species (Whitehouse 2010). Both religion and the House of Lords are human institutions and both rely on distinctive elements of our evolved human psyche in different ways. The wide spectrum of practices and beliefs that we call “religion” (or the family of beliefs and behaviours related to the supernatural) is not a natural kind in any meaningful sense. Nor is it an entirely conventional kind either. For even if during most of the history of our species as hunter-gatherers a word referring to religion did not even exist, this family-resemblance or polythetic - category of beliefs and behaviours scores high as one of the universal characteristics of known human societies.

neighbour as yourself”, which first appeared in the Hebrew Bible but which can be said to have analogues in other state religions appearing at approximately the same time. Wright tries to defend the thesis according to which the history of religion and its progression from ancient times to the present betrays evidence of an “arrow of moral development” (p.432).

As human societies grew and became more interconnected, the opportunities for increased cooperation and respect augmented and new divine attributes were recruited in order to contribute to the motivation for those social exchanges. Wright makes it clear that in hunter-gatherer societies and other forms of social organization that followed, the “holy” or the supernatural was not even especially associated with the “good”. Over time, religious commandments like “love thy neighbour” came to mean that one should love... well, one’s *neighbour*, and not some unknown people hundreds of kilometers away. According to the author, it is because of both the nature of certain emotions that can be recruited during the act of believing as well as the open ended nature of hermeneutics—the interpretation of the holy—that statements regarding the supernatural have this special power of highlighting the non-zero sumness of certain situations.

The primordial pantheons of hunter-gatherers included many different supernatural figures but rarely “high gods” as we understand them in the monotheistic tradition. Besides, many of the hunter-gatherer religious precepts would strike the modern eye as being amoral. On the one hand, spirits are often concerned with the contravention of rules. On the other hand the rules of the spirits or ancestors often appear arbitrary and capricious. The author goes on to argue that since hunter-gatherer societies are relatively transparent with respect to failures to keep up a reputation, punishment of social deviants is something that can be administered in a rather direct fashion without having recourse to supernatural reinforcement. Kin selection and reciprocity psychology seem to be most of the story in that sort of environment. His explanation for the complexification of religion and religious moral standards stresses the social evolutionist trend that links social structure with the divine structure of those early pantheons. It is, therefore, not by chance that with the specialization of labor a myriad of so-called “departmental gods” also arise often representing the professional divisions of the society. Over time and with the progressive hierarchisation of human societies into agricultural states, the old departmental gods happened to be subordinated in sophisticated narratives and in accordance with political facts on the grounds that as these facts changed they also tended to motivate the fates of the divinities in question.

Wright presents several instances of the diverse roads to monolatry—the cult of one god over others. This is the case for the cult of Marduk, one of the more than twenty divinities that are cited in the code of Hammurabi and that came to prominence as Babylonia became the main political power in Mesopotamia. Or the case of Aten, the Egyptian god who was promoted by Amhenotep IV in the 14th century BE. His is the story of a divine coup d’Etat to debunk the increasingly powerful caste of priests of the god Amun. The author links this event to the growing cosmopolitan ethos of the Egyptian empire at that time.

From this point on, the book focuses mostly on the fate of Western Monotheism and on the rise of the Hebrew God as the story of a variational entity that evolves as a result of the synthesis of previous divinities and the interpretative efforts of prophets and theologians who also have an eye to the facts at hand. In this fashion,

*The Evolution of God* is an attempt to establish the phylogeny of gods such as Yahweh, Allah or the Christian God as described in the doctrine according to Paul. The final chapters of the book are devoted to the prospects of our evolved emotions in dealing with the complex problems posed by the globalization of religion with emphasis placed on the question of its further evolution. Towards the end, Wright treats more profound epistemological questions such as whether we are entitled to posit that evolution has a direction—as in his hypothesis of the moral arrow of evolution—or even what God could mean from a scientific point of view. Wright’s God is to be found in the details: the material in the volume is abundant, with numerous and substantial notes based on up-to-date scholarship. In the end, Wright’s own words may summarize the spirit of this the “Greatest Story Ever Told”: “*This is the way moral evolution happens—in ancient Israel, in the Rome of early Christianity, in Muhammad’s Arabia, in the modern world: a people’s culture adapts to salient shifts in game-theoretical dynamics by changing its evaluation of the moral status of the people it is playing the game with. If the culture is a religious one, this adaptation will involve changes in the way scriptures are interpreted and in the choice of which scriptures to highlight. It happened in ancient times, and it happens now*” (p.413).

### **In Coordination We Trust**

In the following pages we want to stress that the concept of adaptation has a place in the cultural evolution of religion described by Wright and that this yields some optimistic prospects for an evolutionary social science of religion.

Framing Wright’s book in terms of “adaptations,” is neither trivial nor equivalent to affirming an evolutionary focus. There are ways in which an object could be studied in an evolutionary fashion and yet not be an adaptation at all. This is true of both the field of biology itself as well as the humanities. It must be added that, in our opinion, even developing an “exaptationist program”—i.e., one that focuses more on traits and behaviours as by-products or “spandrels”—obliges us to consider and eventually test adaptationist hypotheses<sup>3</sup> (Andrews et al. 2003).

The use of “adaptation” is not trivial for one could object that despite the extensive use of concepts imported from evolutionary biology, in the end Wright’s impressive history of Western monotheism hardly uses any of the methods of cultural phylogenesis or replicator dynamics that have been used in other studies of cultural evolution. Instead, he relies mostly on philological analysis, archaeology and economic history—good old-fashioned methods of the human sciences. This is not, however, a matter of mere terminological imperialism. Wright aspires *via* evolutionary theory to obtain some form of “causal closure” by basing his explanations not only on cognitive systems and economic processes but also on a more general view about the evolved human nature that sustains these very interactions. In addition, the thesis that brings together the material in the book is

<sup>3</sup> Otherwise, it may be considered exaptationist “just-so” story-telling. That is, the testing of an alternative hypothesis to adaptationism also requires us to consider and test when possible the adaptationist hypothesis.

certainly an evolutionary one: namely, that important changes in religious forms occur over time in order to accommodate increased opportunities for non-zero-sum cooperation.

The adaptation thus often takes place for increased social coordination with neighbours, theological beliefs thus changing in accordance with the nature of opportunities for social exchange. In that respect, Wright does not maintain that there is an intrinsic—or for some people even biological and “innate”—causal link between beliefs in supernatural agents and increased cooperation in social networks or public good dilemmas—a view that is currently popular and being thoroughly investigated by cognitive psychologists and sociologists (Norenzayan and Shariff 2008). On the contrary, Wright emphasizes the plasticity of beliefs in supernatural agents as well as how these beliefs have been functionally accommodated in certain contexts in order to increase both cooperation and, incidentally, mass murder.

We prefer to use the term “adaptation” instead of “social utility” (also used by Wright) because it is less ambiguous and its use highlights patterns of evolution that do not necessarily serve the welfare of individuals in every case. In spite of its advantages we should nevertheless approach the term adaptation with caution. Firstly, our use of the concept of adaptation clearly does not mean something as precise as in the case of the “biological adaptation” of organisms, a concept backed by a theory, that of evolution by natural selection, which is probably one of the most tested theories in modern science. Such a general and well-tested theory in the study of cultural change does not exist. Rather, we have to rely on piecemeal attempts at explaining cultural phenomena. Secondly, adaptation is not a theoretical term (not even in evolutionary biology) but an interpretation of the theory and models of natural selection. More precisely, it is a shorthand descriptor (Michod 2000). Therefore, in this critical notice we shall specify what this concept means in every case and in reference to which partial models we are applying it. The question as to whether or not God is an adaptation may thus be broken down into at least three questions which we will briefly treat separately.<sup>4</sup>

#### “God” as an Adaptation at the Level of the Individual

At this level, an adaptation can have a basis in biological or cultural heritability. Adaptation at the biologically heritable level denotes the positive effects on fitness of some genetically heritable capacity for believing in supernatural agents or God in a given environment. This is the most direct meaning of biological adaptation. We do not know of any such heritable capacity that would be specific to religion and Wright follows the evolutionary psychological hypothesis according to which religion is a biological by-product (also called “exaptation”) of naturally evolved dispositions for other activities.

<sup>4</sup> Each question will be glossed over in various ways, and for all of them “adaptation” should be understood as referring to a given specific environment. One should notice also that when we use the term “God”, we mean here more generally “the belief in God or holding certain beliefs in supernatural agents.” It is also important to specify that we use the term “belief”, but by this we intend to keep things simple only for the purpose of communication. We recognize that this term is problematic, especially with respect to the study of religion and the idea of supernatural agents. For a more satisfying approach to the nature of beliefs see Tamar Szabo Gendler “Alief and Belief”, *Journal of Philosophy*, 2008, 105:10.

On the other hand, adaptation “at the cultural level” means that adopting certain cultural beliefs can have a positive effect on individual fitness on a culturally heritable basis—those who adopt the religious ideas in question will increase their biological survival or reproduction in a given environment. If we look for actual adaptation at the level of the individual human we may ask for instance the question that appears on the website for the promotion of Wright’s book, namely: “Did shamans have more sex?” This is an empirical question and certainly a difficult one to test! Wright is able to cite abundant ethnographical evidence suggesting that, more often than not, the answer may have been positive. Of course, other putative benefits to individual fitness which are less directly related to reproduction have been posited. For one thing, Shamans already had their means of subsistence assured for them most of the time despite various risks incurred by them: For shamans who made obvious mistakes would not have continued to receive free food much longer.

Another case could be the hypothesis that has been advanced by some scholars linking features of certain religions with specific forms of physical comfort that may also promote biological fitness. Take for example certain cures achieved by self-suggestion— a therapeutic practice that shamanism and other forms of religion sometimes offer (McClenon 2002). Again, this is a controversial matter in need of further empirical testing. More generally it can be argued that it is not always clear that religion compensates for the fears and anxieties that it generates, at the level of the individual (see Atran 2002). In all cases, this depends on a given environment, in so far as transmitted cultural items that are adaptive in one context may not be adaptive in another. In this sense one can possibly observe instances of cultural lag and mismatch (Nisbett and Cohen 1996). And in the opposite adaptive direction, we could in principle observe the construction of cultural niches to compensate for other relatively maladaptive cultural practices (Odling-Smee et al. 2003).

#### “God” as an Adaptation for its Own Cultural Spread

Today there are more than 10,000 different religions in the world, with approximately 1000 new cults being created every year. Some of these religions are very young, others are quite old. Cults appear and disappear. Recently, Richard Sosis (Sosis and Bressler 2003) reviewed anthropological evidence showing that among utopian communities founded in the United States in the 19th century, religious communes were more likely than secular communes to survive for a longer period of time. Sosis points to certain features of the social organization of these communities. Anthropologist Pascal Boyer, studying the memory and cognitive inference systems that bias the formation of religious beliefs, has written that in the selective retention of beliefs in the supernatural, *many are called but few are chosen* (Boyer 2002).

This allows for the study of the various mechanisms of selective retention and transmission of this abundance of religious ideas. Theoretical models dealing with the differential survival of cultural units in selective environments are scarce (but see Boyd and Richerson 1985). In order for such a system of cultural transmission to evolve in a Darwinian fashion it should score high in certain relevant dimensions, such as the fidelity of transmission, the stability across different environments of the property that confers fitness, and the smoothness of the fitness landscapes (see Gray

et al. 2007). If our “God concepts” or cultural beliefs score high on these characteristics we could then expect a population of beliefs to evolve in adaptive ways. Methodological criteria are needed to distinguish the origin of the observed distribution from other plausible mechanisms such as “cultural drift” (Liebersohn 2000). In certain cases, something that can be equated with “selective processes” will be an important force in its evolution (Richerson and Boyd 2005).

In Wright’s view, much as in the discipline of Human Behavioral Ecology, most cultural features of religion are the way they are because of the perceived effects they have on individual agents and because of what agents can do with these beliefs. However, in Wright’s account cultural history matters the most. His case study of the belief in a retributive heaven is an example of this phenomenon. Retributive afterlife is a religious feature that was popular already in the Roman Empire at the time of the rise of the cult of Jesus. Such a belief in religious retribution in the afterworld was present through the spread of the cult of Osiris (or its Greek version, Serapis) through much of the geographical area in which Jesus’ disciples aspired to spread their cult. In Wright’s view, the rise of such a doctrine was only made possible due to the social and psychological environment created by larger and increasingly moralistic post-neolithic societies. This specific set of religious features was thus responding to the previous moralistic turn and to the fears promoted by, earlier religious views. This is a matter of cultural “arm races”, i.e., variants of some form of belief that continuously accommodate to the changes and competition in the pool of other cultural beliefs. Paradoxically, only in this pre-existing population structure could different cults, such as that of Osiris or certain post-Pauline versions of Christianity, compete during the course of their evolution for these particular features of the retributive afterworld. A lesson to be learned from Wright’s approach is that history is a crucial feature of any cultural evolutionary account and must not be evacuated.

### Is God an Adaptation at the Level of the Group?

Claims about group-level adaptations are tricky. Much of the disagreement today about their existence is semantic. Here, “group” can mean a given, genetically mixed group with little migration. For the purposes of this review we need not dwell unnecessarily on this possibility—given its controversial nature—for we have already clarified that Wright’s analysis is not about biological adaptations for religion. People’s minds need not have biologically coevolved with a past religious environment (as in some of Daniel Dennet’s hypotheses concerning the domestication of the human mind by religious ideas (Dennett 2006). Such a scenario constitutes a form of gene-culture coevolution (Bowles et al. 2003) that could have moulded human minds and made them more receptive to religious ideas, even those ideas that are detrimental to individual fitness. However, the evidence pointing in that direction is rather scarce. Indeed, many religious ideas are already artefacts more or less tinkered to fit our minds and stimulate our motivational systems. As it appears clearly in Wright’s account, these religious ideas are also flexible enough to accommodate the social ambitions of shamans, prophets and social reformers alike.

Another possibility is that certain beliefs in God benefit from the survival and reproduction of cultural groups in certain contexts. The so-called cultural group is a



rather fuzzy entity, which makes this idea difficult to test. It could be defined as the lineages of individuals which are relatively more connected with each other around certain cultural conformities and certain conventions of coordination (Boyd and Richerson 2002). Functionalists frequently rely on the benefits that a given behaviour has for the group as a whole, and indeed some biologists and economists have recently defended the theoretical possibility of “cultural group selection”.<sup>5</sup> There are few quantitative studies on this important subject. Yet, we know through the case study of Soltis et al. (1995) on group formation, extinction and cultural change in the ethnographic reports of New Guinea that, even with respect to special conditions including frequent warfare, rates of group extinction were usually lower than what would have been expected for cultural group selection to be an adaptive force over the course of brief historical time periods. Nevertheless, cultural group selection could still be a plausible mechanism for periods ranging over several centuries or millennia. In that respect D. S. Wilson (Wilson 2003) has already argued that several features of Judaism and the Balinese water-temple religion could be adaptations at the level of the cultural group. Under some models, the population mechanism by which cultural group adaptation occurs need not be one of active competition between groups, but rather one of either differential adoption by some individuals of ideas or cultural elements that are more influential in other groups, or of emigrants “voting with their feet” for the most persistent cultural group (see Boyd and Richerson 2009 concerning this last theoretical possibility).

Briefly, for a behaviour to be “group-selected” it naturally needs to be group-beneficial. However, the relation that the behaviour has with the individual that reproduces it can be more nuanced. In a first approximation, the behaviour could be negative or detrimental to individual fitness while being positive for the group (−/ +). Or it could be positive for the individual and positive for the group (+ / +). This last category of behaviours corresponds to collaboration or coordination practices—e.g., deciding together that it is better if we all drive on the right (or left) side of the road. The first category of behaviours is more difficult to identify. It could be argued that historically if some cultural beliefs ever succeeded in convincing people to act clearly against their genetic interests, it would be a rare case of active—and sometimes temporary—indoctrination, coercion or a form of deception. This view does not suppose that humans always maximize their fitness, but simply that they act through decision systems which evolved to that end and also, possibly, to counterbalance the effect of “dangerous memes” and exploitation. Consider for instance the early evolution of religion according to the kleptocracy theory that Jared Diamond has proposed for the origin of Neolithic theocracies. According to Diamond (1997), true state religions only emerge when a central authority co-opts pre-existing supernatural beliefs to set up a pyramid scam. Supernatural beings, in this case, can be seen as means to reinforce the power of kleptocrats (the ruling elite). According to this model certain people, most notably poor peasants and slaves, are exploited and made to believe a certain system of religious ideas that

<sup>5</sup> Interestingly, although much of Wright’s account can be said to be functionalist in thrust, he does not solicit the cultural group selection explanation explicitly and indeed surprisingly he relegates David Wilson’s cultural group-selectionist approach to a few words on note 2 of the appendix at the end of the book.



mainly benefit the powerful. In this type of society it is almost guaranteed that the elite have better health and more children (see Betzig 1986) than the lower classes. Yet in fact they can also be said to play an asymmetric coordination game where even though peasants play the worst role, they in fact succeed better than hunter-gatherers and nomad societies outside their cultural group.

But if that partial coordination game is a usual pattern in the spread of religious beliefs in human groups, does Robert Wright's explanation mean that, in the end, people adopt gods in the same way they adopt driving on the right or left-hand side of the road? Sometimes the social logic depicted by Wright of increased non-zero-sum relations suggests such arbitrary choices of coordination devices. But arbitrariness is relative. This can be seen through Wright's description of what he calls "internal checks" and "external checks" in the cultural evolution of divine attributes. He emphasizes how individuals will sometimes base their acceptance of or consent to a given religious view in accordance with their own rationality as much as with their psychological biases. He advances a type of coalitionary model according to which religious beliefs can be transformed in their different historical environments to benefit the people who provide religious services (prophets, theologians, theocrats, etc.) at least as long as these services are well accepted in their market of believers and coreligionists. Thus, for instance, he demonstrates how the rise of Jewish monotheism was linked to the actions of "Yahveh-alone" theologians who succeeded in enforcing the association between foreign gods and the cosmopolitan ruling elites after this latter group had alienated the lay people. Also of note is the element of group competition referred to by Wright in terms of "external checks." All in all, Wright's account accommodates some of the virtues of the cultural group selection model (external checks) as well as the coalitionary and psychological model (internal checks).

In summary, Wright's account is one in which the notion of adaptation is relevant and central. It is fair to say that there is no one general theory but rather several models under which one could affirm that a religious artefact is an "adaptation" or a by-product ("exaptation"). It seems clear that crucial tests, including quantitative studies, should be devised more often to advance these debates. In that respect, and since an important part of Wright's book is about the adaptive advantages of monotheism, we were surprised that he did not mention some of the data that seems to link the so-called "high gods" and "moralizing gods" with large-scale or resource-scarce societies. Using the Standard Cross Cultural Sample (SCSS), a large database of mostly preindustrial societies, Snarey (1996) showed that belief in "high moralizing gods" is positively correlated with resource scarcity. And using the SCCS and EA (Ethnographic Atlas), Roes and Raymond (2003) have shown that larger societies are more likely to have so-called "moralizing gods." The times seem ripe for more studies of this kind (Atkinson and Bourrat *in press*).

### **Darwinian Higher Purpose?**

To conclude, we would like to raise some points concerning two different (and in Wright's book interrelated) claims that are by their very nature particularly controversial for the reader of *Philosophia*.

- Thesis 1: Biological and social evolution exhibit direction over vast periods of time and tend towards increased cooperation for which religion has played an important role.
- Thesis 2: This direction can be seen as evidence of a higher purpose promoting the expansion of the moral circle.

Unfortunately, it would be impossible to treat with due attention these two far-reaching statements in the framework of this book review; however, a few epistemological remarks are nevertheless in order. The first thesis is mainly developed in Wright's previous book, *Nonzero* and states that human history exhibits a direction or a pattern over time. Wright is thus a firm contemporary exponent of social evolutionism—the scientific hypothesis which affirms that there is a direction of change on certain given parameters in human societies. In the same vein, the history of religion cannot be said to be “one damn thing after another.” Rather, the author asserts that there is evidence for an analogous pattern of increased/enhanced moral commitment towards other fellow humans. Opposed to those who support theses of “radical contingency” in evolution, Wright seems to believe that if one were to rewind the tape of biological and cultural evolution and replay it, the result would be very similar with respect to a number of parameters. He points to the tendency of evolution (both biological and cultural) to maximize non-zero-sum interactions in the long run.

Yet Wright departs further from the social evolutionist thesis when he argues against Steven Weinberg's idea that modern science yields the picture of a “pointless” universe where the moral order “is something we impose.” Wright, on the contrary, aims to re-establish teleology in the universe and he does this basically through a finalistic stance on biological evolution. The author affirms that “*you might say that the evolution of the human moral equipment by natural selection was the Logos at work during a particular phase of organic aggregation* (p.455)”. In his view it would be closer to the truth to say that the moral order was out there in the form of opportunities for non-zero-sum relations and that we adapted to it through biological and cultural evolution. To be fair, Wright does not say that a Logos, instead of natural selection, produced the psychological equipment of humans. In fact he acknowledges that the evolutionary explanations presented in his book need not suppose anything other than the material objects that are part of the biological sciences or the political facts to which he often refers in the context of the cultural evolution of theological stances. Furthermore, the question concerning whether or not biological evolution tends to maximize non-zero sum configurations in the long run as a way of promoting fitness can be defended scientifically. However, the quasi-religious astonishment Wright brings to the question, as well as the philosophical use that he makes of this idea, reminds us rather of the tautological nature of the closely related “anthropic principle.” Scientific evolutionary biology proceeds by showing how organisms adapt by natural selection and certainly not by speculating on how natural selection is adapted to a specific form of organisms (Maynard Smith and Szathmáry 1996). A similar concern could be raised about Wright's perspective on cultural evolution. Adopting a teleological stance can certainly lead to astonishment in some cases, but this is scientifically superfluous. It should also be noted that in spite of the great body of evidence in favour of convergent evolution (Morris 2003),

we do not presently have at our disposal the evidence required in order to draw conclusions about the likelihood of the development of intelligent life like us. Going beyond the tautology according to which the universe exists in such a way that it made human and biological non-zero-sum interactions possible is clearly trespassing on the domain of science. Assessing the improbability of life and the conditional probability of humans once life exists is not something we can do in an uncontroversial way. In spite of much evidence in favour of convergent cultural evolution throughout history, we cannot argue in a convincing fashion about the conditional probabilities of human cultures developing as they did given the initial state of the universe. In addition, it could be argued that the very idea that a specific point of human history constitutes the final cause of some laws of nature is perplexing. From the point of view of causality or teleology it is difficult to see how one position could be privileged over others.

Another similar point involves the extent to which cultural change should be oriented toward the good in the long run thus coinciding necessarily with “the moral arrow” as expressed by Wright. After all, love and compassion are not the only possible, naturally evolved emotions that culture can recycle again and again for situations of violent zero-sum relations: Anger, hate and other emotions are equally viable candidates. Wright does not ignore the obstacles to the realization of non-zero-sum opportunities, such as the ability to recognize these very situations, the aforementioned emotions or the problem of trust in interactions that require it. Yet in our opinion, it could be said that Wright diminishes the importance and generality of such situations in which even if there is a range of non-zero-sum interactivity, there is still room for oppression and exploitation. And more pessimistically, we are not convinced that some evolutionary stable equilibrium cannot include domination of one party over another. It can be argued for instance that certain implicit and explicit attitudes of some group members towards minorities or marginalized groups are motivated by the self-interested aim of maintaining them in a position of inferiority. Consequently, we would be very reluctant to say that the ensuing cultural and religious configuration would be one that shows “the arrow of moral development.” Perhaps it would be more charitable to interpret Wright as arguing that the arrow of moral development is a final cause of the laws of social evolution among others. Still, we disagree with the basis and some of the connotations of the implicit idea that there is something like moral niches out there in the universe to be filled by populations of intelligent beings. In fact, it would be more precise to say that populations in the process of their evolution transform their niches (Lewontin 2000), and although some niches may be convergent with others, chance and individual creativity still have a role to play here, an effect that is not necessarily cancelled in the long run. Wright’s case for an “external” moral order is well argued and deserves serious consideration. Yet we simply do not know how to reliably quantify the importance of so called “niche effects” and “chance effects” in such an evolution, and we would consider it premature to evacuate the importance of any of these two inseparable features.

By focusing on religious forms as a clue to the problem of human altruism and cooperation, Wright makes an important contribution to placing religion in the forefront of the priorities of scientific research. This is a well-deserved place for an important issue. *The Evolution of God* also changes the general contemporary mood

of the evolutionary study of religion. It should no longer be a story of mere risks and purported dangers but also a well argued promise of what the correct scientific understanding of religion can bring to believers and unbelievers alike. We consider Wright's book to be a truly important one. It reads marvellously from the first page to the last and one feels elevated to higher spheres by his impressive scholarship.

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