How Christian Beliefs Harness Darwinian Cooperative Instincts[1]

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Thomas Henry Huxley, the Victorian biologist, was so vocal in defending Darwinism against its opponents that he became known as "Darwin's bulldog". In his essays, Huxley was often critical of both Christian theology and the church and even went so far as to coin the term agnosticism to describe his rejection of spiritual reasoning in favor of scientific knowledge. However, in spite of what might easily be seen as an openly hostile attitude towards religion, Huxley supported the inclusion of the Bible in the British school curriculum. As a member of the London School Board in the 1870s, he argued that Biblical education would positively impact student morality, citing the Bible as a key moral basis of British society.[2]

Was Huxley right? Are religious beliefs particularly important in promoting moral behavior? Is such as assertion consistent with a Darwinian worldview? Might it even be explained in Darwinian terms? In answering these questions, I'll use Christianity as a case study. However, as I'll explain later, I'm not suggesting that Christianity is more amenable than any other religion to Darwinian interpretation.

The idea that there could be a scientific explanation for a relationship between religion and morality is not in itself new. Sociologists like Max Weber, Emile Durkeim and Talcott Parsons, for example, have all proposed such explanations, generally in social "functionalist" terms. However, such explanations are rarely presented in a way that is explicitly consistent with modern Darwinian logic, which usually focuses on how biological adaptations promote an individual's fitness, rather than on how sociocultural institutions promote a society's success. Indeed, the idea of a Darwinist defense for the moral value of religion may seem paradoxical to many people. Christians and Darwinists have not yet succeeded in resolving their differences, despite a century and a half of debate that began when Darwin published the *Origin of Species* in 1859. These differences didn't stop Darwin from being buried in Westminster Abbey, and they haven't stopped prominent evolutionists like Steven J. Gould from insisting that Darwinism and religion can co-exist in a state of mutual non-interference. For many Christians and many Darwinians, however, the conflict is real, and if anything it has become more acrimonious in recent years.

Darwinian analyses of religion have tended to come in two forms. The first is characterized by efforts to debunk, dismiss and sometimes openly ridicule religious (and usually Christian) beliefs. Huxley himself engaged in this type of critique, and Richard Dawkins and Dan Dennett have done so more recently (as have lay Darwinists like Sam Harris and Christopher Hitchens). Darwinian critics, at their most negative, tend to portray religious beliefs as not just irrational and credulous but also as weak

and infantile. Evolutionary psychologist Geoffrey Miller describes his view of how religious believers deal with the fear of death: "They construct pathetic ideologies of self-comfort to plug their ears against such mortal terror. They nuzzle through reality's coarse pelt for a lost teat of supernatural succor. I call them the Gutless, because they aren't bright enough or brave enough to understand their true place in the universe."[3]

In contrast, the second type of Darwinian analysis involves a more earnest effort to understand religious thinking from a scientific perspective. This approach has produced two competing general theories about the origins of religiosity. One Darwinist camp, which includes Dawkins and Dennett, anthropologists Pascal Boyer and Scott Atran, zoologist Robert Hinde, and writer Michael Shermer, has arrived at a "by-product" theory. They suggest that religious thoughts are by-products, the result of the mind's deployment of psychological mechanisms that evolved to fulfil other, non-religious functions. Dawkins, for instance, claims that religion persists because children have adaptations for believing anything their parents tell them.[4] The second Darwinist camp, which includes anthropologists William Irons, Lee Cronk and Richard Sosis, biologists Richard Alexander and David S. Wilson, and political scientist Dominic Johnson, offers an alternative "religious cooperation" hypothesis. This camp argues that religious beliefs evolved to fulfil a particular function: specifically, to enhance the ability of people to cooperate in groups and to successfully compete against rival groups.

The by-product Darwinists tend to discount the religious cooperation view as scientifically suspect, alleging that it smacks of "group selection", the controversial theory that evolution favors traits that benefit groups at the expense of traits that benefit individual genetic interests. However, most advocates of the religious cooperation view (with the exception of Wilson) would deny that they're proposing a model that depends on group selection. Religion, they conclude, evolved to serve the genetic interests of individuals *in* groups. In order to further their individual genetic interests, people often need to form groups that can cooperate effectively, and religion can help them to do this. To see why this is true, it helps to understand something about how natural selection has designed human nature, both in general and for the specific purpose of enabling cooperation.

Like Darwin himself, most modern Darwinists believe that the fundamental organizational principle of all organisms is that they are collections of adaptations. These adaptations are functional traits, encoded in the genome, that allow organisms to solve specific problems related both to reproduction and to activities that are necessary for reproduction, like eating, avoiding predators, and caring for offspring. Milk ducts, for example, are adaptations that allow mammals to feed their offspring, and shells are adaptations that help turtles defend themselves against predators. Genetic adaptations can

also be psychological: the desires to seek a mate and to protect your children, for instance, are both necessary for successful reproduction.

Most of the time, evolution ensures that individuals are concerned primarily with solving their *own* adaptive problems. This is true because the genes for a given adaptation typically spread by enabling the reproduction of the individual carrying those genes: if you have a genetic mutation that allows you to see better than other people, and your good eyesight in turn allows you to survive and reproduce better than others, then you'll have a relatively large number of children who inherit your good eyesight. This creates a positive feedback loop between the good eyesight gene and reproductive success, such that eventually, after many generations, everyone in the population will end up carrying that gene.

Ultimately, after the gene has spread to all members of the species, it may seem to serve "the good of the species", because it will have improved the eyesight of the species as a group. However this may seem, of course, the gene will have spread not because it benefited the species, but because it benefited the reproduction of individuals. This view of adaptation by natural selection—that it occurs because adaptations give an advantage to individuals in reproductive competition—is the basic theory that Darwin presented in the *Origin of Species*.

Apart from the discovery of DNA, probably the most important post-*Origin* refinement of Darwinian theory has been biologist William Hamilton's reconceptualization of the concept of "fitness", which was first published in the 1960s.[5] In classical terms, "fitness" referred to an individual's own reproductive success: a gene spreads by benefiting the reproduction of the individual in whom it's contained. Hamilton was able to show that a gene can also spread by benefitting the reproduction of *other* individuals who share a copy of the same gene. One of my genes, for example, could spread by benefiting my sister's reproduction, because it would be relatively likely (a fifty per cent probability) that she carries the same gene. This kind of "kin altruism" can evolve among very close genetic relatives like full siblings, but it breaks down as genetic distance grows (it is unlikely to occur among relatives who are more distant than first cousins).

Most Darwinians, then, believe that modern humans are composed of adaptations that provided ancestral humans with reproductive advantages—primarily for themselves, and secondarily for their closest relatives. In the field of evolutionary psychology, this adaptationist logic is applied to investigate the design of the mind. This approach strives to identify the myriad cognitive adaptations which generate human emotion, motivation and behavior, in order to achieve a comprehensive and precise definition of human nature.[6]

For evolutionary psychology to explain how people are adapted for religious social life, it must first tackle the fundamental question of how people are adapted for cooperation in groups, and acknowledge that even if people evolved to be concerned primarily with their own genetic interests, they can often further these interests by cooperating with others. Working with others allows people, in many situations, to generate resources that they wouldn't be able to produce alone. In the hunter-gatherer environments of human ancestors, for example, individuals commonly cooperated in order to hunt and gather food, share information, construct shelters, and fight wars (such cooperation is also common in more modern hunter-gatherer societies). People who belong to groups that cooperate more effectively are able to acquire more resources, on average, than those who belong to groups who can not cooperate as well.

Even if it often pays to cooperate, however, our human ancestors would have needed to avoid being *too* cooperative. If my group is working to produce some resource—say, a communal shelter—that will benefit everyone equally, and I am doing a larger share of the work than anyone else, I will end up with lower net benefits than the other members of my group. This is the central social dilemma that bedevils most human cooperative groups. It came to the fore in the 1960s among social scientists as Mancur Olson's "logic of collective action"[7] and as Garrett Hardin's "tragedy of the commons",[8] but this problem is as fundamental in evolutionary biology as it is in the social sciences.

From an evolutionary perspective, if I am willing to contribute to the production of a shared resource, then I face an adaptive problem: how can I avoid being exploited by free riders who take the benefits I produce but don't share in the costs of producing them? I could just ignore these free riders, put my head down and get to work. If I do that, though, the free riders will ultimately end up on top, since they'll get as much benefit as I do, and for a lesser cost. Mathematical models of the evolution of cooperation consistently show that, when free riders can acquire higher net benefits than contributors, they will, over time, exploit contributors to extinction. Once that happens, of course, cooperation ceases to exist. Morality has decayed completely, and the selfish have inherited the world.

My other option is to avoid getting involved with free riders to begin with, and it appears that natural selection has designed us to do just this. The main trick to adaptive cooperation is that my willingness to contribute must be contingent on how much my partners are willing to contribute. As long as my partners are contributing as much as I am, then I'm safe from exploitation—it's when they start slacking off that I need to be concerned. Consequently, evolution has predisposed us to be hostile towards people who intentionally take group benefits without helping with the costs. Research by a number of social scientists (including myself[9]) suggests that punitive sentiment towards free riders is common cross-culturally, and that it results in efforts to negate the advantages that free riders would otherwise enjoy.

The decision about whether to free ride or contribute will depend heavily on the circumstances. Contributing won't disadvantage me personally, as long as other members contribute as much as I do. If I do contribute, I'll be entitled to a share of the public good I helped to produce. I'll also establish a reputation for myself as a trustworthy and reliable cooperative partner—someone who others will want on their team in the future—which can provide me with many additional opportunities to reap the benefits of cooperation.

On the other hand, contributing is a sucker's strategy when others free ride. The more they free ride, the more personally disadvantageous it becomes for me to cooperate. And even when others *are* contributing, free riding will be the most profitable way I can go, provided I can get away with it without being punished or getting a bad reputation. If my group doesn't monitor contributions or punish free riders, and if I can free ride without any long-term reputational consequences—if the members of my group are unlikely to interact again in the future, say—then free riding may start to look awfully tempting.

To produce public goods, then, people need a system of personal incentives that motivate them to contribute (and promote the long-term interests they share with group members) rather than free ride (and promote their own individual short-term interests). This system must keep track of who does what and either reward contributors, punish free riders, or both. Moreover—and this is a crucial point—because this incentive system is essential to public good production, it is *itself* a second-order public good.

Which brings us back to religion. The Darwinian model of selfish cooperation helps illuminates the logic of Christianity, because Christian theology can be seen as a cultural system that effectively harnesses human cooperative instincts, and thus helps Christians produce public goods. What sorts of public goods? This is a thorny issue, since the Judeo-Christian tradition has existed for thousands of years in many different cultural forms, but a good place to start is with the Ten Commandments, which are a particularly explicit and foundational set of instructions that describe how Jews and Christians ought to behave.

The commandments identify sins related to either how you worship God ("faith sins") or to how you treat others ("behavior sins"). First, consider the behavior sins: obey your parents, and don't covet, slander, kill, rob or commit adultery against each other. If everyone obeyed all of these rules, we would live in an environment that was free from intergenerational conflict and essentially free of crime. The absence of murder, theft and adultery would be a public good, because no one would be victimized, and no one would have to worry about or guard against being victimized. In homicide-free environments, parents don't lose children to murder; in adultery-free environments, married people don't get cheated on or cuckolded. (There would also be more specific benefits associated with the

reduced incidence of each act. Murder, for example, may harm the group by robbing it of valuable talent. However here I'm just concerned with the most general ways in which these rules are group-beneficial).

Reductions in crime and conflict don't just protect group members from each other. They also help groups remain cohesive, large, and powerful. Anthropological studies, for instance Napoleon Chagnon's work[10] with the Yanomamö, reveal that disputes over acts like sexual infidelity, theft and murder are primary causes of violence, faction and fission within tribal groups. A group that minimizes these behaviors is less divided by internal strife and more able to function and compete as a coordinated unit. This increased solidarity is most valuable to members when their individual interests are most dependent on group power. If a group is seriously threatened by an external enemy, for example, its power will be especially important to member survival.

Reducing conflict in the group is also important because it increases levels of trust, so people can stop worrying about getting killed or cheated and start focusing on more productive pursuits. If you aren't preoccupied with defending your spouse and property against covetous neighbors, or with exacting blood revenge for the latest murder of a member of your family, then you can go out and generate value for yourself and others by producing some good or service for exchange.

In summary, the behavior sin commandments don't just tell people to avoid certain behaviors; they direct people to produce public goods. These public goods serve the shared long-term interests of individual group members by protecting them from victimization, by increasing group solidarity and competitive ability, and by freeing members up to behave in value-generating ways. But in order for people to produce these first-order public goods, they must also be able to produce the second-order public good; that is, a system for monitoring, rewarding and punishing. This is where the other commandments—the faith sin commandments—come in.

The faith sin commandments demand loyalty and reverence from believers: I am your one and only God, don't worship idols or take my name in vain, remember my day and keep it holy. How does such reverence help Christians produce the second-order public good? It requires that they believe in a God who is a monitoring, rewarding, and punishing God. This God doesn't provide just any incentive system, either. He provides what in theory should be the *perfect* incentive system, because, in the first place, He is the perfect monitor. He's omniscient and concerned in particular with moral behavior, and he's also omnipotent. My neighbors, co-workers, and friends can't watch me every second of the day, and even if they could, I might be wily enough to get away with some free riding anyway. Or I might be really intimidating or powerful, and people might be hesitant to try to punish me when I take advantage of them. An omniscient, omnipotent God, however, cannot be outsmarted or intimidated. What's more, He has an infallible sense of justice and unlimited power to punish and reward. "For the

wages of sin is death; but the gift of God is eternal life through Jesus Christ our Lord".[11] God is capable of delivering terrifying punishment to sinners and glorious rewards to those who believe in Him and keep His commandments. These rewards and punishments are allocated not just during one's mortal existence, but for eternity in heaven and hell.

God's incentive system is an important second-order public good for Christians, in that it helps enable the production of first-order public goods. Since this system can only be effective to the extent that it exists in the minds of believers, sincere faith in God constitutes a contribution to the second-order public good. If all members of a group believe sincerely in God's perfect power to monitor, punish and reward, then the group will be exceptionally well-behaved, and very effective at producing the first-order public goods—a society free from adultery, theft, murder, and all the rest—that God ordered them to produce.

Besides their belief in God's incentive system, Christians have another powerful tool at hand for encouraging members to overcome their short-term selfish desires: they believe that they should strive to emulate Jesus. The belief in Jesus as a role model is, like God's incentive system, a second-order public good. It promotes non-selfish behavior because Jesus epitomizes the altruistic ideal: he sacrificed himself to save humanity.

To maintain production of the second-order public good, it is not enough simply to believe in God, accept His incentive system, and ask yourself what Jesus would do. Believers must also be confident that *other* members hold these same beliefs. As in the production of all public goods, contributors (believers) are disadvantaged relative to non-believers (free riders), in that a non-believer will have less incentive to follow the commandments: if God's punishment doesn't really exist, I may as well pursue that adulterous affair. If other members find out that I'm getting away with it, they'll be tempted to abandon their faith as well, and both the first- and second-order public goods will run the risk of breaking down.

But how can we tell how sincere someone else's faith is? We can't read minds, but we can assess overall levels of religious commitment. As researchers like William Irons and Richard Sosis[13] have noted, many religious behaviors are "costly signals" that indicate serious dedication to a belief system and allow us to judge the sincerity of someone's faith. Does he avoid behaviors that the church says are sins? Does he keep the Sabbath holy, and not worship idols or take the Lord's name in vain? How regularly does he attend church? Does he seem sincere in church when he prays, sings, shouts hallelujah and speaks in tongues? Do his children undergo rituals like baptism and confirmation? Does he engage in acts of self-denial that the church requires, such as abstaining from alcohol or fasting during Lent? When he professes his faith, does he seem confident and honest?

If people are convinced that others sincerely believe, then they will be confident that they can also believe, without the fear that they'll be exploited by non-believing free riders. The second-order public good is thus produced, divinely and psychologically. Still, assessing someone else's level of religious belief is a tricky matter—gauging it isn't always straightforward, and faking religious adherence is possible—so Christians don't rely entirely on God to enforce the rules. As a backup plan, they also deliver their own incentives. The fact that congregations are generally long-lived organizations helps believers to deliver these incentives. When congregants meet regularly and repeatedly, and members know each other reasonably well, it's easier for virtuous members to be recognized for their contributions and to achieve high status and popularity within their congregation. It's also easier to recognize and punish free riders.

In the Bible, methods for punishing sinners range from the draconian to the gently coercive. For instance, while the Hebrew scriptures state clearly that adulterers should be put to death, a New Testament adulterer is let off by Jesus with the simple admonition, "Go, and sin no more."[14] Churches themselves have meted out a similarly disparate range of punishments, from absolution through prayer to incineration at the stake. Graver sins have of course demanded harsher penalties, and cultural attitudes about what kinds of punishments are effective and appropriate have changed over time. Nevertheless, the goal of religious punishment has remained the same: to provide a disincentive to those who would accept church-produced public goods while refusing to help produce them.

Ostracism is the most common form of punishment at the church's disposal. Biblical passages like Romans 16:17 seem to condone the practice: "keep an eye on those who cause dissensions and offenses, in opposition to the teaching that you have learned; avoid them". Excommunication, the severest form of ostracism, is often modelled on Matthew 18:15-17, which commands that a sinner be shunned like "a Gentile and a tax collector", but only after he has forfeited repeated chances to repent. Church rituals often give members the chance to acknowledge the error of their ways, and to seek forgiveness, in order to avoid being shunned. In the traditional Catholic Church, for example, penitents might wear a hairshirt or undertake a public pilgrimage, while shamed New England Puritans might be expected to wear signs declaring their sins, dress in rags, or crawl in front of their congregation.[15]

When excommunication has been deemed necessary, however, Christian churches have generally delivered. Until the introduction of the 1983 Code of Canon Law, the strictest form of Catholic excommunication, *vitandus* ("to be avoided"), prohibited Catholics from all social interaction with the shunned person. Strict excommunication has also been practiced, as a form of "church discipline", by most Protestant groups. Protestants have traditionally regarded the dispensation of church discipline as one of the three marks of a true church (the other two are preaching and administering the

sacraments). More recently, especially in the mainstream Christian churches, emphasis on forgiveness has increased, and public humiliation and excommunication are less frequent and more moderate. Relatively harsh forms of shunning continue, however, among groups like the Amish, Jehovah's Witnesses and Latter-Day Saints.

This mainstream de-emphasis on punishment is criticized by Evangelical leaders such as Albert Mohler, President of the Southern Baptist Theological Seminary, who laments that "the decline of church discipline is perhaps the most visible failure of the contemporary church… churches allow sin to go unconfronted, and heresy to grow unchecked".[16] Whether or not you agree with Mohler's definitions of "sin", his concern over church discipline is consistent with Darwinian logic. If the church is beset by free-riders (people who benefit from the sin-free environment produced by the church, but who don't help produce it by refraining from sin themselves), but is unable to reform or eject them, then it should have an increasingly difficult time keeping sin under control.

If we can accept the logic of this collective action-based view of the church, then Christianity can be seen as a cultural adaptation that has given Christian groups an edge in the production of public goods. This system doesn't require people to "ignore their genes" or "overcome human nature", and it doesn't represent a "triumph of culture over biology". Rather, it is a cultural system that allows members of groups to maximize the potential of their cooperative instincts, by allowing them to realize their shared long-term genetic interests without losing out to those who choose to pursue their own short-term interests. The system works by forbidding behaviors that might harm the group, and by establishing a system of heavenly and terrestrial incentives that make it individually advantageous to follow the rules. By reducing "social ills" like murder, adultery and theft, the system empowers the group and its members: it reduces conflict, frees people up for economically productive work, and increases group solidarity and competitive ability.

I've used Christianity as a case study in this essay, but I don't mean to suggest that Christianity lends itself, more than any other religion, to Darwinian interpretation. If the human mind is the product of Darwinian selection, and religious thoughts are generated by human minds, than all religions should be equally amenable to an analysis like this one. This doesn't mean that all religions are equally well-designed for the specific purpose of producing public goods. However, the basic features that help Christianity regulate group behavior—specific codes for moral conduct and supernatural and natural incentive systems—are shared by other major religions. For example, Judaism has the Talmud and a covenant-enforcing God; Islam has Sharia law and paradise and hell; Hinduism has the Laws of Manu and the principle of Karma.

I also don't intend to suggest that all beliefs and behaviors endorsed by religious groups, Christian or otherwise, always *actually* promote the public good. While time-tested principles like the Ten

Commandments often seem to have clear benefits for the group, religions have also been known to lend fervent endorsement to doctrines that seem detrimental to the public good. In a complex society composed of diverse interest groups, the public good can become a highly elusive concept, and identifying it can become a difficult and contentious matter. Ideologies can become corrupted by those who are unable or unwilling to recognize what, precisely, *is* the public good. A social institution, religious or otherwise, may sometimes be more interested in promoting its own good, or in maintaining some oppressive social order, than in benefiting the larger society.

Religious systems like Christianity do not, of course, provide the only means by which people may overcome their short-term selfish interests and generate public goods. These systems do, however, seem to be exceptionally well-designed for doing so. Could secular institutions be as effective as religious systems at motivating people to produce public goods? It's possible, but religious systems have a crucial advantage: their adherents don't just believe that God knows about all their good and evil deeds, they believe that He is a perfectly just and incorruptible administrator of punishment and reward. Secular institutions for the production of the second-order public good, on the other hand, depend on judgments that are made by police officers, lawyers, judges and juries. A scenario in which fallible, corruptible human beings such as these were allowed to monitor the actions of each citizen, every second of every day, would be regarded by almost everyone as a dystopian nightmare. In the minds of believers, only God can be trusted not to abuse this kind of power.

It is plain to see that, for many people, religion provides a moral framework for their lives that is both meaningful and compelling. We still have much to learn about why so many people cherish their religious beliefs so deeply, and about how these beliefs may help generate the types of social environments in which many people would prefer to live. By identifying the ways in which religious systems harness human cooperative instincts, and thus generate real-world benefits for their adherents, we can gain a Darwinian perspective on religion that does not just dismiss it as a cognitive by-product. This perspective does not imply that religious concepts exist *only* in the minds of believers. It simply suggests that, whatever mysteries may be inherent in religious belief, there are compelling Darwinian reasons to believe that religion's benefits have historically been real.

Endnotes

[1] Thanks to David E. Price, Mac McCorkle and Jade G. Price for comments on the manuscript.

[2] Adrian Desmond, *Huxley. London: Penguin, 1998*, p. 403.

[3] Geoffrey Miller quote downloaded on 15 April 2009 from http://www.edge.org/q2007/q07_4.html.

[4] Richard Dawkins, *The God Delusion*. London: Black Swan, 2006.

[5] William Hamilton, "The genetical evolution of social behavior I & II", *Journal of Theoretical Biology* 7: 1–52, 1964.

[6] Jerome Barkow, Leda Cosmides & John Tooby, *The Adapted Mind*: *Evolutionary Psychology and the Generation of Culture*. Oxford: Oxford University Press, 1992.

[7] Mancur Olson, *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge: Harvard University Press, 1965.

[8] Garrett Hardin, "The tragedy of the commons", *Science* 162:1243-1248, 1968.

[9] Michael E. Price, Leda Cosmides & John Tooby, "Punitive sentiment as an anti-free rider psychological device." *Evolution and Human Behavior* 23: 203-231, 2002; Michael E. Price, "Punitive sentiment among the Shuar and in industrialized societies: Cross-cultural similarities." *Evolution and Human Behavior* 26: 279-287, 2005.

[10] Napoleon Chagnon, "Life histories, blood revenge, and warfare in a tribal population", *Science* 239: 985–992, 1988.

[11] Romans 6:23(King James Version).

[12] William Irons, "Religion as a hard-to-fake sign of commitment," in *Evolution and the Capacity for Commitment,* R. M. Nesse (ed.), pp. 292 - 309. New York: Russell Sage Foundation, 2001.

[13] Richard Sosis, "Does religion promote trust? The role of signaling, reputation, and punishment." *Interdisciplinary Journal of Research on Religion* 1: 1-30, 2005. 2001.

[14] John 8:11 (King James Version).

[15] David Hackett Fischer, *Albion's Seed: Four British Folkways in America*. Oxford: Oxford University Press, 1989.

[16] Albert Mohler quote downloaded on 15 April 2009 from http://www.albertmohler.com/commentary_read.php?cdate=2005-05-13.