

Evolutionary Studies of Religiosity and Religions, started by Charles Darwin

**„The idea of a universal and beneficent Creator of the universe does not seem to arise in the mind of man, until he has been elevated by long-continued culture.“
– Charles Darwin, “Descent of Man”, 1871¹**

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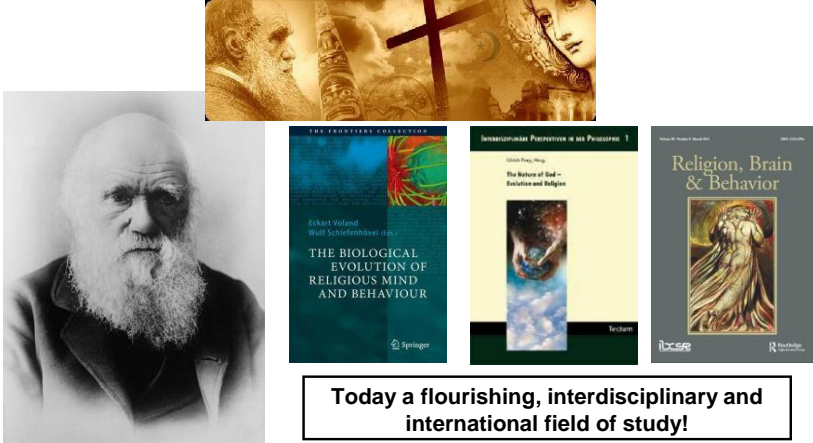
Abstract For more than a century, evolutionary studies and religious mythologies have been debated primarily in opposition to each other. But during the last decade, empirical and interdisciplinary studies about the evolution of religiosity - understood as the (neuro-)biological tendencies to assume the existence of superempirical agents such as ancestors, spirits, angels, gods or God - emerged, connected and flourished. Firmly based on methodological agnosticism, they brought about new insights, experiments, studies and hypotheses concerning the biological trait and its various cultural expressions. And this approach towards an evolutionary understanding of religion turns out to be not entirely new: Charles Darwin, who studied theology, devoted a subchapter and some dispersed sentences of his eminent “Descent of Man, and Selection in Relation to Sex” (1871) to the emergence of religious beliefs and their evolutionary effects. And he could draw on even older works such as David Hume’s “The Natural History of Religion” (1757). In this lecture, Darwin’s core definitions and hypotheses about the evolution of religiosity and religions are introduced and tested against contemporary data and knowledge in the field. Although he underestimated the role of women and cooperative breeding, core theories developed by Darwin on evolution of religiosity turn out to be surprisingly farsighted and viable.

¹ Darwin, Descent of Man, p. 395.

2 Blume, M. 2011: "Evolutionary Studies of Religiosity and Religions, started by Charles Darwin." Lecture at the 13th Congress of the European Society for Evolutionary Biology (ESEB), Tübingen University, 22. August 2011

1 Evolutionary Studies of Religiosity and Religions

Evolutionary Studies of Religiosity and Religions



Today a flourishing, interdisciplinary and international field of study!

Initiated by Charles Darwin, including a chapter in his „Descent of Man“, 1871

It is a great pleasure to be invited to this congress for a lecture in your outreach symposium "Evolution – more than biology". I want to thank the ESEB-panel and especially Thomas D'Souza, Nico Michiels and Daniel Dreesmann, which I suspect of being responsible for this honour. For years, I enjoyed our cooperation here in Tübingen although I have been warned repeatedly by some colleagues from my field, the scientific study of religion (Religionswissenschaft): Do not work with these evolutionary biologists – they are clever intruders! Well, I sure hope you are, as we need more interdisciplinary efforts!²

Because if evolutionary theory is true or viable, it should be able to explain any universal human trait - including religiosity. If religious emotions and behaviors would defy evolutionary studies completely, all of us – those from the natural and social sciences and those from the humanities – should certainly know about it! And the only way to find out is to work together, which happens to be a very fruitful and exciting enterprise. And then, the evolutionary approach to religion is not particularly new and it has not even been started by some biologist, but by a theologian most of you might have heard about: His name was Charles Darwin.

² An expanded script of this lecture with slides and references is available at my homepage www.blume-religionswissenschaft.de.

And he was not even the first one. More than a century before evolutionary theories in a modern sense were formulated, David Hume assumed a “Natural History of Religion” in 1757. And after Charles Darwin published his “Origin of Species” in 1859, a range of hypotheses and theories concerning the evolutionary history of religion appeared. Being a scholar in religion, Darwin drew on Hume and others and included a well-done chapter and a range of definitions and hypotheses concerning the evolution of religiosity and religions in his “Descent of Man” in 1871. In this lecture, I want to give you a brief overview of Darwin’s respective assumptions and their viability from the perspective of contemporary evolutionary studies of religion.

Let us start with the **evolutionary working definitions and framework** presented by Darwin as a sub-chapter of its own:

“Belief in God – Religion. – There is no evidence that man was aboriginally endowed with the ennobling belief in the existence of an Omnipotent God. On the contrary there is ample evidence, derived not from hasty travellers, but from men who have long resided with savages, that numerous races have existed and still exist, who have no idea of one or more gods, and who have no words in their languages to express such an idea.”³



“Belief in God – Religion. – There is no evidence that man was aboriginally endowed with the ennobling belief in the existence of an Omnipotent God. On the contrary there is ample evidence, derived not from hasty travellers, but from men who have long resided with savages, that numerous races have existed and still exist, who have no idea of one or more gods, and who have no words in their languages to express such an idea. The question is of course wholly distinct from that higher one, whether there exists a Creator and Ruler of the universe; and this has been answered in the affirmative by the highest intellects that have ever lived. If, however, we include under the term “religion” the belief in unseen or spiritual agencies, the case is wholly different; for this belief seems to be almost universal with the less civilised races. Nor is it difficult to comprehend how it arose.”

• Darwin, Descent of Man, p. 65.

Darwin’s first bold hypothesis on the matter has been that religiosity as well as specific beliefs in a Monotheist deity are aspects of evolutionary history. Towards the end of his book, Darwin repeated this point, emphasizing the interacting co-evolution of biological and cultural traditions:

³ Darwin, Descent of Man, p. 65




„The idea of a universal and beneficent Creator of the universe does not seem to arise in the mind of man, until he has been elevated by long-continued culture.“⁴

The Evolutionary Framework of Religiosity and Religions

Darwin: There is no evidence that man was aboriginally endowed with the ennobling belief in the existence of an Omnipotent God. On the contrary there is ample evidence, derived not from hasty travellers, but from men who have long resided with savages, that numerous races have existed and still exist, who have no idea of one or more gods, and who have no words in their languages to express such an idea. (p. 65)

The idea of a universal and beneficent Creator of the universe does not seem to arise in the mind of man, until he has been elevated by long-continued culture. (p. 395)

Indeed – An Evolutionary History!

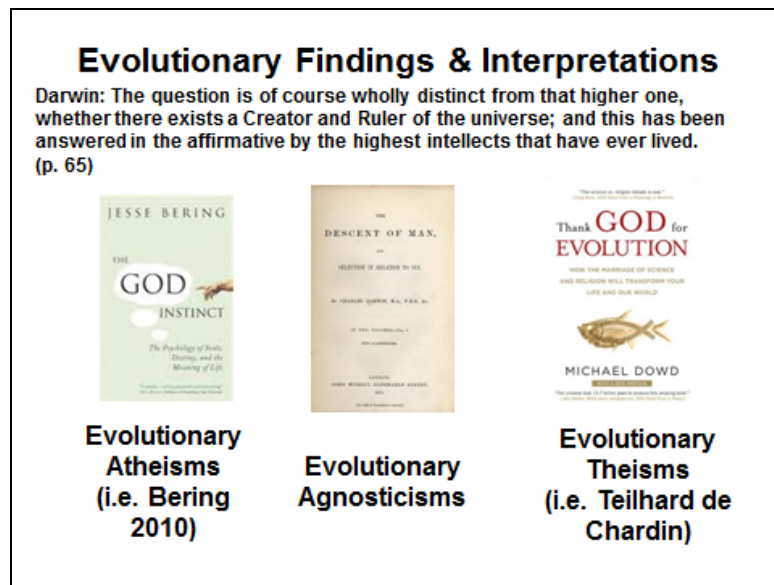
		
Burials 100.000 yrs.	Figurines, Cave Paintings 40.000 yrs.	Buildings 14.000 yrs.

Today, there can be almost no reasonable doubt that Darwin had been right on this: Religiosity and complex religious beliefs did not spring up full-fledged, but evolved over time. We might point out early burials appearing at least about 100.000 years ago among *Homo sapiens* and *Homo neanderthalensis* as the first archaeological indicators of religious or proto-religious beliefs. These were followed by figurines and cave art since about 40.000 years and finally sacred buildings, with complex and convening mythologies finally reaching in our historical time and present. Evolutionary studies are conclusively showing that these biocultural "births of high gods" are driven primarily by demographic and cultural factors, re-influencing genetic outcomes (Lahti 2009, Shariff, Norenzayan & Henrich 2010).

But before proceeding with his empirical and evolutionary hypotheses, Darwin added an important metaphysical caveat:

⁴ *Darwin*, Descent of Man, p. 395

“The question is of course wholly distinct from that higher one, whether there exists a Creator and Ruler of the universe; and this has been answered in the affirmative by the highest intellects that have ever lived.”⁵



Darwin’s metaphysical stand is that of methodological agnosticism – and it has withstood more than a century of heated debate. It is impossible either to verify or falsify the existence of God by the way of evolutionary studies. Atheists might interpret the evolutionary findings as “adaptive illusions” (i.e. Bering 2010), whereas Theists might rejoice in observing God’s ongoing creation and revelation (i.e. Dowd 2009). The evolutionary findings should be discussed in the emerging field of evolutionary epistemology, but I am assured that evolutionary atheisms, evolutionary agnosticisms and evolutionary theisms will likely proceed to flourish.

But then, what about a testable and workable evolutionary definition of religiosity? Did the great scholar offer anything in this regard? Indeed, he did!

“If, however, we include under the term "religion" the belief in unseen or spiritual agencies, the case is wholly different; for this belief seems to be almost universal with the less civilised races. Nor is it difficult to comprehend how it arose.”⁶


⁵ Darwin, *Descent of Man*, p. 65

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Evolutionary Definitions

Darwin: If, however, we include under the term "religion" the belief in unseen or spiritual agencies, the case is wholly different; for this belief seems to be almost universal with the less civilised races. Nor is it difficult to comprehend how it arose. (p. 65)


Religiosity = Belief in Superempirical agents (watching)



**Ancestor Skull
Asmat, New
Guinea**



Totem Poles, America

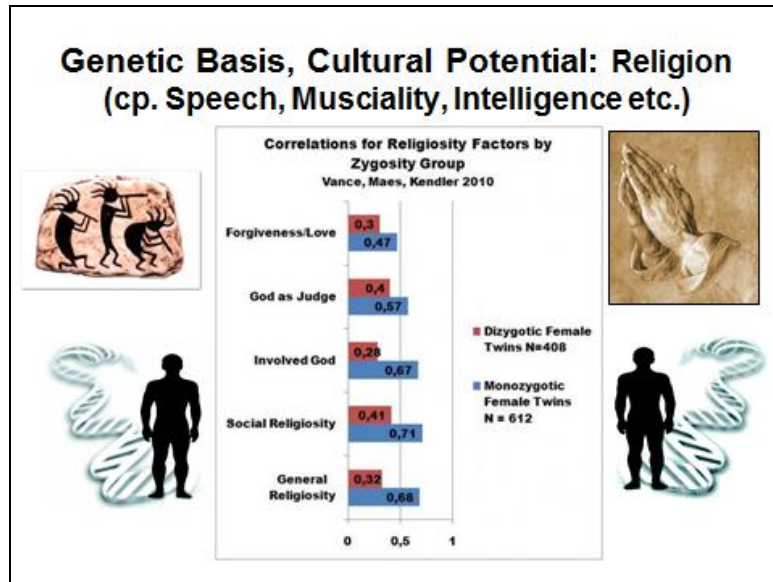


**Eye of God /
Allseeing Eye**

After numerous versions and trials, recent working definitions on the trait have increasingly returned to Darwin's "belief in unseen or spiritual agencies": Religiosity is increasingly defined as beliefs in and behavior towards supernatural (or: more precisely) superempirical agents, including ghosts and spirits, bodhisatvas, tirthankaras, demons, djinns, angels, gods, space aliens and God. (cp. Frey 2010)

And as assumed by Darwin, dozens of modern Twin Studies confirmed conclusively that religiosity turns out to have a genetic and therefore hereditary basis. As Thomas Bouchard put it at the Biology of Religion-Conference in Delmenhorst: The findings measuring the heritability of religiousness are remarkably similar to those concerning musicality or intelligence. (cp. Koenig / Bouchard 2006).

Therefore, Darwin was right to set religion in the same category as speech or music: It is an emergent system of [gene-culture-coevolution, a biocultural trait](#).





Although Darwin did not yet have knowledge about genes, he already excelled in religious studies and in careful observations comparing animal and human behaviors. Therefore, he was able to decipher a range of cognitive modules that have resurfaced as promising candidates in our modern studies.

Cognitive Foundations of Religiosity

Darwin assumed pre-animistic tendencies by observing his (beloved) dog

Evolutionary Psychology: HAD & TOM





Darwin assumed complex social emotions (e.g. devotion, grief) and ritual behaviors among mammals such as apes, dogs and elephants.

Darwin thought about animism as the primary form of religious beliefs:

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„I cannot but suspect that there is a still earlier and ruder stage, when anything which manifests power or movement is thought to be endowed with some form of life, and with mental faculties analogous to our own.“⁷

And he observed corresponding tendencies by observing his beloved dog:

“My dog, a full-grown and very sensible animal, was lying on the lawn during a hot and still day; but at a little distance a slight breeze occasionally moved an open parasol, which would have been wholly disregarded by the dog, had any one stood near it. As it was, every time that the parasol slightly moved, the dog growled fiercely and barked. He must, I think, have reasoned to himself in a rapid and unconscious manner, that movement without any apparent cause indicated the presence of some strange living agent, and no stranger had a right to be on his territory.”⁸

In the meantime, these tendencies have been studied and described among animals and humans extensively as Hyper-Agency Detection (HAD) (cp. Frey 2009, Bering 2010). Coming together with another cognitive module called Theory of Mind (TOM), beliefs in superempirical agents may have emerged. As Darwin put it:

“The belief in spiritual agencies would easily pass into the belief in the existence of one or more gods. For savages would naturally attribute to spirits the same passions, the same love of vengeance or simplest form of justice, and the same affections which they themselves experienced.”⁹

Darwin also probed into the field of religious experiences. He was especially interested in devotion, which he explored not only in his “Descent of Man” but also in his “Expression of the Emotions in Man and Animals” from 1872.

“The feeling of religious devotion is a highly complex one, consisting of love, complete submission to an exalted and mysterious superior, a strong sense of dependence, fear, reverence, gratitude, hope for the future, and perhaps other elements. No being could experience so complex an emotion until advanced in his intellectual and moral faculties to at least a moderately high level. Nevertheless we see some distant approach to this state of mind, in the deep love of a dog for his master, associated with complete submission, some fear, and perhaps other feelings.”¹⁰

⁷ Darwin, Descent of Man, p. 66.

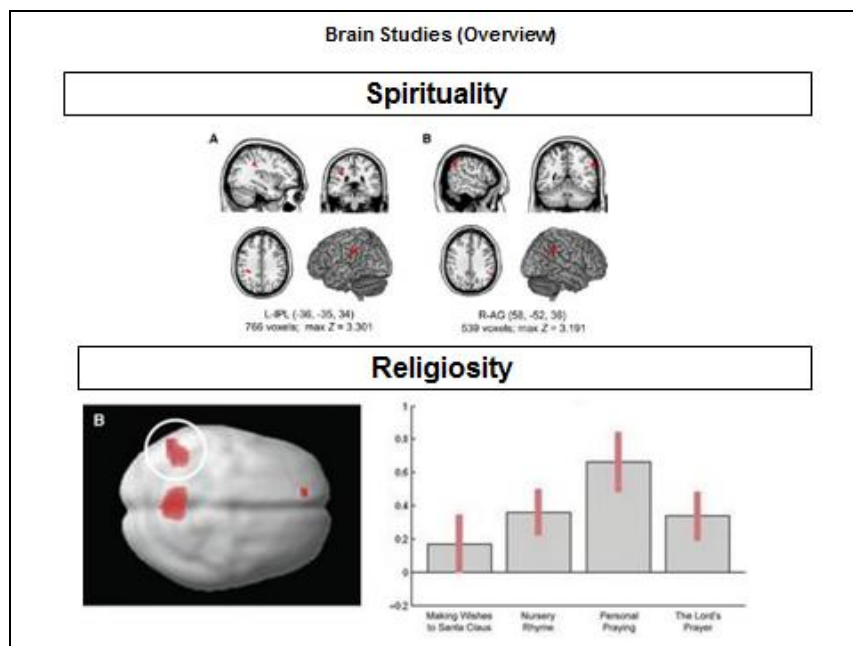
⁸ Darwin, Descent of Man, p. 67.

⁹ Darwin, Descent of Man, p. 67.

¹⁰ Darwin, Descent of Man, p. 68.

From here, the process of cultural evolution could take flight, leading to new and tangled potentials including many maladaptive errors into complex and finally monotheist mythologies. Darwin again:

„Many existing superstitions are the remnants of former false religious beliefs. The highest form of religion – the grand idea of God hating sin and loving righteousness – was unknown during primeval times.”¹¹




Brain studies strongly support these emotional complements to cognitive modules. Meditations, worship services, prayers and recitations of religious texts are inducing complex, spiritual and religious experiences. (Schjoedt et al. 2009, Uresi et al. 2010, Blume 2011)

And Darwin proceeded by assuming that religiosity turned out to be adaptive by fostering in-group cooperation. According to him, the beliefs to be watched by relevant superempirical agents contributed to rule-abiding behaviors among the believers.

¹¹ Darwin, *Descent of Man*, p. 182.

**Augmenting Trust & Cooperating by
Superempirical Policing**



„He must likewise avoid the reprobation of the one God or gods, in whom according to his knowledge or superstition he may believe; but in this case the additional fear of divine punishment often supervenes.“
Darwin, Descent of Man, p. 93

„To do good unto others – to do unto others as ye would they should do unto you, – is the foundation-stone of morality.“ *Darwin, Descent of Man, p. 165*

„He [the believer, Blume] must likewise avoid the reprobation of the one God or gods, in whom according to his knowledge or superstition he may believe; but in this case the additional fear of divine punishment often supervenes.“¹²

In the last years, these purported effects of religious beliefs and even of unconscious primings have been repeatedly observed in psychological experiments (Bering 2010, Norenzayan & Shariff 2008). According to Darwin, these cooperative potentials of religiosity lead to cultural institutions emphasizing altruism and prosociality and finally to the Golden Rule found in all world religions and main philosophies. Paraphrasing Jesus, Darwin assumed:

„To do good unto others – to do unto others as ye would they should do unto you, – is the foundation-stone of morality.“¹³

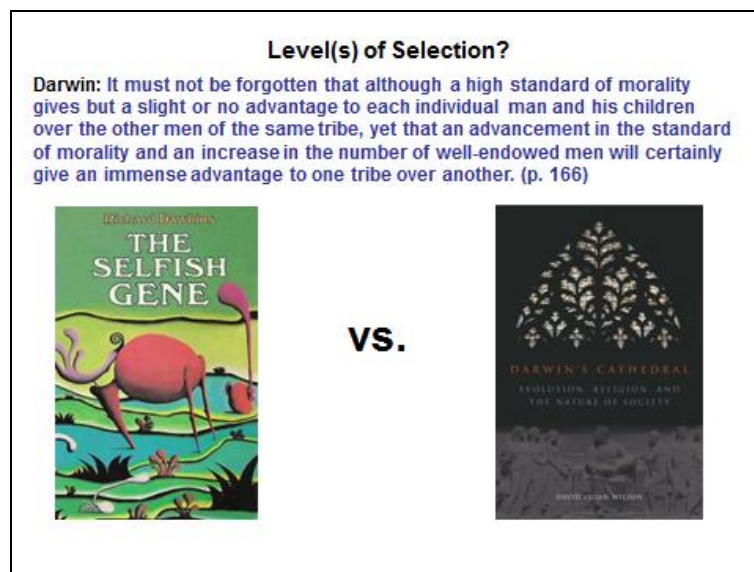
Recent studies and simulations in biomathematics seem to support this bold thesis, too. Without referring to Darwin's respective assumptions, Martin Nowak presented corresponding findings in his profound "SuperCooperators" (Nowak 2011). Although much remains to be explored, there is a growing consensus in the field about the primary evolutionary potential of religiosity: Augmenting in-group cooperation by shared beliefs in relevant agents and traditions (cp. Volland & Schiefelhövel 2009, Bering 2010, Shariff, Norenzayan, Henrich 2010).

¹² *Darwin, Descent of Man, p. 93.*

¹³ *Darwin, Descent of Man, p. 165.*

So, has Darwin been right in everything he wrote about the evolution of religiosity and religions? Certainly not. One of his hypotheses strongly contested is the assumption that the effect of augmented human cooperation would pay out on the group level. Darwin:

“It must not be forgotten that although a high standard of morality gives but a slight or no advantage to each individual man and his children over the other men of the same tribe, yet that an advancement in the standard of morality and an increase in the number of well-endowed men will certainly give an immense advantage to one tribe over another.”¹⁴



This Darwinian assumption was later branded “group selection” and fell in disgrace among evolutionary biologists for some decades. It is a very fascinating coincidence that the re-emergence of debates concerning multi-level-selection concentrated on the evolution of religion, most notably between Richard Dawkins and David Sloan Wilson (2002). Although the case is not yet closed, the empirical findings from the field of evolutionary studies of religion seem to increasingly support multi-level-perspectives especially concerning processes of (bio-)cultural evolution (Atran, Henrich 2010). Maybe Darwin was right even in this aspect!

¹⁴ *Darwin*, *Descent of Man*, p. 166.

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Cooperative Warfare or Cooperative Breeding?

	
„Gods of War“ by the band „Manowar“ (2007)	„Mothers and Others“ by Sarah Blaffer Hrdy (2009)

But then, the Victorian scholar seems to have been largely wrong on another subject: His assumption that religiosity was an all-male trait (he only discussed male believers) – and that it helped primarily in intertribal warfare. Although this way of imagining fierce groups of Man-of-War protecting their submissive Women is still a hit in popular culture, respective evolutionary hypotheses (i.e. Johnson 2008) are facing empirical problems. Although religious communities are able to form fierce battlegroups, many religious and pacifist traditions such as the Old Order Amish, the Hutterites or orthodox Jews managed to flourish throughout the centuries. Their way of spreading has not been conquest – but high fertility! (cp. Berman 2009) Here, Darwin’s colleague Antoinette Brown Blackwell (1825 – 1921) and today’s Sarah Blaffer Hrdy seem to have gotten it right: Human prosocial potentials – including religiosity – evolved (and are evolving) primarily through cooperative breeding! (Blaffer Hrdy 2009)

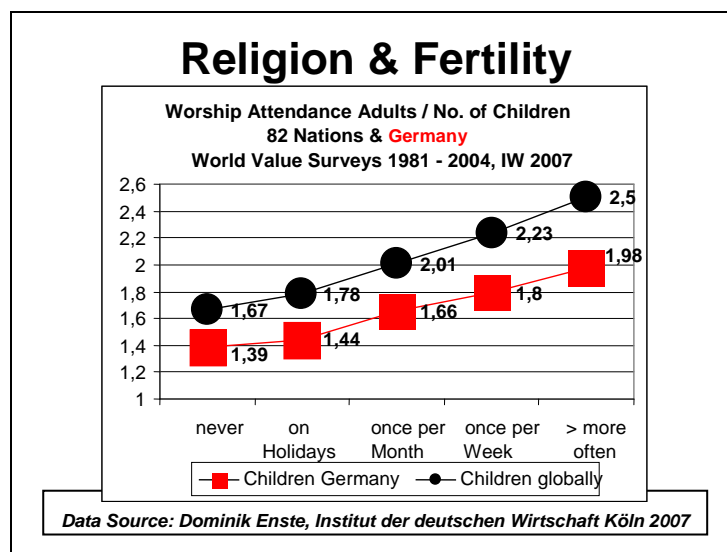
**The first commandment given by
God according to the Bible?**



„Be fruitful and multiply!“,
Genesis 1,28

In a lecture given by Friedrich August von Hayek in 1982 and in the final chapter of his final book in 1988, the evolutionary economist and nobel laureate noticed that the first commandment given by God to the freshly created human pair is to “be fruitful and multiply”. And he noted that this myth could be one of many functionally nurturing human life and culture “because” it reached beyond rational, scientific and immanent arguments. (von Hayek 1982, 1988) Today’s demographic data suggests: Religious lore is even more adaptive than he or Darwin could have imagined!



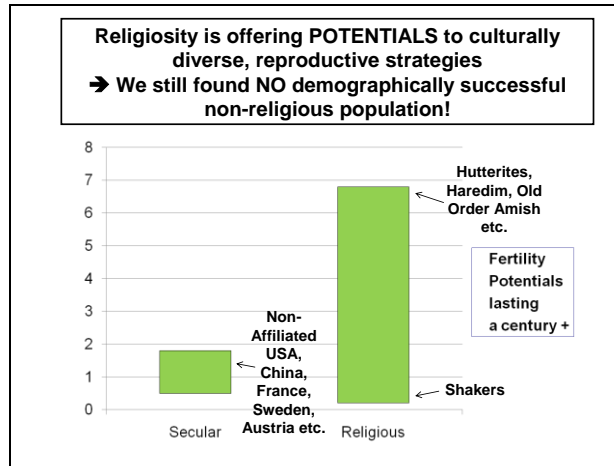
As one of many examples, Dominik Enste tested the correlation of worship attendance and the average number of children with data from waves of the World Value Surveys spanning 82 countries from all continents and world religions. The result was crystal clear: The devout tended to have far more children among Christians, Muslims, Jews, Hindus, Buddhists and other religions. **Religiously affiliated humans reproduce (on average) more successfully than their secular peers.**

It turned out that there have been numerous variants of non-reproductive religious traditions such as the Christian Shakers - but that only those survived to grow into world religions that endorsed marriage and large families. Of course, this doesn't mean that Religion is the ONLY demographic factor, but that it is an INDEPENDENT one.¹⁵ Finally, the findings do help to understand why evolution-

¹⁵ As a resource to help your research, I put an (expanding) „Web-Resource of Religion & Reproduction“ to my homepage www.blume-religionswissenschaft.de, listing studies of religious demography from colleagues around the world.

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ary scientists have not been able to defeat their fundamentalist adversaries: **While non-religious Evolutionists tend to bring up far more scientific arguments, religious Creationists tend to bring up far more children!** It's a surprising stalemate with a deep and informative, evolutionary irony.



In exploring the reproductive outcomes of diverse human populations, communities and traditions, we found a lot of religious variants that managed to retain high levels of fertility throughout many generations. But in contrast, we still did not find even a single example of any non-religious human group past or present that retained at least replacement level of two children per woman for just a century. Religiosity is not only adaptive by augmenting the average Evolutionary Fitness of believers - religious traditions might even be necessary for the persistence of human populations! (Blume 2009, 2011)

The Underestimated Role of Women in the Evolution (not only) of Religiosity

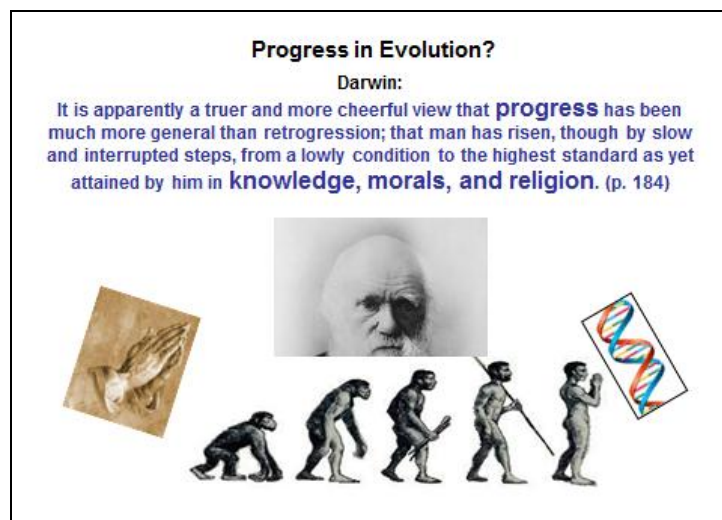
Willendorf, ca. 22.000 BCE	Laussel, ca. 25.000 BCE	Tursac, ca. 20.000 BCE	Hohle Fels, ca. 36.000 BCE
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For all agree in regarding the women as the chief founders of religion, and it is the women who provoke the men to the more attentive worship of the gods, to festivals, and to supplications, and it is a rare thing for a man who lives by himself to be found addicted to these things.
STRABO (Geographica, 1st century AC, cited by HUME)

Correspondingly, Darwin underestimated the role of women in the evolution of human traits such as religiosity. And this happened although one of his main sources, David Hume and his “*Natural History of Religion*” from 1757, cited the classic Greek historian Strabo in asserting a foundational role of women!

“For all agree in regarding the women as the chief founders of religion, and it is the women who provoke the men to the more attentive worship of the gods, to festivals, and to supplications, and it is a rare thing for a man who lives by himself to be found addicted to these things.”¹⁶

Although the studies and debates in this field are rather new, the empirical evidence seems to favour Strabo and Hume over Darwin: Women report on average higher levels of religiosity as well as higher percentages of religious affiliation and volunteering, successfully securing “their” cooperative and reproductive interests. (i.e. Slone 2008, Blume 2009)



I would like to end this lecture with a last and very controversial theory formulated by Charles Darwin: Those of evolutionary progress in the history of humanity. He wrote:

“It is apparently a truer and more cheerful view that progress has been much more general than retrogression; that man has risen, though by slow and interrupted steps, from a lowly condition to the highest standard as yet attained by him in knowledge, morals, and religion.”¹⁷

¹⁶ *Strabo*, Geographica, Book VII, Chap. 3.4

¹⁷ *Darwin*, Descent of Man, p. 184.

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Most of the colleagues from the natural sciences I had the joy to work with agreed to a progress in scientific knowledge. Some acknowledged a kind of slow and interrupted moral progress in matters such as human rights and emerging democracies. But few, if any, would have accepted Darwin's idea that religion would progress, too, toward an enlightened Monotheism. Has Darwin been wrong – or are we? I hope to have shown that Evolution is indeed more than Biology – and that interdisciplinary studies are opening up new, captivating and very relevant realms for shared, scientific explorations and debates.

Thank you very much.

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