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Evolutionism and Creationism: Arguments from Cognitive Science

The problem of origins of morality is an important question in evolutionary psychology and cognitive science. Unlike religious systems, which mostly ascribe moral norms to a supernatural being, authors affiliated with evolutionary psychology view morality as a biological adaptation that developed by natural selection. The disagreement presents one of the stumbling points in the sharp conflict of creationists and evolutionists. The present paper calls upon the theoretical and empirical systems of modern cognitive science in order to suggest a way to reduce the split between the two. The thesis is based on three premises: (1) The position of evolutionists supporting a biological basis of simple moral behavior is endorsed, followed by examples of modern research of empathy on the neurophysiological (mirror neurons, V. Ramachandran) and biochemical levels (oxytocin, P. Churchland). (2) Memetic evolution (D. Dennett) and double-scope blending (M. Turner) are evoked as mechanisms that enabled the rapid development of cognitive capacities in the period of about 50,000 years B.C., which may have included the sudden expansion of norms, such as those found in the morality of the Old Testament. (3) Additional double-scope blending is postulated for the period around *Anno Domini*, which resulted in the development of New Testament morality, proposing that the individual undertake uncompromising struggle with evil in himself, based on love. A possible error of creationists may be found in the frequent disregard of the first two theses, in spite of currently quite convincing empirical evidence (thesis one) and coherent theoretical systems (thesis two). While their methodology does not seem to be able to explain the phenomenon of *primum movens*, on multiple levels, evolutionists could also be wrong in fully ignoring the third thesis, perhaps because it is not directly related to evolutionary adaptation. For this reason, their criticism often fails to hit the target because they seek the foundations of faith in the literal reading of dogmatic texts (the well known problem of the seven day origin of the world) rather than in man's eternal need for self-perfection. Even if they cannot agree on the ontological question of the existence of God, representatives of both schools may benefit from the appreciation of these advantages and drawbacks of their respective systems. The author holds the opinion that, taken together, the three proposed theses may have scientific grounds, and still remain compliant with the Christian worldview.

Key words: cognitive science, creationism, evolutionism, empathy, religiosity.

Evolutionism and Creationism: Arguments from Cognitive Science[1]

This article attempts to provide a few suggestions as to how theories of modern day cognitive science could help initiate a dialogue between the view of morality taken by Christian creationists on the one hand and that embraced by evolutionary theorists on the other. In the first section (1) I lay out my understanding of the problem of morality as presented in (Orthodox) Christianity and cognitive science, trying to draw some parallels between the two views and putting specific emphasis on the phenomenon of *empathy*. The second section (2) gives an outline of a theory of evolutionary origins of morality based on the contributions of authors in cognitive science such as P. Churchland, D. Dennett, V. Ramachandran and M. Turner. The section describes their suggestions related to the work of mirror neurons, the role of oxytocin, memetic evolution, and the capacity for double-scope blending, and discusses the importance of these postulated phenomena in the development of biological and heteronomous morality. Connections with pagan values and the codes of the

[1] Prepared within the project Sustainability of Identity of Serbs and National Minorities in the Borderline Municipalities of East and Southeast Serbia (179013), implemented at the University of Niš – Faculty of Mechanical Engineering, and financed by the Ministry of Education and Science of the Republic of Serbia.

Full reference: Antović, M. (2012). Evolutionism and creationism: Arguments from cognitive science. In: D. B. Djordjević, D. Gavrilović & D. Todorović (Eds.) *Religion, Religious and Folk Customs on the Border,* Yugoslav Society for the Study of Religion (pp. 85-102).

Old Testament are hypothesized. The concluding segment of the section proposes that cognitively modern human beings may have undergone an additional wave of double-scope blending around *Anno Domini*, as best exemplified by New Testament morality – the uncompromising ascetic feat of struggle against the evil in oneself, based on love. This rather dramatic change in the practice of empathy, relevant both historically and individually, seems to remain largely unnoticed by cognitive scientists, perhaps as its potential evolutionary origins remain unclear. While attaining virtue by this kind of effort, the ultimate task for a believer, is tremendously difficult, the argument stresses that a scientific study of this phenomenon may also be of some relevance. The final section (3) predicts possible objections to the connections suggested in the present paper by proponents of both Christian creationism and evolutionary theory and proposes that much of the vigor, even rage, in the apparent creationist/evolutionist controversy may have aroused from the confused targets of their respective criticisms.

(1) The Problem of Morality

In many ways, our appreciation of morality is what makes us human. Our internalized 'knowledge' ('sense'?) of moral values seems to be one of the principal constituents of our 'selves'. It 'follows' us all the time, whether through external coercion ('norms', 'laws', 'customs') or, to paraphrase Chomsky, through internalized 'moral intuition' ('conscience'). While, as with any cognitive faculty, there is significant cultural variation in terms of its micro realizations, the basic mechanisms of the human 'moral mental system' do not appear to depend much on our cultural or linguistic heritage (Hauser, 2007). Although the conflict between universalism and relativism, among many other fields, has also reflected on discussions of the nature of human morality, many agree that at least basic moral norms are biologically grounded and thus equal for all human beings. As the author of the present article is a linguist by primary profession, it would be appropriate to quote here a famous linguist, who happens to also be a leading proponent of universalism in the philosophy of mind (Chomsky, 1998):

"We can begin to see human nature in terms of certain capacities to develop certain mental traits. I think we can go further than this and begin to discover universal aspects of these traits which are determined by human nature. I think we can find this in the area of morality. For example, not long ago I talked to people in the Amazon tribes and I took for granted that they have the same conception of vice and virtue as I do […]. We had no problem communicating although we were as remote as is possible culturally."

Or, on a more recent occasion (Chomsky, 2002):

"More generally, it would be hard to find anyone who accepts the doctrine [that massive bombing is the appropriate response to terrorist crimes] […] if we adopt the principle of universality: if an action is right (or wrong) for others, it is right (or wrong) for us. Those who do not rise to the minimal moral level of applying to themselves the standards they apply to others – more stringent ones, in fact – plainly cannot be taken seriously when they speak […] of right and wrong, good and evil."

Possible political connotations of this view, in our local circumstances in particular, could inspire a separate article. Here, however, I suggest that, following Chomsky, we should accept the methodological position that human 'moral intuitions' are universal. This kind of thinking seems to be adhered to by supporters of two apparently dramatically divergent methodological systems of interest in the present paper: the Orthodox Christian practice of ascetic feat and the quest for the biological grounds of moral intuitions in modern cognitive science. The aim of the discussion that follows, therefore, is to draw possible parallels between the view of morality in the two systems and propose how cognitive science may inform discussions on ethics relevant to practitioners and theorists of religion, including sociologists of religion. The more important personal aim of the article is to suggest to the academic public that a closer appreciation of some claims of the two systems (Orthodox asceticism and the quest for the roots of ethics in cognitive science) may reveal fundamental similarities, where much of the fierce debate between evolutionism and creationism, thus believers and atheists, on questions related to morality, may be off the mark.

For an Orthodox Christian, morality cannot be separated from faith, as the main goal of human life is to reach transcendental salvation after death. To achieve this, however, the person is not expected only to believe. Rather, he or she is called upon to live a life of ultimate self-control and ascetic feat: depending on the level of his or her spiritual achievement, the practitioner is expected to perform incessant, rigorous control of actions, desires, and thoughts, thus abstaining from 'sin', which is defined rather broadly, as any glimpse of egoistic motivation separating the believer from the union with God. An important accompanying element in this process is the quest for 'love', the ultimate renouncement of desires for the sake of spiritual perfection, as manifested in various forms of 'blessing', often mystical sensations of unity with the Supreme Being. Blessing or God's 'grace' may follow after the rejection of sinful thought and behavior, but this is not mandatory: quite commonly, especially in the beginning of one's 'spiritual path', grace is received 'for free', as a gift from God. Thus, while substantial effort by the believer is encouraged, blessing is not fully dependent on human actions, even if most devout, as the 'ways of the Lord' sometimes remain inscrutable to man. God works in the believer's best interest (salvation), and the believer must be aware that his or her judgment on the matter, including the idea that he or she 'deserves' blessing at a particular point of the spiritual path, may often be flawed. Hence the need for ultimate faith, which makes the Christian world of values more transcendental, and arguably more profound, than 'worldly' ethics.

The principal sources of Orthodox Christian morality, as I have attempted to succinctly describe it here, are the Scriptures, patristic literature (especially the four volume collection of monastic texts known as "The Philokalia", or "Love of the Good/Beautiful"), and customary practice. In all of these, three tiers of human moral intuition seem to constantly reappear: pagan values, the values of the Old Testament, and "New Testament morality" (cf. Long, 2010:13 et passim for the overall Christian conception, Jerotić, 2007 for a more specifically Orthodox view). As it may be, in the historical development of Orthodox faith, but also in the individual personality of modern man, the three layers act simultaneously, often 'struggling' with one another. In pagan hedonism morality is, at best, an attempt to

'reconcile' man's destructive and creative desires by sequentially venting out one or the other; this later slowly turns into 'biological' morality, based on experiential evidence (such as the revelation that children born from incestuous marriages have a greater risk of disease, e.g. Wolf & Durham, 2005); then follows the external coercion of the Old Testament, as best exemplified in Moses' Tablets of the Law, where it is largely fear of an external authority, whether God or state, that constrains the range of human hedonistic actions and desires ("Thou shalt not kill"); and finally, there comes the 'perfect' stage: the internal imperative of the New Testament, where a person puts in maximum effort to consciously renounce his or her flaws, not out of fear, but for the sake of *agape* - the unquenchable desire to remain united with God and fellow man, through love.

Quite certainly, from a Christian perspective, it is the third layer that really matters, as it reflects human morality at its most sublime, the unity of man and God through Christ ("God became man so that man could become a god", St. Athanasius the Great, *De Incarnatione*, 54:3). Still, the classification into three levels may be found in numerous original sources. For instance, one can nicely uncover it from a paragraph attributed to St. Anthony the Great, a 4th century hermit venerated in the Orthodox Church as one of the first known 'desert ascetics' (*Philokalia*, Vol I, my translation and italics):

"It is not unknown to you that enemies of the truth are making incessant effort to deny the truth. *Since the very beginning of times*, in each period, God visited His creation and those who approached Him as Creator with all their hearts, and *taught them how to venerate Him*. However, when people not only failed to deliver themselves from sins and return to the primeval condition, but also became *incapable of understanding* what their natural and original features had been, God was merciful and taught them true respect *through the written Law*. Yet, when this did not help, having seen that the wound was spreading and required radical treatment, God decided *to send His Only Son, Who is Our One True Healer*."

For all good and bad consequences of the tendency, open religiosity does not seem to fare well with modern science in general, and cognitive science is no exception. One of the reasons for this may be found in various forms of religious fundamentalism, with their all too familiar tragic consequences in history. Today, fundamentalists occasionally aspire to exert political influence. For instance, many of us have found problems with attempts to banish the Darwinian theory from public schools (e.g. the 2011 Tennessee Creationism Bill) or insist on the literal interpretation of dogmatic texts, such as "the seven-day Genesis" (e.g. Stambauch, 2003). As these actions do not seem to do genuine religiosity much favor, modern cognitive science often acts in stern opposition to them. The problem is that this opposition often implicitly presupposes the open rejection of the very concept of religiosity. Thus, on matters of personal faith, and in public writing, prominent cognitive scientists discussing the origins of human morality either remain somewhat taciturn (e.g. N. Chomsky, S. J. Gould, R. Lewontin) or openly declare themselves atheists (e.g. E. Wilson, R. Dawkins, D. Dennett). This tendency irrespective, their profound interest in the nature of human morality may unwittingly make them write about the same phenomena that Orthodox theologians have long discussed, and sometimes in a quite similar fashion.

In terms of the three-level classification that can be inferred from much of Orthodox Christian teaching, the interest among cognitive scientists is noticeable. Thus, 'pagan' morality, as exemplified by egoistic hedonism, animistic beliefs, and later very basic, 'experiential' taboos, has been of interest for many proponents of evolutionary theory, sometimes as one of the clearest arguments in support of a biological ethics. The 'Law' of the Old Testament may be related to the rapid expansion of human symbolic capacities, resulting in various forms of 'social contract', which many approaches to cognitive development, e.g. the Conceptual Blending Theory, allocate to the period of roughly 50,000 years ago. The self-denying care for others of the New Testament is most closely connected to studies of empathy that many cognitive scientists have been pursuing in recent years (V. Ramachandran, P. Churchland). While the Orthodox Christian concept of radical struggle for self-perfection goes much beyond the traditional psychological definition of empathetic behavior, and may require additional coverage in the cognitive sciences, the connections as proposed here may still be relevant to further discussions.

Therefore, while of course different in ontology, the question for the atheist ('Whence morality in a godless world'?) and the believer ('How did God given morality develop in human beings?') do not need to receive radically divergent answers. Along that line, the next chapter describes five contributions of cognitive science which can shed additional light on the three phases in the development of human morality, as discussed in many Orthodox Christian texts.

(2) The Evolution of Morality – Approaches from Cognitive Science

The relatively new field of evolutionary psychology (Tooby & Cosmides, 1992), and its accompanying movement known as 'Universal Darwinism' (Nelson, 2006), postulate that most, or all, human cognitive capacities have evolved by means of a 'Darwinian' evolution. Thus, just like the thumb (needed for manipulation) and the pelvis (necessary for an upright stance) have likely developed 'accidentally', through hundreds of thousands of years of random genetic mutation, resulting in increased survival rates, numerous human psychological capacities might have come about the same way: this includes the knowledge of language (Pinker, 1994) and even the sense of morality (e.g. Wilson, 1975; Schermer, 2004).

Where some cognitive scientists studying morality remain silent about a "primary motivation" behind this type of evolution, others openly claim that "moral development" may ultimately be attributable to chance. While the undertone is often anti-religious (cf., for instance "the evolution of religion", King, 2007), many authors in the world of cognitive science seem to at least implicitly agree with the Orthodox view that there could have been 'three stages' in the development of human moral norms. In this section, I draw the reader's attention to five theories of modern day cognitive science which, in their own jargon, attempt to track the origins of 'pagan', 'Old Testament', and 'New Testament' morality: sociobiology, memetic evolution theory, conceptual blending theory, 'braintrust' theory, and mirror neuron theory.

What I presented as "pagan" morality in the previous chapter roughly coincides with an egoistic need for the immediate fulfillment of bodily desires and physical survival. On such a view, moral norms would not exist at all were it not for directly observable biological constraints preventing the survival of the individual and/or group. This is a typical position of *sociobiology*. Although Darwin himself was wary of making far reaching connections (Darwin, 1871, chapter 4), the need for physical survival seems to be the most straightforward option in explaining morality in evolutionary terms. "Our deepest intuitions of right and wrong are guided by the emotional centers of the brain, which evolved through natural selection to help the human animal exploit opportunities and avoid threats in a natural environment" (Wilson, 1975: 1). Pagan practices, of course, significantly vary both historically and culturally, yet authors stress at least nine traits encouraged in a polytheistic value system: courage - the ability to face both the joys and the challenges of life fearlessly; truth - honesty and integrity in one's words as well as one's actions; honor - strength of character as reflected in one's behavior and trustworthiness; fidelity - loyalty and faithfulness to family, tribal, and spiritual commitments; discipline - consistency in effort toward reaching one's goals; hospitality - kindness to strangers, travelers, and those who are in need; industriousness - willingness to work hard toward excellence in productivity; self-reliance - pride in the ability to care for one's own needs; perseverance - refusal to admit defeat or to let obstacles thwart one's efforts (Malherbe, 1989). In this regard, some authors vouching for a *biological theory of morality* claim that the clearest connections with animal behavior can be made exactly on these points. This could have started to develop rather early in the human evolutionary line, perhaps early enough to account for St. Anthony's phrase "since the beginning of time". Some examples are the well-documented case of the biomass of ants having emerged from their intricately social behavior and partial sexual abstinence (Holldobler & Haskins, 1977) and numerous connections with humans posed between the apparent proto-moral behavior of higher primates, commonly bonobo monkeys (de Waal, 2006).

In addition to these earliest forms of moral behavior, sometimes also noticed in animals, the most striking argument for a 'biological' (or 'pagan') morality can be found in the connection between incestuous practices and the birth of children with psychological or physiological impairments. Here one gets into the territory of the Old Testament already, since Leviticus (18:6) clearly bans incest. Among the cognitive scientists of sociobiological affiliation, the proverbial position is that the moral rule was not God-given, but that it developed *a posteriori*. In other words, the risk of inherited diseases is too high for society to tolerate this kind of behavior.[2]

Beyond mere incest taboo, the Old Testament provided a rapid expansion of moral norms. The Ten Commandments, for but the most striking example, already seem to transcend the purely biological realm. What could have happened to human beings in the period of early

[2] How big this risk is remains unclear to the present day. Interestingly, as few would suspect, Darwin himself was opposed to this view, perhaps largely for personal reasons (he had married his first cousin some time before the debate started to rage in 19th century England: cf. Arnhart, 2005).

history so that they started to develop complex systems of moral behavior, from the relatively straightforward "not killing and stealing" to the much subtler renunciation of "idols" and "images" of God? If anything, increased brain size, tool use, and development of language, along with the enlargement of human communities, may have required increased social organization, and thus more complex moral norms. Yet, the use of the verb "required" seems to already imply teleology. Is such language that we often use enough to assume the transcendental origins of morals, or could it be just a matter of our metaphorical vocabulary, where the development of a moral code was still a consequence of "aimless" evolution? Some interesting approaches in cognitive science may be of assistance here. One of them is the theory of *memetic evolution*, an elaboration of a proposal from Dawkins' (1977) *Selfish Gene*, today mostly supported by Daniel Dennett (e.g. Dennett, 1995, 2005). The principal thesis of this theory is that social constructs spread through society in a way comparable to the way physical genes are 'handed down' from parents to their offspring. Thus, at the point in which the human mental apparatus reached sufficient complexity and sophistication, the purely biological mechanisms of adaptation started to become superseded by their corresponding social principles. This is where 'cultural time' started, likely anywhere between 50,000 and 80,000 years into the past. For instance, when members of a tribe realized that sparing the lives of their fellow tribesmen could increase their chances of preserving territory and resources, norms such as those forbidding murder slowly started to set in. Such prohibitions might have become early 'moral memes': bits of information spreading through the group and causally influencing the behavior of other group members. 'Social evolution in cultural time' started.

Along the same line, the veneration of a single deity, one not to be presented by images, may have been a consequence of the rapid development of symbolic thinking and increased abstractization of the human conceptual system. A prominent theory in cognitive science touching upon this phenomenon is the *Conceptual Blending Theory* (Fauconnier & Turner, 2002). Briefly, this approach claims that a novel form of "conceptual integration" called "double-scope blending" rapidly developed some 50,000 years ago, resulting in complex symbolical systems, such as language, art, sophisticated ritual and religious behavior, and increasingly complex moral norms. According to Fauconnier and Turner, the most peculiar capacity that human minds have (and animals do not) is that of "blending", i.e. integrating information from diverse conceptual domains (called "mental spaces") into a single conglomerate image, which now contains previously unavailable, emergent attributes. For instance, when a university poster says "You always miss 100% shots that you don't take", the mind needs to "put together" the apparently contradictory images in which an athlete (say, a basketball player) *takes* and also *does not* take shots. A complex mental representation develops, containing some segments of *both* conceptual packets, and creating a novel interpretation – that one needs to try one's hand at something ("take the shots") in order to have any chance of success. The mechanism does not occur just in linguistic puns, but works on more complex narrative levels, too. For a typical Biblical example (Genesis, 3:1), the very possibility to imagine a snake with human properties (speech, hidden evil intentions) is a classic instance of double-scope blending (Turner, 2003). Indeed, to merely understand the story of the Fall (not to mention do something about it, as is required in the Orthodox ascetic

practice), one needs to mentally 'put together' things that do not commonsensically go together (a snake and an evil human being), and then create a 'blended' mental space (that of a deceptive snake, and everything it stands for, being responsible for man's metaphysical torment). In a very important sense, were it not for such a mental capacity, practitioners of religion, including Orthodox Christianity, would not be able to understand, let alone act in accordance with, their faith.

Human beings seem to make blends all the time. Complex numbers, grammatical rules, the conceptualization of time, mathematical operations, artistic symbolism – if one looks at the anthropological record, all these started to occur roughly 50,000 years ago, and have developed ever since. On even more abstract levels, we may hypothesize that it was exactly this kind of mechanism of putting together 'things that don't go together', that was responsible for the development of 'heteronomous', 'externally imposed' morality. The capacity for double-scope blending made room for the metaphorical language, images such as talking snakes in gardens and fiery deities providing tablets in mountain caves. As these became fully comprehensible to the 'moral intuitions' of cognitively modern humans, further double-scope blending started. It now combined this imagery with early societal rules known to members of tribes, and transforming the worldly systems of crime and punishment into their transcendental counterparts: abundant images of heaven and hell and reward or penalty in the afterlife. How exactly this process occurred in the human mind(s) remains a matter of serious controversy. It seems, though, that the Conceptual Blending Theory may provide some useful tools for cognitive scientists in their further study of the origins of externally imposed moral behavior.

And what about "New Testament" morality, as succinctly prescribed in the Biblical quote: "Love the Lord your God with all your heart and with all your soul and with all your mind and with all your strength; [and] love your neighbor as yourself" (Mark, 12: 30, 31)? This relatively simple principle (straightforward in tone, but tremendously difficult to live by) seems to go way further than any prescriptive rule. For a cognitive scientist, the ideal of selfless love, praised by many monotheistic religions, most notably Christianity, may be largely based on what psychologists call "empathy": the peculiarly human need to care for others, which sometimes results in utter self-denial, even sacrifice. Whence empathetic behavior? Two modern theories in cognitive science provide some suggestions as to how empathy may have developed, one from a biochemical, the other from a neurophysiological perspective. In the former, Patricia Churchland (2011) proposes that empathy is largely responsible for the development of all moral behavior in human beings. Yet, its origins are purely biological and can be traced to the "neurobiological platform of bonding", coming from the typical trait of all mammals – care for their offspring. The evolution of the brain resulted in peculiar chemistry that has made humans fight not only for the preservation of their own lives, but also the lives of their children, then mates, then next of kin, etc, in ever wider, concentric "circles of care". Caring for others is in many ways perceived as caring for ourselves, instilling many moral intuitions in us. Biochemically, this type of behavior is strongly correlated with the molecule of *oxytocin*, which decreases the stress response, allows

us to start trusting one another, and ultimately helps us create our bonds of kinship, social institutions, and all morality.

The call by some Orthodox theologians and philosophers to "transcend the boundaries of our own ego" (Berdyaev) may be strongly assisted by oxytocin: through it, mammals (including humans) tend to view their young as they do themselves, and then further extend this attitude to more distant relatives and acquaintances ("Love thy neighbor…"). A more neurophysiological explanation of virtually the same phenomenon is found in V. Ramachandran's account of *mirror neurons* (esp. Ramachandran, 2004). Mirror neurons (e.g. Rizzolatti & Sinigaglia, 2008) are located in the pre-frontal cortex of the brain. They fire *both* when an agent performs an action *and* when the agent perceives someone else perform the action. For instance, moving one's hand and seeing somebody move their hand will incite about 20% of the same neural activation in particular areas of the pre-frontal cortex. Ramachandran especially claims that the development of mirror neurons was the key reason behind the sudden increase in human symbolical capacities in the period of 50-100,000 years ago, as mentioned in the paragraphs above. In many ways, this neurophysiological change made empathy possible: if we observe someone experiencing pain, and have, in part, the same neuronal activation as if we ourselves were experiencing the pain, this indeed helps us 'feel' like others do. Ramachandran sometimes calls these mirror neurons 'Gandhi neurons', stressing their empathetic nature, and makes a connection between the Eastern religions calling for 'the oneness of all' and high-tech research of modern neuroscience.

Even though causal links remain unclear (e.g. no one knows why exactly mirror neurons were installed in the first place), theories of cognitive science seem to provide parts of the missing link between the biological properties of our bodies and our resultant moral behavior. The most far-reaching question of Christian Orthodox morality, however, still remains unanswered: the ultimate renunciation of selfish desires, in search of love. In the experience of practitioners, this longing for 'perfection' goes much beyond the classical psychological definition of empathy. For illustration, let me quote another excerpt from the Philokalia (St. John Cassian, VI, 96): "Fasts and vigils, the study of Scripture, renouncing possessions and everything worldly are not in themselves perfection, as we have said; they are its tools. For perfection is not to be found in them; it is acquired through them. It is useless, therefore, to boast of our fasting, vigils, poverty, and reading of Scripture when we have not achieved the love of God and our fellow men. Whoever has achieved love has God within himself and his intellect is always with God."

In plain words, the saint is hardly satisfied with the observance of the Commandments and practical empathetic behavior towards our next of kin. Rather, in just one paragraph, he requests from practitioners (primarily monks, but, as much as possible, every Orthodox believer): abstinence from food and sleep; renunciation of all physical possessions; the study of the Bible; the mental effort not to boast about these spiritual achievements (as it leads to vanity, a sin much graver than gluttony or greed); finally, once they are all there, these hard-won feats will be mere *tools*, enabling one to only *start* walking along the path of true love (of both God and fellow man).

A formidable path to tread. From a more cognitively-oriented perspective, one could then ask: what is it that happened around Anno Domini, that changed the system of morality this dramatically once again? A believer would reply that "God decided to send His Only Son, Who is Our One True Healer", and that He (has) healed us by showing us the Way, the Truth, and the Life, through virtues such as humility, willful suffering and unconditional love. Cognitive science, on the other hand, has not yet paid enough attention to this most recent change in the 'evolution of morality'. Perhaps in the last two thousand years we have witnessed (and still are) another wave of double-scope blending: the slow realization that true happiness (or salvation) can be achieved only by transcending our egoistic desires, to the very limit of our capacities. The task is difficult, but commendable. While everyone is called to attempt to achieve it, a cognitive scientist may have an additional task: to try and understand its biological basis.

(3) Unacknowledged connections

Is there any room for dialogue? The ontological question of the existence of God is of course unanswerable (hence the requirement of *faith*) and would hardly represent a venue where Anglo-American cognitive scientists would agree with Orthodox theologians. In no way am I trying to understate the divide: the problem is crucial in all relevant respects, not the least as it means a very different starting position, from which an entire worldview emerges. For instance, an evolutionary scientist would consider the "pagan" phase a beginning – human beings are first egoistic and only later become aware of the "need" to become altruistic, as much as they can. An Orthodox theologian would defend a radically opposite interpretation of the Creation Myth: before the Fall (which started already with the egoistic, "pagan" phase) people were perfect, living in unity with God. What has detached them from God ever since has been sin, and sin is a deception imposed by the snake and everything it stands for. For an evolutionary scientist, there is no deception: by reorganizing our system of values to adapt to new environmental circumstances, we are becoming better, albeit perhaps all too slowly. For an Orthodox Christian theologian, sin is so omnipresent that the rare moments of 'seeing through' the deception, and even rarer ones in which we try to reject it, always with some Divine Assistance, are top-notch spiritual achievements in themselves.

This paper of course does not attempt to suggest a metaphysical reconciliation. Yet if the two parties should agree to put the question of the 'beginnings' aside for a moment, there seems to be some room for a truce. In the rest of the text I try to look beyond the different ontology, focus, and metaphorical vocabulary, and pose some questions for proponents of both positions. I end by proposing that much of the fierce debate on morality, which often rages between evolutionary cognitive scientists and Christian creationists, is quite unnecessary as the targets of their respective criticisms are often erroneously chosen.

As has been seen, both Orthodox Christians and cognitive scientists acknowledge the difference between pagan and Old Testament moral codes. For Christians, the change coming with the Old Testament was God-given, in the sense of God's revealing Himself unto man and the world; for cognitive scientists, it was more likely a matter of the evolution of human

cognitive capacities. Regardless of this fundamental difference in ontology, the practical ramifications of the two positions need not be so radically divergent. The observance of moral rules is equally expected from a decent person – whether Christian, atheist or adherent of another religion. Yet while an atheist may be content with just being a 'law-abiding citizen', the real Orthodox practitioner claims that this is not enough. Rather, he or she will adopt a much more stringent program of self control and ascetic enterprise. Even more, while doing so, he or she will believe that for final salvation an element of God's grace, fully beyond human control, is required. This is a phenomenon worth noticing and studying, by religious and atheist researchers alike.

While practicing so, the Orthodox Christian should be careful when deciding on the version of the creationist doctrine to adhere to. In the modern world it would be naïve to plainly ignore scientific discoveries, such as the role of neurophysiological mechanisms, perhaps mirror neurons, or biochemical reactions, maybe those involving oxytocin, in human higher cognitive capacities. But this should hardly pose a problem for an Orthodox believer. A common misconception about Christianity is that, being a religion and hoping for an afterlife, it somehow dismisses the body in favor of the soul. Nothing is farther from the truth. Orthodoxy only preaches that the body should not be *abused* for purposes not intended by the Creator. For a most down-to-earth example, eating is fine unless it becomes overindulgence. How far one should go in abstaining from this 'abuse' is a matter of degree: everyone should try their best, but of course more is required from an experienced ascetic than from an average person in an urban environment. The 'prize' for this self-control, if such a concept makes sense at all, is 'grace', the feeling of unity with God. This mystical state that results from abstinence is often described by Orthodox ascetics and, as a psychological phenomenon at least, it may be both interesting and acceptable for cognitive scientists. Most importantly, Orthodox Christians believe that one can get God's grace *here*, on earth, while even for the most devout, transcendental salvation remains a *hope*, rather than established fact (again, this last position is usually perfectly acceptable for atheists). While non-practitioners are often familiar with these concepts, the one that follows confuses even some people who call themselves Christians: the bold (Schmemann, 1980) idea of the resurrection *includes the body*, not just soul. In the end of time, people will rise the way Jesus did: he appeared to the Apostles in his body, was able to eat, drink, and was touched by doubting Thomas (John 20: 24-29). Of course, how, when, and whether this is going to happen are difficult theological questions. But they do not preclude the fact that Christians are (or should be) expecting to return to New Jerusalem *in their bodies*. Thus, the fact that there is a connection between oxytocin, mirror neurons and empathetic behavior should not pose any anti-scientific sentiments among Christians at all. There is a correlation between oxytocin and morality. An Orthodox practitioner should say "Fine. Now that we have morality, can we do something to become better persons?" For some perspective, there is a link between the fullness of the stomach and hunger. The average believer of course accepts this. It is not this physiological fact, however, but rather the tendency of human beings to often want to eat *long after they are no longer hungry* that relates to the belief system of an Orthodox ascetic.

On the other hand, proponents of evolutionary theory should always be painfully aware (most of them are) that the idea of the "accidental beginning" cannot explain *primum movens*. The proverbial catch phrase is "What happened before the Big Bang?" and physicists usually claim that the question does not make any sense: before the Big Bang there was neither space nor time, so physics cannot discuss this state even in principle[3]. If there was indeed a Big Bang, it happened so long ago that radical creationists should not exult, and science should not feel inferior for not being able to resolve so hard an ontological issue. Note, however, that evolutionary theory has problems explaining causal links on numerous "smaller" levels, and this often goes unnoticed in the scientific community. The explications are all too commonly mechanistic. For some examples, *what exactly* happened 50,000 years ago when morality 'took off'? What was the trigger, other than the increased complexity of the nervous system, from which the complex cognitive capacities just 'emerged'? And if they emerged, how so? In other words, how does added computational complexity result in *radically new* forms of thought? Or, for another problem issue, *What exactly is the nature of the connection* between neurophysiological and biochemical findings and the *introspective quality* of human mental states, including moral norms and empathy (philosophers call this the problem of *qualia*)? Viewed this way, the 'braintrust' theory of P. Churchland, for instance, provides a *correlation* between the levels of a chemical substance and behavioral signs of empathy. In itself, this is a huge step forward in neuroscience and should by no means be undervalued. In terms of causation, however, it only opens up new questions. I'd say that, for an impartial observer (and it's difficult to be impartial in issues of highest relevance for human fate), God and Accident as causes can be at least equally viable options here.

But there is another misunderstanding in the debate, and it has to do with God's supposed role. For an Orthodox believer, God is not just a "Divine Mechanic" ("an impoverished idea of a Christian God", cf. McGrath, 2011:17), one who originally set the scene (perhaps exactly "before" the Big Bang) and has not interfered with human affairs since. For an Orthodox Christian God is not the Supreme Controller either, the all-seeing Eye of Providence (famously presented on the one-dollar bill), capable of catching us when we are up to some mischief. Much more than this, the (Orthodox) Christian God is the Perfect Person exhibiting perfect Love, total, unchangeable, inexplicable and unfaltering Goodness, Whose Essence (though not all manifestations) are beyond human comprehension. This sounds like just a new set of words for an entity which is supposed to be perfect anyway. Yet one should be careful: the more elaborate description comes from a significant change in approach. If one wishes to apply this changed doctrine consistently, then nothing bad can come from such a God, not even punishment. He is always there, waiting for us to address Him, and it is solely on us to decide if we choose Him or something else (for the Orthodox Christian, this "else" by definition equals sin). In fact, that one decision, posed before us time and again, is all the

3 For some more unexpected agreement, let me quote not Einstein or Edwin Hubble but St Augustine (City of God, 12.15): "Where no creature is, whose motion may bring forth time, there can be no time". Interestingly, according to some sources, the Big Bang concept (and the fact there could have been neither space nor time before it) can be attributed to the Belgian Catholic priest and physicist Georges Lemaître (e.g. Lemaitre, 1931).

freedom that we have, and all the freedom that we will ever need. So the purpose of the ascetic feat is to put in all the effort, all the energy, all the resources that we have to get rid of the unnecessary load that we are carrying (fear, anger, aggression, pride…) so that we can get as close to Him as possible (and, hopefully, stay in such condition). This is where the idealism of Christian moral norms comes from and this is why we are called upon to wage an incessant struggle against ourselves. For a Christian, it became clear to us that we should do this after God finally revealed Himself through God-Man Jesus Christ. For cognitive scientists, the 'revelation' may as well have been just another wave of evolution of morality, perhaps a new instance of double-scope blending, which occurred roughly around the beginning of AD. Whether or not one believes in this changed idea that Christianity preaches, originally it was so powerful that it (1) spread in a matter of decades through a world that was very slow for today's standards, (2) many were willing to die for it, and (3) to the present, many have been eager to 'sacrifice' a lot of their 'natural', egoistic urges for it. To paraphrase Dennett (1995), "Christ's dangerous idea" has certainly changed the way we look upon morality. Thus it seems rather strange that cognitive science, to my knowledge, pays relatively little attention to it. Perhaps the phenomenon is not easily explicable as a biological adaptation and so remains relatively uninteresting to Darwinian theorists. My take is that approaches operating with the concepts of 'cultural time' and 'cultural evolution' may be more successful in trying to explain what happened (and how) so that Christian ethics became as powerful a concept. The Conceptual Blending Theory could provide some new ideas on this in the years to come.

More generally, the 'fierce battle' between evolutionists and creationists largely misses the target anyway. This is especially conspicuous in the more radical, sometimes politically motivated, forms of this debate. Evolutionary theory often criticizes the idea of God as 'the Primary Motivator' of the development of human morality (Dawkins, 2006). Yet, to my knowledge, cognitive scientists rarely even notice the role of God that Orthodox Christianity considers much more important: that of 'the Invisible Assistant' helping *a particular person at a particular point in time* make morally right decisions. To do this, we have one perfect mechanism available – *conscience.* Little has been written on it in cognitive science (Lawson&McCauley, 1993; Taylor, 2009), while patristic literature is packed with suggestions as to how conscience is the best indicator of the will of God (for but one example: "If you want spiritual health, listen to your conscience, do all it tells you, and you will benefit", St. Mark the Ascetic, Philokalia, VI, 115). There is almost no discussion between the two teams on this most relevant of topics.

The same confused target of criticism applies to radical creationists, who hardly do their belief any good by insisting on the literal interpretation of Biblical texts ("the seven day creation"). As Joseph Campbell (1988) was all too wise to remark, interpreting myths literally means ruining them. It is easy for evolutionary theorists to attack such exaggerated stances, but the lack of dialogue causes misunderstandings here, too. Proponents of an evolutionary theory of morality are often unaware that many prominent theologians simply do not favor such literalist interpretations. Bishop Irinej Bulović, now Dean of the Faculty of Orthodox Theology in Belgrade, for instance, lectures that the six days may stand for six

geological epochs. This sounds to me like a position which would be perfectly acceptable for evolutionary theorists.

Accordingly, in my opinion the biggest stumbling point is related to the misinterpretation of the "essence of religion" as having to do with issues such as the duration of genesis, the impossibility to put all those animals in Noah's ark, or the exact number and wording of "externally imposed" moral norms, notably the Ten Commandments. My take is that the essence of religion is not to be sought in dogmatic positions (even less in attempts of their literal interpretation), but rather in man's eternal need for self-perfection. Centered on this phenomenon, Christian theologians and evolutionary cognitive scientists do not need to be on opposing sides: the former will keep trying to achieve this perfection through incessant 'unseen warfare' (St. Nicodemus the Hagiorite), a struggle they shall wage against themselves, with or without the need to rationally explain its grounds; the latter will have the task to empirically, perhaps evolutionarily, situate this longing (ideally taking the self-perfection feat themselves, as, I must add, such personal effort would be extremely useful along the way). If they go hand in hand, both tasks can be commendable, as long as the seekers acknowledge that the effort requires *all three* skills of the psychological system (cognition, emotion, and connation).

Just like in the case of morality, modern psychologists could be surprised to learn that this three-partite division is not new, either: already St. Maximus the Confessor (7^{th} century) proposed "the three forces of the mind: the *nous*, or inner heart, the will, and the passions. With the *nous* we ask to know what is good; with the will we long for the good that we have known; with the passions we perform a feat in fighting for the good. Those who love God use the three to strive towards Divine Virtue and knowledge, using the first to ask, the second to wish, and the third to struggle. Such people receive the incorrupt food and knowledge of things Divine, filling the mind."

Let us therefore explore the human mind further, but not forget that we have a responsibility for it as part of Creation – with our intellect, will and hearts. As this is no easy task, for either Christian ascetics or cognitive scientists, for starters, it would be good if the two teams could talk with more respect for one another. Unless they do so, the only one who can win – is the snake.

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