PHILOSOPHICAL ASPECTS OF TEACHING THE THEORY OF EVOLUTION IN A RELIGIOUS ENVIRONMENT

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Abstract

Despite the fact, that the scientific justification of Evolution has more than 150 years of history, and the theory of Evolution is taught in secondary schools, colleges and universities, the percentage of its acceptance in society is far from absolute. This can be due to certain cultural traditions in the religious worldview, insufficient awareness about the principles of scientific thinking, including the Biology field. On the other hand, the extremely atheistic orientation of biological science, which excludes the role of God in the life development, can cause difficulties in perceiving Evolution ideas among students. The religious-cultural competence of secular teachers in evolutionary education can improve learning outcomes and the Evolution theory acceptance degree in religious students. The aim of the article is to define the opportunities for dialog between Biology teachers who provide training in the discipline 'Theory of Evolution', and undergraduate students who adhere to the creationism ideas. The article explores the ways of establishing a constructive dialog between evolutionists and creationists, as well as discusses the advantages of agnosticism over atheism and holistic evolution concept over the synthetic one. Agnosticism in the scientific worldview avoids a sharp confrontation between the scientific worldview and the religious one. Agnosticism makes it possible to avoid conflicts between scientific and religious worldviews, as religious people tend to perceive atheism as a threat to Revelation. Meanwhile, the holistic approach leaves the place for the transcendent and helps ease the tension between evolutionists and creationists.

Keywords: theory of Evolution, agnosticism, holism, neovitalism, the Word of God

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1. Introduction - acceptance and denial of Evolution in the modern world

The theory of Evolution is taught in secondary schools, colleges and universities in most countries of the world. Nevertheless, Evolution theory is far from being accepted by many people in educational environment and society. The recent surveys have demonstrated that a significant number of respondents from Russia (26%), Greece (29%) and Poland (23%) believe humans have existed in their present state since the dawn of time [***, *Science and religion in Central and Eastern Europe. Pew Research Center's Religion & Public Life Project*, 2017, https://www.pewforum.org/2017/05/10/science-and-religion]. Furthermore, 40% of Americans hold creationist views [Brenan M. *40% of Americans Believe in Creationism*, Gallup.com, 2019, https://news.gallup.com/poll/261680/americans-believe-creationism.aspx]. Such a low percentage of Evolution acceptance can be explained by insufficient knowledge of the theory itself or deficient critical thinking skills [1]. However, the research on this matter remains ambiguous, while persistent appeal to scientific facts often causes a pushback from creationists [2]. Assumptions about deficient critical thinking ability or lack of knowledge in Biology and Evolution are harmful to education and often cause a negative response if made among students who accept creationism [3]. The recent studies reveal that acceptance of Evolution largely depends on the affiliation, religious culture and natural science knowledge of the respondents. For example, more Catholic and Jewish students accept the Evolution than members of the Church of Jesus Christ of Latter-day Saints, Baptist [4], and the Orthodox Churches [5]. Other factors harming evolution acceptance include Biblical literalism, participation in religious ceremonies [L. Saad, *Record Few Americans Believe Bible is Literal Word of God. Social & Policy*, 15.05.2017, https://news.gallup.com/poll/210704/record-few-americans-believe-bible-literal-word-god.aspx], limited knowledge of Biology and Geology, as well as low critical thinking skills [5].

At the same time, the religious-cultural competence of secular teachers in evolutionary education can improve learning outcomes and the Evolution theory acceptance degree in religious students.

The aim of the article is to define the opportunities for dialog between Biology teachers who provide training in the discipline 'Theory of Evolution', and undergraduate students who adhere to the creationism ideas.

2. Effective ways to establish a dialog between evolutionists and creationists

The recent study shows that direct criticism of creationism provokes a backlash against evolutionary ideas among religious students [***, *Exploring Different Ways of Asking About Evolution*, Pew Research Center's Religion & Public Life Project, 2019, https://www.pewforum.org/2019/02/06/the-evolution-of-pew-research-centers-survey-questions-about-the-origins-and-development-of-life-on-earth/; 6]. A more effective educational practice involves appealing to the authority of prominent scientific and religious personalities who supported

both evolutionary and creationist ideas. As far back as in the 1950s, Pope Pius XII wrote there is no contradiction between the Evolution and the Catholic faith [Pius XII, *Encyclical Humani generis 36*, Archived April, 19, 2012 at the Wayback Machine, https://www.vatican.va/content/pius-xii/en/encyclicals/documents/hf_p-xii_enc_12081950_humani-generis.html]. His successors also made statements in favour of the Evolution theory, including the incumbent leader of the Roman Catholic Church [I. Tharoor, *Pope Francis says evolution is real and God is no wizard*, Washington Post, 2014, https://www.washingtonpost.com/news/worldviews/wp/2014/10/28/pope-francis-backs-theory-of-evolution-says-god-is-no-wizard/]. Adopting a reconciliatory approach and emphasizing the fact that Evolution and faith are not mutually exclusive and can find common ground provides an opportunity to significantly increase the number of religious people accepting the Evolution theory. The survey has demonstrated the reconciliatory approach helped reduce the number of Evolution deniers among religious Americans from 31 to 18%. Said 18% of respondents claim that although they think Evolution is a real thing, God plays a certain role in the evolutionary process [https://www.pewforum.org/2019/02/06/the-evolution-of-pew-research-centers-survey-questions-about-the-origins-and-development-of-life-on-earth/]. It has been discovered that only 6 minutes of competent education, intended to ease the tension between evolutionary and creationist ideas, can reduce the level of perceived conflict among 80% of surveyed students [7].

The second method that facilitates acceptance of the Evolution theory involves explaining the nature of Science and scientific research principles. This method is considered to be the most effective for expanding the horizons of students' worldview [8]. The studies demonstrate that the attempts to reconcile the two concepts among Biology and Theology students have increased both understanding and acceptance of evolutionary processes ($p < 0.01$, $p < 0.05$, respectively). Meanwhile, neither of the two groups became less religious - on the contrary, Theology students even got higher levels of faith. These results confirm that the reconciliation of scientific and religious concepts can significantly increase the acceptance of evolutionary ideas both in religious and scientific communities [3, 5].

Recent research has proved that for better acceptance of the Evolution theory among religious students, the education must promote the agnostic approach to Science and Evolution, in particular, explaining that evolutionary ideas do not refute the existence of God [9]. What is also important, the atheistic definition of Evolution causes a negative reaction among religious Biology students. Approximately 30% of Biology students do not acknowledge any evolutionary ideas, regardless of their view on divine intervention. The surveys demonstrate that 32.8% of religious students and 47.7% of non-religious students believe it is necessary to reject a literal interpretation of sacred texts to accept Evolution; 49% of religious students and 47.2% of non-religious students responded that people need to completely reject the notion of God and religion in general to accept the Evolution theory [9]. For 30% of believers, however, even these approaches can become ineffective [9]. We may assume that teaching

the specifics of religious knowledge to Biology and Geology students, as well as partial liberalization of its delivery in the classroom, can help reconcile religious and evolutionary views. Any discourse aimed to make religious students accept the Evolution theory must keep the boundaries set by the Gospel, while answers to questions about the origin of life and its Evolution must take into consideration the cultural background [10, 11].

3. Reconciling evolutionists and creationists by differentiating religious and scientific knowledge

When explaining the evolutionary theory basics to a potentially religious audience, it is necessary to highlight that Science and religion are two separate types of knowledge; no competition or contradiction between them is possible, as they explore different aspects of being. The source of religious knowledge is Revelation, or the Word of God, while scientific knowledge is based on experimentation, observation, measurement, description, comparison and systematization of physical processes. The understanding of Revelation is similar to scientific intuition, when a scientist, who has been working on a challenging theoretical task, has a moment of epiphany and finds the solution. Nevertheless, there is a great difference between Science and Revelation as the source of religious knowledge. Revelation can be achieved only when a person is interested in the meaning and foundation of existence that will always remain a secret. Revelation is impossible without experiencing the sacred, being fully immersed in the mystery. Thus, many scientific ideas cannot be considered a revelation, as they deal with finite objects, whereas the meaning and origin of being are beyond any practical tasks. Revelation presents the mystery of being to human cognition; this knowledge can be perceived only as a miracle or ecstasy. This correlation defines the specifics of knowledge of Revelation [12], inseparable from the situation when it has happened and inapplicable to practical knowledge. It does not expand our understanding of nature, its evolution, historical processes, or other areas of research; it is irrelevant for biologists, chemists, historians, psychologists, or other scientists, as it adds nothing to the current scientific knowledge and removes nothing from it. However, scientific knowledge has nothing to say about Revelation, as well. For Revelation, no scientific theory is more preferable to the others; otherwise, this could have harmed Theology. On the other hand, theologists' attempts to oppose scientific achievements may lead to obscurantism and expand the rift between religious and secular cultures (that has become a problem in the past two centuries). Theologists do not need to worry about any scientific assumptions, including the evolution theory, as the truth of the Revelation is beyond any scientific facts and can be neither supported nor disproved by them [12]. What is more important, the theory does not contradict the Christian teachings (kerygma). The Bible does not provide a detailed description of human creation, this process could have been done gradually, i.e. by Evolution. On the other hand, the process of human

alienation from God is universal, and people need the Word of God for salvation.

4. The holistic evolutionary concept as the basis of dialog between evolutionists and creationists

For a long time, Evolution has been the topic of debate between the followers of holistic (epigenetic) and synthesis theories. The holistic perspective in Science and Philosophy proclaims the priority of the whole over its parts. Proponents of this concept may have a different understanding of the whole, yet they all agree the whole cannot be reduced to its parts, which are determined by it [13]. The whole dominates its parts both in biological and physical realities; the world itself is the whole so its separate objects have meaning only within its context [14]. This concept is a worldview, not a scientific theory, yet it can help teach the theory of Evolution to a religious audience. It is worth noting that the first philosophical endeavours to study the whole were made before the Common Era. For instance, Aristotle originated the notion of entelechy, understood as the movement towards a certain goal, during which the potential becomes the actual. This goal reflects the principle of unity, typical for entelechy, or the soul [15]. In the early 20th century, H. Driesch conducted a series of research demonstrating that during the individual development of living organisms, the whole is determined before the parts [16]. He claimed that regulation, reproduction and regeneration of living organisms indicate the presence of a certain factor that helps them remain whole, despite potential removal of physical parts; something 'immaterial' continues to influence the physical system, while not being a part of it. Referencing Aristotle, Driesch called this non-physical causal factor entelechy. He believed entelechy controls and manages physical and chemical processes in organisms while driving the process of morphogenesis towards its goal. Genes are responsible for supplying the morphogenesis with necessary material resources; however, the direction of chemical reactions in an organism is determined by the non-physical factor of entelechy [17, 18]. The scientist believed that microscopic processes in living beings cannot be fully determined, with entelechy affecting them by stopping or launching them at the right moment while requiring no energy resources [16, p. 207]. According to modern vitalism, entelechy organizes physical and chemical processes in organisms by affecting events not determined by Physics, with their statistical limits set by energetic causality, thus having its time-and-space organization [18]. Within this context, genes are responsible for coding the synthesis of all body proteins, while the spatial organization of cells, tissues, organs and the whole body is determined by entelechy.

In more recent works on neovitalism, entelechy is defined as the morphogenetic field [19-22], the integrity factor that actually exists in space and time and is primary to cellular structures [18, 23]. Living organisms are understood as the hierarchy of morphic units [18, p. 42-53; 24]. According to R. Sheldrake, the morphic unit is the term that indicates the structure and form

('morphic') and the system integrity ('unit') [18, p. 42-53]. The impetus for development is given to a morphic unit via morphic resonance, a certain set of morphogenetic field vibrations transmitted from previous morphic units. Genes and cellular structures set the environment for making a new morphic unit - the morphogenetic germ that enables individualization [18, p. 42-53]. Thus, neovitalism can be rightfully called neo-Aristotelism, as neovitalists also distinguish the principle of entelechy, or morphic unit, based on two major components - the whole ('holos') and the ultimate purpose ('thelos') [25]. The principle of life development goes beyond self-organization or creating a supercomputer. The living organism is something bigger than just an organized system; it arranges its structures and forms in an environment that, in a certain way, is an extension of its integrity. However, the living being is superior to any order or organization, as it is capable of creating order, destroying it, and building again on a higher level; it brings both order and chaos. Within a living being, chaos and order coexist in harmony, facilitating development, sustaining the structure, and upholding the spatial organization. Development is the immanent attribute of life [O.S. Volgin, *Development and life*, Scientific and Digital Library Portalus.ru, 2007, https://portalus.ru/modules/philosophy/print.php?subaction=showfull&id=1169103180&archive=1398581676&start_from=&ucat=6&], while the system is capable only of operating within the pre-set functions [26]. Thus, development is an act of freedom that goes beyond organization; there can be no freedom without development. The development of living organisms rests on the balance between chaos and order - the logos shaping the perception of freedom. This is an open process; within the whole, as it is being developed, opposites turn into something bigger than they initially are. Development gradually reveals and actualizes the potential, enriching the existence [26, p. 20]. It is the unfolding, objectification of intrinsic content, i.e. the whole can be developed without disconnection of its parts. The parts co-evolve, baring the potential infinity of its internal content [https://portalus.ru/modules/philosophy/print.php?subaction=showfull&id=1169103180&archive=1398581676&start_from=&ucat=6&]. Organization, on the other hand, is based on the subordination of its components; the principles of freedom, harmony and chaos cannot be interpreted from the synergetic standpoint, as it deals with discrete systems, where every element has a strictly determined function. In certain situations, synergetic formalism can become a useful approach to studying biological processes. However, neither the synergy concept nor synergetic views on evolution do not make it possible to draw any conclusions on the structure and functioning of a living organism as the whole, i.e. as a complex, unconfined, self-replicating and self-developing being [27]. Development implies improvement, reaching beyond the boundaries of oneself and striving for the ideal. Integrity is the basis of spirituality, and spirituality is the basis of life. According to the holistic principle, all living beings constitute the whole; this includes the human personality and the universe spiritualized by living God, the foundation of life and existence. This world was created out of 'nothing', without any prerequisites or prior states of being; it is based on the

spiritual whole, infinitely superior to any limited existence [12, vol. 1, p. 202-261]. God is a living being and the spirit, while the spirit is neither a part nor attachment to something nor a special function of existence; the spirit is integral and all-encompassing, comprising all elements of being. Only God, as the source of being undetermined by existence, has absolute freedom. Like God, a human is also an integral living being, who has certain freedom relative to destiny [12, vol. 1, p. 182-186] that is influenced by natural necessities [28]. A human is a dynamic unity of actually existing hierarchies of being, where biological or chemical causality is organized and managed by the principle of life. Mental activity can be overcome by the spirit in case the mentality centre becomes influenced by the personality centre [29]. Multiple dimensions of human existence can be described by evolutionary terms, i.e. life does not only preserve itself but also constantly self-develops by turning the potential into the actual [30, 31]. Empiric being is characterized by existential anxiety, fear, worry and the feeling of meaninglessness due to alienation. Alienated being is not authentic, as it is self-absorbed and lies outside the divine centre. To reach the perfect being, alienation must be overcome by stepping beyond one's boundaries and becoming one with God through free choice [28, p. 31]. It is the end goal of the evolutionary process that has the eschatological connotation. This concept has been explored by many prominent theologians [12, vol. 3, p. 357-371; 32; 33].

5. Conclusions

Nowadays, Evolution ideas remain largely unacknowledged in religious communities and society in general. Studies show that 23-40% of people living in the Christian world do not accept evolutionist views [https://www.pewforum.org/2017/05/10/science-and-religion; https://news.gallup.com/poll/261680/americans-believe-creationism.aspx]. Secular Biology teachers have significant difficulty in teaching the theory of Evolution if there are religious students in the classroom. Sometimes this can be associated with cultural background, deficient critical thinking skills, initially insufficient knowledge of Biology and Geology [2, 3]. Criticism of religion and Revelation as the source of religious knowledge usually leads to the opposite outcome and does not increase the number of students accepting Evolution ideas [4, 5]. A more effective approach to teaching Evolution to religious students involves reconciliation and emphasizing that the Evolution theory and Revelation belong to different realms of knowledge. Science does not disprove the existence of God, and that atheism is a worldview and not a scientific paradigm [10]. When explaining the evolutionary theory basics, it is worth appealing to prominent religious leaders who accepted evolution [https://www.vatican.va/content/pius-xii/en/encyclicals/documents/hf_p-xii_enc_12081950_humani-generis.html, https://www.washingtonpost.com/news/worldviews/wp/2014/10/28/pope-francis-backs-theory-of-evolution-says-god-is-no-wizard/, 33]. Mutual acceptance of evolutionists and creationists can also be based on the holistic paradigm of evolution, organization of the world,

and particular elements of existence. In this case, the world of the living is alive as well, as its existence is based on living God. To live is to evolve, to evolve is to self-improve, and to self-improve is to go beyond the boundaries of the finite, to transcend and strive for God as the source of perfection and life itself.

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