Entropic and Negentropic Transitional Model:
A SemioPhysical Context

Ioan G. Pop[a]*, Ilie Soritau[b]

* Corresponding author: Ioan G. Pop, ioan.pop@emanuel.ro

[a]*Emanuel University Oradea, Romania, ioan.pop@emanuel.ro*
[b]*Emanuel University Oradea, Romania, ilie.soritau@emanuel.ro*

Abstract

http://dx.doi.org/10.15405/epsbs.2016.09.97

The two very complex symbols, Bethel and Ai, are associated with two very specific axiological communicational sources for the people living on the earth, with information and knowledge transmitted in every possible direction, having a different impact on the listeners. BETHEL is considered to be the place where negentropic actions are happening, where Wisdom and goodness are speaking to all the smart people interested in the message. AI is the source of the entropic events, where complete chaos and madness spread outward to all the people of the city, where foolishness and evil have a permanent voice. The transitional processes are well-defined processes, aimed to create new emergent states, evil or goodness; also, using the Kuramoto weak coupled oscillators model as a basis in order to explain the entropic and negentropic transitions in different semiophysical contexts by introducing the interaction parameter f_p of faithfulness within the environment, represented in this context by the Pantokrator. The use of the transdisciplinary knowledge search window as a new methodology works with the top-down and bottom-up levels of knowledge, integrating complementarily the advanced knowledge through DIMLAK (Data, Information, Messages, Learning, and Advanced Knowledge) model. The apokataphatic method identifies the most probable trend of the transitional processes in a given context *x*, as a pattern of three main questions: *what is, what isn't*, and *how does it work* as a transitional process in a synergistic context (space-wise, time-wise, and act-wise).

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Keywords: contextual message; synergistic significance; entropic and negentropic transitions; Kuramoto model; semiophysical ethic-semiotic valuation.

1. Introduction

There are two kinds of messages in a communicational process, I_o, named standard information, with its level of advanced knowledge N_o, and I_x, as information in a given context x (space-wise, time-wise, action-wise), with the correspondent level of advanced knowledge N_x (Šlaus, 2003; Pop, 2011; Pop & Soriţău, 2014; Pop, Talpoş & Prisac, 2015). In every communicational process there can be identified two different situations; the first one being a *negentropic way* to achieve the complete advanced knowledge (Pop, Talpoş & Prisac, 2015; Ho, 1994), when the sequential information I_x tends to become coincident with standard information I_o, so $I_x{\to}I_o$, or I_x-$I_o{\to}0$, with the correspondent knowledge levels, N_o and N_x, quite identical, or N_o-$N_x{\to}0$, when the synergistic communication is realized. The second situation, with I_x-$I_o{\to}\infty$ (infinite), is identified with lack of knowledge, or evil knowledge, with the correspondent levels, N_o and N_x very different one from another, where N_o-$N_x{\to}\infty$, the communicational process working as an *entropic degenerative process* (Ho, 1994; Georgescu Roegen, 1971; Bernstein, 2009). Generally speaking, entropy defines the loss of the informergy (informaction incorporated in matergy) present in a closed source system, and negentropy is connected to the increase or maintenance of the informergy present in such systems (Pop, 2011; Pop & Maties, 2011). A semiophysical system (Pop & Maties, 2011; Thom, 1990; Locke, 1975) has three pillars of the knowledge building: a) *phenophysics* (phenomenological physics, or common sense physics with structural functionalities) (Petitot, 1990; Arecchi, 2007); b) *semiotics* (with the logical-creative significance of a message in a given context) (Eco, 1997; Sebeok, 2001; Morris, 2003); and c) *ethics* (with the perspective of power through authority in leadership, learning, and relations, as moral, axiologic, deontologic, and even aesthetic aspects) (Pop, 2011; Henry, 1996; Rae, 2009). The seven fundamental questions considered as seven habits necessary to be put everywhere and at all times, to the *"here and now; and/or; then and there",* in order to achieve the integrated knowledge about the future trend of the knowledge-based society (Pop, 2011; Pop, Talpoş & Prisac, 2015) are: (a) "*where"*, through spatial participative sequence, space-wise-SPS, configured by the shape, dimensions, and proximity in which specific agents are to be found in a specific distribution and relationship; (b) "*when"*, through temporal connective sequence, time-wise-TCS, marked by synchronic events in kairotic significance, and finally five questions (c) "*who, with whom, what, how, and why"*, as a synergistic contextual message (SCM), through interactions which can be described in time and space through the actional-interactive sequence, act-wise-AIS (Pop & Maties, 2011; Pop, 2011; Pop & Soriţău, 2014). The synergistic significance (synergy, $1+1>2$, and significance, $1-1\neq0$), works as a transdisciplinary whole-transcending barriers, demolishing walls, and building bridges through the gaps, in order to optimize the synergistic communicational process, assuring the connection between the Sender as the transmitter and the Receiver as a recipient of the information while facilitating the transmission of significant information from an ethic and semiotic point of view as well. The synergistic significance works with a positive consequence from the negentropic action N_x-$N_o{\to}0$, or as a negative, entropic action with N_x-$N_o{\to}\infty$ (Pop, 2011; Pop & Soriţău, 2014; Soriţău & Pop, 2014).

2. The Semiophysical Context in the Knowledge Process

The synergistic contextual message model works by three spheres of the communicational process: *Pathos,* for the Sender (transmitter); *E* (to know who), determined by the authoritative-expressive principle with its specific rules: *responsibility, credibility, and deference*; the complementary communicational sphere *Ethos*, for the Receiver; *R*(to know with whom), governed by the participative-conative principle with specific rules: *receptivity-choice, availability-accountability, and involvement-action*, and the *synergistic contextual message* (*SCM)* working through the cooperative-referential principle-knowledge sphere *Logos*-with the rules: the *quantity and quality of the message* (selection-to know what), *the contextual relevance of the message* (legitimacy-to know why), and *the manner of transmission (code, channel, communication by participation, noises, feedback, feed-forward,* to know how), in a specific transdisciplinary way (Pop, 2011; Pop & Soriţău, 2014; Locke, 1975). Considered as an interface between Sender and Receiver, the *Synergistic Contextual Message (SCM)* works in a transdisciplinary communicational pattern as an arrow, needle, and bullet; bridging the gaps and assuring the avoidance of the specific barriers, walls, and any other confusion in a superior ethic-semiotic valuation of the advanced knowledge products (Pop, 2011; Lute, 2006; Nicolescu, 2008).
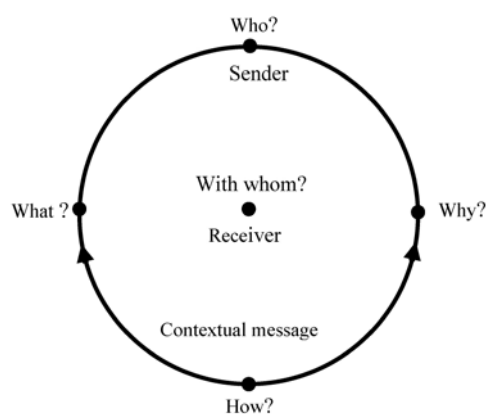

Fig. 1. The semiophysical contextual message model (Pop & Maties, 2011; Pop & Soriţău, 2014)

Synergy exists through the function of memory-messages that are conceptually integrated and that repeat essential units of meaning over time through different channels and from different sources that come together to create coherent knowledge and attitude structures in the receiver (Pop, 2011; Zhu, 2002). Every message is identified through its informational content (transthematic identificators-what), the manner the messages are presented (code and channel - phenomenological descriptors-how), and the context the messages created are sent (logical abstractors-why) (Pop & Maties, 2011).

It is necessary to introduce a new transdisciplinary perspective to work pragmatically by an integrative sustainable all life learning in order to introduce open learning concepts as a movement toward integrated knowledge contextually as complex dynamics in the chain of knowledge (Pop, Talpos & Prisac, 2015; Waldorp, 1992; Nicolescu, 2007; Montuori, 2013). The result of this inquiry is the DIMLAK model, as a holistic way of knowledge integration, with different heterarchic-hierarchic stages of knowledge integration represented as a transdisciplinary chain, as follows: Data (**D**, statistics approach) → Information (**I**), as syntactic way to relate descriptions, definitions, or perspectives →

Synergistic Contextual Message (**M**), as semantics in order to give significance in a synergistic context→ Sustainable integrative all life Learning (**L**), as pragmatic pattern comprising strategy, practice, method, or approach → Advanced Knowledge (**AK**), as an apobetic embodying principle, insight, moral, or archetype, to attend the desired level of Expertise (Wisdom as top-down perspective, and Skills as bottom-up perspective), in order to achieve its final goal-the Truth, representing an emergent continuum flow. In this way the new perspective of the knowledge creates a better, transdisciplinary understanding about knowledge as a dynamic synergistic integrative process (fig. 2) (Pop & Soriţău, 2014; Pop, Talpoş & Prisac, 2015).
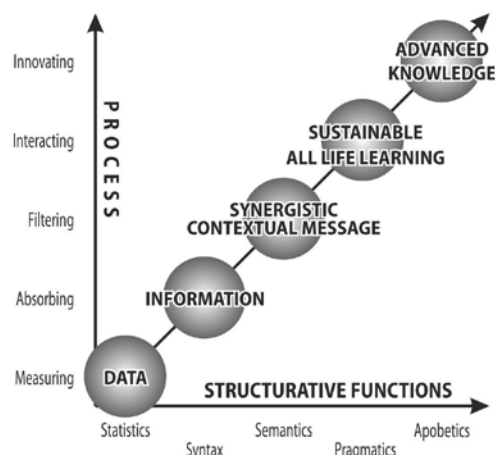

Fig. 2. The advanced knowledge flow of the transdisciplinary DIMLAK integration (Pop, Talpoş & Prisac, 2015)

Two very complex symbols, Bethel and Ai, are detected and associated, in the Biblical context, with two very specific ethical (as moral, axiological, deontological, aesthetic issues) communicational sources for people living on the earth with information and knowledge transmitted in every possible direction, having a different impact on the listeners (Pop & Soriţău, 2014; Bernstein, 2009; Henry, 1996; Rae, 2009). Wisdom is speaking from Bethel, through the voice of the Priest of God, and madness is speaking from Ai, through the voice of the priest of Evil. The message presented by the madness has a lot of negative consequences acting *"like chaff that the wind blows away" (Ps. 1:4)*. In the backstage, with both of these sources, there are two specific authorities: God, the wellspring of good, and Satan, as a source of evil. BETHEL is representing the place where negentropic actions are happening, and AI is the source of the entropic events, where the madness offers bad things to the people at all the times. There is a permanent opposition between the two mentioned messages-the negentropic discourse of the wisdom coming from BETHEL, and that of the madness, as an entropic message coming from AI, addressed as well to wise people who take account the messages of goodness, and the foolish people, who hate the council of the wise and embrace the evil (Ho, 1994; Pop & Soriţău, 2014; Soriţău & Pop, 2014). The only way to refuse the call of the madness and fall prey to the chaos is to stay under the authority of God, affirming: "…*He is my refuge and my fortress, my God in whom I trust" (Ps 91, 2)*. There is a key verse working here as a "*janus*", with a two-faced function, determining the decisive choice about death and life, wrong and right, curses or blessings, as entropic and negentropic ethic-semiotic concepts (Pop, 2011; Pop & Soriţău, 2014). The feedback of the communicational process is very important for its final assessment: *„If you are wise, your wisdom will reward you, if you are a mocker, you alone will suffer" (Prov. 9:12)*. The contextual message

transmitted to all the people walking in the city does contain enough information to eliminate any confusion, even from the final consequences: *„Leave your simple confusing ways and you will live"* (Prov. 9:6) (Pop, 2011; Pop & Soriţău, 2014; Soriţău & Pop, 2014).

3. The Seven Churches from Revelation as Complementary Entropic-Negentropic Systems

Transitional processes are present in many fields of knowledge (engineering, economy, psychology, politics, etc...) as a well-defined uncertain process, entropic or negentropic, aimed to create new emergent states, evil or goodness. In the context of transitional processes the transdisciplinary knowledge search window is introduced as a new methodology working with the top-down and bottom-up levels of knowledge and integrating complementarily the advanced knowledge through the DIMLAK model (Pop, 2011; Pop, Talpoş & Prisac, 2015; Gibbons et. al., 1994; Kuramoto, 1975) (fig. 2). The Kuramoto weak coupled oscillators model is introduced to explain the entropic and negentropic transitions in different semiophysical contexts (Pop, Talpoş & Prisac, 2015; Ho, 1994; Pop & Maties, 2011; Strogatz, 2001; Acebrón, 2005). As a consequence, by using the apokataphatic method it is possible to identify the most probable trend of a transitional process in a given context *x*, as a pattern of three main questions: *what is, what isn't*, and *how does it work,* as a transitional process in a synergistic context (space-wise, time-wise, and act-wise), (Mushakoji, 1988; Staune, 2006), with the included middle as transdisciplinary instrument for contextual choosing (Lupasco, 1987); lateral thinking (De Bono, 2003); and the bootstrap theory (Nicolescu, 2007). The proposed study is focused on the church systems, especially on the seven churches from Revelation. Every sociocultural system, in this case every church, (no matter what historical period) is under a dangerous threat, and naturally is falling from the top desired state of faithfulness (f_p=1) in a known pattern, through the three sequences, to the bottom level state of faithfulness (f_p=0) (fig.3). At the same time, in determined sequences there is a possibility to realize negentropic transitions from bottom to top (Soriţău & Pop, 2014) (fig.4). In the Bible, such negentropic transitions are presented in John 4, Psalm 40, and Ephesians 4 as spiritual ladders to heaven, known as ***"metanoia"***, a very specific negentropic concept of faith (Pop & Soriţău, 2014; Brooke & Basden, 2004). If the couplage between weak oscillators characterized by connecting coeficient f_p is strong enough, a totally synchronized oscillation with the same frequency has a place, even the phase could be randomly different with f_p=1 (sequence A). In the intermediate transitional entropic sequence some of the connections are synchronized and others are suffering a non coherent drift with $0<f_p<1$ (sequence B). The statistical steady-state, with connecting faithfulness coefficient f_p→0 is correlated with random oscillations and with no coherence between the agents involved (sequence C) (fig. 3). The negentropic transitional system of integrative knowledge is starting from the bottom contextual level N_x to the top level N_o, as a process where N_x - N_o→0 (Pop, 2011; Ho, 1994). The first stage of a negentropic process is working as a statistical steady-state configuration with connecting coefficient f_p→0 where oscillations are randomly correlated, with no coherence between them. In the intermediate transitional entropic sequence some of the connections are acting as synchronized oscillators and others are suffering a non-coherent drift, with $0 < f_p < 1$. At the top there is a strong couplage between weak oscillators characterized by connecting faithfulness coefficient with

value f_p=1, with a totally synchronized oscillation having the same frequency, even the phase could be randomly different (fig. 4).
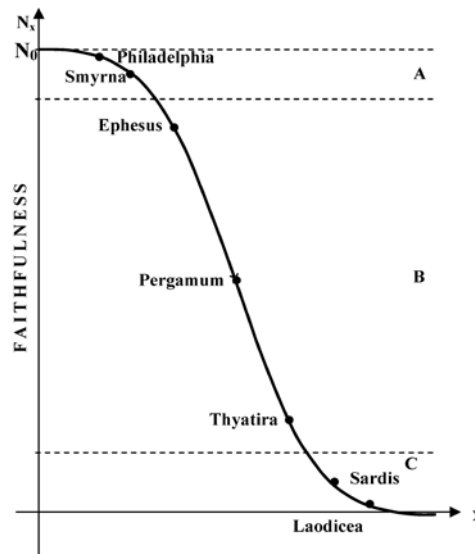

Fig. 3. The entropic transitional pattern of the multiple level for militant churches (Soriţău & Pop, 2014)

In order to explain the framework of the transitional process, both entropic and negentropic are used the special spline-cubic functions, fuzzy logic, exploring complex networks, and crossing from one sequence to another through the critical point of the transition (Strogatz, 2001; Pop & Iancu, 2006; Pop, 2009).
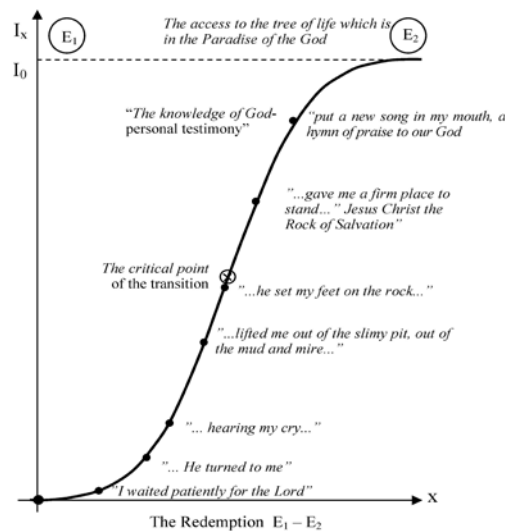

Fig.4. The negentropic transitional model as a ladder to heaven (Soriţău & Pop, 2014)

A complex dynamic analysis of the behavior of a system of believers is made by the well-defined interaction parameter f_p (faithfulness) with the environment, represented by the Pantokrator with his specific contextual message using the Kuramoto model (Kuramoto, 1975). The seven churches from Revelation are grouped in a new paradigmatic pattern, "2+3+2", following the values N_x of knowledge associated with the faithfulness connective parameter f_p in a given space-wise, time-wise, and act-wise context x (Pop, 2011; Pop, & Soriţău, 2014; Šlaus, 2003). The entropic degeneration of the situation is

determined by internal causes and external attacks, as well as the perseverant resistance to preserve the values that are present (Soriţău & Pop, 2014; Patterson, 2012). The negentropic aspect is represented contextually by the positive test of life *"through faithfulness till death"* where God gives a promise, to Philadelphia: *"...no one will take your crown"* (Rev. 3:11); and to Smyrna: *"I will give you life as your victor's crown"* (Rev. 2:10). In every semiophysical context the splendor and the power of the earthly world is not the currency of heaven, as entropic characteristics, but the precious values of the Kingdom of God are the souls of the believers with a good testimony speaking the words of God and live them every day, as negentropic representation of the advanced knowledge (Pop, 2011; Pop, Talpoş & Prisac, 2015; Georgescu Roegen, 1971). On the other hand, because of the gradual entropic growth of compromise there are external and internal threats such as: false doctrines, immorality, idolatry, a slippery slope, or a self-esteem slide that causes spiritual death and flirting with the values and operational methods of the world due to the mixing of true religion with paganism resulting in a complacent attitude and compromise with the world on all levels (Soriţău & Pop, 2014; Patterson, 2012). The doctrinaire, moral and institutional obscurity could cause sleep paralysis and spiritual death, as well as a compromised testimony as a result of a total interchanging of values with the world, resulting an entropic disaster (Ho, 1994; Georgescu Roegen, 1971).

The three groups identified in the analyse are: (A) - the group of two faithful living churches (Philadelphia, Smyrna); (B) - the group of three churches involved in a falling entropic process (Ephesus, Pergamum, Thyatira); and (C) - the group of two dead churches, as completely disordered systems (Sardis, Laodicea) as is presented in fig.3. The first group (A) has a high value of the parameter of faithfulness f_p (very close to 1), working as totally synchronized oscillators with the same frequency, with commendation (praise without reproof) and faithfulness, steadfastness, conservatism, pro-life attitude, awareness of the true membership to the Kingdom of God, authentic knowledge of God, as high negentropic values (Soriţău & Pop, 2014; Patterson, 2012). Both of these two churches are holding Grace while victoriously fighting against their doctrinaire opponents, the persecution, and martyrdom. The second group (B) works in the intermediate transitional state where some of the connections are synchronized, others suffering a noncoherent drift, with negentropic commendation (praise), coming out from Bethel, and entropic condemnation (reproof and admonition), having as source Ai (Georgescu Roegen, 1971; Soriţău & Pop, 2014; Patterson, 2012). Here there is a tolerant destabilizing attitude in a descending transition from commendable deeds (not a few) to first-love loss (Ephesus), acceptance of Nicolaitans' practices (Pergamum), and tolerance with an active cohabitation with the prophetess, Jezebel's doctrines (Thyatira) (Patterson, 2012; Soriţău & Pop, 2014). The last group (C) is working in the statistical steady-state configuration, with randomly connections of the agents and with no coherence between them, in a very low state of valuation with the faithfulness parameter f_p close to zero. It is expressed here a very high entropic degradation level with a majority, or total compliance with the world resulting in a bad testimony as individuals, and as a group as well, with condemnation (reproof and admonition) without commendation (praise). This group represents the dead churches, the chance for a negentropic ascending transition being only for individuals (fig. 4). Nevertheless, as negentropic signs in very entropized systems, there are a few people who are to be rewarded for their faithfulness, being dressed in white clothes in Sardis, or sitting by the Lord's Supper,

in Laodicea (Bernstein, 2009; Soriţău & Pop, 2014; Patterson, 2012). For them the positive change of mind is very present, as a *metanoia* process presented in fig.4, where *"the darkness is changed into light of the Lord, with fruit of light consisting in all goodness, righteousness and truth, doing what pleases the Lord"* (Ephesians 5: 8-10). There is here an *"all life integrative sustainable educational process (lifelong learning, wide-life learning, and learning for life)"*, in order to create a new life pattern from a negentropic point of view *("you were taught with regard to your former way of life, to put off your old self, which is being corrupted by its deceitful desires, to be made new in the attitude of your minds, and to put on the new self-created to be like God in true righteousness and holiness,"* *Ephesians 4:22-24*). In such a semiophysical significant synergistic context only the victorious people from each church could achieve a possible conversion of the entropic transitional trend into a negentropic one (Pop & Soriţău, 2014; Ho, 1994; Bernstein, 2009). Every believer from the seven churches has access to the triumphant level only with the help of the Sender, as a combined top down and bottom up process (Bernstein, 2009; Pop, 2009). This transition follows the specific known pattern in order to achieve the high triumphant level of reality (Soriţău & Pop, 2014; Patterson, 2012). The specific semiophysical context integrates the message, coming from the Panthocrator, and identified by the *Promises to Conquerors (Overcomers),* as follows: "…*a memorial pillar*…" for the faithfulness church, Philadelphia (Rev. 3:12), …*the eternal life*…for the suffering church, Smyrna, (Rev. 2:11),…*a spiritual food*… for the first love church, Ephesus (Rev. 2:7), "…*a new name*…" for the mixed church, Pergamum (Rev. 2:17), "…*the authority*…" for the church of tradition, Thyatira (Revelation 2:26), "…*the robes of righteousness...*", for the sleeping church, Sardis (Rev. 3:5), and "…*the enthronement*…" for the delusional church, Laodicea (Rev. 3:21) (Soriţău & Pop, 2014; Patterson, 2012). In order to achieve the triumphant spiritual ethic-semiotic level for the churches as conquerors, every believer and part of the community has to ascend with the help of the Almighty on the Ladder of Heaven as a negentropic process, entering the reality of the overcoming triumphant church (fig. 4) (Ho, 1994; Soriţău & Pop, 2014).

4. Discussions and Conclusions

On the subject of the relevance and novelty of the presented research, there could be identified three important original aspects. The first one is the semiophysical contextualization of every communicative process, using two complex symbols, Bethel and Ai, as sources for synergistic significant messages transmitted for the people living on earth, in every possible direction, to all interested people, with a different impact on them, and with various consequences, negentropic transitions, and entropic transitional events, respectively. The second original aspect of the paper is the use of the Kuramoto weak coupled oscillators model to explain the entropic and negentropic transitions by introducing the interaction faithfulness parameter f_p. Considering every analyzed church system under a dangerous threat, it is natural that every church falls from the top desired state of faithfulness, where $f_p=1$, in the established pattern, through the three sequences, to the bottom level state of faithfulness, where $f_p=0$, with the possibility to observe negentropic transitions from the bottom to the top. The third original contribution takes into account that within an entropic or negentropic transitional process, with a given context *x*, the apokataphatic method allows to identify the most probable trend as well as a pattern of

three main questions: *what is, what isn't*, and *how does it work,* in a synergistic context with the included middle as transdisciplinary instrument for contextual choosing; lateral thinking, and the bootstrap theory, focused on the seven churches from Revelation. Connected with this the specific new methodology of the knowledge search window, with top-down and bottom-up levels of knowledge, allows to integrate in a synergistic way the advanced knowledge, identifying the most probable trend of the transitional processes in a synergistic context, with a possible synergistic significant contextual chance for a negentropic transition, but only with an external informergic authoritative influence. Finally, having the roots in two very different fields of specialization, the research is putting together science and theology in a very original methodological approach as a novelty in both fields, coming from a transdisciplinary perspective. Because till now there is no publication in the field of the synergistic communication on faith as a semiophysical approach of transitions between different levels of reality, this research could be considered as a challenge for both scientists and theologians, as well, with possible controversies and welcoming researches on this field of knowledge integration in the very next future.

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