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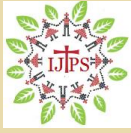
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Preface

The 8-th issue of *International Journal of Theology, Philosophy and Science* (May 2021) presents scientific and theoretical articles on various aspects, all of them centred on the area of Philosophy, Theology, and Science.

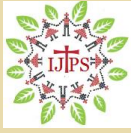
In the first article: *HANNAH ARENDT IN THE LIGHT OF SAINT AUGUSTINE. FROM POLITICAL ONTO-THEOLOGY TO REPUBLICAN PHENOMENOLOGY*, Prof. Ph.D. Spiros MAKRIS scrutinizes in-depth the theological dimension in Hannah Arendt's political and ethical thinking. The next work is called: *HENRI BERGSON: SCIENCE, LIFE-SCIENCE, PHILOSOPHY AND THE HUMAN CONDITION* and it belongs to Ph.D. Raz SHPEIZER. After that, the paper entitled: *THE JUSTIFICATION OF THE DENIAL OF THE DIVORCE THESIS*, written by Prof. Ph.D. Sudhakar VENUKAPALLI is a contemporary philosophical understanding of scientific rationality fundamentally distinguishes itself from the conservative positions by what may be considered a categorical reorientation. It replaces the old categories by the new ones in terms of which the essential nature of the structure and dynamics of science are described and explained.

The next study, by Prof. Ph.D. Roberto Parra DORANTES, presents the issue: *ORIGINALISM, RULE OF LAW AND HUMAN RIGHTS*. Author defends a normative, moderate version of originalism according to which there is a possibility that in a constitutional system there will be cases for there is no correct legal (constitutional) solution. *GENESIS AND BLACK HOLE UNIVERSE: THE FIRST DAY* is the article presented by Prof. Ph.D. Tianxi ZHANG. This study is an innovative interpretation of Genesis according to the black hole universe model. This paper as Paper-I focuses on the first day - the beginning of creation, enduing words like Earth, Water, Night, and Day in the book of Genesis with physical implications and meanings, eliminating all discrepancies between Genesis and observations.

THE RADICALIZATION PROGRAM OF PHENOMENOLOGY OF JEAN-LUC MARION is the issue presented by Ph.D. Piotr KARPIŃSKI. The article discusses Jean-Luc Marion's project of radicalization of phenomenology. The very idea of radicalization has been associated with phenomenology since its origin and it is a return to the main idea to study the appearance of phenomena, rethink it and draw the maximum consequences from it. Marion argues with Husserl and Heidegger, who, in his opinion, stopped halfway in the phenomenological path: the first reducing all phenomena to objects, the second reducing everything to being. *CO-DEPENDENCY IN INTIMATE RELATIONSHIP-A LEARNED BEHAVIOUR* is the final article of volume presented by Prof. Ph.D. Claudia VLAICU and Ph.D. Candidate Felicia Aurica HAIDU, who explain the codependency paradigm in intimate relationship, analysing the symptoms of codependency and suggesting cognitive-behaviour therapeutic ways of healing from codependency.

The scientific content presented in the current issue of *International Journal of Theology, Philosophy and Science* distinguishes the opportunity of examining altogether truth-claims found in Theology, Philosophy, and Science, as well as the methods laid out by every discipline and the meanings derived from them. This is the aim and also the scientific task of IFIASA International Journal of Theology, Philosophy and Science.

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GENESIS AND BLACK HOLE UNIVERSE: THE THIRD DAY

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ABSTRACT

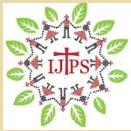
Recently the author has fully addressed the first two days of Genesis according to his well-developed black hole universe model (see Paper-I and Paper-II). In accordance with this new interpretation of Genesis, God first created the infinite entire universe called "earth" with matter named "water", and light, space and time, fundamental forces and motion. Then, he hierarchically structured the entire universe by separating the matter and space with infinite layers bounded by event horizons (called "vaults") and further formed our finite black hole universe. The efforts bridged the gap between Genesis and observations of the universe and brought us a scientific understanding of the Genesis. In this sequence study as Paper-III, we describe how God constructed the interiors of our finite black hole universe. It includes the formation of celestial objects by gathering the water or gravitationally collapsing the initial super fluidal matter under the sky or inside the even horizon of our black hole universe. These formed celestial objects could be stars and planets called dry grounds or lands, in which matter is not in the water state any more, and galaxies and clusters called, respectively, seas of stars and seas of galaxies.

Keywords: Genesis; Cosmology; Black Hole; Universe

INTRODUCTION

In Paper-I [1], the author has interpreted the first day of Genesis according to the black hole universe model, a new cosmology that the author recently developed [2-14]. The first day of creation was a long day. It contained the entire time period for God to create the three-dimensional (3D) infinite (or formless) and dark empty space (called earth in the book of Genesis), to make matter (named as water in the book of Genesis) and fill it into the empty space, to power the matter with motion and hence start the time, to create the fundamental forces among matter and issue matter with inertia of motion, and to generate light or radiation so that switched the entire space or the grand universe from darkness to brightness or from night to day (i.e. evening to morning)

In Paper-II [15], the author interpreted the second day of Genesis on the basis of the interpretation of the first day according to the black hole universe model. In the second day, God structured the entire space that he created in the first day into layers by separating the waters (i.e. the matter or super fluidal substance that God initially made and filled into the space) with vaults, which in physics can be understood as event horizons. God did this work by only setting the light speed as the speed limit for any matter and particles. From the entire infinite universe, which has infinite large radius and mass and infinitesimal density and temperature, to our finite black hole universe, which has finite mass, radius, density, and



temperature, there are infinite layers, which are structured hierarchically and governed by the same fundamental laws of physics.

In the book of Genesis, the first through fifth sections of the first chapter describe the first day's work by God on creating the entire universe with matter and light, while the sixth through eighth sections of the first chapter describe the second day's work by God on structuring the entire universe with layers. Both the first and second days are not our earth day (i.e. 24 hours), the time needed for our earth to make one rotation about its axis. In the first two days, the Sun, planets including our earth, moon and even the interiors of our finite black hole universe were actually not formed and placed yet, and thus it is meaningless to say the earth day.

This paper as Paper-III attempts to self-consistently explain God's work on the third day in construction of the interiors of our finite black hole universe, including formation of stars and planets, galaxies and clusters, etc. With overall of this sequence of study, we aim at an attempt to develop author's well-developed new cosmological model, for revealing the mysteries of the universe and wiping out the discrepancy between science of cosmology and the book of Genesis. It provides a new interpretation of Genesis and meanwhile supports the black hole universe model in terms of Genesis. Through this effort, we will demonstrate the black hole universe model to be not only scientific because it reveals truths and self-consistently explains observations of the universes, but also philosophical because it is complete and simply answers questions and overcomes difficulties without any non-testable hypothetical entities, and further theological because it is biblical and innovatively interprets the Genesis of the bible.

1. GENESIS AND BLACK HOLE UNIVERSE: THE 3rd DAY

In this section, we interpret the third day of Genesis according to the black hole universe model. We again apply the New International Version (NIV) of the bible [16].

1.1. *Creating Celestial Objects in Our Universe*

⁹And God said, "Let the water under the sky be gathered to one place, and let dry ground appear." And it was so. ¹⁰God called the dry ground "land", and the gathered waters he called "seas". And God saw it was good. Here, the matter (i.e. the water or the God's initially created super fluidal matter) under the vault (i.e. inside the event horizon, e.g. our finite black hole universe) gathers (or gravitationally collapses) to one place appears (or produces) dry ground that God called it as "land". Since the God's created initial super fluidal matter is called the water as Paper-I described, then a dry ground or land is something without such water or not in the initial super fluidal state. Here, we suggest that the dry ground or land is an enough condensed, and thus not anymore super fluidal (i.e. gaseous, liquid, or solid) celestial object that God could stand firmly on, such as a star, a planet including our Earth, etc. The waters under the vault (i.e. inside the event horizon, e.g. our black hole universe) gather to many places so that appears or produce seas such as galaxies (i.e. the seas of stars including planets, etc.), clusters (i.e. the seas of galaxies), etc. Gathering water to one place appears a land or celestial body such as a star and planet, and gathering waters to many places appears many lands or celestial bodies (e.g. many stars and planets) that form a sea such as a galaxy. A galaxy is a sea of stars and a cluster is a sea of galaxies. The sea refers to a vast expanse or quantity of something.

In the Hebrew's era, concepts of galaxies and clusters were not built or developed, so that they were named as seas in the book of Genesis. In China, since the ancient time to the

present, our galaxy, Milky Way, had being called as a river “Silver River” (or in Chinese “Yin He”). Figure 1 shows examples of seas of stars (i.e. galaxies) and seas of galaxies (i.e. clusters). This section of Genesis of the bible told us how God created stars, planets, galaxies, clusters, etc. from the initial super fluidal matter, i.e. the God's waters, through gravitational collapses under a vault or in a black hole universe (i.e. inside an event horizon). The matter or water flows downward across the vault and the vault rises upward, which explains the expansion of the black hole universe or spacetime. When a black hole accretes matter (or absorbs waters), it expands or enlarges its size. Observations indicate our black hole universe contains billions of galaxies and each galaxy contains billions of stars (Figure 2). For instance, our galaxy – the Milky Way – contains about hundred billions of stars. The Virgo cluster contains thousands of galaxies, in which the giant elliptical galaxy M87 is one of the largest and brightest galaxies. In general, galaxies formed from self-gravitationally collapsing of gas clouds are pancake-like [17, 18], as seen in the left panel of Figure 1.



Fig. 1: A sea of stars - galaxy (left panel, credit by universetoday.com) and a sea of galaxies - cluster (right panel, credit by galaxies: nasa.gov).

Once God created gravitation in the first day [1], matter gravitationally shrinking and collapsing are inevitable. Jeans instability causes the collapse of the fluidal matter or gas clouds and subsequent formation of celestial objects [19]. This occurs when the internal gas pressure or collision is not enough to prevent from gravitational collapse of a region filled with matter. Jeans length is the critical radius of a gas cloud where thermal energy is counteracted by gravity and Jeans mass is the mass of the gas cloud within Jeans length. They are determined, respectively, by

$$L_J \sim \sqrt{\frac{k_B T}{G \rho m}}, \quad \text{and} \quad M_J \sim L_J^3 \rho \sim \frac{k_B T}{G m} \sqrt{\frac{k_B T}{G \rho m}}, \quad (1)$$

where k_B is the Boltzmann constant, G is the gravitational constant, T is the gas temperature, ρ is the gas mass density, and m is the mass of gas particles (e.g. protons). For an instance, for a gas cloud with temperature of 10^4 K and particle number density of 10^{14} protons/m³, the Jeans length is about 10^{15} m and the Jeans mass is about 10^{32} kg, the order in magnitude of the mass of a star. For other density and temperature, we may have a Jeans mass about the mass of a planet, a galaxy, or a cluster, etc.



Fig. 2: Our universe contains billions of galaxies, each of which contains billions of stars (credit: kalilily.net). From the outside view, it is a black hole because nothing from the universe can escape.

1.2. Initiating Nuclei Fusion and Nucleosynthesis for Star Formation

At this moment of time, all astronomical or celestial objects formed are composed of mainly hydrogen atoms (may be ionized to be protons and electrons). They do not significantly shine or emit light because nuclear fusion could not occur due to that the Coulomb barrier between protons ($\sim 9.5 \times 10^9$ K or 820 keV) is too much higher than the temperature of celestial bodies (e.g. for the Sun, $\sim 1.67 \times 10^7$ K or 1.5 keV). The book of Genesis called these types of highly condensed celestial objects as dry ground or land as described above. The stars due to no fusion occurrences do not emit visible light and thus darkness or in the evening or night. Figure 3 shows the potential energy as a function of the radial distance between two protons, given by [20]

$$V(r) = \begin{cases} \frac{1}{4\pi\epsilon_0} \frac{e^2}{r}, & \text{if } r \geq a \\ -V_0, & \text{if } r < a \end{cases} \quad (2)$$

At $r = a \sim 1.78 \times 10^{-15}$ m, about the proton's diameter, one can find the Coulomb barrier (or the maximum potential energy) to be $V(a) = U = 820$ keV or 9.5 billions Kelvins. Here V_0 is the potential energy of the strong force with $-V_0 \gg U$.

In accordance with the Maxwell-Boltzmann distribution function [21, 22], the number of protons with energy from E to $E + dE$ in the object with temperature T can be determined by

$$dN = \frac{2\rho N_0}{(\rho k_B T)^{3/2}} \sqrt{E} \exp\left[-\frac{E}{k_B T}\right] dE, \quad (3)$$

where N_0 is the total number of protons. This distribution indicates that there is no single proton to be able to actually overcome the barrier in, for instance, a solar sized ($\sim 10^{30}$ kg) and hot ($\sim 10^7$ K) celestial body [23, 24]. No fusion could be happened in these dry grounds or lands appeared or formed from the collapses of the matters or waters. Figure 4 plots that

this reaction rate of protons in the Sun as a function of the core temperature [24]. It is seen that the reaction rate of protons is about zero (many orders in magnitude less than one proton per second), so that no nuclear fusion occurs in the core of the Sun if the core's temperature is equal to the conventional value $T_{\text{core}} = 1.67 \times 10^7$ K. For the reaction rate of protons to be the actually observed rate of 3.6×10^{38} protons per second, the temperature of Sun's core must be about 1.3×10^8 K or above. Therefore, from the classical physics, the solar nuclear fusion is hardly to occur.

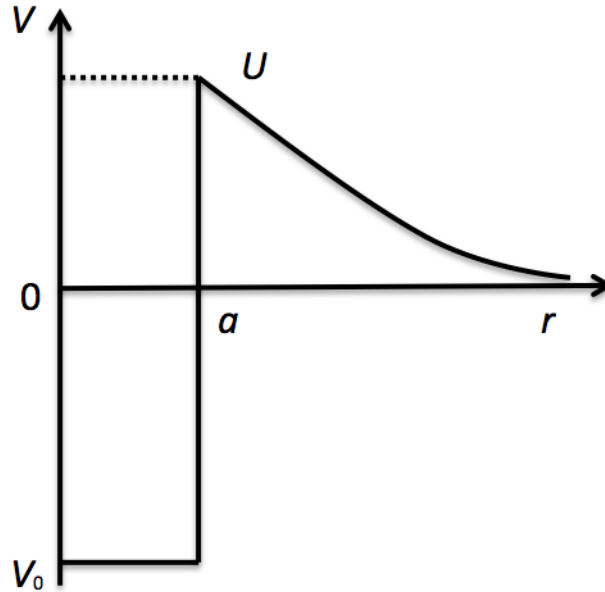


Fig. 3: The Coulomb barrier between two protons is given by $U = 820$ keV or 9.5 billion Kelvins. The temperature of the core of a celestial body such as the Sun is only 1.5 keV or 16.7 million Kelvins, about six hundred times lower than the barrier. In general a star size celestial object, before the fusion occurs, should have a lower temperature in comparison with a fusing one.

Then, to shine his created stars, God assigned particles of matter with also the wave property as the quantum physics has described. For a moving particle of mass m and speed v , the de Broglie wavelength of the particle is given by [25]

$$\lambda = \frac{h}{mv}, \tag{4}$$

where $h = 6.62 \times 10^{-34}$ (J s) is the Planck constant. The state of particle is described by a wave function $\Psi(\vec{r}, t)$, which is governed by the Schrodinger equation [26]

$$i\hbar \frac{\partial \Psi(\vec{r}, t)}{\partial t} = -\frac{\hbar^2}{2m} \nabla^2 \Psi(\vec{r}, t) + V(\vec{r})\Psi(\vec{r}, t), \tag{5}$$

and statistically interpreted as the wave of matter or probability. The $|\Psi(\vec{r}, t)|^2$ is the density of probability of finding the particle at the time t and the position \vec{r} . Meantime, light or radiation is set to have particle property and composed of photons, massless particles, whose energy is determined as [27, 28]

$$E = hf, \tag{6}$$

where f is the light frequency. Both matter and massless radiation have duality of particle and wave.

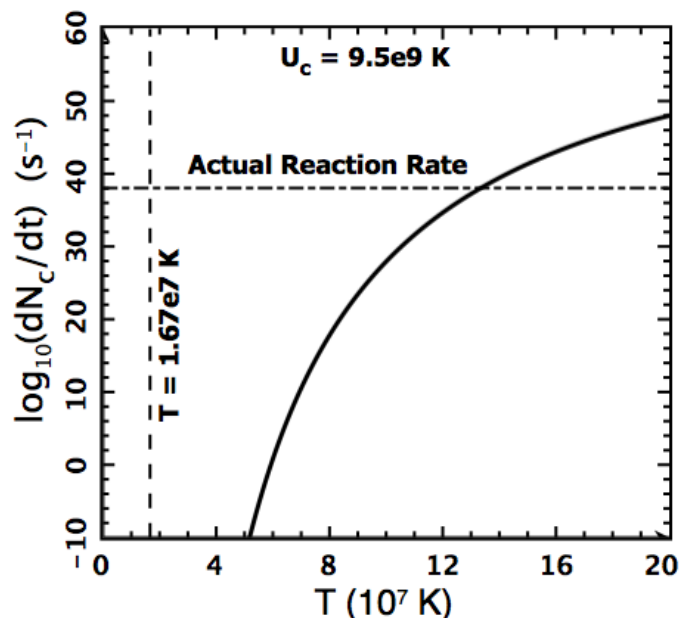


Fig. 4. The reaction rate of protons is plotted as a function of the Sun's core temperature in the case of without considering the quantum tunnelling effect [24]. The result indicates that no nuclear fusion can actually occur.

As particles behave like waves, quantum mechanics shows that particle waves can significantly tunnel through or penetrate the Coulomb barrier that is even though much higher than the energy of particle. This quantum tunnelling effect ignites or causes the start of nuclear fusion in the celestial bodies formed. According to the Gamow tunnelling probability [29]

$$P_g = \exp\left[-\sqrt{\frac{E_g}{E}}\right], \tag{7}$$

one can determine the number of protons with energy from E to $E + dE$ that can tunnel through or penetrate the Coulomb barrier as

$$dN_g = P_g dN, \tag{8}$$

where E_g is the Gamow energy given by

$$E_g = m_p c^2 (\rho \alpha)^2, \tag{9}$$

with m_p the proton mass, c the light speed in the vacuum, and α the fine-structure constant. This distribution (Eq. 8) exhibits a maximum called the Gamow peak that has energy to be hundred or more times less than the Coulomb barrier (Figure 5), so that the quantum tunneling effect greatly enhances the fusion reaction rate in the core of the astronomical objects and stars (e.g. the Sun). Taking the Sun as an example, we have that, without the quantum effect, the 10^{69} collisions among all (e.g. 10^{56}) protons in one second in the core of the Sun with temperature about 1.5 keV cannot have a single collision of overcoming the

Coulomb barrier. With the quantum effect, the percentage of tunneling through the Coulomb barrier raises to the order about one per million collisions (i.e. 10^{-6}). In other words, the 10^{63} collisions among the 10^{56} protons in one second in the core of the Sun may penetrate the Coulomb barrier and form diprotons. The rate of formation of deuterons from diprotons via the β^+ -decay must be about 10^{-25} s^{-1} in order for the fusion rate of diprotons to deuterons in the core of the Sun to be the order of $3.6 \times 10^{38} \text{ s}^{-1}$, so that the Sun can shine at the observed luminosity about $3.85 \times 10^{26} \text{ W}$.

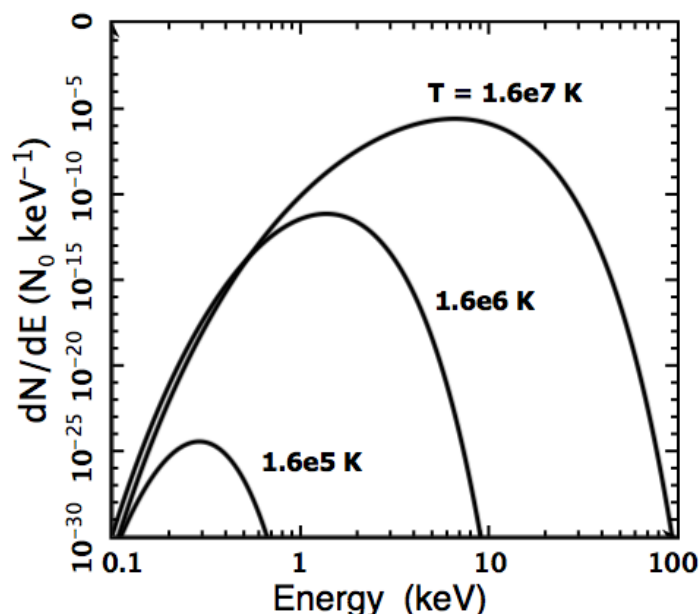


Fig. 5: Gamow peaks. The number of tunneling protons per unit energy in the core of astronomical object is plotted as a function of the proton energy in three cases of the core temperature.

However, as pointed out recently by the author [24], in the conventional analysis and calculation with the Fermi theory of the β^+ -decay, the significant wave function of two-scattering protons was usually used for the inefficient wave function of the diproton outside the potential energy well [30]. This is not physical and greatly weakens the wave function of the diproton inside the potential energy well, so that leads to the probability for a diproton to form a deuteron via a β^+ -decay to be extremely under calculated [24]. In other words, the rareness of β^+ -decay in diprotons may not be rare enough to inhibit the solar nuclear fusion or lower the fusion rate by an order of magnitude 25, in order to stop the Sun's instantaneous explosion and have the currently observed luminosity. Quantum tunneling effect allows many diprotons formed in the Sun's core, but the probability for a diproton to form a deuteron via a β^+ -decay may not be lower than that for a diproton to separate back to two protons by an order of magnitude 25. Observations have only given an upper bound that a diproton (or helium-2 nucleus) gets β^+ -decay by less than one per ten thousands, i.e. $< 0.01\%$ [31], which is many orders higher in magnitude than 10^{-25} .

Recently, the author of this paper has proposed a new mechanism of inhibition that can significantly reduce the fusion reaction rate and thus effectively prevent the Sun from an instantaneous explosion. It has been suggested that the core of the Sun involves a significant physical effect or inhibitor called plasma oscillation or wave, which significantly reduces the

electric permittivity of the core plasma. A significantly reduced electric permittivity will greatly raise the Coulomb barrier as well as efficiently lower the Gamow tunneling probability. These changes lead to the Gamow peak greatly shift to the region of higher energies of particles. Quantitative study by the author has indicated that, if the frequency ω of the plasma oscillations or waves that are globally generated in the core plasma of turbulences (e.g. Longmuir waves) is about 1.28 times the plasma frequency ω_p , the Sun can have the actual fusion rate or shine on at the currently observed luminosity, as shown in Figure 6. Therefore, in addition to the quantum tunneling effect, the plasma oscillations may play also an essential role in the Sun's nuclear fusion and power emission. The quantum tunneling effect makes the fusion to occur, while the plasma oscillations in association with the weak β^+ -decay of diprotons guarantees the Sun to be not exploded. The author also suggested that a supernova explosion occurs when plasma oscillations in the core of a star at the end of its life are significantly weakened in intensity or changed in frequency that cause the heavy ion fusion to be significantly speeded up and the huge amount of energies and neutrinos to be instantaneously emitted. The result of this study also gives important implications to plasma nuclear fusion in laboratory and solar neutrino missing problem.

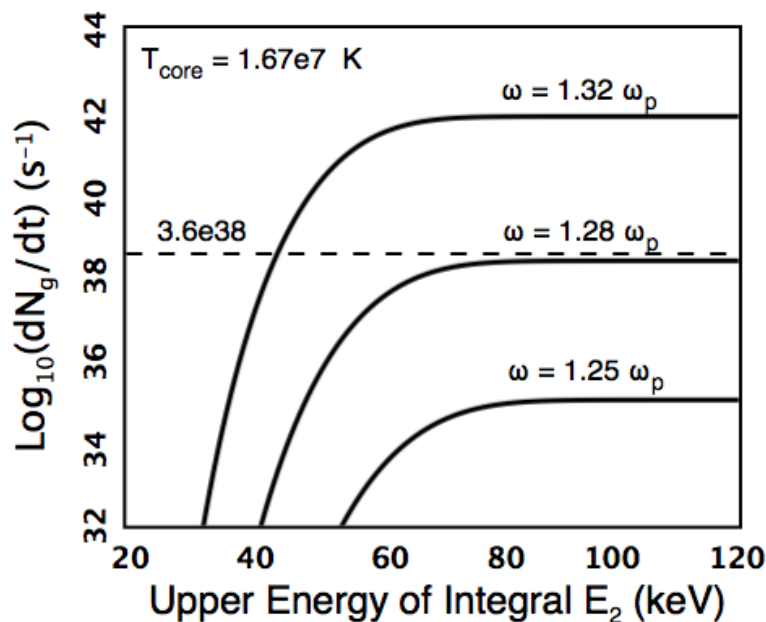


Fig. 6. The reaction rate of protons in the core of the Sun with the plasma oscillation effect [24]. The number of adequate collisions per second between protons is plotted as a function of the upper energy of the integration.

At the end of its life, a star runs out proton-proton fusion that varies the plasma composition and oscillations, so that cause the proposed efficient inhibition of plasma fusion reaction to be ineffective. When plasma oscillations in the core of a star at the end of its life are significantly weakened in intensity or changed in frequency, fusion reactions among heavy nuclei will be significantly speeded up and out of control that leads to huge amount of energies and neutrinos to be instantaneously emitted. This provides us another alternative mechanism for supernova explosions, in addition to the previously proposed and well-developed models of supernova explosions driven by magnetohydrodynamic (MHD)

rotation [32], acoustic waves [33], neutrinos [34], and gravitational field shielding [35]. After supernova explosion, the core of a star forms a black hole if the star's initial mass is over 20 solar masses, otherwise forms a neutron star. A star with mass less than 8 solar masses usually ends as a white dwarf after most of its outer material is expelled. The existence of black hole in the nature was recently conformed by LIGO, which first ever detected gravitational waves from mergers of binary black holes [36]. The observational discovery of neutron stars was done in the middle of the 1960s from the measurement of pulse-like radio emissions from the Crab Nebula [37,38]. The conventional interpretation to the observed pulse-like radio emissions was based on the lighthouse model of pulsars as fast rotating neutron stars [39]. Recently, the author developed a physical model of pulsars as gravitational field shielding and oscillating neutron stars [40] and quantitatively interpreted the emission characteristics of pulsars, in accordance with the author well-developed 5D fully covariant theory of gravitation [41] and the physics of radiation from thermal and accelerating charged particles [42], as shown in Figure 7.

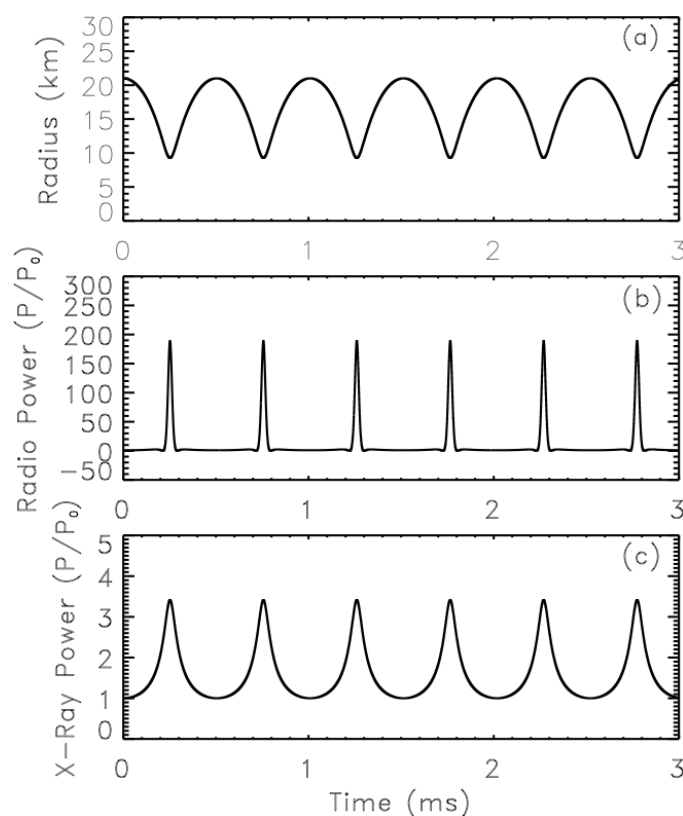


Fig. 7. Oscillation of a neutron star with 1.5 solar masses versus synchronous emissions of the Dirac Delta shape radio pulses and the Lorentzian shape X-ray oscillations [40]. The radial distance (a), the power of radio emission (b), and the power of X-ray emission (c) are plotted as functions of time.

At the center of a galaxy, there in general exists a massive black hole. The Sagittarius (Sgr) A* is believed to be a massive black hole with 4.3 million solar masses at the center of the Milky Way [43,44]. It is usually quite and faint, but occasionally emit intensive flares of X-rays. Recently, NASA Chandra X-ray Observatory and other missions such as Swift,



NuStar, XMM-Newton, and Roast have discovered intensive and rapid X-ray flares, at a rate of about once a day from Sgr A*, with luminosity at the peak up to a few times 10^{35} erg/s [45,46]. To explain the mysterious X-ray flares, astronomers have suggested that there exists a gas cloud around Sgr A* containing hundred-trillions of asteroids, comets, and planets that are stripped from their parent stars by the tidal forces of the massive black hole. When these objects rain down or are accreted onto the massive black hole, X-ray flares take place via physical processes such as the non-thermal synchrotron emission [47], the inverse-Compton scattering [48], and stochastic electron acceleration [49]. To emit the high-energy X-rays detected, an object that was striped from its parent star had to be torn apart into gases during its falling and the gases when arriving nearly at the massive black hole had to spike to hundreds of million degrees Celsius, which is ten or more times hotter than the center of the Sun. However, why the gases heat up so suddenly and efficiently on a regular basis is still poorly understood. Especially, Sgr A* may not be able to gravitationally tear an asteroid into parts as small as a human body, because the gravitational field difference between the head and feet of a 2-meter height person, who stands on Sgr A* surface is only 10^{-3} m/s². Up to the date, astrophysicists are still out on what really caused these giant X-ray flares from Sgr A*. The mechanism for the origin of X-ray flares from the galactic center is still a mystery and in pending for a physical explanation. Recently, the author developed a new mechanism for X-ray flares from Sgr A* as emissions of dynamic massive black hole at the Milky Ways center, in accordance with the author well-developed black hole model of the universe [12]. An any sized black hole, when accreting matter, becomes dynamic and breaks its event horizon, which leads to the inside hot (or high-frequency) blackbody radiation leaking out of it and produces an X-ray flare or burst. The energies and spectra of X-rays calculated can explain the current measurements of X-ray flares from Sgr A* including its steady emissions (Figure 8). It also predicts big events that possibly occurred in the past or will possibly occur in future at our galactic center, and compare the predicted intensive events with the measurements of strong X-ray flares from other normal and active galactic centers.

Quasars are quasi-stellar objects, from which light is extremely shifted toward the red [50]. Quasars are generally believed to be extremely luminous galactic centers powered by supermassive black holes with masses up to billions of solar masses [51]. It is usually suggested that the material (e.g., gas and dust) falling into a supermassive black hole is subjected to enormous pressure and thus heated up to millions of degrees, where a huge amount of thermal radiation including waves, light, and X-rays give off [52]. However, the density of the falling material, if it is less dense than the supermassive black hole, is only about that of water. In other words, the pressure of the falling gas and dust may not go such high required for a quasar to emit energy as amount of that emitted by hundred billions of the Sun. The author proposed a possible explanation for quasars to ignite and release a huge amount of energy in accord with the black hole universe model [5]. General relativity tells us that a main sequence star will, in terms of its mass, form a dwarf, a neutron star, or a black hole. After many stars in a normal galaxy have run out of their fuels and formed dwarfs, neutron stars, and black holes, the gravity cause the galaxy to eventually collapse and form a supermassive black hole with billions of solar masses. It has been shown that this collapse can lead to the extremely hot stellar black holes to merge each other and further into the massive black hole at the center and release intense thermal radiation energy as great as a quasar emits. When the stellar black holes of a galaxy collapse and merge into a supermassive black hole, the galaxy is activated and a quasar is born (Figure 9). The observed distant quasars were donuts from the mother universe. They were actually formed

in the mother universe as little sisters of our universe. After the quasars entered our universe, they became our universe's child universes. The results from this quasar model are consistent with observations. In addition, the author developed a new redshift mechanism called electric redshift in terms of his 5D fully covariant theory of gravitation to alternatively explain the non-cosmological components of quasar large redshifts [53].

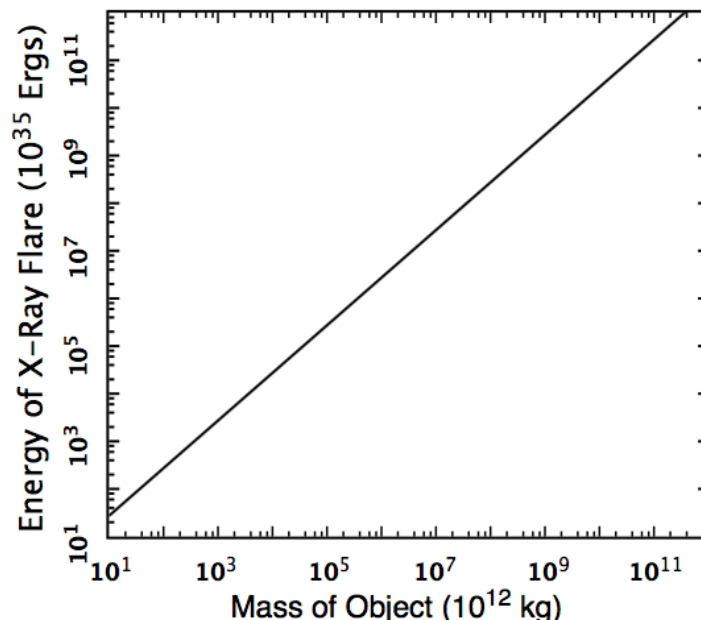


Fig. 8: The energy of X-ray flares from Sgr A* versus the mass of the object accreted [12].

2.3. Creating Plants and Trees on Our Earth

¹¹Then God said, "Let the land produce vegetation: seed-bearing plants and trees on the land that bear fruit with seed in it, according to their various kinds." And it was so. ¹²The land produced vegetation: plants bearing seed according to their kinds and trees bearing fruit with seed in it according to their kinds. And God saw that it was good. ¹³And there was evening, and there was morning - the third day. Here God chose one land (i.e. celestial body or planet) that he created as our land or our Earth to produce plants and trees that bear fruits with seeds according to their various kinds. God let our Earth produce or grow vegetation, including plants that bear seeds according to their kinds and trees that bear fruits with seeds in them according to their kinds. Since this part does not belong to physical science, the author cannot appropriately describe the details. Therefore, the third day was the day of structuring the interiors of our finite black hole universe by creating celestial objects from the gravitationally collapsing matter such as stars including planets and our Earth, on which plants and vegetation were produced. To shine the stars, God assigned matter and light or massless radiation with duality of particle and wave. This leads to fusion reaction to occur in the core of stars and power emissions from the stars. It was the time for God to form stars (lightness or day) including galaxies (seas of stars) and clusters (seas of galaxies) from the initial waters (darkness or night) and to create our planet, the Earth, that grows plants and vegetation.

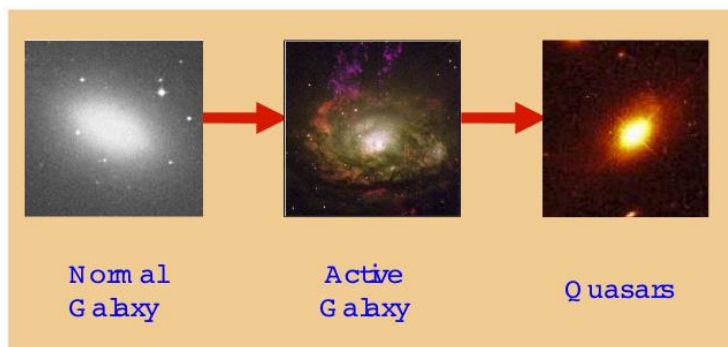


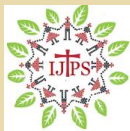
Fig. 9: Formation of quasars [5]. A normal galaxy evolves into an active one and ends by a quasar (Credit: Images of Hubble Space Telescope).

CONCLUSION

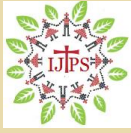
We have interpreted the third day of Genesis as the day of forming stars including planets, galaxies, and clusters in our finite black hole universes. In the third day, God constructed the interiors of our finite black hole universe. The work includes the formation of celestial objects by gathering the waters or gravitationally collapsing the initial super fluidal matter under the sky or inside the even horizon of our black hole universe. These formed celestial objects could be stars and planets called dry grounds or lands, in which matter is not in the water state any more, and galaxies and clusters called, respectively, seas of stars and seas of galaxies. Stars luminously shine when fusion occurs after particles of matter were assigned with the wave property. God further selected one land (i.e. our Earth) for plants to grow and further for humans to live.

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WHAT CAN EARTH HISTORY AND EVOLUTION TELL ABOUT THE CREATOR OF THE UNIVERSE?

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ABSTRACT

Conclusions about the Creator of the universe are drawn from the evolution and diversity of living beings. Furthermore, four events of the Earth's history are addressed. From them, it can be concluded that the Creator actively intervened in the history of the Earth to promote the development of intelligent life. Following characteristics of the Creator are observed: He is patient, creates an exuberant fullness, and gives freedom to his creation. He uses causal links and seemingly random events to steer the course of his creation. The Creator is in constant dialogue with his creation to lead it into ever greater abundance and freedom. He uses evolutionary processes, which are not goal-oriented, to achieve his goals. The observed characteristics of the Creator fit very well with the Judeo-Christian God. The question is raised whether the Creator is timeless or not.

Keywords: Earth history; intelligent life, palaeontology; Christianity; freedom; dialogue; natural theology; theistic evolution;

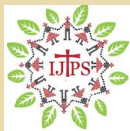
INTRODUCTION

Many people of our planet are convinced that this universe has a Creator, a transcendent superior intelligence. There are different ways to learn more about this Creator: religious revelations, philosophical reflections, and observation of the nature that surrounds us. The ways of religious revelation and philosophical reflection have been taken for a long time; however, they have the disadvantage that their intersubjective verifiability is more or less limited. Since the rise of the natural sciences, therefore, a third way – the study of nature – has become increasingly important and there is a great deal of literature on it. This study of nature is based on the assumption that “some aspects of the natural world reflect something about its creator.”¹

In the attempt to obtain clues through the observation of nature, as to whether there is a transcendent Creator of the universe and what properties he might have, astronomical and physical topics – such as quantum physics, fundamental physical constants and the origin of the universe – are often considered in the literature. I would like to mention in particular:

- It seems that there is a “fine-tuning” of the fundamental physical constants that are necessary for the development of life. Various authors derive the anthropic principle

¹ Rope Kojonen, R. “Natural theology in evolution: a review of critiques and changes”, in *European Journal for Philosophy of Religion* 9 (2017), p. 87.



from this observation – Barrow and Tipler deserve special mention.² A critical overview of the literature on the anthropic principle is provided by Mosterín.³ For many authors, this “fine-tuning” proves the existence of an intelligent Creator.⁴

- Another research area derives from Heisenberg's uncertainty principle. It is not possible to predict exactly the position and motion of a particle at the same time, but one can only indicate probabilities.⁵ Quantum physics brings indeterminacy into the universe.⁶ Therefore, the future is no longer clearly calculable. Peters even goes so far as to say that the indeterminacy of quantum physics is a necessary prerequisite for human freedom.⁷ Furthermore, several authors argue that the Creator of the universe could use the indeterminacy of quantum physics to intervene in this immanent universe without coming into conflict with any laws of nature.⁸

These are topics where the time component does not play such a big role.

However, in this article, I analyse topics for which the course of time is of essential importance, namely the history of the Earth as well as the evolution of living beings and the

² John D. Barrow / Frank J. Tipler, *The Anthropic Cosmological Principle*, Oxford University Press, Oxford, 1988.

³ Jesús Mosterín, “Anthropic explanations in cosmology”, in Petr Hájek, Luis Valdés-Villanueva, and Dag Westerståhl (eds.), *Logic, Methodology and Philosophy of Science: Proceedings of the Twelfth International Congress*, College Publications, London, 2004, pp. 441-472.

⁴ Alister E. McGrath, *A Fine-Tuned Universe: The Quest for God in Science and Theology*, Westminster John Knox Press, London, 2009; Tim J. Mawson, “Explaining the fine tuning of the universe to us and the fine tuning of us to the universe”, in *Royal Institute of Philosophy Supplements* 6 (2011), pp. 25-50; Glenn Siniscalchi, “Fine-tuning, atheist criticism, and the fifth way”, in *Theology and Science* 12 (2014), pp. 64-77; Roger Tucker, “Fine tuning mission to reach those influenced by Darwinism”, in *Verbum et Ecclesia* 35 (2014), a891, <https://doi.org/10.4102/ve.v35i1.891>, 06.05.2021; David H. Glass and Mark McCartney, “Explaining and explaining away in science and religion”, in *Theology and Science* 12 (2014), pp. 338-361; Walter L. Bradley, “The fine tuning of the universe: evidence for the existence of God?”, in *Perspectives on Science and Christian Faith* 70 (2018), pp. 147-160; Jason Waller, *Cosmological Fine-Tuning Arguments: What (if Anything) Should We Infer from the Fine-Tuning of Our Universe for Life?*, Routledge, London, 2019; Richard Swinburne, *The Existence of God. Second Edition*, Oxford University Press, Oxford, 2004, pp. 172-188.

⁵ Charles H. Townes, “Basic puzzles in science and religion”, in Ted Peters and Nathan Hallanger (eds.), *God's Action in Nature's World, Essays in Honour of Robert John Russell*, Ashgate, Aldershot, UK, 2006, p. 130.

⁶ George F. R. Ellis, “Necessity, purpose, and chance”, in Robert John Russell and Joshua M. Moritz (eds.), *God's Providence and Randomness in Nature: Scientific and Theological Perspectives*, Templeton Press, West Conshohocken, PA, 2019, pp. 21-68; Dillard W. Faries, “A personal God, chance, and randomness in quantum physics”, in *Perspectives on Science and Christian Faith* 66 (2014), pp. 13-22; Chris Barrigar, “God's agape/probability design for the universe”, in *Perspectives on Science and Christian Faith* 70 (2018), pp. 163-164.

⁷ Ted Peters, “Contingency and freedom in brains and selves”, in Robert John Russell and Joshua M. Moritz (eds.), *God's Providence and Randomness in Nature: Scientific and Theological Perspectives*, Templeton Press, West Conshohocken, PA, 2019, pp. 278-280.

⁸ Charles H. Townes, “Basic puzzles”; Marcos Ruiz Soler and Ignacio Núñez de Castro, “La kénosis del Dios trinitario: reflexiones desde la teología de la naturaleza”, in *Estudios Eclesiásticos, Revista de investigación e información teológica y canónica* 92, no. 360, (2017), pp. 61-62; George L. Murphy, “The nuts and bolts of creation”, in *Perspectives on Science and Christian Faith* 70 (2018), p. 57; Daekyung Jung, “The RNA world and divine action in and through quantum mechanics”, in *Theology and Science* 16 (2018), pp. 498-519; Ted Peters, “Science and Religion: Ten Models of War, Truce, and Partnership”, in *Theology and Science* 16 (2018), pp. 31-34; Robert John Russell, *Cosmology from Alpha to Omega: The Creative Mutual Interaction of Theology and Science*, Fortress Press, Minneapolis, 2008; Robert John Russell, “What we've learned from quantum mechanics about noninterventionist objective divine action in nature – and its remaining challenges”, in Robert John Russell and Joshua M. Moritz (eds.), *God's Providence and Randomness in Nature: Scientific and Theological Perspectives*, Templeton Press, West Conshohocken, PA, 2019, pp. 133-172.



resulting diversity of forms. This broadening of the view opens up new perspectives on topics that have been discussed in literature since long time.

First, I will briefly outline the diversity of living beings on Earth today and their evolution. Second, I will describe four events in the history of the Earth which were necessary for the present diversity of living beings and the present human civilisation to develop. I will explain why they can be interpreted as interventions of the Creator of the universe. Then I will use these data to derive important characteristics of the Creator. A Creator will become visible, who leads his creation in a constant dialogue to ever greater freedom and abundance. These character traits fit very well with the God of Judaism and Christianity. Finally, I will discuss three specific aspects of the assumption of a dialogue between the Creator and the creation.

1. EVIDENCE FROM BIOLOGY AND PALAEOLOGY

1.1. The diversity of life

Today the planet Earth is inhabited by an abundance of different living beings, an exuberant diversity of forms that biology has not yet been able to grasp fully. Many people do not adequately perceive this diversity of forms because they lack the necessary biological knowledge. What at first glance looks like one kind of living being often comprises many very different species. As an example I would like to take my home country Germany: Let us look at the frequent living beings grass, beetle and mouse. In Germany there are several hundred grass species, 7,000 beetle species and dozens of species of mouse-like small mammals. And yet Germany is anything but a hot spot of biodiversity.

Another example is that more than 22,000 orchid species are known worldwide.⁹ But orchids are only one family of the flowering plants (phylum Anthophyta) and flowering plants are only one phylum of the kingdom Plantae. In addition to the kingdom Plantae exist the kingdom Animalia, the kingdom Fungi, the kingdom Protista (unicellular organisms with nucleus), and the kingdom Monera (unicellular organisms without nucleus).¹⁰ According to Chapman, if all the kingdoms of living beings are taken together, 1.9 million (!) species are known and it is supposed that a total of 11 million different species exist in the world today.¹¹ Mora et al. come to similar numbers.¹²

Breaking down these numbers, there are at least 4,300 species of mammals and at least 9,000 species of birds on our planet today, but that is little compared to the million species of insects.¹³ The kingdom Animalia has a total of 1.4 million species, while the kingdom Plantae has 310,000 species. Of these, 268,000 species are flowering plants.¹⁴ Furthermore, it should be noted that Rödder, Ziegler, and Falk estimate that in total as many as 180 million animal species have existed over the entire history of the Earth.¹⁵

⁹ Jing Cai et al., "The genome sequence of the orchid *Phalaenopsis equestris*", in *Nature genetics* 47 (2015), p. 65.

¹⁰ Neil A. Campbell / Jane B. Reece, *Biology*, 6th ed., Pearson Education, San Francisco, 2002, pp. 522-523.

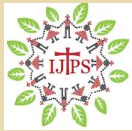
¹¹ Arthur D. Chapman, *Numbers of Living Species in Australia and the World*, 2nd ed., Canberra, Australia, 2009, p. 11.

¹² Camilo Mora et al., "How many species are there on earth and in the ocean?", in *PLoS Biology* 9, no. e1001127 (2011), pp. 1-8, <https://doi.org/10.1371/journal.pbio.1001127>, 06.05.2021.

¹³ Arthur D. Chapman, *Numbers of Living*.

¹⁴ Arthur D. Chapman, *Numbers of Living*.

¹⁵ Gerhard Rödder, Fred-Karsten Ziegler, and Eberhard Falk, "Wie viele Arten? Der Stand der Forschung gegen Ende des Jahrhunderts", in *Paläontologische Zeitschrift* 67 (1993), p. 220.



1.2. Evolution

For over 200 years, biology and palaeontology have been providing an overwhelming wealth of evidence that the diversity of living beings observable today has evolved in geological periods from other, more primitive organisms and that probably all living beings on this planet had the same living cell as their first ancestor.

The first reliable evidence of life are structures in 3.7 billion years old sediments that were produced by bacteria or similar microbes.¹⁶ Fossils of dividing bacteria have been found in sediments 3.4 billion years old.¹⁷ At first, the evolution of life was very slow, but since the beginning of the Cambrian, 541 million years ago, it has accelerated. By studying the fossils, palaeontology can confirm that the diversity of living organisms observable today and in Earth history has evolved from a small number of body plans.¹⁸

Whereas palaeontologists can only say something about the evolution of those living beings of which fossils are known, biology can also make far-reaching statements by examining the DNA. It is a well-founded hypothesis that all living beings today are descendants of a single very primitive living cell. If one compares the sequence of the nucleic bases in a certain DNA strand between different organisms, one can recognise when the common ancestors of these organisms separated from each other. The result is a family tree with a kind of “molecular clock”,¹⁹ whose abstract times can be converted into years by comparing corresponding fossil finds. As a result of these investigations, Betts et al. come to the conclusion that the last common ancestor of all living beings on Earth existed more than 3.9 billion years ago.²⁰ This would mean that life on Earth must have arisen shortly after the Earth's crust had cooled to such an extent that the condensing water could fill the first oceans. The diversity of life on Earth, including us humans, has developed from this first primitive cell.

2. IMPORTANT EVENTS IN EARTH'S HISTORY

In order for the first primitive living cell to develop into today's abundance and diversity of life and human civilisation, various extraordinary circumstances and events were necessary throughout the history of the Earth. In the following I would like to highlight four events in particular and explain why they were necessary.

I limit myself here to events that have something extraordinary about them. That is why I will not mention here that, about 2.8 million years ago *Australopithecus afarensis* split into two lines: on the one hand, the line that leads to us; on the other hand, the line of *Paranthropus*.²¹ Although this event was of central importance for the emergence of the

¹⁶ Allen P. Nutman et al., “Rapid emergence of life shown by discovery of 3,700-million-year-old microbial structures”, in *Nature* 537 (2016), pp. 535-538.

¹⁷ Frances Westall et al., “Early Archean fossil bacteria and biofilms in hydrothermally-influenced sediments from the Barberton greenstone belt, South Africa”, in *Precambrian Research* 106 (2001), pp. 93-116; Scott Freeman / Jon C. Herron, *Evolutionary analysis*, 3rd ed., Pearson Education, Upper Saddle River, NJ, 2003, p. 638.

¹⁸ Neil A. Campbell / Jane B. Reece, *Biology*, pp. 635-643.

¹⁹ Scott Freeman / Jon C. Herron, *Evolutionary analysis*, p. 571.

²⁰ Holly C. Betts et al., “Integrated genomic and fossil evidence illuminates life's early evolution and eukaryote origin”, in *Nature Ecology & Evolution* 2 (2018), pp. 1556-1562.

²¹ Friedemann Schrenk and Timothy G. Bromage, “Origins of hominin biocultural diversity”, in Nicole Rupp et al. (eds.), *Winds of Change: Archaeological Contributions in Honour of Peter Breunig*, Verlag Dr. Rudolf Habelt, Bonn, 2017, pp. 409-419 (pp. 412-414); Zeresenay Alemseged et al., “Fossils from Mille-Logya, Afar, Ethiopia, elucidate the link between Pliocene environmental changes and *Homo* origins”, in *Nature Communications* 11, no. 2480 (2020), pp. 1-12, <https://doi.org/10.1038/s41467-020-16060-8>, 04.05.2021;



genus *Homo*, it can be explained simply by the fact that two different populations of *Australopithecus afarensis* reacted in different ways to the climate-induced increase in the grass-rich savannah. In the ancestors of *Paranthropus*, natural selection led to a strengthening of the dentition and chewing muscles to be able to chew harder plant food. In contrast, our ancestors learned to use tools to work the food and they increased meat consumption.²²

2.1. Collision with a Mars-sized body

About 4.53 billion years ago, a body about the size of Mars collided with Earth.²³ This unimaginably violent collision released an enormous amount of energy and caused the following:

- Our moon was formed.²⁴
- The planet Earth was melted down to the core and the heavy metals sank down. In this way developed the present zonation of Earth's interior with a solid metallic inner core and a liquid metallic outer core.²⁵
- The Earth's axis of rotation is no longer perpendicular to the Earth's orbit around the Sun, but inclined against it (axial tilt).²⁶

Even without the gigantic collision with a Mars-sized body there probably would be life on Earth. Nevertheless, the above mentioned consequences of this collision have been very beneficial for the evolution of a diverse life on Earth:

- The interaction between the solid metallic inner core and the liquid metallic outer core creates the strong magnetic field of the Earth. This magnetic field protects us

Andrew Du et al., "Statistical estimates of hominin origination and extinction dates: A case study examining the *Australopithecus anamensis-afarensis* lineage", in *Journal of Human Evolution* 138, no. 102688 (2020), pp. 1-13, <https://doi.org/10.1016/j.jhevol.2019.102688>, 30.04.2021.

²² Vincent Balter et al., "Evidence for dietary change but not landscape use in South African early hominins", in *Nature* 489 (2012), pp. 558-560.

²³ David J. Stevenson, "Origin of the moon – The collision hypothesis", in *Annual Review of Earth and Planetary Science* 15 (1987), pp. 271-315; Alex N. Halliday, "Terrestrial accretion rates and the origin of the Moon", in *Earth and Planetary Science Letters* 176 (2000), pp. 17-30; Daniel Herwartz et al., "Identification of the giant impactor Theia in lunar rocks", in *Science* 344 (2014), pp. 1146-1150; Charles F. Gammie, Wei-Ting Liao, and Paul M. Ricker, "A hot big bang theory: magnetic fields and the early evolution of the protolunar disk", in *The Astrophysical Journal* 828 (2016), pp. 1-9, <https://iopscience.iop.org/article/10.3847/0004-637X/828/1/58/meta>, 28.04.2021; Edward D. Young et al., "Oxygen isotopic evidence for vigorous mixing during the Moon-forming giant impact", in *Science* 351 (2016), pp. 493-496; Frank Press / Raymond Siever, *Understanding Earth*, 3rd ed., W. H. Freeman and Company, New York, 2000, pp. 8-9; Martin Redfern, *50 Schlüsselideen Erde*, Quercus Books, London 2014, p. 8; John W. Valley et al., "Hadean age for a post-magma-ocean zircon confirmed by atom-probe tomography", in *Nature Geoscience* 7 (2014), pp. 219-223.

²⁴ David J. Stevenson, "Origin of the moon"; Alex N. Halliday, "Terrestrial accretion rates"; Robin M. Canup and Erik Asphaug, "Origin of the Moon in a giant impact near the end of the Earth's formation", in *Nature* 412 (2001), pp. 708-712; Daniel Herwartz et al., "Identification of the giant"; Charles F. Gammie, Wei-Ting Liao, and Paul M. Ricker, "A hot big bang"; Edward D. Young et al., "Oxygen isotopic evidence"; Joseph L. Spradley, "Ten lunar legacies: Importance of the Moon for life on Earth", in *Perspectives on Science and Christian Faith* 62 (2010), pp. 267-275.

²⁵ Frank Press / Raymond Siever, *Understanding Earth*, pp. 9-10; Martin Redfern, *50 Schlüsselideen Erde*, pp. 9; Douglas Rumble et al., "The oxygen isotope composition of earth's oldest rocks and evidence of a terrestrial magma ocean", in *Geochemistry, Geophysics, Geosystems* 14 (2013), pp. 1929-1939; John W. Valley et al., "Hadean age".

²⁶ Joseph L. Spradley, "Ten lunar legacies", pp. 269-270.



from high-energy charged particles from space (such as the solar wind), because it captures these particles in the so-called “Van Allen belts”.²⁷

- The axial tilt of the Earth's axis causes seasons on Earth.
- Due to the existence of the moon, we have the tides on Earth – ebb and flow.

Only because of this collision do we have tides, seasons and the Van Allen belts, which protect us from high-energy charged particles from space. Without the Van Allen belts as well, primitive life could have originated in the oceans. Nevertheless, the high-energy charged particles from space would have prevented or at least made very difficult the leaving of the water. Seasons and tides cause changes in environmental conditions that can stimulate the further evolution and diversification of living beings. In consequence, without this gigantic collision life on Earth would not have evolved as far and as diverse as it is today, on an Earth without seasons, without tides and especially without the protective Van Allen belts.

2.2. Oxygen content of the atmosphere

Over the last 4 billion years, always most of the water on Earth has been in a liquid state. This is absolutely necessary for the emergence and evolution of life. Nevertheless, the Sun's brightness has increased by about 25 percent over the past 4.5 billion years.²⁸ Had we had an atmosphere of today's composition 4 or 3 billion years ago, all water on Earth would have frozen to ice. Fortunately, at that time we had an atmosphere without free oxygen, which produced a much stronger greenhouse effect.²⁹ Therefore, despite the weaker sun, the Earth had a life-friendly temperature.

The invention of water-splitting photosynthesis by cyanobacteria released oxygen. 2.4 billion years ago, the atmosphere contained a significant amount of oxygen.³⁰ The more oxygen there was in the atmosphere, the less was the greenhouse effect. If water-splitting photosynthesis had been invented much earlier, or if too much oxygen had been produced too early, our planet and life on it would literally have frozen. But if the production of oxygen had started much later, or had been too low, life on Earth probably would have died through overheating...

2.3. Mass extinction at the end of the Cretaceous period

The extinction at the end of the Cretaceous period, 66 million years ago, wiped out 76 percent of all species,³¹ including all dinosaurs. Today, there is no doubt that this mass extinction was caused by the impact of a giant asteroid, which was probably 6–10 kilometres

²⁷ Martin Redfern, 50 Schlüsselideen Erde, p. 37; Joseph L. Spradley, “Ten lunar legacies”, p. 270.

²⁸ Tjeerd H. van Andel, *New Views on an Old Planet: A History of Global Change*, 2nd ed., Cambridge University Press, Cambridge, 1994, p. 287; David C. Catling and Kevin J. Zahnle, “The Archean atmosphere”, in *Science Advances* 6, no. eaax1420 (2020), p. 8, <https://advances.sciencemag.org/content/6/9/eaax1420>, 20.04.2021.

²⁹ Tjeerd H. van Andel, *New Views*, pp. 280-289; David C. Catling and Kevin J. Zahnle, “The Archean atmosphere”.

³⁰ Andrew H. Knoll and Martin A. Nowak, “The timetable of evolution”, in *Science Advances* 3, no. e1603076 (2017), p. 2, <https://advances.sciencemag.org/content/3/5/e1603076>, 24.04.2021; Lewis J. Alcott, Benjamin J. W. Mills, and Simon W. Poulton, “Stepwise Earth oxygenation is an inherent property of global biogeochemical cycling”, in *Science* 366 (2019), pp. 1333-1337; David C. Catling and Kevin J. Zahnle, “The Archean atmosphere”.

³¹ David Jablonski, “Extinctions: A paleontological perspective”, in *Science* 253 (1991), p. 755.



in diameter. When this asteroid hit the Earth, it produced the Chicxulub crater in the north of the Yucatan peninsula in Mexico.³²

While the dinosaurs lived, the mammals were small and only of minor importance. Maor et al. believe that nocturnality may have allowed mammals to avoid antagonistic interactions with diurnal dinosaurs.³³ The dominance of dinosaurs prevented the further diversification and evolution of mammals. Only after the extinction of the dinosaurs were the mammals able to develop their present diversity and importance.³⁴ If this asteroid had passed the Earth, dinosaurs would probably still dominate the world now and the most highly developed primates would not be humans, but the prosimians!

2.4. Interbreeding with Neanderthals

All races and tribes of the modern-day *Homo sapiens* who live outside Africa or north of the Sahara are descendants of a single group from Northeast Africa who emigrated from Africa about 70,000 years ago.³⁵ Shortly after this group of *Homo sapiens* emigrated from Africa, about 55,000–60,000 years ago, they interbred with the Neanderthal *Homo neanderthalensis* in the Near or Middle East.³⁶ Hence, all non-Africans today have about 2%

³² David A. Kring, “The Chicxulub impact event and its environmental consequences at the Cretaceous-Tertiary boundary”, in *Palaeogeography, Palaeoclimatology, Palaeoecology* 255 (2007), pp. 4-21; Frank Press / Raymond Siever, *Understanding Earth*, pp. 559-561; Scott Freeman / Jon C. Herron, *Evolutionary analysis*, pp. 686-691; Martin Redfern, *50 Schlüsselideen Erde*, pp. 168-171; Alfio Alessandro Chiarenza et al., “Asteroid impact, not volcanism, caused the end-Cretaceous dinosaur extinction”, in *Proceedings of the National Academy of Sciences of the United States of America* 117 (2020), pp. 17084-17093.

³³ Roi Maor et al., “Temporal niche expansion in mammals from a nocturnal ancestor after dinosaur extinction”, in *Nature Ecology & Evolution* 1 (2017), pp. 1889-1895.

³⁴ Robert W. Meredith et al., “Impacts of the Cretaceous terrestrial revolution and KPg extinction on mammal diversification”, in *Science* 334 (2011), pp. 521-524; Maureen A. O’Leary et al., “The placental mammal ancestor and the post-K-Pg radiation of placentals”, in *Science* 339 (2013), pp. 662-667; Thomas John Dixon Halliday, Paul Upchurch, and Anjali Goswami, “Eutherians experienced elevated evolutionary rates in the immediate aftermath of the Cretaceous–Palaeogene mass extinction”, in *Proceedings of the Royal Society B* 283, no. 20153026 (2016), pp. 1-8, <https://doi.org/10.1098/rspb.2015.3026>, 11.05.2021; Christopher A. Emerling, Frédéric Delsuc, and Michael W. Nachman, “Chitinase Genes (CHIAs) provide genomic footprints of a post-Cretaceous dietary radiation in placental mammals”, in *Science Advances* 4, no. eaar6478 (2018), pp. 1-10, <https://advances.sciencemag.org/content/4/5/eaar6478>, 20.04.2021.

³⁵ Scott Freeman / Jon C. Herron, *Evolutionary analysis*, pp. 752-759; Pedro Soares et al., “The expansion of mtDNA haplogroup L3 within and out of Africa”, in *Molecular Biology and Evolution* 29 (2012), pp. 915-927; Qiaomei Fu et al., “A revised timescale for human evolution based on ancient mitochondrial genomes”, in *Current Biology* 23 (2013), pp. 553-559; Luca Pagani et al., “Tracing the route of modern humans out of Africa by using 225 human genome sequences from Ethiopians and Egyptians”, in *The American Journal of Human Genetics* 96 (2015), pp. 986-991; Anna-Sapfo Malaspinas et al., “A genomic history of Aboriginal Australia”, in *Nature* 538 (2016), pp. 207-214; Ludovica Molinaro and Luca Pagani, “Human evolutionary history of Eastern Africa”, in *Current Opinion in Genetics & Development* 53 (2018), pp. 134-135.

³⁶ Richard E. Green et al., “A draft sequence of the Neanderthal genome”, in *Science* 328 (2010), pp. 710-722; Qiaomei Fu et al., “Genome sequence of a 45,000-year-old modern human from western Siberia”, in *Nature* 514 (2014), pp. 445-449; Anna-Sapfo Malaspinas et al., “A genomic history”; Michael Dannemann and Fernando Racimo, “Something old, something borrowed: admixture and adaptation in human evolution”, in *Current Opinion in Genetics & Development* 53 (2018), pp. 1-8, <https://doi.org/10.1016/j.gde.2018.05.00>, 04.05.2021; Melinda A. Yang and Qiaomei Fu, “Insights into modern human prehistory using ancient genomes”, in *Trends in Genetics* 34 (2018), pp. 184-196; João C. Teixeira and Alan Cooper, “Using hominin introgression to trace modern human dispersals”, in *Proceedings of the National Academy of Sciences of the United States of America* 116 (2019), pp. 15327-15332; David L. Wilcox, “Genetic insights for human origins in Africa and for later Neanderthal contact”, in *Perspectives on Science and Christian Faith* 66 (2014), pp. 140-153.



of their genetic material from the Neanderthals.³⁷ This introgression of Neanderthal DNA into modern human genome brought us many advantages, such as an improvement of our immune system³⁸ and an expansion of our genetic diversity, which had been drastically reduced in the course of emigration from Africa.³⁹

This improvement of the immune system and expansion of genetic diversity was certainly necessary for the survival of the *Homo sapiens* who emigrated from Africa; because outside Africa, many unknown pathogens were threatening them. To acquire comparable genes through normal evolution would have taken a lot of time; and presumably this emigration would have been as unsuccessful as the previous emigrations of *Homo sapiens* from Africa.⁴⁰ Without this interbreeding with the Neanderthal the emigration of *Homo sapiens* from Africa would probably not have lasted, and today there would be *Homo sapiens* only on the African continent.

3. INFERENCES ABOUT THE CREATOR

The consideration of different parts of scientific knowledge can lead to different ideas about the Creator of the universe, so it is important to look at the different parts together. The data given in the previous two chapters are an essential complement to what we know about the Creator from astronomy and physics.

Both the Kalam cosmological argument,⁴¹ which considers the beginning of the universe, and the already mentioned “fine-tuning” of the fundamental physical constants present very good arguments for the belief, that our universe was created by a transcendent

³⁷ Richard E. Green et al., “A draft sequence”, p. 721; Anna-Sapfo Malaspinas et al., “A genomic history”; João C. Teixeira and Alan Cooper, “Using hominin introgression”.

³⁸ Michael Dannemann, Aida M. Andrés, and Janet Kelso, “Introgression of Neandertal- and Denisovan-like haplotypes contributes to adaptive variation in human toll-like receptors”, in *The American Journal of Human Genetics* 98 (2016), pp. 22-33; Hélène Quach et al., “Genetic adaptation and Neandertal admixture shaped the immune system of human populations”, in *Cell* 167 (2016), pp. 643-656; Aaron J. Sams et al., “Adaptively introgressed Neandertal haplotype at the OAS locus functionally impacts innate immune responses in humans”, in *Genome Biology* 17, no. 246 (2016), pp. 1-15, <https://genomebiology.biomedcentral.com/articles/10.1186/s13059-016-1098-6>, 10.04.2021; Stephanie Marciniak and George H. Perry, “Harnessing ancient genomes to study the history of human adaptation”, in *Nature Reviews Genetics* 18 (2017), pp. 659-674; Olga Dolgova and Oscar Lao, “Evolutionary and medical consequences of archaic introgression into modern human genomes”, in *Genes* 9, no. 358 (2018), pp. 1-12, <https://www.mdpi.com/2073-4425/9/7/358>, 10.04.2021; Alexandre Gouy and Laurent Excoffier, “Polygenic patterns of adaptive introgression in modern humans are mainly shaped by response to pathogens”, in *Molecular Biology and Evolution* 37 (2020), pp. 1420-1433.

³⁹ Eugene E. Harris, *Ancestors in Our Genome, the New Science of Human Evolution*, Oxford University Press, Oxford, 2015, p. 123; David C. Rinker et al., “Neandertal introgression reintroduced functional ancestral alleles lost in Eurasian populations”, in *Nature Ecology & Evolution* 4 (2020), pp. 1332-1341.

⁴⁰ Huw S. Groucutt et al., “Rethinking the dispersal of *Homo sapiens* out of Africa”, in *Evolutionary Anthropology: Issues, News, and Reviews* 24 (2015), pp. 149-164; Ryan J. Rabett, “The success of failed *Homo sapiens* dispersals out of Africa and into Asia”, in *Nature Ecology & Evolution* 2 (2018), pp. 212-219.

⁴¹ Paul Copan / William Lane Craig, (eds.), *The Kalam Cosmological Argument, Volume 1: Philosophical Arguments for the Finitude of the Past*, Bloomsbury Academic, London, 2019; Paul Copan / William Lane Craig, (eds.), *The Kalam Cosmological Argument, Volume 2: Scientific Evidence for the Beginning of the Universe*, Bloomsbury Academic, London, 2019; Andrew Loke, “Is an uncaused beginning of the universe possible? A response to recent naturalistic metaphysical theorizing”, in *Philosophia Christi* 14 (2012), pp. 373-393; Andrew Loke, *God and Ultimate Origins. A Novel Cosmological Argument*, Springer Nature, Cham, 2017; Peter J. Bussey, “God as first cause – a review of the Kalam argument”, in *Science & Christian Belief* 25 (2013), pp. 17-35; Richard Swinburne, *Existence of God*, pp. 133-152; James Goetz, “Theodicy, supreme providence, and semiclassical theism”, in *Theology and Science* 19 (2021), pp. 42-64.



superior intelligence. However, about the Creator himself they give relatively little information:

- One can assume that the Creator is very generous, because he has created an immensely large universe. Modern astronomy has shown us that our Sun is one of hundreds of billions of suns in the Milky Way, and our Milky Way is only one of about 2 trillion galaxies in the entire universe.⁴²
- From the “fine-tuning” of the fundamental physical constants one can conclude that the Creator has an interest in the creation of life in this universe.⁴³

Very different ideas are compatible with this little information – e.g. also the idea of a divine watchmaker who leaves his universe to itself; for in the beginning he created the universe with fixed laws that determine its entire history.⁴⁴

The indeterminacy of quantum physics refutes the idea of a deterministic universe. Quantum physics brings a first dimension of freedom to the universe. From this one can conclude that the Creator wants his creatures to have freedom. Moreover, quantum physics enables the Creator to intervene in this universe without violating the laws of nature. Nevertheless, the question must remain open whether the Creator intervenes in this universe at all, or whether he leaves it to itself. The question whether the Creator intervenes in this universe or not is very important to many people, because a Creator who intervenes is important for us, whereas many people are more or less indifferent to a Creator who does not intervene at all.

3.1. Did the Creator intervene in the history of the Earth?

The events of the Earth's history presented in the previous chapter can be seen as important indications for the assumption that the Creator actively intervened to promote the development of life – and especially intelligent life – on planet Earth.

It is possible for the most primitive forms of life to develop on a planet. From numerous experiments we know that it is plausible that the simplest forms of life develop by organizing abiotically formed organic substances, if certain circumstances are given and sufficient time are available.⁴⁵ But what are the prerequisites for a diverse life to evolve, or

⁴² Christopher J. Conselice et al., “The evolution of galaxy number density at $z < 8$ and its implications”, in *The Astrophysical Journal* 830, no. 83 (2016), pp. 1-17, <https://iopscience.iop.org/article/10.3847/0004-637X/830/2/83/meta>, 15.04.2021.

⁴³ Joshua M. Moritz, “Big bang cosmology and christian theology”, in Richard Gordon / Joseph Seckbach, (eds.), *Theology And Science: From Genesis To Astrobiology*, World Scientific, New Jersey: 2018, pp. 353-360.

⁴⁴ Egbert Giles Leigh Jr, “Does evolution compromise Christian faith? R. J. Asher’s Evolution and Belief”, in *Evolution: Education and Outreach* 6, no. 15 (2013), p. 2, <http://www.evolution-outreach.com/content/6/1/15>, 15.04.2021.

⁴⁵ Stanley L. Miller, “A production of amino acids under possible primitive earth conditions”, in *Science* 117 (1953), pp. 528-529; Neil A. Campbell / Jane B. Reece, *Biology*, pp. 518-521; Scott Freeman / Jon C. Herron, *Evolutionary analysis*, pp. 616-636; Bernd M. Rode, Daniel Fitz, and Thomas Jakschitz, “The first steps of chemical evolution towards the origin of life”, in *Chemistry & Biodiversity* 4 (2007), pp. 2674-2702; Sean F. Jordan et al., “Promotion of protocell self-assembly from mixed amphiphiles at the origin of life”, in *Nature Ecology & Evolution* 3 (2019), pp. 1705-1714; Dirk U. Bellstedt, “The building blocks and origins of life”, in *HTS Teologiese Studies / Theological Studies* 76 (2020), a6054, <https://doi.org/10.4102/hts.v76i1.6054>, 25.04.2021; Emily Boring, J. B. Stump, and Stephen Freeland, “Rethinking abiogenesis: part 1, continuity of life through time”, in *Perspectives on Science and Christian Faith* 72 (2020), pp. 25-35; Ziwei Liu et al., “Harnessing chemical energy for the activation and joining of prebiotic building blocks”, in *Nature Chemistry*



even for intelligent living beings to develop? In the previous chapter I listed four events that were of central importance for the development of life and mankind. Certainly there have been more events of vital importance in the course of Earth's history. But these four events in themselves are extraordinary and very unlikely, and their combination in that order is even more unlikely.

Let us begin with the first event, the Earth's collision with a Mars-sized body. How rare might such a thing happen? And how rare might it be that the results of such a catastrophe lead not to the permanent and complete uninhabitability of the planet, but to an improvement? The collision of the planets could have blown up both planets. Or the axial tilt of the Earth against the orbit of the Earth around the Sun would have become so large that extreme differences between the seasons and devastating storms would have hindered the development of life.

In the second event, the production of free oxygen, the time and extent of the release of oxygen was of extraordinary importance for the further development of life. And for the third and fourth events, too, the timing was of crucial importance.

How can it be that in the course of the Earth's history this sequence of events occurred at exactly the right time? Is life on this planet and humanity the random result of an extremely unlikely random chain of unlikely events that chanced to happen at exactly the right time? I cannot imagine that all this is just coincidence, because the probability of this is negligible. It is much more plausible to assume that the Creator of the universe deliberately intervened to promote the development of intelligent life.

However, one must admit that neither one nor the other interpretation can be proven.

We cannot prove that the Creator has NOT intervened here: Admittedly, we cannot see in any of the events that they contradict the laws of nature known to us. But this could also be because we do not know enough details about these events. Even if we knew at some point that they do not contradict any of the laws of nature, this would not mean that the Creator's deliberate intervention is impossible. For the Creator could also intervene without violating the laws of nature.

Neither can we prove that the Creator intervened here; for probability only says that it is extremely unlikely that this chain of events is accidental; but it does not say that it is impossible.

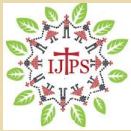
At this point we can only work with plausibilities, because objective proof is impossible. In this chain of unlikely events it is much more plausible to suppose an intervention of the Creator of the universe, than to suppose that this extremely unlikely chain of events happened by chance.

If the Creator has intervened in the history of the Earth to promote the evolution of (intelligent) life, then (intelligent) life has great significance for the Creator, and the consideration of the history and diversity of life in the previous chapters can give us important conclusions about the Creator.

3.2. Characteristics of the Creator

The diversity and history of life presented in the previous chapters allows numerous conclusions about the Creator of the universe, which, together with the Kalam cosmological

12 (2020), pp. 1-6; Christopher J. Butch et al., "Open questions in understanding life's origins", in *Communications Chemistry* 4, no. 11 (2021), pp. 1-4, <https://doi.org/10.1038/s42004-021-00448-8>, 12.05.2021.



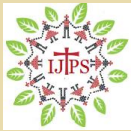
argument, the “fine-tuning” of the fundamental physical constants and the indeterminacy of quantum physics, paint the following picture:

- It is important to the Creator that life can arise and develop in this universe.
- The Creator gives freedom to his creation. A first fundamental dimension of freedom emerges from Heisenberg's uncertainty principle. What Heisenberg's uncertainty principle is for quantum physics, the evolution of living beings is for biology: a further dimension of freedom, of unpredictability, of uncontrollable dynamic growth arises in a structure determined by natural laws. This increase in freedom is closely linked to the increase in autonomy that Dalleur considers.⁴⁶ This all culminates in the emergence of man through evolution. Man is the climax of evolution on our planet, because he can decide freely.
- This universe comprises an abundance that suggests an exuberant generosity of the Creator: It would have been enough for us if the Creator had created a single sun with a single planet and a small number of plant and animal species. However, the Creator created an entire universe of unimaginably many suns. On our small planet Earth there are probably 11 million different species of living beings today. And there were many more species in the course of Earth's history.
- Patience must be an important characteristic trait of the Creator; for he did not create directly a finished Earth and the life on it, including us humans, as it is now, but he has accompanied an evolutionary process lasting billions of years.
- The sequence of events necessary for the emergence and spread of life and *Homo sapiens* can be interpreted as the work of a Creator who uses causal links and seemingly random events to steer the course of his creation in the right direction. From this it can be concluded that the Creator actively intervened several times in the processes of this universe and probably still does so today.
- An interplay between an evolutionary process in which life unfolds, and seemingly random events that give this evolutionary process a new direction, becomes apparent. This interplay could be described with the image of a constant dialogue between the Creator and his creation. Life enters into the dialogue with the Creator by unfolding independently according to its own laws. From time to time, the Creator responds by intervening and then allowing life to follow its own laws again.
- From the exuberant generosity of the Creator, together with his great patience and his constant dialogue with creation, one can conclude that the Creator loves his creation very much. One could even go so far as to suppose that love is an important characteristic of the Creator.

The image that emerges from these puzzle pieces is anything but that of a divine watchmaker who leaves his universe to itself. An image of a Creator becomes recognisable, who always accompanies his creation and guides it by means of seemingly random events and – where necessary – intervenes correctively. This is a Creator who renews his creation again and again in a process of creation that is not yet complete. This is a Creator who has patience with his creation. In a constant dialogue with his creation, he travails and waits patiently until his creation has unfolded its full beauty in freedom.⁴⁷ Comparable views have

⁴⁶ Philippe Dalleur, “La possession du degré d'autonomie chez les vivants”, in *Scientia et Fides* 3 (2015), pp. 115-138.

⁴⁷ John F. Haught, *Deeper Than Darwin: The Prospect for Religion in the Age of Evolution*, Westview Press, Boulder, CO, 2003, p. 80.



already been expressed by other authors. For example, Byrnes and Haught also characterise creation with words such as “process” and “novelty”.⁴⁸ Herce speaks of God accompanying evolution.⁴⁹ Similar thoughts can also be found in Martínez Baigorri, Franklin, and Murphy as well as Boring, Stump, and Freeland.⁵⁰

What in this universe is most valuable to the transcendent Creator? If an intelligent higher being has created the universe, it has a purpose. And to whom may his intention have been directed in a special way? Perhaps to the gas molecules and the stones that cannot think and feel and always obey only the laws of nature? Certainly not! Only the representatives of intelligent life can think, love, make free decisions and commune with him, the Creator. And here, on planet Earth, we, the human beings, are the intelligent life. From these considerations, it can be assumed that we humans have a special value for the Creator of the universe, because he can communicate with us.⁵¹ In logical consequence, we might assume that the Creator longs to communicate with us. From this point of view, human being’s religiosity can be interpreted as a human trait, created and/or promoted by the Creator of the universe in the course of evolution, which shall prepare and/or enable the communication of human being with the Creator.

Let us dare to go one step further: we have seen that in the relationship between the Creator and his creation, dialogue is of central importance. Therefore, it is reasonable to suppose that the Creator is not a monolithic block, but that he himself is in some way engaged in an inner dialogue. The abundance and beauty of our universe could then be a faint reflection of the abundance and beauty of the Creator's inner dialogue.

3.3. Identification of the Creator with the Judeo-Christian God

It would go beyond the scope of this article to compare the characteristics of the Creator worked out here with what the various religions say on this subject. At this point, I will only try to compare the Creator with the Judeo-Christian God, because in my opinion the religious teachings of Christianity correspond best to what we have shown above.

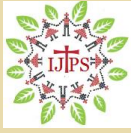
- A central point of Judaism and Christianity is freedom. The central meaningful event of Judaism is the liberation from slavery in Egypt. Similarly, Christianity insists that Jesus Christ has rescued us from the slavery of sin.
- The exuberant generosity of the Creator is documented by the promise of eternal life in an exuberant fullness after biological death, which is the essential hope of Christianity.
- The fact that the Judeo-Christian God has much patience can be seen in the Bible in many places. I would particularly like to mention the slowly progressing self-

⁴⁸ W. Malcolm Byrnes, “Epigenetics, evolution, and us”, in *The National Catholic Bioethics Quarterly* 3 (2003), pp. 489-500; John F. Haught, *Deeper Than Darwin*.

⁴⁹ Rubén Herce, “Evolución y Creación, ¿qué nos puede aportar la controversia de auxilii para entender su relación?”, in Ildefonso Murillo, (ed.), *Pensar y conocer a Dios en el siglo XXI*, Diálogo Filosófico, Colmenar Viejo, 2016, p. 550.

⁵⁰ Martínez Baigorri, J. “La teología de la creación a la luz de la ciencia: Presente y futuro en la constante tarea de renovar la teología de la creación”, in *Scientia et Fides* 7 (2019), pp. 183-205; Franklin, P. “Understanding the beginning in light of the end: eschatological reflections on making theological sense of evolution”, in *Perspectives on Science and Christian Faith* 66 (2014), pp. 154-70; George L. Murphy, “The nuts and bolts”, pp. 53-55; Emily Boring, J. B. Stump, and Stephen Freeland, “Rethinking abiogenesis”, p. 33.

⁵¹ Paul M. Rosenblum, “Seeking purpose in creation and evolution: the agapic principle”, in *Theology and Science* 18 (2020), pp. 86-98.



revelation of God, and the history of the people of Israel documented in the Old Testament.

- The Bible shows not only the great patience of the Judeo-Christian God, but also that he always tries to enter into a dialogue with his creatures. In both the Old Testament and the New Testament, God repeatedly seeks man as a dialogue partner, in order to conduct a dialogue with him from You to You. An important goal of these dialogues is to lead people into ever greater abundance and freedom.
- The incarnation of Jesus Christ can be understood as the culmination of the dialogue between the Creator and his creation. Since man, as the crown of creation, evades dialogue with his Creator, God becomes man in order to make dialogue with man as easy as possible. The mission of Jesus is to let us participate in the exuberant fullness of God (*John 10:10*).
- The supposition expressed above that the Creator is not a monolithic block, but is himself in some way engaged in an inner dialogue, fits very well with the concept of a Trinitarian God that Christianity has. This belief that God consists of three persons who communicate with each other radically distinguishes Christianity from Judaism and Islam; for in both Judaism and Islam God is understood as a monolithic block.
- It has been noted that the Creator loves his creation very much, and it is supposed that love is an important characteristic of the Creator. Both are explicitly stated in the Bible about the Judeo-Christian God; in the New Testament it is even defined that God is love (*Genesis 1:31; John 3:16; 1 John 4:8; 1 John 4:16*).

4. A CLOSER LOOK ON THREE IMPORTANT ASPECTS

This essay presents an image of a Creator who patiently, in an evolutionary process lasting billions of years, leads his creation to ever greater freedom and abundance. This process can be described as a dialogue between the Creator and its creation. In the following I would like to counter two possible criticisms of this interpretation: 1) that the Creator might be timeless and 2) that evolution might be a directed process. Furthermore, at the end I will take a closer look at freedom, because it is very important in this context.

4.1. Is the Creator of the universe timeless?

Above I stated that the Creator is patient and in constant dialogue with his creation. This statement may meet with protest from some philosophers, because in Christian philosophy the prevailing opinion has been that God as the Creator of the universe is timeless.⁵² And with a timeless Creator it makes no sense to say that He is patient or that He participates in a progressive dialogue, since “progress” necessarily has a temporal component. This criticism can be refuted with the following arguments:

- Some modern Christian philosophers and theologians hold the view that God is not timeless, but that there is a kind of time with him.⁵³

⁵² R. T. Mullins, *The End of the Timeless God*, Oxford University Press, Oxford, 2016.

⁵³ See in particular: R. T. Mullins, *The End of*; Jon Paul Sydnor, “God is not eternal, nor are we: on the blessedness of being in time”, in *Process Studies* 47 (2018), pp. 172-90; Richard A. Holland, *God, Time, and the Incarnation*, Wipf and Stock, Eugene, OR, 2012; Robert John Russell, *Time in Eternity: Pannenberg, Physics, and Eschatology in Creative Mutual Interaction*, University of Notre Dame Press, Notre Dame, IN, 2012. Furthermore: Antje Jackelén, *Time & Eternity: The Question of Time in Church, Science and Theology*, Templeton Press, West Conshohocken, PA, 2005; Joseph Diekemper, “Eternity, knowledge, and freedom”, in *Religious Studies* 49 (2013), pp. 45-64; Ted Peters, “Time in eternity and eternity in time”, in Jennifer Baldwin,



- Already the Book of Genesis, the first book of the Bible, describes the Judeo-Christian God as a God who is in relationship with his creatures. He is present and active in the world and interacts with his creatures.⁵⁴
- God makes a historical journey with the people of Israel. In this way God reveals Himself to the people of Israel step by step more and more – from Abraham to Moses and the prophets to Jesus Christ.
- In many places in the Bible, God is expressly described as patient.⁵⁵
- In Jesus Christ the transcendent God becomes man. What is decisive here is not only, that God, through his incarnation, engages in the temporality of our world, but also, that he carries this temporality into the innermost part of the Trinity of God through the resurrection and ascension of Jesus Christ. For in the ascension, Jesus Christ takes with him a risen human body that bears the wounds of the crucifixion (*John* 20:25-29). The incarnation and resurrection of Jesus Christ not only mark a “before” and an “after” in this universe, but in the same way they mark a “before” and an “after” for the Trinitarian God.

4.2. Is evolution a directed process?

Another question worthy of discussion is: Is evolution a directed process in the sense of teleology with the aim of producing humans? This view is frequently held in the literature.⁵⁶ What significance do mutations have there as undirected and random events?

If evolution were a directed process in the sense of teleology, I don't think it would make sense to say: “The Creator gives his creation time to develop autonomously.” It is precisely because mutations are undirected and random events that a dimension of indeterminacy comes into evolution, which enables free and autonomous development. However, since there are numerous internal and external constraints that limit the scope of what is possible, it often seems as if the process of evolution is directed.

I am not claiming that the goal of biological evolution are humans, but I am claiming that under favourable conditions, one of the expected results of biological evolution is the emergence of intelligent life. This view is also held by Conway Morris and Barrigar.⁵⁷

Mutations are undirected and random. Nonetheless, it does not follow that the visible results of biological evolution are undirected and random. Natural selection means that carriers of advantageous mutations have better chances than carriers of disadvantageous

(ed.), *Embracing the Ivory Tower and Stained Glass Windows*, Springer Nature Switzerland AG, Basel 2016, pp. 3-12.

⁵⁴ Bruce C. Birch et al., *A Theological Introduction to the Old Testament*, Abingdon Press, Nashville, TN, 1999, p. 42.

⁵⁵ See for example: *Exodus* 34:6; *Numbers* 14:18; *Psalms* 103:8; *Nahum* 1:3; *Sirach* 1:11; *2 Peter* 3:9-15. In many cases the New International Version uses “slow to anger”.

⁵⁶ Johan De Smedt / Helen De Cruz, *The Challenge of Evolution to Religion*, Cambridge University Press, Cambridge, 2020, pp. 8-25; Gaven Kerr, “Design arguments and Aquinas's fifth way”, in *The Thomist: A Speculative Quarterly Review* 82 (2018), pp. 447-471; Mariusz Tabaczek, “An Aristotelian account of evolution and the contemporary philosophy of biology”, in *The First Virtual International Conference on the Dialogue between Science and Theology: Cosmology, Life & Anthropology*, Ovidius University, Constanta, Romania, 2014, pp. 57-69; Mariusz Tabaczek, “Thomistic response to the theory of evolution: Aquinas on natural selection and the perfection of the universe”, in *Theology and Science* 13 (2015), pp. 325-344.

⁵⁷ Simon Conway Morris, *Life's Solution: Inevitable Humans in a Lonely Universe*, Cambridge University Press, Cambridge, 2003; Simon Conway Morris, “The predictability of evolution: glimpses into a post-Darwinian world”, in *Naturwissenschaften* 96 (2009), p. 1328; Chris Barrigar, “God's agape”, J. B. Stump, “Did God guide our evolution?”, in *Perspectives on Science and Christian Faith* 72 (2020), p. 18.



mutations. Which mutations are advantageous in a specific situation depends on the one hand on the living being itself (genetic material, metabolism, body plan, etc.) and on the other hand on external factors (environmental conditions and interactions with other living beings). As a result, one can often observe certain trends in the evolution of a group of living beings:

- A classic example is the parallel development of the lens eye in vertebrates and molluscs.⁵⁸ Conway Morris gives further examples of convergent evolution.⁵⁹
- Another classic example is the phylogenetic evolution of horses.⁶⁰ From the dog-sized, forest-dwelling *Hyracotherium* to the horse *Equus* living today, the same evolutionary trends (reduction of lateral toes, adaptation of teeth to grazing and enlargement of the body) have been followed, as they always represented an evolutionary advantage.
- Another example is “Cope's rule”, the trend of increasing body size within an evolutionary series.⁶¹

Just as the further development of the eye brings advantages in natural selection, the further development of the brain also brings selection advantages. However, there are limitations here due to the animal's body plan. For example, insects are very limited in their body size because they do not have lungs but breathe through tracheas. Reptiles do have lungs, but are poikilothermal animals, which also limits the development of the brain. If we then go into the evolutionary series of man to *Australopithecus*, we see that *Australopithecus* gave rise to two different lines: On the one hand *Paranthropus*, whose body specialised in hard plant foods and in which the brain remained small; and on the other hand *Homo*, who used tools and in which the brain became larger.⁶²

Increasing intelligence is not the only possible solution to the challenges of natural selection, but it is one possible solution. Therefore, through random mutations and natural selection, intelligent beings can be created without having to adopt any teleology or alignment to a goal. So far, I speak as a scientist who ignores all transcendence. From now on, I speak as a believer: I believe that the Creator of the universe uses these natural processes, which are not goal-oriented, to achieve his goals, because he knows that these processes serve his goals, although they are not goal-oriented. Furthermore, I see the above-mentioned extraordinary events in the history of the Earth and cannot believe that it is pure coincidence that they happened at exactly the right time. That is why I do not interpret these events as coincidental, but I see in them the work of the Creator of the universe, who

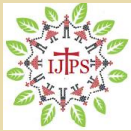
⁵⁸ Neil A. Campbell / Jane B. Reece, *Biology*, p. 477; Scott Freeman / Jon C. Herron, *Evolutionary analysis*, pp. 97-98; Ulrich Kutschera and Karl J. Niklas, “The modern theory of biological evolution: an expanded synthesis”, in *Naturwissenschaften* 91 (2004), p. 272; Bradford McCall, “The God of chance and purpose”, in *Theology and Science* 17 (2019), pp. 133-142.

⁵⁹ Simon Conway Morris, *Life's Solution*; Simon Conway Morris, “The predictability of evolution”.

⁶⁰ Neil A. Campbell / Jane B. Reece, *Biology*, pp. 480-481.

⁶¹ David W. E. Hone and Michael J. Benton, “The evolution of large size: how does Cope's Rule work?”, in *Trends in Ecology & Evolution* 20 (2005), pp. 4-6; Joel G. Kingsolver and David W. Pfennig, “Individual-level selection as a cause of Cope's rule of phyletic size increase”, in *Evolution* 58 (2004), pp. 1608-1612; Noel A. Heim et al., “Cope's rule in the evolution of marine animals”, in *Science* 347 (2015), pp. 867-870; Andreas May, “Statistics on *Thamnopora* (Tabulata, Devonian)”, in *Boletín de la Real Sociedad Española de Historia Natural (Sección Geológica)* 91 (1997), p. 222; Andreas May, “Statistische Untersuchungen an der tabulaten Koralle *Thamnopora* (Anthozoa, Devon)”, in *Geologica et Palaeontologica* 32 (1998), p. 147.

⁶² Friedemann Schrenk and Timothy G. Bromage, “Origins of hominin”, pp. 412-414.



intervenes in the history of the Earth through these events, in order to influence the course of Earth history and evolution.

I cannot and do not want to exclude the possibility that the Creator of the universe has in some other way intervened in Earth history and evolution, in order to achieve that intelligent life arises and spreads on Earth. This kind of influence can have been quite different. For example, various modern authors have argued that God could use the indeterminacy of quantum physics to intervene in this immanent universe without coming into conflict with any laws of nature.⁶³ Ulanowicz looks at other natural processes and sees also there possibilities how God could intervene without coming into conflict with any natural laws.⁶⁴ The chaos theory also offers space for an inconspicuous intervention of God.⁶⁵

In this context, I would like to point out that according to Brink, Ridder, and Woudenberg the randomness of mutations is compatible with the divine guidance of the evolutionary process.⁶⁶ And McCall works out that God does not determine the outcome of every scientifically random event, but that he instead controls randomness by setting wide limits.⁶⁷ Conway Morris uses convergent developments to show how narrow these limits are that the evolutionary process has.⁶⁸

4.3. Freedom

As noted above, the freedom of his creatures is very important to God, the Creator of this universe. From the very beginning, He prepared everything so that we humans have the greatest possible freedom, starting with the indeterminacy of quantum physics and other natural processes.⁶⁹ This is not yet freedom in the sense of a conscious decision, but it is a step in this direction. Then God let all living beings arise through biological evolution, which led to further degrees of freedom. Presumably, God chose the way of evolution to ensure that we, the intelligent living beings, have the perfect freedom to believe in Him or to let it be, as well as to love Him, ignore Him or reject Him. This freedom is in fact a necessary condition to be able to love Him freely. Humans are the crown of creation on Earth; for only humans are able to accept or refuse God's love in conscious free decision. From this point of view, we can accept all the suffering that has occurred in the context of evolution as part of God's

⁶³ Charles H. Townes, "Basic puzzles"; Marcos Ruiz Soler and Ignacio Núñez de Castro, "La kénosis del Dios", pp. 61-62; George L. Murphy, "The nuts and bolts", p. 57; Daekyung Jung, "The RNA world"; Ted Peters, "Science and Religion", pp. 31-34; Robert John Russell, *Cosmology from Alpha*; Robert John Russell, "What we've learned".

⁶⁴ Robert E. Ulanowicz, "The universal laws of physics", in Robert John Russell and Joshua M. Moritz (eds.), *God's Providence and Randomness in Nature: Scientific and Theological Perspectives*, Templeton Press, West Conshohocken, PA, 2019, pp. 69-84.

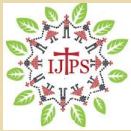
⁶⁵ John Polkinghorne, *Science and Christian Belief: Theological Reflections of a Bottom-up Thinker*, SPCK Publishing, London, 1994; Ignacio Silva, "John Polkinghorne on divine action: a coherent theological evolution", in *Science & Christian Belief* 24 (2012), pp. 20-22.

⁶⁶ Gijsbert van den Brink, Jeroen de Ridder, and René van Woudenberg, "The epistemic status of evolutionary theory", in *Theology and Science* 15 (2017), p. 468.

⁶⁷ Bradford McCall, "The God of chance".

⁶⁸ Simon Conway Morris, *Life's Solution*; Simon Conway Morris, "The predictability of evolution".

⁶⁹ Charles H. Townes, "Basic puzzles", p. 130; George F. R. Ellis, "Necessity, purpose"; Ted Peters, "Contingency and freedom", pp. 278-280; Robert E. Ulanowicz, "The universal laws".



very good creation.⁷⁰ Since God has chosen to create the exuberant abundance of life and us through evolution, natural disasters, physical suffering, illness and death are not only unavoidable concomitants, but necessary instruments of creation through evolution.⁷¹

The Bible documents how much God strives to lead people to freedom: In the Old Testament, God acted exemplarily on the people of Israel by liberating them twice: on the one hand, the liberation from slavery in Egypt; on the other hand, the liberation from the Babylonian exile. Christianity teaches that the ultimate and comprehensive liberation of man is the liberation from the slavery of sin and death. This liberation took place through the death of Jesus Christ on the cross. Jesus Christ entirely voluntarily took upon himself the death on the cross.⁷² At the same time, he was always completely obedient to God the Father. Through his loving obedience, Jesus Christ liberated us comprehensively.

Why is our freedom so extremely important to God? The only plausible answer is love: God wants us to be able to respond to His love for us freely and without constraint. God does not want any will-less slaves, because the entire universe already obeys Him unconditionally; God is looking for a “you”, to whom He can be “You” and who can participate in His Trinitarian community of love.

If we wish to respond adequately to this love that God has for us, we might try to use all our freedom to give all our love and all our capacity for obedience to God. The highest possible act of freedom and love that we can do, is to give our freedom back to God as loving obedience. By giving back our freedom to God-Son as loving obedience, our own freedom does not diminish; on the contrary, it increases: the more we obey Jesus Christ, the freer we become, and we share in the freedom of the children of God.⁷³ This is an important paradox of Christianity: obeying Jesus Christ will set us free.

5. CONCLUSION

In this essay I tried to draw conclusions about the Creator of the universe from the evolution and diversity of life and from the Earth's history. Thereby, my essay differs fundamentally from many papers and books that have been written on the subject of evolution and Christianity; because normally these works start from a Christian world-view and thus try to interpret the scientific findings. Here, exactly the opposite way is taken. This opens up completely new possibilities of dialogue with the natural sciences; from now on, one cannot claim that an alien interpretation is imposed on the scientific insights, but the interpretations result naturally from the scientific observations.

It was possible to sketch an image of a Creator who patiently, in an evolutionary process lasting billions of years, leads his creation to ever greater freedom and abundance.

⁷⁰ Denis O. Lamoureux, “Toward an evangelical evolutionary theodicy”, in *Theology and Science* 18 (2020), pp. 12-30; Keith B. Miller, “And God saw that it was good: death and pain in the created order”, in *Perspectives on Science and Christian Faith* 63 (2011), p. 90; *Genesis* 1:31.

⁷¹ Marcos Ruiz Soler and Ignacio Núñez de Castro, “La kénosis del Dios”, p. 63; Miller, K.B. “Natural hazards: challenges to the creation mandate of dominion?”, in *Perspectives on Science and Christian Faith* 53 (2001), pp. 184-187 (p. 187).

⁷² *John* 10:17-18; *Philippians* 2:6-8; Lohmann, F. “God's freedom: free to be bound”, in *Modern Theology* 34 (2018), pp. 368-385.

⁷³ *Romans* 8:21; Highfield, R. *God, Freedom and Human Dignity: Embracing a God-Centered Identity in a Me-Centered Culture*, InterVarsity Press, Westmont, 2012, pp. 181-190; Pope Francis, „The Freedom of God's Children, Thursday, 4 July 2013’, The Holy See, http://www.vatican.va/content/francesco/en/cotidie/2013/documents/papa-francesco-cotidie_20130704_freedom-children.html, 12.05.2021.



The characteristics of the Creator that are worked out here fit very well with the Judeo-Christian God.

When comparing the relationship of the Creator of the universe to his creation with the relationship of the Judeo-Christian God to human beings, we observe the same pattern: the Creator is in constant dialogue with his creation. He gives his creation time to develop autonomously and intervenes from time to time to correct the direction of development. The aim of the Creator's intervention is to lead his creation to ever greater abundance and freedom.

In retrospect, it is remarkable how largely the results of this essay agree with interpretations that start from a Christian world-view. Nevertheless, the reversal of approach has yielded important insights:

- God's exuberant generosity and extraordinary patience become much more apparent in this essay than in other reflections.
- For God, the freedom of his creation is a very important good.
- Much more clearly than in other papers, it is shown that evolution is a dialogue between the Creator and His creation.
- There is a wide discussion in the literature about whether and how God intervenes in evolution. Concrete examples of God's intervention in the Earth's history are shown here.

Finally, the essay debunks two possible criticisms. It elaborates that there are good reasons to assume that the Creator of the universe is not timeless, but that there is a kind of time with him. Evolution is interpreted as an undirected process that, among other things, also leads to intelligent living beings. The intelligent life forms that have come into being through evolution have the freedom to decide for or against the love of the Creator for them.

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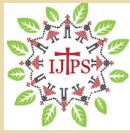
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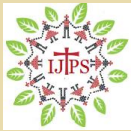
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A THEOLOGICAL SUPPORT, FROM CHALCEDON, TO THE SHROUD IMAGE NATURAL FORMATION

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ABSTRACT

The fourth Ecumenical Council of Chalcedon (451 AD) sanctions, for the Holy Church very important conclusions regarding the nature of Christ. The above results do not contrast, but rather open to a natural formation of the Shroud body image. This occurs because it was affirmed in Chalcedon that Jesus Christ, the Nazarene, has two natures, one human and one divine, “inconfusedly, unchangeably, indivisibly, inseparably”, which coexist in one person (hypostasis). Consequently, the monophysitism of Eutiche and of the Egyptian, Syrian and Armenian Churches, was rejected. Now, the Resurrection of the Nazarene is a Transcendental event that, according to those like us who support the natural formation of the Shroud body image, acted only on the corpse leaving the burial linen in the Immanent, under the dominion of the natural sciences. So, the Miracle of the Resurrection shows the divine nature of Christ, while the Shroud body image formation, the human one..

Keywords: Shroud body image; natural formation; Council of Chalcedon; monophysitism; dyophysitism; hypostasis;

INTRODUCTION

Nowadays, there are many archaeological findings that have not had a clear explanation. Among these the Linen of Turin deserves an important place, studied for over a century by both scientists and people. The former ones, despite their historical, technical and scientific knowledge furnish different results that we crudely list: for some the above burial linen cloth is a fake, for others it is the result of a Miracle due to the Omnipotent, for still others (a minority of scientists) it is due to a natural process. However, the majority of the scientists are divided between the ones that support the Transcendental event and others that believe in the action of a Medieval forger.

With this state of affairs, the Shroud's world becomes a very confusing research area (Fazio 2016). Moreover, it is opportune to take into account that religion has a weight in this scientific research. Obviously, its action is bidirectional: believers go in their well precise direction (the sheet is the burial one of the Nazarene) while atheists, anticlericals and agnostics in the opposite one (the sheet was produced by a Medieval forger). Thus, the results of the former are rejected by the latter and vice versa.

The goal of the research on the Linen of Turin is to understand the mechanism of the body image formation. A process sought with determination for over a hundred years and never fully understood.



Moreover, an important problem is also understanding who the man of the Shroud is. Our unchangeable conviction is that such a man can only be Jesus Christ, the man of Nazareth. This certainty is due to the distribution of blood on the sheet in relation to the body image, to the evident correspondences between the Turin Shroud and the Sacred Texts and other Messianic prophecies present in the aforesaid Texts (New American Bible 2010).

- a. The characteristics of the blood image. The center of each stain shows the presence of both hemoglobin and albumin, the corpuscular part of the blood (Heller and Adler 1981; Schwalbe and Rogers 1982, Pellicori 1980). All around the bloodstains, there is the serum, perfectly visible in fluorescence (Miller and Pellicori 1981). Such stains are of body-sheet contact: the Shroud wrapped a wounded human body by flagellation and crucifixion (Bucklin 1982, Zugibe 2005).
- b. The presence of bile pigments (Heller and Adler 1981) in such a quantity as to explain the unspeakable suffering endured by the Nazarene during His Passion.
- c. The perfect correspondence among the wounds described in the Sacred Texts (New American Bible 2010) and the blood image as it appears in the Linen of Turin (Bucklin 1982, Zugibe 2005)
- d. On the linen there are wounds which have nothing to do with Roman crucifixion. They are to the forehead, nape and chest and are clearly described in the four Gospels (New American Bible 2010).
- e. The bones of the Crucified, during His Passion were not broken, as it is written in the Old (Psalms 34, 20) and New (John 19, 33-36) Testaments (New American Bible 2010).
- f. The other Messianic prophecies. As an example, we can cite (Isaiah 50, 6; 53, 5; 53, 7) and (Psalms 22, 7; 22, 16).
- g. The face of the Man who has suffered so much violence is devoid of the “grin”; the typical smile that appears evident in people who have died brutally. On the contrary, our Man shows a great serenity.

1. MECHANISMS OF IMAGE FORMATION

We neither believe the fake hypothesis nor the miraculous one. The first one is discarded due to the results obtained by the STURP team (STURP’S Conclusion 1981, Jumper et al. 1984) which, among other things, affirms: “The data, taken together, do not support the hypothesis that the images on the Shroud are due to an artist.” Moreover, in addition to considering the items from a) to g), we must take into account that the formation of the blood image has preceded that of the body image. This is what a Medieval artist/forgery would have done.

The distribution of yellowed fibrils lies in the region of the body image and are mixed with the background color. All these fibrils, which tick 10-15 micron each, have the same optical density value (Pellicori and Evans 1981) regardless of the z body-burial linen distance (with z that range from 0 to $R_0=37\text{mm}$ (Jackson, Jumper and Ercoline 1984)) and the body image that ‘floats’ in the linen since its thickness is 20-30 micron only (Mottern et al. 1980). In addition, the linen of our concern has such complex characteristics even for a skilled medieval forger. The second one is widely described and discussed in literature by many authors. However, because of the various ways it is presented, it is theologically inconsistent (Fazio 2020). These scientists should know that the Transcendental events are incomprehensible for the natural sciences and, obviously, for the people. Miracles are due to



God and only to Him. Therefore, they happen instantly (see Lourdes (De Franciscis and Anastasi 2021)). Consequently, the natural sciences can only affirm that such an event has occurred. In fact, they cannot be described step by step, as occurs during a natural event that is under the dominion of natural science. Thus, all the papers present in literature describing a Miracle to explain the Shroud body image formation must be rejected.

Obviously, we cannot exclude the Miracle due to the Omnipotent. However, a mathematical correlation, for this image on the Linen of Turin, exists between the density of yellowed fibrils (those that highlight the body image) and the body-sheet distance (Jackson, Jumper and Ercoline 1984). This suggests a natural process in the formation of the Shroud body image (Fazio, Mandaglio and Anastasi 2019). This last hypothesis is also supported by the “Ockham’s razor” that is often considered in the scientific world (Soklakov 2002).

We recall that the “Ockham’s razor” is not a physical law. However, in the case of several hypotheses that need to be considered for an explanation, it suggests that the most probable is the one that requires the least number of special assumptions. In these cases, we have the highest probability of being closest to the truth. William of Ockham was a Franciscan friar, theologian and philosopher, known supporter of the separation of the Temporal and Spiritual powers. He lived between the thirteenth and fourteenth centuries.

2. BURIAL, RESURRECTION, LATENT IMAGE

Our analysis begins when the corpse of the Nazarene was taken by Joseph of Arimathea and Nicodemus. The two men, both with the women and John the evangelist, went to the Sepulcher and after sprinkling the body with balms and ointments, according to the Jewish burial custom, placed The Lord on the tombstone (The New American Bible 2010). Here, due to the difference between the thermal states of corpse and sheet, there was a transfer of thermal energy (the only, reasonably, present in a first century tomb) from the corpse to the sheet. Also, if the quantity transferred is very little, the Nazarene distributed energy to the burial linen (the sowing soil) preparing the conditions for developing the latent self-image, resulting from the action of the stochastic process triggered by the small amount of energy (Fazio et al. 2015).

At the instant of the Resurrection, with the disappearance of Jesus Christ, the burial linen remained flattened on the stone in the Sepulcher. Consequently, the above linen did not receive the nitrogen compounds (like ammonia, amines and diamines) which are emitted by the corpses during their decompositions. These chemicals would have destroyed any image or any trace of it. This clarifies the uniqueness of the Shroud body image. For all other corpses the burial sheets receive the chemical products leaving sheets entirely stained.

However, the Resurrection left the burial linen without the wrapped body of Jesus Christ. The sheet remained in the region of the Immanent (practically, under dominion of natural sciences). The energy already distributed is sufficient to trigger the natural process. In fact, only with zero transferred energy, the stochastic effects are absent. On the contrary, when there is a transfer, the effects are present but are latent. Thus, this explains why the evangelists did not write about an imprinted image of the Nazarene on the burial linen. The body image will appear after years or decades. In fact, as we have already written, the effects of a stochastic process are latent (Fazio et al. 2015). These two events, Resurrection and Shroud body image formation, remind us that Jesus Christ is truly God and truly man. The first one is a Transcendent event (Miracle), the second one is in line with the laws of the natural sciences (Fazio, Mandaglio and Anastasi 2019) because the image formation is a natural process as the ones that occur in the Immanent.



3. THE 451 AD COUNCIL OF CHALCEDON

Now, to understand the nature or natures of Jesus Christ, we shall go back in time, sixteen centuries ago, to review the conclusions of the fourth Ecumenical Council of Chalcedon. At that time, the Greek Eutiche, theologian and Archimandrite of a large monastery in the area of Constantinople, was the main guide of the monophysitism (Acerbi 2006) which supports the hypothesis that the person of Jesus Christ has only the divine nature. The monophysists were present in the Egyptian, Syrian and Armenian Churches. On the contrary, the Eastern Orthodox Church, the Roman Catholic Church and the Eastern Catholic Churches, the Anglican Church, the Old Catholic Church and various other little Christian Churches, were the proponents of the dyophysitism that accepted and supported the two natures, both divine and human, of Jesus Christ.

The Mysteries of the Christology (O'Collins 1995, Xavier 1996, Kessler 2010) were already debated since the first centuries (and are still today). However, at the beginning of the fifth century the double nature of Christ was so debated that a schism could have been close. With this state of affairs, the fourth Ecumenical Council of Chalcedon, ancient city of Bithynia (Asia Minor), was convened by the Eastern Roman Emperor Marciano. The Council was celebrated in the Basilica of S. Euphemia where the participating Bishops were several hundred. There, during the month of October, these Christological themes were widely debated with many interventions, discussions and comparisons.

Finally, it was the first of November 451 AD, the majority of the Council established that: i) the monophysitism of Eutiche, supported by the Churches of Egypt, Syria and Armenia, was condemned, ii) Jesus Christ of Nazareth is fully God and fully man. He has two natures, a human and a divine one, "inconfusedly, unchangeably, indivisibly, inseparably" which coexist (*hypostasis*) in one person. Here, it is opportune to recall the Gospel of (John 1,1): "*In the beginning was the Word, and the Word was with God, and the Word was God* (The New American Bible 2010). Here, we remind the reader of the Encyclical Letter of Pio XII about the fourth Ecumenical Council of Chalcedon which took place in the fifth century (Pio XII 1951). However, this Ecumenical Council with its dogmatic definition did not cease the controversy about the nature or natures of Jesus Christ.

To this point, remembering that the pillars of the Christian Creed are Revelation and Tradition, we should make some considerations. In fact, what is discussed in this article can be considered an example of how Tradition works. However, we affirm: Tradition is not less important than Revelation. Among other things, at the beginning, when the Gospels were not written, for at least three decades, Tradition had supported the commitment to expand the Belief. Thus, the hypothesis of the formation of the Shroud body image, by natural process, is not against the conclusions of the fourth Ecumenical Council of Chalcedon. In the sense that the image of the Nazarene, that appears on the Shroud, may have formed naturally representing the human nature of Jesus Christ. This result, beyond our scientific (Fazio, Mandaglio and Anastasi 2019) and religious (Fazio 2020) convictions and conclusions, is unexpected and by us highly appreciated. The Resurrection of the Nazarene is a Miracle, while our hypothesis of the Shroud body image formation is an event that lies in the Immanent, where everything is governed by the natural sciences. After this analysis, we can affirm what happened about XX centuries ago: "The Resurrection of the Nazarene was a Transcendental event that did not act on the burial linen." This remained on the stone in the sepulcher and from there, after a dozen centuries, reached Europe. Currently, it is in the Guarini's Chapel. In any case, a definitive comprehension of the body image formation is increasingly linked to the presence of a natural process.



CONCLUSION

We are sure that, for the Turin Shroud, the false hypothesis, as the miraculous event, is not adequate for the understanding of the formation of the body image. Consequently, only a natural process is able to obtain the desired result. In this context, we must also consider the natural hypothesis made by Rogers: a Maillard reaction between nitrogen compounds coming by the corpse's degradation and reducing sugars present on the linen threads due to the manufacturing procedure. (Rogers and Arnoldi 2002 and 2003; Rogers 2008)

Also, our natural process, the stochastic one, has been already studied (Fazio, Mandaglio and Anastasi 2019). Unfortunately, the two mechanisms have not had the attention we hoped. We are certain that this occurs because almost all scientists are for the false hypothesis or for the miraculous event. Moreover, we must also take into account the religious problems always present in the Shroud of Turin research. It seems that to be considered scholars of the Shroud of Turin, it is necessary to belong either to the ones who support the hypothesis of the Medieval forgery or to those in favour of the miraculous event. These two visions (fake and Miracle) are still in constant contrast today, generating confusion upon confusion and making the solution of the problem more difficult.

To prove our reasons, we have acted at first with the support of the natural science laws. For example, with articles (Fazio et al. 2015) where we demonstrated that the yellowed fibrils distribution is the result of the action of a natural process, the stochastic one, excluding the Transcendental event and the presence/act of a Medieval forger. Uselessly!

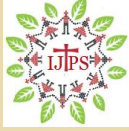
Thus, in this article, as we have already done previously (Fazio 2020), we also turn to Theology and Christology to reach the result. In fact, as it clearly appears in this article, the choice of this line of research has produced new interesting results. They give major consideration to the natural formation of the Shroud body image, removing the other hypotheses.



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THE DEVIL – THE FIRST APOPHATIC THEOLOGIAN

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ABSTRACT

The first page of the invisible creation changed at the dawn of its beginnings. The crisis of authenticity has disfigured Lucifer (the opposite of existential transfiguration), the genius of shadowing light behind the wall of darkness. The fall brought, to the angelic order „foresitter”, the forever loss of its genuine state as virtuous angel. In other words, the guardian cherubim of the celestial armies wished to install an eschatology of disorder and evil in God's creation. In fact, the „morning star of dawn” had in mind to draw „a new heaven and a new earth” where evil, dismantling and chaos were supposed to be the governing laws. His wrong understanding of beings' personal freedom will bring the scaffold of his self-petrification.

Keywords: Lucifer; falling; the tragedy of evil; sin; death; hell;

Motto: „The Devil knew God before the fall, and still sees the Glory of God, but, being impossible to heal, his nature is dark, and he sees the Glory of God as fire, hence the icon painters painting him in black, dark. The greatest *apophatic theologian* is the Devil, for he sees the Glory of God as both darkness and fire. The Devil knows the Holy Scripture and interprets it from his own perspective, as seen from the temptations of Christ, where he uses Scriptural passages according to his own conceptions”¹.

INTRODUCTION

The Devil is not an abstract theological construct, nor is he a bizarre metaphor or a conjectural feat of imagination. To live in totalitarianism, to survive in an infernal universe – these were the limits of real experience for many human beings – is the *calling card* of a demobilizing way of life, under the influence of pseudo-aesthetical values. We are speaking of the one who exploits human naiveté, who releases hatred, wrath, envy, resentment, into the world created by God. He is an extremely clever creature, who mobilizes, abets, intoxicates, both the elite and the masses of society with the flavor of ideology. The demon pretends to offer solutions to vital (or mortal) human matters, by canceling the distance between the *Citadel of God* – the *place* where the *dough* of Eternity is kneaded – and the *Citadel of Man* – the world where the *yeast* of sin is leavened. The expertise of evil is the art of seduction, which consists of the amplification of the human proclivity toward grand utopias.

¹ Ierótheos VLACHOS, Metropolitan of Nafpaktos, *Dogmatica empirică după învățăturile prin viu grai ale Părintelui Ioannis Romanidis (Empirical Dogmatics according to the spoken word teachings of Father Ioannis Romanidis)*, vol. II, Doxologia Publishing House, Iași, 2017, p. 90.



But the essential purpose of the presence and work of the devil in history is the usurpation of God from His position as Creator and Almighty of all that is seen and unseen, by applying unceasing pressure upon the collective mentality. Simultaneously, the devil fights against God, seeking to destroy His creation. Realizing that a direct confrontation is impossible, and that he would be defeated, no matter what, he indirectly fights against God, fighting against His creation, through all created things and beings, self-deluding with the illusion that he might be able to defeat God by defeating one of these. There is no greater joy to the devil than one not believing in his existence. As an enemy conceals their presence and aggressive intentions until the moment of the attack, so the devil is delighted by the naïveté of atheists, who deny his existence together with that of God. „Therefore, to renounce Satan does not only mean to reject a mythological being in which one no longer believes. It means rejecting this entire conception of a world filled with sufficiency and despair. Of course, Satan will not forget this rejection, this defiance, this renunciation: *Blow and spit upon him!* The war is declared. A true struggle begins, the real stakes of which are eternal life”².

1. A WONDERFUL LAND BECOMES DESOLATE: LUCIFER – THE DARING THINKER – OR „FROM THE BEGINNING”³ THERE WAS NARCISSISM

Angelology⁴, as an official teaching of the Church, is founded upon the testimonies of the Holy Scripture and the Holy Tradition. The same method applies to the revealed teachings about demons as fallen angels. One cannot understand the role of good angels, in service to God and man without being informed about the role of Satan, „The lord of this world”, and his *agents*, the angels of darkness. When referring to the Holy Angels, or the Angels of God, we refer, in fact, to this entire Heavenly hierarchy composed of the nine hosts of angels of the Heavenly Army. “The purely understanding powers, meaning the bodiless angels, mostly remained in their fold, in obedience to their Maker. But many of the angels, led by the Morning Star, meaning Satan, did not stay, but fell with frightful fall, with eternal fall”⁵. Thus, when we say „demons”, we mean the angels fallen from the Glory of God through their sin. Their fall was revealed by the Lord Jesus Christ, in *Luke 10:18*, when He said: „I beheld Satan (*Ἐθεώρουν τὸν Σατανᾶν*) as lightning fall from Heaven (*ὡς ἀστραπὴν ἐκ τοῦ οὐρανοῦ πεσόντα*)”, and Satan is the leader of demons, meaning angels who fell from the Glory of God together with him.

The first verse of the first Biblical book provides us with the following information: „In the beginning, God made the Heavens and the Earth”. Shortly afterwards, though, the situation changed dramatically. In *Genesis 1:2*, we find it written that „the earth was without form and void”. The translation does not fully put across the meaning of the Hebrew original. The adjectives *tohu* and *vohu*, should better be rendered through the words „desolate and void”. Nevertheless, in *Isaiah, 45:18*, that He created it “not in

² Alexander SCHMEMANN, *Din apă și din Duh. Studiu liturgic al Botezului (From Water and Spirit. A Liturgical Study of Baptism)*, translated by Ion Buga, Symbol Publishing House, Bucharest, 1992, p. 12.

³ *John 3:8*.

⁴ The prophet Daniel ecstatically saw the Kingdom of God. He saw „a fiery stream issued and came forth from before him” (*ἐξεπορεύετο κατὰ πρόσωπον Αὐτοῦ ποταμὸς πυρός*) and „thousands ministered unto Him” (*χιλίας χιλιάδες ἐθεράπευον Αὐτὸν*), and „ten thousand times ten thousand stood before Him” (*καὶ μύρια μωριάδες παρειστήκεισαν Αὐτῷ*)” (*Daniel 7:10*). The stream of fire is His eternal, uncreated Glory, that issues forth from His being, whilst these thousands and ten thousand times ten thousands of heavenly creatures incessantly serving God are the powers of the Heavens of God.

⁵ Saint John of KRONSTADT, *Despre tulburările lumii de astăzi (About the turmoil of today's world)*, translated by Adrian and Xenia Tănăsescu-Vlas, Sophia Publishing House, Bucharest, 2011, p. 68.



vain(deserted).” The same word, *tohu*, is used there. If God did not create the Earth in a state that was “desolate and void”, then how did the Blue Planet nevertheless end up in such a state? Partially, the answer is given in *Genesis* 1:2. The Hebrew verb *haya*, translated as „was”, could also be translated as „became”, „was made” or „was turned”, (meaning „was transformed”), as it is translated in *Genesis* 2:8 and 19:26. The earth was not created „without form” (deserted) and void, but it became (was transformed) this way at a certain moment after its *foundation*. Thus, the following translation would result: „Then, the Earth became desolate and void”. God created Earth in such a bright state of beauty that „the morning stars sang together and the sons of God shouted for joy”⁶. But something occurred that was meant to bring a devastating and desolate state unto the created earth. Its initial beauty was destroyed. God then remade it, turning it into a wonderful home meant for the habitation of the first human family. Thus, something happened between the first two *verses* of the Book of Genesis, something not recorded therein.

Entire pages of the corpus of the revelation of God soberly describe the fact that the Devil exists. Then, we find out that this creature, and the entire spiritual world, are as real as our own world. Also, the aforementioned sources describe Satan as an unbelievably powerful spiritual being, with a surprising influence over mankind. Together with his cohorts – known as *devils* or *demons* – he is frequently mentioned in the Holy Scriptures, from Genesis to Revelation. The Bible or the Holy Scripture offers much and precious information about this character. Thus, Satan, prior to becoming the *prince* of the Abyss, was the greatest chieftain of the angelic *office*. He was called Lucifer and he had his place upon the *peak* of perfect creation. In spite of his fall, he is closer to the nature of God than that of man, for he has no age and he cannot die. But we must not forget that the created spiritual nature of Satan entails a small number of his limits. These are only understandable when regarding him as we regard all other angels who are in a relationship with God. The superiority of spiritual beings over the material world cannot be compared whatsoever to the almighty nature of God. That of angels is executive, which means it is a relative superiority, not an absolutely creative one. The *agents* of the Heavens of God can use their powers and principles enrooted in their own nature by their Creator. As such, due to his bodiless nature, we see the Devil as a pure spirit, ageless, independent, and complete within himself, an entirely pure form. He is dependent upon God, but independent of all the other structures of the created area, reflecting the living brightness and the unspeakable beauty of the Living God in a unique splendor: „The Devil, before the fall, was good. But having proven carelessness and allowed himself to be overcome by despair, he fell into such great evil that he could no longer rise”. Scripture also reveals that he was good. It says: I beheld Satan as lightning fall from heaven (*Luke* 10:18). This likening of the fall to lightning reveals his prior state the quickness with which it occurred”⁷.

The *tragedy of sin* began when the *foremost* of angels turned his eyes from the creator and began to admire creation⁸ – meaning himself: „Thine heart was lifted up because of thy

⁶ *Job* 38: 7.

⁷ Saint John CHRYSOSTOMOS, *Problemele vieții (The Troubles of the life)*, translated by Cristian Spătăreanu and Daniela Filioreanu, Egumenița Publishing House, Bucharest, 2007, p. 339.

⁸ „Lucifer was so beautiful in his glory that he fell in love with his own beauty. Thus, he grew proud of his brightness and intelligence. This self-pride made him wish to be like his Creator. It is because of this that he lost his inner light, thus becoming separated from God the Creator (fragment of the sermon of His Beatitude, Patriarch Daniel, spoken on November 8, the Feast of the Holy Archangels, Michael and Gabriel, at the Chapel of St. Gregory the Illuminator from Bucharest), cf. <https://doxologia.ro/cuvantul-ierarhului/sfintii-ingeri-sunt-icoane-ale-sfinteniei-dreptatii-lui-dumnezeu>.



beauty, thou hast corrupted thy wisdom by reason of thy brightness”⁹. He became prideful and exalted himself, and thus the desire for conquest was born inside of him. He wanted to sit in the place of God: „How art thou fallen from heaven, O Lucifer, son of the morning! how art thou cut down to the ground, which didst weaken the nations! For thou hast said in thine heart, I will ascend into heaven, I will exalt my throne above the stars of God: I will sit also upon the mount of the congregation, in the sides of the north. I will ascend above the heights of the clouds, I will be like the Most High. Yet thou shall be brought to Hell, to the sides of the Pit”¹⁰. There are two types of narcissism: the fixation upon one’s own physical beauty, and the fixation upon one’s own personality. A narcissist will take themselves as a unit of measure; they themselves are their own law, not the Law of God. Basically, Lucifer started developing that sickly type of passion toward himself.

The beginning of evil within creation coincides with this conjugation: *I will*. Satan has ceased to submit to the Will of God and seeking out his own will. When placing another will atop the will of God, it is akin to considering that His will is not perfect. God reveals His own name by saying: „I am”.¹¹ He does not reveal His full name to anyone. He who seeks to be himself enters a conflict with God. The sin of Lucifer consists of loving himself up to the point of excluding everything else, and this has no excuse. His sin was the sin of an evil that was born in and of itself and not induced by any outer influence. Satan fell from his high state because he did not wish to fulfill the role for which he had been created, and thus forever lost his initial state. „The essence of falling into sin is always the same: someone wants to become good by themselves; someone wants to become perfect by themselves; someone wants to become god by themselves... for he too (the devil), wanted to become a god by himself, to replace God with himself. And in his arrogance, he suddenly became a devil, utterly separated from God and entirely turned against God”¹². Eternal separation from God is the punishment of Lucifer and all of those who followed him and who continue to follow him, whether from the world of angels or from the kingdom of man. All of those who chose the wrong path follow Satan, taking the risk of losing God forever. In his agony and rage, the enemy seeks to destroy everything in his path, seeking to lure others into a misfortune as absolute and dark as his own turmoil: „Then, by default (the angels who allowed themselves to be lured), they were crushed and fell from their dignity and their place. At the same time, they lost the amazing, bright beauty of their countenances. They became horrible monsters, the very mention of which is frightening. In their diabolical hypostasis, there exists nothing beautiful, nothing righteous, nothing honest, nothing rational, and nothing true”¹³.

In another few chapters of the Holy Scriptures, the Spirit of God gives us more information about the unfortunate event of the rebellion in Heaven. In the *Second Epistle of Saint Apostle Peter*, its author recorded several examples that describe the judgment of God, uttered upon the entire world for the wickedness committed. In chapter 2, verse 4, we read: „For if God spared not the angels that sinned, but cast them down to hell, and delivered them into chains of darkness, to be reserved unto judgment”. When did these angels sin and what

⁹ Ezekiel 28:17.

¹⁰ Isaiah 14:12-15.

¹¹ Exodus 3:14.

¹² Benedict STANCU, *Cuvinte de nădejde celor fără de nădejde (Hopeful Words for the Hopeless)*, Sophia Publishing House, Bucharest, 2008, p. 107.

¹³ Joseph of Vatoped Monastery, *Dialoguri la Athos (Dialogues in Athos)*, translation and notes by Nicușor Deciu, Doxologia Publishing House, Iași, 2012, p. 71.



was their sin? *The Epistle of Saint Apostle Jude*, verse 6, provides the answer to the aforementioned question: „And the angels which kept not their first estate, but left their own habitation, he hath reserved in everlasting chains under darkness unto the judgment of the great day”. We have seen before that upon the day of the foundation of the Earth, all of the angels rejoiced in song and praise of the Lord. It is obvious that at a later moment, some of them sinned – thus destroying the wonderful harmony and understanding in which they had rejoiced. What was the nature of their sin? They „kept not their first estate, but left their own habitation” – they left the places and positions that God had given unto them, rebelling against the Creator of the entire Universe. The Holy Scripture does not mention the exact number of angels who fell from Heaven, but only says that those who were cast down from Heaven together with Lucifer represent *the third part of the stars of heaven*, meaning angels¹⁴. The place where the evil angels dwell is the air, meaning the ethereal space between heaven and earth¹⁵. Other verses in Scripture attest that the angels of Satan were cast into the darkness, far from the *Face* of God, until the upcoming judgment¹⁶. Nevertheless, God even loves the devil. But the question of the redemption of the devil is not even posed. The problem is not whether I redeem myself if God loves me. The problem is whether I submit myself to the therapy that is required for me to reach the state of enlightenment that I need to see the Glory of God as light, not as eternal fire and the outermost darkness¹⁷. In the previously exposed situation, the following question may be posed: was the devil aware of committing this act of spiritual suicide? Yes. Because in his case, there was no induced error of judgment; he is perfectly aware of what he is doing, and this is why his name is Satan, the accuser or the adversary. Being a creature, limited in his nature, his power is inferior to the power of God, but equal to that of other celestial leaders.

The Lord Jesus Christ claimed to have seen Satan „like lightning fell from Heaven”¹⁸. Using His Godly knowledge and experience, the Savior of the World referred to that which happened before the beginning of Time, the dramatic episode of the fall of angels. In the blinding flash that marked the *cataclysm* of the cosmos, two aspects are to be remarked: the light, and the zigzag movement of the one who was cast down from the glory of God. Alluding to the fall of Satan, the Lord underscores the demonic power that he has only upon this world, as well as the deceiving, deluding nature of his power. It is because of this that we find the Archangel Michael at war with the enemy. It is not the seraphs or cherubs who wage war with the darkness, for they do not oversee our world, but the archangels – the guardians of visible creation. Therefore „there also comes a joy in Heaven on account of the fact that by fighting the good fight, the angels had – if it can be said so – rendered justice unto God, establishing a normal rapport between creature and Creator¹⁹. The name Michael, a transliteration of the Hebrew *mi ka El*, means „who is (like) God”. After a more thorough analysis, one finds that the name of this archangel is mentioned in several parts of the Scripture. In these places, he is always positioned as a direct adversary to Satan. The

¹⁴ *Revelation* 12:4 and 9.

¹⁵ *Ephesians* 6:12.

¹⁶ *Isaiah* 14: 12 and 15; *Luke* 8:31; *II Peter* 2:4 and *Jude* 1:6.

¹⁷ Ierótheos VLACHOS, Metropolitan of Nafpaktos, *Dogmatica empirică după învățăturile prin viu grai ale Părintelui Ioannis Romanidis (Empirical Dogmatics according to the spoken word teachings of Father Ioannis Romanidis)*, vol. II, Doxologia Publishing House, Iași, 2017, p. 89.

¹⁸ *Luke* 10:18.

¹⁹ Anca MANOLACHE, *Un capitol de anghelologie. Creația, natura și căderea îngerilor (A chapter of angelology. The creation, nature and fall of angels)*, in *Studii Teologice*, nr. 1-2/1955, pp. 132-133.



meaning of his name attests his nature as an instrument against the devil. Michael is referred to as one of the chief princes of angels²⁰, great prince²¹ and archangel²².

Jewish literature describes Michael as the foremost angel, the true representative of God, identifying him as the angel of Yahweh²³. According to *Midrash Rabbah*, in the commentary to *Exodus* 12: 29, Michael was the angel who defended Israel against the accusations of Satan²⁴. Nowhere is the story of the fall of Satan described more impressively than in the Godly vision of Saint Apostle John, in the book of *Revelation*. At the same time, one must remember that Saint John gives a symbolic account of the War in Heaven, which had begun long before the creation of the Earth and in which the Church is engaged: „And there was war in heaven: Michael and his angels fought against the dragon; and the dragon fought and his angels and prevailed not; neither was their place found any more in Heaven. And the great dragon was cast out, that old serpent, called the Devil and Satan, which deceiveth the whole world: he was cast out into the earth and his angels were cast out with him... Therefore, rejoice, ye heavens, and ye that dwell in them. Woe to the inhabitants of the earth and of the sea, for the devil is come down unto you, having great wrath because he knoweth his time is short”²⁵. His fall from Heaven produced an unquenchable wrath, for he now exerts his power over Earth alone. Satan is twice more incensed with rage, for his power is only limited to our world, and he is very aware that at the end of this age, his power to deceive man shall be no more. His time for each of us runs even shorter than that, for his skills of trapping us with the *tentacles* of sin²⁶ is limited to the life given unto us on Earth. Man receives the repayment of their struggle against temptations upon this Earth in eternity. The history of the fall of Satan is so dramatic that one can hardly remove their gaze from the abyss over which he reigns²⁷, and look to Heaven, to the angels which did not fall, and directed their ardent love in its entire greatness, toward their Creator, to remain faithful to His will.

2. THE DEVIL AND THE ARCHIPELAGO OF SIN IN INVISIBLE AND VISIBLE CREATION

Who is Lucifer? A murderer! Why? Because, to God, *sin* and *death* are two sides of the same coin. To the devil, however, sin was a weapon; we know from the Holy Scripture that the devil committed a murder (by urging the first humans to sin, and therefore leave the *sphere* of theophoric virtue).

²⁰ *Daniel* 10:13.

²¹ *Daniel* 12:1.

²² *Jude* 1:9.

²³ *Talmud Yoma* 37a, Soncino Edition, University Press, Oxford, 1935, p. 172; *Midrash Rabbah*, commentary on I la *Genesis* 18, and *Exodus* 3, 2, vol. I, Soncino Edition, Hardcover, University Press, Oxford, 1977, pp. 411, 53.

²⁴ *Midrash Rabbah*, p. 222.

²⁵ *Revelation* 12:7-15.

²⁶ „In this manner, the demons have their conversations with us in hiding, so that we might not feel where our struggle comes from. Demonic bodies (or embodiments, we might say), taking from their imaginative form various faces, colors and the shapes that they desire, they put them into our souls and spirits, and show us many things through them, they give us suggestions, they refresh memories of pleasures, faces of unholy desires, they often trouble us in our state of wake or sleep, sometimes even excite our genitals by stroking them, inciting them toward mad, unlawful erotic impulses, and they often take the warm juices inside of us to their aid (Michael PSELLUS, *Dialogus de daemonum energia seu operatione*, Jacques-Paul Migne, *Patrologia Graeca* (abbreviated *PG*), vol. 122, Bibliothecae Cleri Universae, Paris, 1889, 848 and 861).

²⁷ *Revelation* 12:9.



The crime committed by Lucifer does not imply physically harming the primordial couple, but urging them to sin – and by *ingesting* sin, they, themselves, become mortal²⁸. The *poisoned* angel produces the death of the soul in the most unexpected of manners, using lying as a weapon of mass destruction. The lies of the devil²⁹, which came to be through deceit, eventually led straight to the fall of man from the state of Paradise. The *venom* of lies was *injected* the moment *the old serpent* told Eve that they would not die. In order to be able to persuade Eve, the devil held a *speech*, showing the *benefits* of the tree of knowledge of good and evil. In fact, we are dealing with the first advertisement, or the first advertising license of the following type: from ideologies to news. The *deal* with the devil or the *embrace* of the unnatural as a state of being has represented the common tendency in the path that mankind acceded in its path to self-development. Where in the history of mankind has such a concentration of contradictions and errors ever been seen? Some were committed via commission, others via omission, and of such a magnitude, density and intensity as the dramatic episode of the fall of man, set in the Garden of Eden? From that moment on, the divided unanimity of evil will dig out the foundation of the indomitable *fortifications* of good. Unfortunately, for mankind, there is no way back to the *bosom* of lost Paradise; their fate was sealed by themselves.

What is certain is that the *initiator* of disobedience instrumented sin, truly, as something lethal: „From the beginning, he was a murderer of men”³⁰. The 8th Chant of the Matins of *The Sunday of the Expulsion of Adam from Heaven* reminds us of the fact that we sin because we speak to the „soul-murdering serpent (*έρπετιῶ ψυχοφθόρω*)”³¹. For we consider our enemy, Satan, as our „counsellor (*σύμβουλον*)”³².

The Lord Jesus Christ referred to the unfortunate incident, to the homicide committed in the Garden of Eden, when He confronted those who were opposed to His mission and sought to kill Him on account of having called Himself the Son of God. Jesus identified the source of their motivation: „But now you seek to kill Me, a Man who has told you the truth which I heard from God. Abraham did not do this. You do the work of your father, the devil”³³.

In establishing the guilt of Satan, we may take more causes into consideration. Thus, one of them is envy toward man. Satan did not want to be equal to God, but envied man, a creature so beloved by its Creator. To oppose God would have been a sacrilege and madness, but envy toward man was a more true-to-life and feasible sin. Satan, according to a theory from the 14th century, was suffering because he had not been designated by God as the instrument of the incarnation of divine Logos, and a human being was chosen instead as a *vessel* of incarnation³⁴. How did the Devil know all of this? God revealed the angels the plan of redeeming mankind by sending His Son into the world. Thus, the Devil wanted to be the

²⁸ According to *Romans* 6:23.

²⁹ „The introduction of evil, as an active principle, into the world, is an act of creation, which is analogous to the divine one. Satan was tempting Adam, whispering: you shall be as God”. Thus speaking, the devil did not entirely lie: the human being, for a moment, became divine, creating evil, which contaminated everything – Nicolae STEINHARDT, *Jurnalul fericitii (The Journal of Happiness)*, Rohia Monastery Publishing House, Rohia, 2005, p. 196.

³⁰ *John* 8:44.

³¹ *** *Triodul (The Triode)*, IBMBOR Publishing House, Bucharest, 1986, p. 92.

³² *Ibidem*.

³³ *John* 8:41.

³⁴ „For indeed He does not give aid to angels, but He does give aid to the seed of Abraham” (*Hebrews* 2:16).



Redeemer, not God. In this state, the devil may be portrayed as a jealous, disappointed lover, who was not chosen by God, in spite of his perfection, to be the second nature of Christ.

On the other hand, Apostle Paul urges his disciple, Timothy, not to anoint in the episcopal function anyone who was freshly christened, „lest being puffed up with pride he fall into the same condemnation as the devil”³⁵. Here are the attitudes that can be gleaned from the aforementioned text: the pride that leads to autonomy or independence. The Old Testament portrays the devil as a created, dependent being that aspires to self-sufficiency and independence. But independence means separation from something or someone. The text of *I John* 3:8 states that the devil „has sinned from the beginning”, and verse 4 defines sin as lawlessness (crime). Thus, we understand that the sin of Satan – which took the form of independence and self-sufficiency – was his desire to free himself from the „restrictions” imposed by God. Thus, when refusing to submit to the authority of the law of God, Satan showed that he wanted to live under a different set of conditions. His rebellion against the law of God denotes the fact that Satan actually rebelled against God, the author of moral law.

The three-part equation of God-man-devil is also portrayed in the Gospel scene of the healing of the two demoniacs from Gadara. Unlike atheists, the devil believes in God and fears Him: „What have we to do with You, Jesus, You Son of God the Most High? Have You come here to torment us before the time?” shouted the demons from the two Gadarenes, proving that they knew of and believed in the day of judgment, and that the present day and this illusion and temptation-fraught world were their time and their place. Within this period, they are trying to win over as many souls as possible.

His acerbic hatred toward man³⁶ is reflected in the scene of the temptation of the righteous Job. The *Book of Job* seeks to answer the following question: how is something like this possible? „From the grand inaugural scene, Satan, *the accuser*, demands a radical trial of the fidelity of Job. And his demand is fulfilled. At first sight, the various temptations Job is subjected to seem to focus only on his worldly possessions and his physical integrity, but the speeches of his friends and even clearer from the chastisement of his wife, one can understand what these sorrows must provoke Job to do: to rebel against God. This is the very thing that his accuser predicts³⁷.

³⁵ *I Timothy* 3:6.

³⁶ Demons, like angels, have the capacity of making astounding changes in the material world. In the *Book of Job*, 1:13-19, we read about how the fire sent by the devil consumed the flocks of sheep and the shepherds. Also here, we find out that a powerful gust of wind started as a result of the action of an unholy spirit, and the house in which the sons and daughters of Job were gathered collapsed onto them, claiming their lives. The book of Tobit mentions the demon Asmodeus, who killed the seven men Sarah was married to, one by one (*Tobit* 3:8). The action of demons upon matter, as well as other characteristics of spirits are revealed in the book of Judges. An angel revealed himself to Gideon, the future judge of Israel, and when he prepared his offering, „the angel of the Lord put forth the end of the staff that was in his hand and touched the flesh and the unleavened cakes; and there rose up fire from under the rock and consumed the flesh and the unleavened cakes; then the angel of the Lord departed from him” (*Judges* 6:21). We observe that immaterial spirits were created from the very beginning from a substance that is more subtle than that which human beings are made of, and endowed with powers that allow them to exert a considerable influence upon the whole creation. Furthermore, they possess vast knowledge about the organization of matter and the laws of the visible world, having means that give them the possibility of influencing these laws. But the sensorial capacities that demons possess disorganise and destroy.

³⁷ Gabriel BUNGE, *Gastrimargia sau nebunia pântecelui — știința și învățătura Părinților pustiei despre mâncat și postit plecând de la scrierile avvei Evagrie Ponticul (Gastrimarchy or the madness of the stomach – the science and teachings of the Holy Fathers of the Desert)*, translated by Ioan Moga, Deisis Publishing House, Sibiu, 2014, p. 59.



Satan is permanently driven against the Gospel, as it is obvious during the entire public activity of our Lord Jesus Christ³⁸. He sometimes worked through the disciples of our Savior, as in the moment apostle Peter rejected the solution of crucifixion for our Lord, and was then chastised: „Get thee behind me, Satan!”³⁹. The wicked one had other traps set for the oldest of the Apostles, but the Lord prayed for him⁴⁰. All of this reached a peak in the last days of the earthly life of our Lord. The work of Judas is described as being a work of the evil one. At the Last Supper, Satan entered the person of the traitor⁴¹, „having put into the heart of Judas Iscariot, Simon’s son, to betray Him”⁴². Thinking of His frightening trials, Jesus states: „The prince of the world cometh”⁴³.

Satan continues to tempt people⁴⁴. We read about his pernicious work, through a so-called believer, Ananias⁴⁵, then through the sorcerer Elymas⁴⁶, and last, but not least, through the acts of those who live where „the seat of Satan”⁴⁷ lies. The Devil impeded the work of Christian missionaries⁴⁸. He steals the *good seed* sown into the hearts of people⁴⁹ and sows the *tares* of lies in the ground of this world⁵⁰. By countering the devastating actions of the devil, through obeisance to our Lord Jesus Christ, through His suffering, death and resurrection, God offered everyone the only means of atonement for the sins of mankind. Thus, those who, through grace, good deeds and faith, accept to construct the *edifice* of their redemption, shall gain eternal life⁵¹. At the same time, all of creation may better understand the boundless and peerless love of the Maker of all. In His endless love and mercy, God made it so that Christ, who knew not sin, be made *sin* for our sake, so that through Him we may inherit the holiness of God.

CONCLUSIONS

To conclude with, through His death upon the cross, *the Anointed One* of God has triumphed over the forces of evil; He who compelled *demonic spirits* during His earthly ministry shattered their power and made their final condemnation certain. The victory of the Lord Jesus Christ is the source of our triumph over the forces of evil which are trying to rule

³⁸ See Colin BROWN, *The New International Dictionary of New Testament Theology*, vol. 3, Zondervan Publishing House, Reprint edition (1979), pp. 468-473.

³⁹ *Matthew* 16:23.

⁴⁰ „What could our enemy, the devil, not have done if the Lord were not with us? Listen to what Christ says unto Simon Peter: Simon, Simon, behold, Satan hath desired to have you, that sift you like wheat, but I have prayed for you, that thy faith not fail (*Luke* 22:31). For the beast is wicked and ravenous, and were it not kept at bay, it would upend everything” (Saint John CHRYSOSTOMOS, *Diavolul și magia, culegere de texte patristice și traducerea lor în neogreacă de Ieromonahul Benedict Aghioritul (The devil and magic: A Collection of patristic texts and their translation from New Greek by Hieromonk Benedict Hagiorite)*, translated by Zenaida Anamaria Luca, Agaton Publishing House, Făgăraș, 2012, p. 59.

⁴¹ *Luke* 22:3 and *John* 13:27.

⁴² *John* 13:2.

⁴³ *John* 14:30.

⁴⁴ See *I Corinthians* 7:8.

⁴⁵ *Acts* 5:3.

⁴⁶ *Acts* 13:10.

⁴⁷ *Revelation* 2:13.

⁴⁸ *I Thessalonians* 2:18.

⁴⁹ *Mark* 4:15.

⁵⁰ *Matthew* 13:38.

⁵¹ Alin Cristian Scridon, *Memoriile unui protopop uitat: Simion Cornea și realitățile ecleziiale din anii 1924-1928 (Memoirs of a forgotten archpriest: Simion Cornea and the ecclesial realities of 1924-1928)*, in *Altarul Banatului*, Anul XXVIII (LXVII) serie nouă, nr. 10-12/2017, octombrie-decembrie, Timișoara, p. 125.



over us. If we join with Him in peace and joy, having the certainty of His love, we truly feel the restoring, sanctifying work of the Holy Spirit dwelling within us. As we ceaselessly consecrate ourselves to life in Christ, we free ourselves from the burden of deeds inspired by spirits of wickedness, no longer living in darkness and abandoning ignorance and a meaningless life.

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MYTH OF EUROPEAN DARK AGE (5TH-15TH CENTURY) SCIENTIFIC KNOWLEDGE STAGNATION: CRITICAL STUDIES OF SCIENTIFIC IDEA INTERACTIONS BETWEEN THE LATE MEDIEVAL THEOLOGIAN AND EARLY MODERN PHILOSOPHER

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ABSTRACT

Within common historical context, most historians consider the European renaissance age as age of origins of modern scientific knowledge, also, they assume European Medieval Age (5th-15th centuries) as age full with scientific knowledge ignorant. This research paper gives important historical review about interactions of scientific idea between the late medieval theologian and early modern philosopher. However, most previous research was more emphasized on scientific knowledge development during the age of renaissance and age of enlightenment without considering the contribution of early medieval age theologian. By examining this historically event with critical review, I do give some clarification to such pervasive myth by using qualitative research methodologies, which involving analyst of historical facts from primary resources and secondary resources such as archives, journals, book chapters, and published research paper. This research challenges the argument that scientific knowledge development only happened since renaissance age. In the comparatives studies, I found out that early medieval theologian, from William of Ockham to Gabriel Biel, who did played an important role of influencing early modern philosopher, Rene Descartes to David Hume, with scientific ideas. Such finding does give a significant clarification to the myth of medieval Europe scientific knowledge stagnation in modern historical debate.

Keywords: Medieval age; scientific knowledge stagnation; theologian; philosopher; influences; renaissance age; enlightenment age;

HISTORICAL INTRODUCTION

Medieval age Europe can be considered as a significant era that last from the fall of Roman Empire to age of renaissance (Grant, 1996). Most historians agree that the rise of *Dark Age*, which is a sarcastic term for medieval age, is a negative impact caused by the fall of Roman Empire. Common stereotype historical fact that we can found at European Dark Age were the Black Death that killed the majority European population, corruption of church authority and societal obsession of irrational religious dogma. Because of such negative phenomenon, medieval age always categorized as Dark Age by most historian. For them, Dark Age is an era when European society experiencing development degradation within social, politics, scientific and economic context.



However, most historians forgot that even though medieval age experienced development degradation, there are scientific activities carried out by some Christian theologian (Hannam, 2009). Catholic theologian during that era wrote a lot of philosophical ideas which contribute to scientific development, where they contribute to religious knowledge and scientific knowledge side by side together in their writing. They wrote religious scripture, and, they also wrote philosophical ideas for society (Dixon, 2005). It is their philosophical ideas which influenced societal thinking during that era. Such influence does spark up scientific idea and speed up the scientific idea gradually, leading to scientific revolution during the end of renaissance (Hannam, 2009).

One of the significant issues which is always manipulates by some historian is the scientific knowledge stagnation during the medieval age, or, Dark Age. According to them, European Dark Age didn't experience any scientific knowledge development at all. In contrast, Dark Age society was more emphasized to religious activities rather than scientific activities. The most schematic answer provided by them is, not many significant scientific scholars which can be identified during that era compare with ancient Greek era, such as Archimedes (Brooke, 2014). They have to understand that religious theologian did play a role as *natural philosopher* who wrote philosophical ideas that influence scientific development.

1. MYTH OF MEDIEVAL EUROPEAN DARK AGE

Most historians portrayed Medieval Europe as a religious continent, where its populations were church-centered since childhood. Catholic Church authority plays important role in baptizing, marriage, and spiritual aspect. Almost every European life aspects were dominated by church doctrines and conservative dogmas (Dixon, 2005). Churches authorities also dominated education from schools to universities, as the main educational provider to whole society. Because of such bigger dominant role in European society, most European society was so obsessive to catholic churches dogma until the breaking of any minor rules of religious preaching would be considered as heretical. Hence, European society would preferred religious dogma in life problem solving rather than applying secular scientific knowledge (Draper, 2009).

Such obsessions of religious dogmas did solved some life spiritual problem in moral character building, but, it did not solving critical problem, such as Black Death that killed millions of European, unexplained astronomical phenomenon and unexplained life phenomenon . There were some scientists who conducting research in finding practical ways to dealing with such critical problem. Unfortunately, their scientific findings were not accepted by Church authority. Condemnation by church authority happened because of the research finding is contradicting with the bibles' preaching. Scientific thinking is considered radical during that era and it can be classify as religious heretical (Gregory, 2016).

Most Historians also making an irrational speculation for the Dark Age, for example, medieval Europe did not having many interactions with Islamic civilization, which is experiencing Golden scientific era. The rise of Islamic civilization had causing the down fall of European civilizations, by using the Holy War at Jerusalem as excuse. The only interaction was the warfare between the crusaders and the Islamic knights at Middle East. They considered knowledge transfer interaction not happened at all between Europe and Islamic civilization. The obsession of Christianity dogmas by European did stop them from interacting with the Muslims for few centuries.



2. LATE MEDIEVAL THEOLOGIAN AND MODERN PHILOSOPHER SCIENTIFIC IDEAS INTERACTION

William of Ockham (1214-1294), is the most renowned theologian during the late medieval age by his preaching of philosophy 'Ockham's Razor' (Spade, 2006). Ockham's razor gave him the title of Father of modern epistemology, Father of modern philosophy and father of Nominalism. His writing, *Summa logicae*, describes about medieval knowledge of logic and contains philosophy of nominalism. Nominalism describes how universe exists in humanity. By using this philosophy, Autrecourt (1295-1369) wrote and proposed Skepticism, which describe the importance of philosophical logic thinking instead of using religious doctrine. Gabriel Biel (1410-1495), a nominalist and Ockham's follower, applying the view of Ockham in political economy in his writing, *Expositio Canonis Missae*, which emphasized the price of commodity, is determining by human needs.

Francisco Suarez (1548-1617), who received influence from Ockham, wrote *Metaphysical Disputations*, a writing that challenges Aristotelian metaphysics by using Nominalism (Evan, 2001). Ockham's razor did influence Thomas Hobbes (1588-1679), who wrote *Leviathan*. The writing do laid a foundation for modern political philosophy, a preaching that emphasized the separation of government and religion. Hobbes also received influence from Pierre Gassendi (1592-1655), a theologian who introduce improved Aristotelian version of Atomism. Gassendi also introduce empirical method and experimental analysis that laid a good foundation for modern science experimental methodology.

Francis Bacon (1561-1626) has been called the father of empiricism. His works emphasized the possibility of scientific knowledge based only upon inductive reasoning and careful observation of nature. He proposed that accurate scientific finding could be achieved by applying of a skeptical and methodical approach. He invented the Baconian method, a skeptical methodology makes Bacon the father of the scientific method. This method was a new rhetorical and theoretical framework for science, which is used by the scientists as references in the following era, especially, Issac Newton, John Locke, Robert Boyle, Thomas Hobbes and Voltaire.

Rene Descartes (1596-1650), is known as father of modern philosophy and father of modern mathematics. He wrote *Meditations on First Philosophy*, which describes the interaction between mind, body, and god. As the inventor of the Cartesian coordinate system, Descartes founded analytic geometry in mathematics. He is also regarded as first thinker to create frameworks known as methodological skepticism for the development of scientific knowledge. By using the frame work, Robert Boyle (1627-1691), known as father of modern chemistry, had wrote *Sceptical Chymist*. The writing had challenged traditional views on the nature of chemical elements and their composition. Influenced by the writing *Meditations on First Philosophy*, Nicholas Malebranche (1638-1715) proposed and wrote *Treatise of Human Nature* which spreading the doctrine of vision of god, Occasionalism and theodicy.

Isaac Newton (1643-1727), who is the father of modern science and father of classical mechanics, had written *Philosophie Naturalis Principia Mathematica*. His writing describing the law of universal gravitation and three laws of motion, and it had laid a good ground work for Newtonian mechanics. He discovers light composed of corpuscles, developed calculus and improved binomial theorem.

Newton's writing did influence George Berkeley (1685-1753) in natural philosophy. Berkeley published his writing, *An Essay Towards a New Theory of Vision*, in which he



discussed the limitations of human vision and improved the corpuscles theory that the human eye sight are not material objects, but rather, light and color. David Hume (1711-1776) is renowned in modern world for his improved version of philosophical empiricism, skepticism, and naturalism. In his writing, *A Treatise of Human Nature*, he emphasized the psychological basis of human nature is that the mind, which consists of perceptions, or the mental objects inside it. He also emphasized that human knowledge derives solely from experience. This places him together with Francis Bacon, Thomas Hobbes, John Locke, and George Berkeley, as an Empiricist.

CONCLUSION AND CLARIFICATION OF THE MYTH

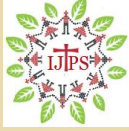
development in the following centuries especially the renaissance age and enlightenment age. Early medieval theologian, William of Ockham, played an important role as a pioneer, or, origin of modern scientific thinking in his philosophical writing, known as Ockham's razor. Most of his writing did influence the scientific thinking of fellow theologian since early medieval age until early renaissance age. Rene Descartes, known as father of modern philosophy did gain significant philosophical influences from him. Also, father of modern science, Isaac Newton, did received philosophical influences from most of the early medieval theologian, starting from William of Ockham. Such indirect influence did speed up scientific revolution since Enlightenment Age.

The critical studies did debunk the myth of scientific knowledge stagnation during the European Dark Age. Most historical arguments emphasized that Dark Age is an era where European society experiencing civilization degradation, a society which is too obsessive with religion, church authorities conflicting with scientists and lack of interactions with other civilizations. By using the examples of theologian philosophical contribution, it did provided a good clarification review to debunk such pervasive myth speculating by most modern historians. Indirectly, early medieval theologian did provide philosophical ideas that influence the scientific thinking of early modern philosophers.

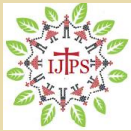
Finally, the argument of medieval age scientific knowledge stagnation is no more acceptable by using the concrete example stated in this study. Modern historians should give more emphasized in European medieval age research since some great philosophers in this era did produce significant writing, which is considered radical, but, do provided advance philosophical framework viewpoint for the scientific development in the mankind history. European Dark age is no more considered as irrelevant era; in contrast, it has to be given more attention in modern historical studies. An extra effort should be given to rethinking, research and review the important role of early medieval theologian by most modern historical scholars.

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GIORDANO BRUNO AND JEWISH THOUGHT: RECEPTION AND REINTERPRETATION¹

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ABSTRACT

This article is focused on the philosopher Giordano Bruno (1548-1600) and the references to Jewish culture in his oeuvre. We discuss about Bruno's reception of Jewish thought and describe this subject in a comprehensive way. We highlight Bruno's view on the Jews and their religion, also explaining the reasons behind his polemic against the Jewish people. Furthermore, we underline the influence of the Kabbalistic tradition and Jewish philosophy on various aspects of Brunian thought. Specifically, we discuss about the use of the letters of the Hebrew alphabet in Bruno's works on the art of memory, the relation between Brunian infinitist cosmology and Kabbalistic concepts such as ensoph and the ten sephirot, the relation between Brunian thought and the philosophical theories of Avicenna, Moses Maimonides, Hasdai Crescas and Leo the Hebrew.

Keywords: Kabbalah; Jewish Philosophy; Renaissance Philosophy; Hermeticism;

INTRODUCTION

From the 19th century to the present, Giordano Bruno's thought has been interpreted in several ways and several aspects concerning his philosophical doctrines came to light. It is worth to remember the famous view of Frances Yates, who described the Nolan as a mage and showed the connection between his philosophy and the *Hermetica* in her seminal study *Giordano Bruno and the Hermetic Tradition* (1964). Despite the fact that Yates' approach to the study of Brunian works has been discarded, the paths outlined by this scholar were followed by others and the esoteric themes in Brunian works still awake interest. In a relatively recent publication, Karen Silvia De León-Jones shifted the focus from Bruno's hermetic background to the use of Kabbalah and the presence of Jewish symbolisms in his oeuvre. Her *Giordano Bruno and the Kabbalah* is the only monograph dealing with this compelling and less known subject in the field of Renaissance studies. De León-Jones depicted the philosopher of Nola as a kind of Kabbalist, claiming that the "dialogue *Cabala* is exactly what its title claims it to be: a work of Kabbalah".² However, we do not share this

¹ In this study we re-examine the issues discussed in Francesco Malaguti, "Sul ruolo della Qabbalah e della filosofia ebraica nelle opere di Giordano Bruno", in *Materia giudaica* 24 (2019), pp. 547–70. We translated most of the Italian and Latin quotations.

² Karen Silvia De León-Jones, *Giordano Bruno and the Kabbalah. Prophets, Magicians, and Rabbis*, Yale Univ. Press, New Haven CT-London, 1997, p. 17. Cf. Id., "Giordano Bruno e la Kabbalah", in *Il Mondo* 3 2 (1995), pp. 328–64. On the inadequacy of De León-Jones' methodology and the inconsistency of some of her assertions, cf. S. Campanini, "Review of *Giordano Bruno and the Kabbalah. Prophets, Magicians, and Rabbis*", in *Journal of Jewish Studies* 49/2 (1998), pp. 385–86. On the term *cabala* in this context, cf. Fabrizio Meroi, "Il lessico della *Cabala*", in Id. (ed.), *La mente di Giordano Bruno*, Olschki, Firenze, 2004, pp. 211–23 and Id., "Cabala, cabalista, cabalístico (caballístico; cabalisticus)", in Michele Ciliberto (ed.), *Giordano Bruno*.



opinion. We are quite sure that, unlike Italian humanists such as Pico della Mirandola and Francesco Zorzi, Giordano Bruno did not learn Hebrew: therefore, he could not read the main sources of the Kabbalistic tradition.³ Bruno's knowledge of Kabbalah was scarce and indebted to the contents of Latin sources like Pico's *Conclusiones cabalisticæ* and Cornelius Agrippa's *De occulta philosophia*, which surely Bruno knew quite well. In addition to this, it is not unlikely that Bruno read works of other Christian Kabbalists of the Renaissance, e.g. Johannes Reuchlin's *De arte cabalistica* and *De verbo mirifico*, Francesco Zorzi's *De harmonia mundi* and Arcangelo Pozzi's writings on Jewish themes. However, the Nolan does not make reference to these sources, as far as we know. De León-Jones does not make any comparative analysis on the Kabbalistic doctrines outlined in the sources mentioned above and what can be found in Brunian works.

In our opinion, her thesis should be revised and the gaps in her research, which also overlooks Bruno's relation to Jewish philosophy, should be filled. De León-Jones is not the only scholar who missed her target, since also David Harari made questionable assumptions about Bruno's knowledge of Jewish culture, which should be discarded: for instance, he claimed that "the plot of the Italian play *Candelaio* is based on two midrashim. The first is in the midrash, written in Aramaic, from the treatise *Kiddushin*, and the second from the midrash *Bambidar Raba*".⁴ However, there is no proof that Bruno knew those texts or intermediate sources about them: therefore, we discard Harari's hypothesis.

Both De León-Jones and Harari jumped to false conclusions, basically because they did not consider the sources of Bruno's knowledge concerning Jewish culture and assumed that the Italian philosopher read Hebrew sources, instead. Moreover, these two scholars did not always analyze Brunian assertions in relation to their theoretical context. Various aspects concerning the relation of Bruno with Jewish culture have been studied and described more carefully by other researchers: Saverio Ricci wrote on the reception of Jewish intellectual heritage in 16th century Europe and described the Nolan's perspective on Jews; Fabrizio Meroi, who studied Bruno's opinion on the Jews too, analyzed the meaning of the term *cabala* within Brunian terminology; Mariassunta Picardi showed interest in Brunian magic and its possible connection with the Kabbalah; Michael Spang put Bruno's monadology into relation with Neoplatonism and Kabbalah. Other authors, whom we quote in the next paragraphs, dealt with Bruno's reception of Jewish philosophy (specifically regarding Avicbron, Maimonides, Hasdai Crescas and Leo the Hebrew).

In this article, we take into account the results of the previous scholarship in order to provide a comprehensive overview on Giordano Bruno's relation to Jewish culture. We also make some personal remarks about the following issues: the interconnection of Judaism and Hermeticism in Brunian works; the relation between Bruno's art of memory, the theories of Ramon Llull and the combinatorial art of the Kabbalists; the possible influence of Jewish philosophical and esoteric doctrines on Brunian cosmology and metaphysics.

Parole, concetti, immagini, vol. 1, Edizioni della Normale-Istituto Nazionale di Studi sul Rinascimento, Pisa-Firenze, 2014, pp. 271–74.

3 Cf. Frances A. Yates, *Giordano Bruno and the Hermetic Tradition*, Univ. of Chicago Press, Routledge & Kegan Paul, London, 1964, ch. 14. According to Yates, it is improbable that the Nolan read Hebrew texts. She believed that Bruno was interested in Hermetic magic, rather than in the Kabbalah, because he criticized the Jews in his works and despised Pico della Mirandola in a conversation with Guillaume Cotin.

4 David Harari, "Some Lost Writings of Judah Abravanel (1465?-1535?) Found in the Works of Giordano Bruno (1548-1600)", in *Shofar* 10/3 (1992), pp. 62–89: 79.



1. JUDAISM AND HERMETICISM

In order to understand what Jewish culture really represented for Giordano Bruno, we should first look at his opinion on religion. It is acknowledged that the Nolan's effort to develop an innovative philosophical system is linked to his anti-religious polemic: the will to obtain "the freedom to use the words we prefer and choose definitions and names"⁵ leads him beyond the limits of religious dogmatism. According to Bruno, religions are first and foremost instruments of power:

"*Teofilo*. [...] the same Scripture lies in the hands of Jews, Christians and Muslims, such different and contrary sects, which are, in turn, giving birth to innumerable other most contrary and different sects, all of which know how to find in the Scripture the meaning which pleases them and suits them better, but also its exact opposite, by making a no from a yes and a yes from a no."⁶

This argument explains the reasons behind Bruno's critique of Judaism, but we should also consider other aspects. Bruno's attitude against the Jews and their cultural tradition is unique in its kind and, as Ricci claims, "it does not only seem to be incompatible with the Jewish and the Christian Kabbalistic point of view, or that of the heretic and messianic philosemitism, but opposite to the pragmatic tendency of the greatest European courts",⁷ which have been tolerant with the Jews in the 16th century.

More detail about Bruno's opinion on the Jewish people is implicitly present in his preadamite theory, which contrasts with the biblical account of history. The Nolan believed that Adam was not the first man on earth and suggested that ethnic groups do not share a common origin. In Bruno's Latin pomes, three patriarchs are listed: Enoch, Leviathan and finally Adam, who is the ancestor of the people of Abraham.⁸

This point of view highlights Jewish diversity in terms of ethnicity: in other words, the Jews would be different from the other peoples of the world, insofar they would descend from Adam and not from Enoch or Leviathan. Though, the uniqueness of the Jews is due also to their cultural tradition. Bruno expresses different opinions about it, which makes it difficult for us to understand his view: the wisdom of Talmudists and Kabbalists is praised in *De la causa, principio e uno*, *De gli eroici furori* and in the Latin works; on the other hand, in the *Cabala del cavallo pegaseo* and the *Spaccio de la bestia trionfante* we can find a fierce mockery of the Jewish people. In these dialogues, Nolan writes about "the Jews, who are by nature, genius and fortune saturnine and lunar – a vile, servile, mercenary, solitary, uncommunicative people, unable to converse with others, whom they bestially hate and by

5 Giordano Bruno, "Cabala del cavallo pegaseo", in Id., *Dialoghi italiani: dialoghi metafisici e dialoghi morali*, eds. Giovanni Gentile-Giovanni Aquilecchia, Sansoni, Firenze, 1958, II-I, p. 890.

6 Id., "La cena de le Ceneri", in Id., *Dialoghi italiani*, IV, 126.

7 Saverio Ricci, "Lo "spaccio" della *Cabala*. Bruno e il giudeo-cristianesimo", in Eugenio Canone (ed.), *La filosofia di Giordano Bruno. Problemi ermeneutici e storiografici. Convegno internazionale. Roma, 23-24 ottobre 1998*, Olschki, Firenze, 2003, pp. 217-61: 259. See also Fabrizio Meròi, "Ebrei, ebreo (*Hebraei, hebraeus, hebraicus*)", in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 1, pp. 579-81.

8 Cf. Bruno, "De innumerabilibus, immenso et infigurabili", in Id., *Opera latine conscripta*, ed. Francesco Fiorentino, vol. 1-2, Domenico Morano, Napoli, 1884, p. 284: "Propheticum est illud et populi cuiusdam celebritas, quod omnia hominum genera ad unum primum genitorem referantur, vel ad tres, ut ex Ebreorum monumentis accipimus et firmiter credimus, quorum quidam solum optimum genus, id est, Iudaeorum, ad unum protoplasten referunt; et reliquas gentes ad duos priores, qui biduo ante creati sunt". Cf. Bruno, "De monade, numero et figura", in Id., *Opera latine conscripta*, ed. Francesco Fiorentino, vol. 1, Domenico Morano, Napoli, 1879, IV, p. 363: "Et ternae genti ternus datus est Patriarcha, Cum peperit Tellus genitrix animalia, primum Ennoc, Leviathan, et quorum est tertius Adam; Maxima Iudaeae ut credebat portio gentis, Cui erat ex Uno tantum generatio sancta".



whom they are hated for every possible reason”.⁹ Furthermore, Bruno defines the Jews with negative terms such as “leprous people”¹⁰ and “excrements of Egypt”.¹¹ According to Bruno, Egypt is the cradle of civilizations and the land where the mythical prophet Hermes Trismegistus transmitted his wisdom to mankind. In this perspective, the Jews are heirs and keepers of Hermetic magic, including the mysteries of the letters and sacred names, which play a fundamental role in the Kabbalistic combinatorial art.¹² Bruno appreciates the Old Testament’s wisdom literature and has a sincere admiration towards the Kabbalists. However, for him, the Jews are unable to practice the purest form of magic, because the primordial wisdom of Egypt was lost: therefore, the Jews are not different than “some senseless and foolish idolaters, who no longer imitate the excellence of the Egyptian cult [...] and seek the divinity [...] in the excrements of dead and inanimate things”.¹³ According to this view, the prophet Moses was “he who learned all those sciences of Egyptians at the court of Pharaoh, he who in the multitude of his manifestations surpassed all those experts in magic”,¹⁴ but also a “very smart mage; [...] who did many tricks and went alone to the mountain so that no one could witness, and those clouds that could be seen were caused by fumes and igneous spirits, and the law he gave was fake and not divine, because it was tyrannical and bloody”.¹⁵

We rule out that Bruno planned to restore a Hermetic cult, as Yates used to believe, but we agree on the idea that for Bruno the Hermetic revelation represented the starting point of a history of cultures and religions. It is no coincidence that, in *De monade*, Bruno mentions Ieovah and Adonai alongside the names of other deities, which would be cultural

⁹ Id., “Cabala”, I, p. 868.

¹⁰ Id., “Spaccio de la bestia trionfante”, in Id., *Dialoghi italiani*, I–III, p. 625. Cf. ibidem, I–III, p. 616.

¹¹ Cf. ibidem, III–II, p. 799. Here Bruno claims that the Greeks used to believe that their wisdom was rooted in that of the Egyptians. On the contrary, one of the principal arguments of Jewish apologetics in the Hellenistic age was that Jewish revelation is the source of human knowledge.

¹² See the following passages referring to the Kabbalists and the magic of the letters and names: Id., “De magia naturali”, in Id., *Opere magiche*, eds. Simonetta Bassi-Elisabetta Scapparone-Nicoletta Tirinanzi, Adelphi, Milano, 2000, p. 160: “Antequam de magia, sicut antequam de quocunque subiecto disseratur, nomen in sua significata est dividendum; totidem autem sunt significata magiae, quot et magi. Magus I sumitur pro sapiente, cuiusmodi erant trimegisti apud Aegyptios, druidae apud Gallos, gymnosophistae apud Indos, cabalistae apud Hebraeos, magi apud Persas, qui a Zoroastre, sophi apud Graecos, Sapientes apud Latinos”; Id., “De rerum principiis et elementis et causis”, in Id., *Opere magiche*, pp. 702–04: “Magna mysteria Cabalistae habent super numero litterarum et mysteriis quae sunt circa ea, ut in virtute nominum et cognitione eorum summam omnium operationum et intelligentiarum intelligant esse sitam, quod dicunt de Messia, de nomine dato illi supra omne nomen, sed addant quasdam rationes occultas, quae illi nomini graphico intelligibiliter adiiciuntur”; ibidem, pp. 696–98: “Ad haec etiam principia pertinet considerare vim magnam insitam esse in nominibus, cum quorum virtute fortunam et statum rei nominatae currere existimant, praetereaque cum nominum mutatione convenire mutationem fortunae vel genii plurimi affirmant. Hoc credidisse Hebraeos, Graecos et alias gentes, per edita est valde manifestum; primum vero hii qui magis religioni et fidei sunt addicti, et qui Deum nihil perperam facere habent pro principio et axiome, non sine causa pluribus patribus nomina mutasse concionantur. Mutatum fuit enim nomen Abrahami, et dicunt Cabalistae in virtute unius litterae ך illum acquisivisse facultatem generandi. Idem dicunt quod cum deberet Iacob praesere fratri et gentibus per benedictionem et primogenituram, mutatum fuisse eius nomen in Israëlem. Item de Isaac, de Sarai in Saram”.

¹³ Id., “Spaccio”, III–II, pp. 777–78. Cf. Ilenia Russo, “Escremento (*excrementum*)”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 1, pp. 650–51.

¹⁴ Bruno, “Spaccio”, III–II, pp. 791–92. See also ibidem, III–II, pp. 782–83: here the character Saulino talks about “Kabbalah of the Jews, whose wisdom [...] comes from the Egyptians, among whom Moses was instructed”. Cf. Laura Carotti, “Mosè”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 2, Edizioni della Normale-Istituto Nazionale di Studi sul Rinascimento, Pisa-Firenze, 2014, pp. 1286–88.

¹⁵ Luigi Firpo, *Il processo di Giordano Bruno*, ed. Diego Quagliani, Salerno editrice, Roma, 1993, p. 274.



variants of the same god. He also shows the presence of the divine name יהוה in different traditions, including Kabbalah and Pythagoreanism.¹⁶ This association was first made by Johannes Reuchlin, according to whom the Biblical *tetragrammaton* is in direct correspondence to the Pythagorean *tetraktys*, a triangular figure consisting of ten points arranged in four rows. In Reuchlin's view, which makes us think of Neoplatonic metaphysics, the *tetraktys* would represent the descent from the unity of the God into the plurality of creation.¹⁷ As pointed out by Michael Spang, Bruno might have developed further these Kabbalistic and Neoplatonic discourses in his theory of the monad. The monad, to which Bruno dedicated one of his Latin poems, is also known as “metaphysical minimum”, since it is the elementary unit on which every complex form is based.¹⁸ Despite his more or less implicit references to Jewish esotericism, the Nolan does not provide any systematic and exhaustive description of the doctrines related to that tradition and he does not even give a clear definition of “Kabbalah”. In the *Cabala del cavallo pegaseo*, the Nolan plays with words and makes an association between three distinct disciplines: “Kabbalah, theology and philosophy: I speak of a Kabbalah of theological philosophy, a philosophy of Kabbalistic theology, a theology of philosophical Kabbalah”.¹⁹

Bruno assigned a personal meaning to the term *cabala*, referring to a sort of metaphysical wisdom, but he knew nothing about the practices of Jewish mystics, because his knowledge about Jewish esotericism was superficial and limited to what he could draw from Latin authors. According to Mariassunta Picardi, Bruno would have used the terms of renaissance magic to describe Kabbalistic practices through figures like the enchantress Circe, a recurring character in Brunian works.

Picardi suggested that her evocations, rites and seals might be Kabbalistic, insofar as they have little in common with the magic of the Circe of the *Odyssey*.²⁰ However, we do not find this hypothesis convincing, because the Nolan could not know those Jewish ritual practices in detail for the reasons discussed above.

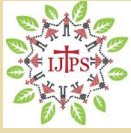
¹⁶ Cf. Bruno, “De monade”, V, p. 390: “Hinc fortasse nomen Dei quadrilaterum ubique gentium ab antiqua institutione comperitur, praesertim vero apud Cabalistas ineffabile illud ex decimo, et quinto, decimo, et sexto Hebraeorum elementis, cuius loco explicatur illud ex primo, et quarto, et quartodecimo et decimo. Sic et ex iis quas novimus linguis principes, et eae quae originalibus et primitivis proprius accedunt, quadrilatero nomine Deum significant: IEVAH et ADONAI enim Hebraeis. Theut Aegyptiis. ORSI Magis. SIRE Persis. THEOS Graecis. Deus Latinis. Alla Arabibus. GOTT Germanis. DIEU Gallis. DIOS Hispanis. IDIO Italis: et hi sunt omnes quorum hodie cultiores sunt linguae, et qui soli loqui videntur. ITA PER VENERANDAM TETRADEM iureiurando affirmabant Pythagorici”. The *tetragrammaton* is also mentioned in relation to the *sephiroth*. Cf. Bruno, “De magia mathematica”, in Id., *Opere magiche*, pp. 43–44.

¹⁷ Cf. Moshe Idel, “Johannes Reuchlin: Kabbalah, Pythagorean Philosophy and Modern Scholarship”, in *Studia Judaica* 16 (2008), pp. 30–55.

¹⁸ Cf. Michael Spang, “Brunos *De monade, numero et figura* und christliche Kabbala”, in *Bruniana & Campanelliana* 5/1 (1999), pp. 67–94; Felice Tocco, “Le fonti più recenti della filosofia del Bruno”, in *Rendiconti della R. Accad. dei Lincei. Classe di scienze morali, storiche e filologiche*, 1/7-8 (1892), pp. 503–538; 534; Marco Matteoli, “Reuchlin Johann”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 2, pp. 1651–52. Bruno never mentioned Reuchlin, but we do not rule out that he read his works. Even if this hypothesis is not valid, Bruno surely found his doctrines in Agrippa's *De occulta philosophia*. Cf. Marco Matteoli, “Agrippa di Nettesheim Heinrich Cornelius”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 1, pp. 55–57.

¹⁹ Bruno, “Cabala”, p. 837.

²⁰ Cf. Mariassunta Picardi, “La magia dell'asino. Filosofia e cabalismo in Giordano Bruno”, in *Studi filosofici* 32 (2009), pp. 55–78.



2. THE KABBALAH AND THE ART OF MEMORY

While it is certain that Giordano Bruno read Latin sources concerning the Kabbalah, we rule out that he read Hebrew texts, since he did not understand the language. Though, he knew the Hebrew alphabet and used its letters for his art of memory, adding them to other letters and symbols. Mnemotechnics are based on the use of graphical devices such as diagrams, tables and concentric circles in order to associate signs with textual information. Every possible combination of signs gives a specific mental picture as a result. Using this combinatorial method, Bruno intended to fill the mind of the practitioner with images representing the knowledge of the world and also open a pathway to the intelligible world: for this reason, the art of memory plays a relevantgnoseological role within Brunian thought. In *De umbris idearum*, a relevant work on the art of memory, the Nolan represents combinatorial wheels with Latin, Greek and Hebrew letters written upon them (23 alphabetic letters followed by $\nu, \zeta, \epsilon, \theta$ of $\text{dnopserroc yletamixorppa srettel nitaL eht} \cdot (\theta \text{ dna } \omega, \varphi, \psi, \wp$ phonemes of the missing Hebrew and Greek letters. The Nolan developed a new mnemonic alphabet, extending the possibilities of the standard alphabet previously adopted by the medieval friar Ramon Llull, whose art of memory inspired Bruno consistently.²¹

It seems that the Nolan's wheels and tables of memory have no relation to any kind of esotericism. As Eugenio Garin claims, "the 'wheels' in *De umbris idearum* show traces of the astrological decans, but they are deprived of their occult meaning"²² and their function is mainly practical. The same can be said of the tables exposed in the *Explanatio triginta sigillorum*, in which the 22 letters of the Hebrew alphabet are displayed diagonally in mnemonic cells. It is almost sure that these tables are inspired by a table of Agrippa von Nettesheim,²³ who numbered the Hebrew letters according to the symbolic values of Kabbalistic numerology: probably, this philosopher and mage intended to use this table to compose the names of demons and angels (that would be a magical method to summon them). Bruno knows Agrippa's numerology,²⁴ but the 22 Hebrew letters in the table of the

²¹ Cf. Bruno, "De umbris idearum", in Id., *Opere mnemotecniche*, eds. Marco Matteoli-Rita Sturlese-Nicoletta Tirinnanzi, vol. 1, Adelphi, Milano, 2004, p. 224: "Ex iis ergo triginta tua notitiae inhaerentes ad triginta elementorum expressionem faciendam eligantur, quae completum reddunt numerum eorum, quae diversis inserviunt in tribus idiomatibus prononciationum differentiis. Neque enim necessarium est triplex instituire elementarium, cum A ipsum equivaleat ipsi α et \aleph , B ipsi β et \beth , similiter et alia multa aliis. Ubi vero super nostri generis elementa sunt Graeca, ut ψ, ω, θ , et ultra haec et illa sunt Hebraea, propriis sunt notata caracteribus. Et ita unum simplex elementarium deseruit tribus linguis et iis quae illis sunt subalternatae".

²² Eugenio Garin, *Lo zodiaco della vita. La polemica sull'astrologia dal Trecento al Cinquecento*, Laterza, Roma-Bari, 2007, p. 124. Cf. Bruno, "De umbris idearum", pp. 84–85, 116–17, 210–21, 224–25, 230–31, 234–35, 256–57, 340–41, 378–79; Id., *Corpus iconographicum. Le incisioni nelle opere a stampa*, ed. Mino Gabriele, Adelphi, Milano, 2001, pp. 103–04; Frances A. Yates, *The Art of Memory*, Ark, London-Melbourne-Henley, 1984, pp. 173–230; Harvey J. Hames, *The Art of Conversion. Christianity and Kabbalah in the Thirteenth Century*, Brill, Leiden-Boston-Köln, 2000, pp. 1 ff.

²³ Cf. Henricus Cornelius Agrippa, *De occulta philosophia libri tres*, ed. V. Perrone Compagni, Brill, Leiden-Köln-New York, 1992, II, 19, pp. 304–06; Bruno, *Corpus iconographicum*, pp. 200–11; Id., "Explicatio triginta sigillorum", in Id., *Opere mnemotecniche*, eds. Marco Matteoli, Rita Sturlese-Nicoletta Tirinnanzi, vol. 2, Adelphi, Milano, 2009, pp. 180–85.

²⁴ Cf. Bruno, "De magia mathematica", p. 50: "Est et alius modus – olim apud Cabalistas veneratione habitus, nunc vero et apud prophanos locum sortitus –, qui fit dividendo viginti septem characteres Hebraeorum in tres classes". Bruno's source on these topics is Agrippa, who re-elaborated the Kabbalistic numerology exposed in Francesco Zorzi's *De harmonia mundi*.



Explanatio are numbered from 1 to 22 in a simple consecutive order: this makes us believe that the function of Bruno's tables is (mnemo)technical, rather than magical or Kabbalistic.²⁵

Just like in the art of memory, letters and combinations play an important role in the Kabbalah, which is considered as a kind of numerology, as mentioned above. For this reason, it has been supposed – but not yet proven – that, centuries before Bruno and Lull, the *Sefer Yetzirah* was used also for mnemonic purposes.²⁶ In the Renaissance, Pico della Mirandola noticed similarities between the mnemonic art of Ramon Lull and the Kabbalistic use of letters, which he called *Alphabetaria revolutio*.²⁷ Also Giordano Bruno acknowledged that the Kabbalah is a combinatorial art, just like mnemotechnics. This explains why, in the letter of dedication prefixed to *De specierum scrutinio*, he refers to his *Lampas triginta statuarum* as *Lampas cabalistica*, despite not being a work of Kabbalah. Moreover, we highlight that the Nolan knew the pseudo-Llullian treatise *De auditu cabalístico*, which has nothing to do with the Kabbalah, but the title. Bruno believed that that work was written by Lull and this probably led him to find a correspondence between Kabbalah and Llullism.²⁸ Actually, Lull never made use of the Kabbalah, but it should not be ruled out that the doctrines of the Jews of Spain, with whom he lived in contact, drew his attention.²⁹ The use of the attributes of God as combinatorial elements in Llullian mnemotechnics might be related to the function of the divine names in the Kabbalah. It is very likely that Bruno made a similar conjecture, since in his *De compendiosa architectura* the virtues previously listed by Lull are associated with the emanations of God called *sephirot*.³⁰

Bruno mentions the ten Kabbalistic *sephirot* several times in his oeuvre and we suppose that he attached to them a gnoseological value: in fact, in *De monade* they are associated with the ten Aristotelian categories of being, whose function is to define and determine the entities of reality.³¹ Though, in order to completely understand the role

²⁵ Cf. Agrippa, *De occulta philosophia*, II, 19, pp. 304–06; Bruno, *Corpus iconographicum*, pp. 200–11; Id., “Explicatio triginta sigillorum”, pp. 180–85. Brunian tables might be related to magic, however the Nolan does not explain how they work and also the function of the 30th seal in the *Explicatio* is not cleared.

²⁶ Cf. Giuseppe M. Cùscito, “Mnemotechnics in the *Sefer Yesirah?*”, in *Materia giudaica* 23 (2018), pp. 307–16.

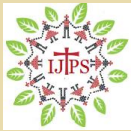
²⁷ Cf. Ioannes Picus Mirandola, “Apologia”, in Id., *Omnia opera*, vol. 2, S.H. Petri, Basileae, 1601, pp. 119–20: “In universali autem duas scientias, hoc etiam nomine honorificarunt, unam quae dicitur ars combinandi, & est modus quidam procedendi in scientiis, & est simile quid, sicut apud nostros dicitur ars Raymundi, licet forte diuerso modo procedant. Aliam quae est de uirtutibus rerum superiorum, quae sunt supra lunam, & est pars Magiae naturalis suprema. Utraque istarum apud Hebraeos etiam dicitur Cabala, [...] et de utraque istarum etiam aliquando fecimus mentionem in conclusionibus nostris: illa enim ars combinandi, est quam ego in conclusionibus meis uoco, Alphabetariam reuolutionem, est ista quae de uirtutibus rerum superiorum, quae uno modo potest capi, ut pars Magiae naturalis, alio modo, ut res distincta ab ea: est illa de qua loquor in praesenti conclusione, dicens: Quod adiuuat nos in cognitione diuinitatis Christi ad modum iam declaratum, & licet istis duabus scientiis nomen Cabalae, ex primaria & propria impositione non conueniat, transumptiue tamen potui eis applicari”.

²⁸ Cf. Bruno, “Explicatio triginta sigillorum”, p. 68. *De auditu cabalístico* is mentioned also in the dedicatory letter prefixed to Bruno's *De specierum scrutinio*.

²⁹ Cf. Frances A. Yates, *The Art of Memory*, pp. 173–98.

³⁰ Cf. Bruno, “De compendiosa architectura et complemento artis Lullii”, in Id., *Opere lulliane*, eds. Marco Matteoli-Rita Sturlese-Nicoletta Tirinnanzi, Adelphi, Milano, 2012, p. 80: “Quae omnia Iudaei Cabalistae ad decem Sephiroth et nos ad triginta, haud quidem illis addentes sed easdem explicantes, redegimus indumenta. Quod ad dignitates et proprietates spectat, colunt Hebraei nomen, quod divinae substantiae proprius appellant, quod est tetragrammaton ‘Iehova’”. In the next lines, this Kabbalistic reference emphasizes the bond between creation and the metaphysical level of God. Cf. Frances A. Yates, *The Art of Memory*, pp. 209 ff.

³¹ Cf. Bruno, “De monade”, XI, pp. 461–462. On the role of the *sephirot* in Brunian works, cf. Marco Matteoli, “Sephiroth (*sephirot*, *sephiroth*)”, *Parole, concetti, immagini*, ed. Michele Ciliberto, vol. 2, pp. 1762–63.



covered by the *sephirot* in Brunian mnemotechnical works, we should go back to *De umbris idearum*, in which Bruno makes a fundamental distinction between the light of truth and the shadows of ideas, which are God's projections through the lens of nature. According to the theory outlined in the book, the human cognition cannot see the light, but only the shadows and their relation to the ideas. The Nolan has this in mind, when he refers to the archetypal ideal world of the *sephirot* in later works.³² Similarly to the shadows of the ideas, the *sephirot* are the Kabbalistic keys of truth. Though, divine truth goes beyond human understanding and remains covered by veils: one can get closer and closer to it, but he will never grasp the ultimate truth. The *sephirot* are mentioned again in the following passage of the *Cabala*, which underlines what we just said and also brings us back to our previous discourse on Judaism and Hermeticism:

“Saulino. [...] according to the Kabbalistic revelation Hocma, corresponding to the forms or wheels called Cherubim, which influence the 8th sphere, where Raziel's virtue of intelligence is placed, the ass or asinity is the symbol of wisdom. [...] Some Talmudists understand the moral reason of that influence, tree, scale or dependence; though, they say that the ass is the symbol of wisdom in relation to the divine Sephirot, since he who wants to penetrate the secrets and occult wisdom of that [i.e. the ass] must be necessarily sober and patient and he must have the mustache, the head and the back of the ass; he must have a humble, self-controlled and modest soul, and his sense should not confuse thistles with lettuces.

Sebasto. I would rather believe that the Jews stole those mysteries from the Egyptians and, in order to hide [their] kind of shame, they have raised the ass and asinity to the heavens.”³³

Saulino shows the correspondence between asinity and Hokhmah, the *sephirah* of wisdom.³⁴ In the dialogue *Cabala del cavallo pegaseo*, the ass is also a symbol of wisdom: the character Onorio, the reincarnation of the wise Aristotle, has the body of an ass; also the Jews are described as “those saturnine asses [...] receiving the influence from the so-called Sephiroth, from the archetypal ass”.³⁵ From this passage, we deduce that asinity also stands for the wisdom of the Kabbalists and defines the traits of a “learned ignorance”: the knowledge of a divine truth situated between the light of revelation and the darkness of occultation.

3. KABBALAH AND COSMOLOGY

An in-depth reading of the *Cabala del cavallo pegaseo* shows that Bruno's reflection on the Kabbalah may concern also cosmological issues. In a passage of the dialogue, he lists the “dimensions Ceter, Hocma, Bina, Hesed, Geburah, Tipheret, Nezah, Hod, Iesod, Malchuth”, the *sephirot*.³⁶ Here the Italian term *dimensioni* replaces the Latin *numerationes*, which can be found in Agrippa's *De occulta philosophia*, while in the later work *De magia mathematica* the Nolan remains loyal to Agrippa's text, using the term *numeratio*. Though, it is still not clear why in the *Cabala numerationes* has been translated with *dimensioni*. This word makes us think of the physical concept of space: it should not be

³² Cf. Bruno, “Cabala”, I, p. 873.

³³ Ibidem, I, pp. 866–67.

³⁴ On the variety of meanings of asinity in Brunian works, cf. Fabrizio Meroi, “Asinità”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 1, pp. 179–82; Id., “Asino”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 1, pp. 182–83.

³⁵ Bruno, “Cabala”, I, pp. 870–71.

³⁶ Ibidem, I, p. 865. Cf. Agrippa, *De occulta philosophia*, III-10, pp. 424–27; Bruno, “De magia mathematica”, pp. 44.



ruled out that Bruno wanted to give another shade of meaning to the original term. It remains unclear why he made this linguistic choice, though.

In the *Cabala*, the Nolan also refers to angelological themes: in particular, he mentions the Jewish names of celestial intelligences and their bond with the *sephirot*. There are further references to the angels in *De magia mathematica*. It is acknowledged that medieval angelology regained importance after the recovery of the Rabbinic culture in the Renaissance.³⁷ Even if Bruno has a scarce knowledge of these topics, he has a general idea of the Kabbalistic systems of the world, despite the fact that his cosmology is very different: in fact, he refused geocentrism and the medieval theory of the great chain of being, which describes the cosmos as a hierarchical system based on “influx, tree, scale or dependence”.³⁸ Despite of this, we have reason to believe that the Kabbalah might have influenced the development of Brunian cosmology. When the Nolan talks about the doctrine “of the enlightened Kabbalists”,³⁹ he speaks of the “deep abyss of the unwordly and ensophic universe: in order to contemplate those ten Sephiroth, which we call members and induments, they penetrated, saw, conceived what a man can say within his limits”.⁴⁰ *En soph* is the essence of God understood as “nothingness without end”. Bruno could have found information on this in Agrippa and in Pico. Infinity plays a central role in Jewish esotericism as well as in Brunian philosophy. Even though the Brunian doctrine of the infinity of the universe is based on other sources, he might have drawn inspiration also from the concept of *en soph*.

There may be also a link between Jewish esotericism and Bruno’s idea that an invisible and immanent force operates within things and animates them. In fact, the Kabbalah does not distinguish between the natural and the spiritual world, since in this tradition the manifestation of God is conceived as the creative process of nature. Bruno’s vitalistic pantheism is similar to this perspective, but it goes even further, since it identifies God and nature as one. In order to justify this view, the Italian philosopher relies on the authority of the “extraordinary wise Solomon, esteemed by the Jews”.⁴¹

4. AVICEBRON

We believe that Jewish philosophy influenced Brunian cosmology even more than the Kabbalah actually did. In *De la causa*, Bruno mentions thrice “a certain Arab called

³⁷ Cf. Elisabetta Scapparone, “Angelo”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 1, pp. 90–92.

³⁸ Bruno, “Cabala”, I, p. 867.

³⁹ Ibidem, I, p. 864.

⁴⁰ Ibidem, I, p. 865. See also the reference to *en soph* in Id., “De magia mathematica”, p. 44: “Sunt nomina divina eminentissimae virtutis, quae in proposito oportet non ignorare. Horum quaedam pertinent ad hierarchias ternas, quorum singulae tribus distribuuntur ordinibus qui Curetes appellantur et Dii intemerati ab Orpheo, quos timore divino appropriant Cabalistsae: unde Ensoph in Cabala ab Orpheo Nox vocantur; Zamael in Cabala, Typhon ab Orpheo”. The correspondence between the Orphic *nox* and the *en soph* was already present in other Latin sources: Picus, “Conclusiones cabalisticæ”, in Id., *Opera omnia*, XI, 15; ibidem, LXXI, 4; Agrippa, *De occulta philosophia*, III-10, p. 424.

⁴¹ Bruno, “De la causa, principio e uno”, in Id., *Dialoghi italiani*, II, p. 246. Cf. ibidem, V, 324: “All philosophers, commonly known as physicians, say that nothing is generated with substance and nothing is corrupted, if we do not want to call the transformation in this way. Solomon understood this. He said that ‘there is nothing new under the sun, but what already was before’ [cf. *Qo* 1: 9-10]. You now understand why all things are in the universe, and universe is in all things; we are within it, that is within us, and then everything is a perfect unity”. Cf. Simonetta Bassi, “Salomone”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 2, pp. 1686–90.



Avicbron”,⁴² who actually was a medieval Jewish Andalusian called Ibn Gabirol. His *Fons vitae*, which was originally written into Arabic and later translated into Latin, is a philosophical work inspired by Arabic Neoplatonism. Like his contemporaries, the Nolan is mistaken about Avicbron’s origin, because in the *Fons vitae* there is scarce information about the author’s religious affiliation.

Bruno’s knowledge of the *Fons vitae* is mainly mediated by the writings of Albertus Magnus and Thomas Aquinas. Aquinas criticized the theory of “composition of form and matter in intelligences and souls, an opinion that seems to have begun with Avicbron, the author of *The Fountain of Life*”.⁴³ Avicbron claimed that every degree of reality consists of matter and form: this means that souls and angels are not simple and immaterial. According to Avicbron’s universal hylomorphism, all things are progressive emanations of the universal matter and the form existing in God’s mind.⁴⁴ Unlike his creations, God “can have no form by which to become a unity and be distinguishable from others. This is why the eternal Existent is illimitable, because of being without form”.⁴⁵

If we examine Brunian thought, we can notice some affinities to Gabirolian philosophy. What is said about God in the passage above reminds of Bruno’s concept of divine matter: in *De la causa*, we find that matter is not defined by a specific form, because it contains all the possible forms in itself;⁴⁶ according to Bruno – but not to Avicbron and the Peripatetics – matter is the producer of forms. The Aristotelian distinction between matter and form is maintained, but the Nolan does not need it anymore, since matter *per se* is enough to define entities, according to his view.

We now take a look at Brunian passages on Avicbron. The first time the Nolan mentions this Jewish philosopher, he erroneously associates him with the materialistic monism of the Greeks:

“*Teofilo*. Democritus and the Epicureans, who call nothingness what is not a body, consequently claim that matter is the sole substance of things and that is also divine nature, as claimed by a certain Arab called Avicbron in a book called *Fountain of Life*. The same thinkers, along with Cyrenaics, Cynics and Stoics, believe that forms are nothing else than certain accidental dispositions of matter. I shared this opinion for a long time, only because the principles of this theory correspond to nature more than the Aristotelian principles do. Though, after having maturely meditated on the basis of more aspects, I found it is necessary to acknowledge two kinds of substance in nature: one is form and the other is matter [...]”⁴⁷

What Bruno says about the *Fons vitae* is inaccurate. It is possible that he did not read that work and based his assertions on Gabirolian philosophy on secondary sources about the *Fons vitae*. If the Nolan had a deep knowledge of Avicbron, he would have not compared him with the ancient atomists: in fact, according to Gabirolian hylomorphism, substance is not composed only by matter. Here Bruno also claims that, in order to define

⁴² Bruno, “Causa”, III, p. 262.

⁴³ Thomas Aquinas, *On Being and Essence*, ed. A. Maurer, The Pontifical Institute of Mediaeval Studies, Toronto, 1968, p. 51.

⁴⁴ This topic is present also in Leo the Hebrew, who writes that if soul and angels “are not composed of matter and form, neither they are part of chaos, their own essence is separated from bodies and lost in contemplation of God. If they are composed of matter and form, just like substance and incorporeal matter, then they are part of chaos, common mother, as our Albenzubron claims in his book *De fonte vitae*” (Leone Ebreo, *Dialoghi d’amore*, ed. Delfina Giovannozzi, Laterza, Roma-Bari, 2008, III, p. 233).

⁴⁵ Avicbron, *The Fountain of Life*, eds. A.B. Jacob-L. Levin, The Jewish Theological Seminary, New York, 2005, 4, IV, p. 201.

⁴⁶ Cf. Bruno, “Causa”, III, pp. 264 ff.

⁴⁷ *Ibidem*, III, pp. 262–63.



substance he found necessary to maintain the Aristotelian theory of matter and form. Though, this Aristotelian distinction is not significant anymore for the Nolan: form and matter, act and potential, cause and principle are seen as unified aspects according to his philosophical vitalism.

Bruno refers to Avicbron critically also in another passage of *De causa* and this time he describes this “Arab” as a supporter of Aristotelian philosophy, probably because of his extensive use of the Aristotelian lexicon.

“*Dicsono*. [...] according to them [i.e. peripatetics], the principle [of matter] is necessary, eternal and divine, just like that Moor [named] Avicbron means, calling it God in all things.

Teofilo. This is the mistake of those who were convinced that the accidental form is the only knowable kind of form; and this Moor, although he accepted the [theory of] substantial form from the peripatetic doctrine he had fed on [...], however, considering it as a corruptible thing, not just as mutable around matter, and as what is birthed and does not give birth, what is founded and does not found, what is rejected and does not reject, he despised it and considered it vile, in comparison to stable, eternal, progenitor, maternal matter.”⁴⁸

Bruno means to say that Avicbron did not go beyond the limits of Aristotelian philosophy and undervalued the ontological status of sublunar matter, depriving it from its active role and considering it as a passive receiver which “does not give birth” to the form. However, the Nolan also points out that Avicbron shed light on the divine nature of matter, supporting the idea that God is in all things. Though, we must clarify that this opinion is not really present in the *Fons vitae*. Bruno supports this idea again in a later work and claims that “not unreasonably, David of Dinant and Avicbron [...] used to call matter ‘God’”.⁴⁹ The Nolan is mistaken once again. Avicbron’s doctrine is very different from the pantheism of David of Dinant: as a supporter of Neoplatonic theory of emanation, Avicbron preserves divine transcendence and the distinction between God and the cosmos, unlike David of Dinant and Giordano Bruno. According to a study of Terracciano, the Nolan’s misunderstanding might be due to the fact that his knowledge of the *Fons vitae* is (consistently?) based on Aquinas’ writings and this scholastic criticized both Avicbron and David of Dinant.⁵⁰ On the basis of the above, we claim that Bruno does not provide a correct explanation of Gabirolian philosophy, but rather a reinterpretation of its main concepts, and he made an instrumental use of them to support a pantheistic view.

5. MAIMONIDES

Avicbron is the only Jewish philosopher explicitly mentioned by Bruno. However, it seems that the Nolan knew other figures of the Jewish philosophical tradition. According to a hypothesis of Miguel Granada, he could have read also the work of Moses Maimonides. This assumption is based on possible references to his *Dux perplexorum* in some passages of

⁴⁸ Ibidem, III, pp. 273–74. See also ibidem, IV, p. 298.

⁴⁹ Id., “De vinculis in genere”, in Id., *Opere magiche*, p. 520. On the Brunian reference to David of Dinant, cf. Pasquale Terracciano, “David di Dinant”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 1, p. 454.

⁵⁰ For example, see the reference to Avicbron in Thomas Aquinas, *Summa contra gentiles seu de veritate catholicae fidei*, Marietti, Torino, 1933, I, p. 17. On Bruno’s interpretation of Avicbron, cf. Michael Wittmann, “Giordano Brunos Beziehungen zu Avencebrol”, in *Archiv für Geschichte der Philosophie* 13 (1900), pp. 147–52; Ernst Bloch, *Avicenna und die aristotelische Linke*, Rütten & Loening, Berlin, 1952; Pasquale Terracciano, “‘Nemici et impazienti di poliarchia’. Riflessioni sul rapporto tra Bruno e Shelomon Ibn Gabirol”, in Olivia Catanorchi-Diego Pirillo (eds.), *Favole, metafore, storie. Seminario su Giordano Bruno*, Edizioni della Normale, Pisa, 2007, pp. 551–75; Laura Pinato, “Avicbron”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 1, pp. 209–11; Felice Tocco, “Le fonti più recenti”, pp. 529–31.



*De la causa, principio e uno.*⁵¹ In Bruno's dialogue, the character Dicsono claims that divine substance can be known only in "a way of veils [*indumenti*], as the Kabbalists say, of shoulders and back ["*spalli e posteriori*"], as talmudists say, of mirrors, shadows and enigma, as Apocalypitics say".⁵² The theme of the hidden God veiled by *indumenti* (standing for the accidental forms, which veil substance) is related to Kabbalah and occurs more than once in Brunian works. Undoubtedly the above quotation is based on Biblical sources, but it should not be ruled out that one of the "talmudists" mentioned might be Maimonides, who commented a Biblical passage, in which Moses asks God to show him His essence and attributes. The expression "shoulders and back" in Bruno's text might allude to these.⁵³ Other possible references to Maimonides are present in the fourth part of the dialogue, in which the characters Poliinnio and Gervasio argue about the figure of the woman. Poliinnio adopts a misogynist point of view and sees the woman as the primary cause of original sin, claiming that the first man stopped contemplating God because of his attraction for feminine bodily matter:

"Poliinnio. [...] the woman is nothing but matter. If you do not know what is woman and therefore you cannot understand what is matter, then study the Peripatetics, who will teach you what is the woman in order to teach you what is the matter."⁵⁴

Matter, which continuously changes form, is represented as a prostitute constantly seeking for the carnal union with man. Gervasio (who impersonates Bruno) dislikes this analogy, which was quite popular among the Aristotelian thinkers of the Renaissance: "he [Poliinnio] gave me headache with the similitude of the woman and matter, and the idea that the woman is not content of men and matter of forms and so forth".⁵⁵ At the end of his reply, Gervasio says that "not only the castles of Poliinnio are fallen, but also those of *others*",⁵⁶ maybe alluding also to Maimonides, who compared sublunar matter to a prostitute, as it can be seen in the passage below.

"Quam dulcia sunt verba Salomonis in sapientia sua cum comparat et assimilat materiam mulieri vagae et conjugatae: quia non invenitur materia nisi cum forma ullo modo. Quod

⁵¹ Cf. Miguel Á. Granada, "Bruno and Maimonides: Matter as a Woman and the Ontological Status of Matter", in *Bruniana & Campanelliana* 23/2 (2017), pp. 458–72.

⁵² Bruno, "Causa", II, pp. 227–28. Cf. *1 Cor* 13: 12 and *Ex* 33: 20–23. See also the reference to *indumenti* in the following passages: Id., "De compendiosa architectura", p. 80: "Quae omnia Iudaei Cabalistae ad decem Sephiroth et nos ad triginta, haud quidem illis addentes sed easdem explicantes, redegimus indumenta"; Id., "De monade", XI, p. 462: "Hinc Decem illi Indumenta (quae Sephiroth Mecubales appellant) adtribuuntur. Indumentorum nomine celebrata, quia deum in substantia absoluta innominabilem et incomprehensibilem non significant, sed externis quibusdam respectibus, tamquam lucis inaccessibilis *velaminibus*. Ipsa sunt EHEH, HOCMA, BINAH, KEIHER, NEZAH, HOD, TYPHERETH, GEBURAH, MALCUTH, HESED"; Id., "De magia mathematica", p. 44: "Sunt deinde decem divina nomina veluti numina, quae per decem Sephyrot – id est numerationes vel indumenta, vel instrumenta, vel explementaria omnium creaturarum [quae] influunt in omnia a supernis usque ad infirmas". Cf. Marco Matteoli, "Indumenta", in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 1, p. 959.

⁵³ See also Bruno, "De gli eroici furori", in Id., *Dialoghi italiani*, II–V, p. 1093: "[...] la difficoltà con la quale egli fa copia di far vedere al meno le sue spalli ["shoulders"], che è il farsi conoscere mediante le cose posteriori ["backs"] ed effetti". Cf. Moses Maimonides, *Dux seu Director dubitantium aut perplexorum, in treis Libros divisus, & summa accuratione Reverendi patris Augustini Iustiniani ordinis Praedicatorii Nebiensiu[m] Episcopi recognitus*, Badius Ascensius, Parisiis, 1520, I, 54; *ibidem*, I, 21, f. 9r ("Posteriora mea videbis"); *ibidem*, I, 37 ("Videbis post me, hoc est apprehendes quod ex me manat, et sequitur ex voluntate mea, ac si diceret omnes creaturas meas").

⁵⁴ Bruno, "Causa", IV, p. 296.

⁵⁵ *Ibidem*, IV, p. 315.

⁵⁶ *Ibidem*, IV, p. 316 (emphasis added).



si ita est, semper est uxor alicuius viri: nec invenitur sola. Licet autem est uxor viri, non abstinet quin quaerat alium virum. Eodem modo se habet materia.”⁵⁷

In this passage, Maimonides emphasizes an Aristotelian point of view and puts it into relation with Jewish ethics. He connects moral vices to the corruption of matter and virtue to form (to which God would have assigned the capacity to “dominate” matter, in the case that moral norms are respected). In accordance with this idea, Maimonides invites to moderate the excesses and to follow the way of Solomon and the prophets. Therefore, Maimonidean ethics condemns the sense of touch and concupiscence. Bruno knows Aristotelian-Maimonidean analogy between woman and matter, but he has a completely different view and considers bodily pleasure as one of the ways to achieve knowledge: in the next paragraph, we aim to show that the Nolan gave an effort to re-evaluate the ontological status of matter.

6. LEO THE HEBREW

In Brunian thought, knowledge is something which must be achieved. In *De gli eroici furori*, the search for wisdom is metaphorically described as a divine hunt conducted by the wise man who seeks the Divinity in nature. In the Italian dialogues we also find the idea that God is present in all material things. This is why the matter has great importance in relation to Brunian epistemology and Bruno attaches to it a positive and creative role.

In the Renaissance, also the Jewish philosopher Judah Abravanel, known as Leo the Hebrew, who wrote about this issue in his *Dialoghi d’amore*:

“*Filone*. This [i.e. matter], as Plato claims, has an appetite for all generated things and loves them, just like the woman loves the man. And, since his love, appetite and desire of the presence of other forms in actuality is not satiated, she falls in love with the other [forms] she has not taken and, leaving that [form], she takes this [other form]: in this way she acquires all forms sequentially, one after another, since she cannot hold all of them together in actuality. She still owns all forms together in many of its parts, but each of them has to transform continuously into the other, since one is not enough to satiate her appetite and love, which cannot be satisfied, because only one of these forms is not enough to satiate her insatiable appetite. And, being the cause of the continuous generation of those forms she does not own, she is [also] the reason of the corruption of her forms. For this reason, they call her the prostitute, since she does not have a single stable lover; when she has one, she wants to leave it for another. Despite this adulterous love, the sublunar world is adorned with such a wonderful diversity of such beautiful things. This is why the generative love of this matter and her desire for a new partner and the pleasure for the new union is the reason of generation of all sensible things.”⁵⁸

Leo the Hebrew changes the meaning of the Aristotelian matter-woman analogy to emphasize the productive potential of the material principle: according to him “Generative love is in the elements and in the matter of all inferior [sublunar] things”.⁵⁹ Moreover, the continuous process of change is not seen as an imperfection of matter, because it opens the path to the search of beauty, showing its various expressions through different forms. We do not rule out that Leo the Hebrew had also Maimonides in mind, when he wrote on this topic: as pointed out by Sergius Kodera, the re-evaluation of matter in the *Dialoghi d’amore* may

⁵⁷ Maimonides, *Dux*, III, 9, f. 74r. Maimonides knows that this topic was present in Plato: “Plato et qui praecesserant eum vocabant materiam foeminam, et formam masculum” (cf. *ibidem*, I, 17, f. 8v). Though, his view is more similar to the Aristotelian one. Cf. Plato, *Timaeus*, 50d; Aristotle, *Nichomachean Ethics*, III, 10, 1118b; Id., *Physics*, 1, 9, 192a 20-25.

⁵⁸ Leone Ebreo, *Dialoghi d’amore*, II, 73.

⁵⁹ *Ibidem*, I, 72.



be seen also as an anti-Maimonidean critique, if considered in relation to the cultural context of Judaism.⁶⁰

The concept of matter in the *Dialoghi d'amore* reminds us of ideas expressed by in *De la causa* and *De gli eroici furori*. Could Bruno have drawn inspiration from Leo the Hebrew while writing those Italian dialogues? Despite he never mentioned him, he could have made an implicit reference to him during a conversation with Guillaume Cotin: in fact, in a note of 12th December 1585, the librarian of the Saint-Victor abbey wrote that “Among the preachers, [Bruno] praises only the Jew for its eloquence, rather than for his wisdom”.⁶¹ However, Felice Tocco underlined that it is unlikely that the Jew mentioned in that conversation is really Leo the Hebrew: more probably, he is referring to a contemporary. In any case, we do not need historical proofs to demonstrate that Bruno read the *Dialoghi d'amore*: the comparative studies of David Harari and Salvatore Carannante showed strong resemblances between the *Dialoghi d'amore* and *De gli eroici furori*. These works share the same style, sources and Neoplatonic topics (e.g. the relation between finite and infinite, the world soul and mental happiness).⁶²

Just like Leo the Hebrew, Bruno intended to speculate on the theme of love in a philosophical way. Basing on a classical Platonic and Aristotelian view, the Jewish philosopher makes a distinction between “bestial love, human love and divine love”⁶³ and exalts “the love of wisdom and eternal cognitions”⁶⁴ that makes men “partakers of divine beauty”.⁶⁵ Similarly, the Nolan defines the heroic frenzies as the greatest kind of love and makes a distinction between “three kinds of Platonic rapt. One tends to contemplative or speculative life, the other to the active moral life, the other to the idle and voluptuary life; these are three kinds of love of which one raises from the aspect of corporeal form to the speculation of the spiritual and divine form; the other is just concerned by the pleasure of sight and conversation; the other one falls from the sight to the concupiscence of touch”.⁶⁶

⁶⁰ Cf. Sergius Kodera, *Disreputable Bodies: Magic, Medicine and Gender in Renaissance Natural Philosophy*, Centre for Reformation and Renaissance Studies, Toronto, 2010, p. 42.

⁶¹ Felice Tocco, “Di un nuovo documento su Giordano Bruno”, in *Nuova antologia di lettere, scienze ed arti* 185 (1902), pp. 86–97: 90.

⁶² Cf. Salvatore Carannante “...sotto la scorza d'amori et affetti ordinarii’. Essere e apparire nei Dialoghi d'amore di Leone Ebreo e negli Eroici furori di Giordano Bruno”, in *Rinascimento* 50 (2010), pp. 21–53; Id., “Leone Ebreo”, in Michele Ciliberto (ed.), *Parole, concetti, immagini*, vol. 2, pp. 1063–68; David Harari, “The Traces of the Fourth Dialogue on Love by Leone Ebreo in *Eroici Furori* by Giordano Bruno”, in *Italia* 7 (1998), pp. 93–155 (Hebrew); Id., “Léon l'Hébreu et Giordano Bruno; leur rapports: solution des enigmes”, in *Revue des études juives* 150/1-2 (1991), pp. 305–16; Id., “Some Lost Writings”. Basing on the analogies between those works, Harari even suggested that Bruno might have left traces of a lost fourth dialogue of love in the last dialogue of the *Furori*: since the conclusions of the first and the second dialogue of the *Dialoghi d'amore* make an anticipation of the topics exposed in the second and the third one, Leo the Hebrew could have written a fourth dialogue on the effect of love on the lovers, the topic mentioned at the end of the third dialogue. For Harari, it is no coincidence that, in the last part of the *Furori*, Bruno introduces the figures of nine blind lovers – hypothetically, the topic of the fourth dialogue of love. From a philological point of view, we cannot accept this conjecture. The dialogue II-V of the *Furori* includes elements of the autobiographical experience of Bruno (hidden under the allegories of the lovers and the feminine characters of Giulia and Laodomia) and the theme of the “blind lover” is a classical theme, which Bruno could have easily found outside of the *Dialoghi d'amore*.

⁶³ Leone Ebreo, *Dialoghi d'amore*, III, p. 345.

⁶⁴ Ibidem, III, p. 346.

⁶⁵ Ibidem, III, p. 346.

⁶⁶ Bruno, “Furori”, I-II, p. 983.



Even the most “vulgar, animal, bestial love”⁶⁷ somehow leads to truth, since matter is divine, according to Brunian pantheism. That said, the refusal of the matter-woman analogy is significant: love is the medium through which God governs the world and the boundary between microcosm and macrocosm; for the “furioso”, it the way to get closer to the divine. In the *Furori*, Bruno describes this path of knowledge through the myth of Actaeon, the hunter who seeks Diana (the divinity) and ends up being turned into a deer (symbolizing nature) and eaten by his own hounds: according to the Nolan’s interpretation, the death of Actaeon indicates that he achieved his goal, becoming nature and understanding that nature is divine. Going back to the previously analyzed topics, that is also “the death of souls that the Kabbalists call kiss of death, which is mentioned in the *Song of Salomon*”.⁶⁸

7. HASDAI CRESCAS

There is a fourth Jewish philosopher we must consider in our investigation on Bruno’s reception of Jewish thought. In a study concerning the influence of Aristotelianism on Jewish and Arabic philosophy, Harry Wolfson suggested that the Nolan might have been influenced by the Spanish Jew Hasdai Crescas (1340-1410). More recently, Mauro Zonta developed Wolfson’s early hypothesis and, in order to strengthen it, he provided a textual comparison between Crescas’ *Or Adonai* (IV, 2) and Bruno’s *De l’infinito* (V) and *De immenso* (VII). In this paragraph, we add a further comparison to those previously made by Zonta and make some remarks on this case of study.⁶⁹

Firstly, we must consider that Bruno never mentions Hasdai Crescas and it is highly improbable that he read the Hebrew treatise *Or Adonai*. Though, as underlined by Wolfson, there are significant resemblances between the cosmological doctrines of the two authors in question. Moreover, they address philosophical problems in a similar way: in *Or Adonai*, Hasdai Crescas strongly attacked the Aristotelian philosophers Averroes and Maimonides, just like two centuries later Bruno provided a systematic critique of Aristotelianism. Furthermore, both authors justify theories, which would not be valid within an Aristotelian framework. For instance, Crescas called into question the Stagirite’s argument for the uniqueness of the world, in order to support the idea of plurality of worlds. According to him, God could have created more than one world, because his grace has no limits:

⁶⁷ Ibidem, I-II, p. 935.

⁶⁸ Ibidem, I-IV, p. 1010. Cf. Nicoletta Tirinnanzi, “Il *Cantico dei Cantici* tra il *De umbris idearum* e gli *Eroici furori*”, in Bruno, *Gli eroici furori*, ed. Nicoletta Tirinnanzi, Rizzoli, Milano, 2015, pp. 5–50. The *Song of Songs* is also one of the sources of Leo the Hebrew: “*Philo*. That has been the death of our blessed, who left the body in a state of contemplation of the divine beauty with the greatest desire and converted their whole soul into it; where the Sacred Scripture talks about the death of the two saint pastors Moses and Aron, it says that they died at the behest of God and the wise men metaphorically affirm they died kissing the divinity, that means captured by the amorous contemplation and divine union, if you understood what I mean” (Leone Ebreo, *Dialoghi d’amore*, III, p. 169).

⁶⁹ Cf. Harry Austin Wolfson, *Crescas’ Critique of Aristotle. Problems of Aristotle’s Physics in Jewish and Arabic Philosophy*, Harvard Univ. Press, Cambridge MA, 1929, pp. 35 ff.; Mauro Zonta, “Due note sulle fonti ebraiche di Giovanni Pico e Giordano Bruno”, in *Rinascimento* 40 (2000), pp. 143–56; Id., “The Influence of Hasdai Crescas’s Philosophy on some Aspects of Sixteenth-Century Philosophy and Science”, in J. Helm-A. Winkelmann (eds.), *Religious Confessions and the Sciences in the Sixteenth Century*, Brill, Leiden-Boston-Köln, 2001, pp. 71–78. The discussion on Bruno and Crescas is summarized in Y. Tzvi Langermann, “East and West in Hasdai Crescas: Some Reflections on History and Historiography”, in Id.-Josef Stern (eds.), *Adaptations and Innovations: Studies on the Interaction Between Jewish and Islamic Thought and Literature from the Early Middle Ages to the Late Twentieth Century. Dedicated to Professor Joel L. Kraemer*, Peeters, Dudley MA, 2007, pp. 229–48.



“For with respect to its own perfection, each world is independent of the others. And since the oneness that this world exhibits is not in any way dependent on another world, the plurality in the number of worlds need not detract from the perfection of the oneness that this world exhibits. Even if [generally] the emanated must be one since the emanator [is one], nevertheless, since the end of His emanating is benefaction and grace, a plurality of recipients of His benefaction is not precluded. This is self-evident.”⁷⁰

In this passage Crescas claims that the plurality of worlds is not absurd, since the existence of a world does not preclude the existence of other worlds: one system can be independent from another, in the full respect of the physical laws. This view theoretically allows the idea that infinite worlds exist – however, Crescas seems hesitant to claim this explicitly and believes that the existence of an infinite moving thing is impossible.⁷¹ Despite this, in the *Or Adonai* we still find the idea of an infinite (but empty) space.

In the 16th century, the problem of the limit of creation is similarly addressed by Marcellus Palingenius Stellatus, who believed in the existence of an infinite light outside the cosmos. Though, in his *Zodiacus vitae* Palingenius does not speak of plurality of worlds. His view is justified on the basis of the idea that God has no limitations in the process of creation: if nothing can impede God to create an infinite universe, why should God limit His own unlimited power? Bruno, who was strongly inspired by Palingenius on this issue and used basically the same argument in *De l'infinito* and in *De immenso* to justify the infinity of universe and worlds:

“Why should we or could we imagine that divine power were otiose? [...] Why should infinite amplitude be frustrated, the possibility of an infinity of worlds be defrauded? Why should be prejudiced the excellency of the divine image which ought rather to glow in an unrestricted mirror, infinite, immense, according to its way of being?”⁷²

This reflection is similar to that of Crescas in content and argumentative form. We also underline that both Bruno and Crescas reinterpret the Aristotelian concept of natural place. In their view, there is not just one world, to which all bodies move towards, but many worlds independent from each other, each of which has its own natural place: according to this perspective, a body cannot move from a world to another world. Crescas says this clearly:

“According to him [Aristotle], if we concede the existence of many worlds, we eliminate natural places. For he said that if we accept them, it would follow necessarily that, for example, parts of the earth in one world would move to their natural place in another world. But these are seductive words that are baseless. For in positing many worlds, we accept that there are natural places in each one. That is, earth will find its center in its world, and fire will find its periphery in its world.”⁷³

Similarly, Giordano Bruno harmonizes the Aristotelian concept of natural place with the infinity of worlds in the following passage:

“To this we reply that in the very manner that our earth revolves around our region in this infinite universal space and occupies this part thereof, so also the other stars occupy their parts of space and revolve around their own regions in the immense field. [...] we say that there is indeed likeness between all the stars, between all worlds, and that our own and the

⁷⁰ Hasdai Crescas, *Light of the Lord* (Or Hashem), ed. Roslyn Weiss, Oxford Univ. Press., Oxford, 2018, IV-2, pp. 336–37.

⁷¹ Ibidem, I-I, pp. 37–47.

⁷² Bruno, “De l'infinito, universo e mondi”, in Id., *Dialoghi italiani*, I, pp. 380–81. This argument is present also in Id., “De immenso”, II, 292–93, in which Palingenius is quoted explicitly. Cf. Alexandre Koyré, *From the Closed World to the Infinite Universe*, Johns Hopkins Press, Baltimore, 1957, ch. 1-2; Miguel Á. Granada, “Il rifiuto della distinzione fra *potentia absoluta* e *potentia ordinata* di Dio e l'affermazione dell'universo infinito in Giordano Bruno”, in *Rivista di Storia della Filosofia* 49/3 (1994), pp. 495–532.

⁷³ Crescas, *Light of the Lord*, IV-III, p. 337.



other earths are similarly organized. [...] as particles of our fire tend toward our main fire, and the fiery particles of other worlds tend toward the main fire thereof, and as the [elemental] particles of our earth tend toward our whole earth, so do the particles of another earth tend similarly toward her. So only by constraint and against their nature could the particles of that earth which we call the moon, with the waters thereof, be brought to move to this earth, or the particles of this earth move toward the moon.”⁷⁴

A further concept taken into account by Crescas and Bruno is void. According to Crescas, void is not the total absence of things, but the virtual space, in which creation takes place: “it would be necessary that there be empty space before there could be a universe. And this is because the empty spaces in which the universe resides must contain the possibility for a body to reside in them. For empty space is nothing but this”.⁷⁵ Crescas also believes that “if between the worlds there is emptiness, no absurdity will ensue”.⁷⁶ In Brunian works, the concept of void has a similar meaning: in *De l’infinito*, the void in the interstitial space between the worlds is defined by the terms “vacuo” and “aere”, while in *De immenso* “the accessible place is called ether” (though, we find also “vacuum”).⁷⁷ The opinions of Crescas and Bruno are in line with the perspectives of the moderns, who revised ancient physical concepts – e.g. “natural place” and “place”, that according to Aristotle is “the limit of encompassing body” – in order to put the emphasis on concepts like spatial infinity and void, as well as spatiality and corporeality.⁷⁸

Despite all these analogies between Bruno and Crescas, we cannot demonstrate with certainty that the Nolan knew the doctrines exposed in the *Or Adonai*. He never mentions Hasdai Crescas by name and it is very improbable that he knew his Hebrew text directly. Harari suggested that Bruno could have found Crescas’ doctrines in *De coeli harmonia*, which was written by Leo the Hebrew (maybe on the request of Gianfrancesco Pico della Mirandola). In fact, Leo the Hebrew is known to have made use of Crescas in the *Dialoghi d’amore* and he could have exposed doctrines of this thinker also in *De coeli harmonia*.⁷⁹ However, we do not know the content of that treatise, which has been lost. Furthermore, Leo the Hebrew never deals with the problem of plurality of worlds in his other writings. The texts of Christian Kabbalists and Renaissance humanists versed in Jewish studies might offer new hints and stronger arguments for Harari’s opinion. Though, we do not find this scholar’s hypothesis solid enough, since our current knowledge of *De coeli harmonia* is scarce.

CONCLUSION

A large variety of topics were covered in the previous pages. In the first part of this study, we underlined that Bruno’s perspective on Judaism is influenced by syncretistic

⁷⁴ Bruno, “De l’infinito”, IV, pp. 475–76.

⁷⁵ Hasdai Crescas, *Light of the Lord*, III A-I, p. 256.

⁷⁶ Ibidem, II, p. 335.

⁷⁷ Bruno, “De immenso”, II, p. 79. Cf. ibidem, II, p. 80: “Sedes vero Dei est universum ubique totum immensum caelum, vacuum spacium cuius est plenitudo”; Id., “De l’infinito”, V, p. 230: “Because in our heaven regions and distances are placed between the worlds; it [i.e. heaven] spreads everywhere, it penetrates everything and it is containing, contiguous and continuous to the whole [universe], and it does not leave vacuum; [...] if we intend it as something persistent, we call it the ethereal field containing the worlds; if we intend it as something consistent, we call it the space in which the ethereal field and the worlds are placed”.

⁷⁸ Cf. Giorgio Israel, “L’origine dell’idea moderna dello spazio tra matematica, fisica e teologia”, in Michele Emmer (ed.), *Matematica e cultura 2011*, Springer, Berlin, 2011, pp. 213–22.

⁷⁹ Cf. David Harari, “Who Was the Learned Jew that Made Known Hasdai Crescas’s *The Light of the Lord* to Gianfrancesco Pico della Mirandola?”, *Jerusalem Studies in Jewish Thought* 14 (1998), pp. 257–69 (Hebrew). On *De coeli harmonia*, see also Eugenio Garin, *Storia della filosofia italiana*, vol. 2, Einaudi, Torino, 1966, p. 596.

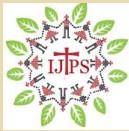


views, which very likely owe much to Marsilio Ficino's *prisca theologia*: the Nolan believes that Hermeticism is the origin of all philosophies and religions, including Judaism and Christianity. Bruno "redeems" the Jews, despite the fact that he portrays them in a bad light: in fact, according to the Nolan, the Jews are heirs of the magical knowledge of the Egyptians, the first keepers of the Hermetic wisdom. This belief partly explains why the Nolan includes themes of the Kabbalah in his oeuvre every now and then, despite the fact that his knowledge of the Jewish esoteric tradition is very poor and inaccurate. Kabbalistic concepts like the *sephirot* and the magic of letters are reinterpreted in a new way by the Nolan, who adopts them as conceptual details of his arguments in order to support original philosophical perspectives.

All things considered, we found Bruno's use of the Kabbalah less interesting than his reference to Jewish philosophy. It seems in Brunian works the theories outlined by Avicbron and Leo the Hebrew are used in a more conscious and functional way in comparison with the Kabbalistic notions, which Bruno does not even introduce with a proper description or contextualization. Though, also the indirect influence of the Kabbalistic tradition might have played its role in the development of Brunian physical and cosmological theories, as we claimed in the previous pages on the basis of the analysis of Brunian lexicon. In our opinion, the current state of the art concerning the studies on Bruno's reception of Jewish culture needs to be pushed further and we hope that our study can give new suggestions for future researches on the various topics discussed above.

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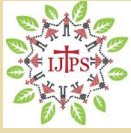
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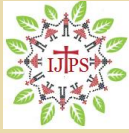
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