

GALILEO IN THE RUSSIAN ORTHODOX CONTEXT: HISTORY, PHILOSOPHY, THEOLOGY, AND SCIENCE

by *Teresa Obolevitch*

Abstract. The trial of Galileo remains a representative example of the alleged incompatibility between science and religion as well as a suggestive case study of the relationship between them from the Western historical and methodological perspective. However, the Eastern Christian view has not been explored to a significant extent. In this article, the author considers relevant aspects of the reception of the teaching of Copernicus and Galileo in Russian culture, especially in the works of scientists. Whereas in prerevolutionary Russia Galileo was considered a symbol of the unity of science and religion, in the Soviet period his name and especially his trial was largely used for atheistic propaganda purposes. The author discusses the most recent debate in the Russian Orthodox milieu. The second part is dedicated to the presence of Galileo in Russian religious philosophy, especially in the thought of Gregory Skovoroda, Ivan Kireyevsky, and Sergey Glagolev. Finally, the relation of the Russian Orthodox Church to the teaching of Galileo is considered.

Keywords: Galileo; heliocentrism; Orthodox Church; Russian religious thought

“The Galileo affair”—the history of the relation of the Catholic Church to the theories of the Italian scientist—had several “acts.” The most dramatic moment was the condemnation of Galileo’s teaching in 1633. The final “act” or, more precisely, the epilogue of the Galileo trial, took place in the 1970–1990s of the last century when Pope John Paul II initiated a multi-aspect investigation from the perspective of history, science, philosophy, theology, and law. The resulting discussion on the verdict led to the further rehabilitation of the author of *The Dialogue Concerning the Two Chief World Systems*. In 1984 a special commission admitted that the condemnation of Galileo was a mistake; in 1992 the Pope announced it in person. However, the Galileo case still draws the attention of large groups of scholars: historians of science, historians of Christianity and—first and

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foremost—researchers dealing with the relationship between science and religion (i.e., Fantoli 2003; Finocchiaro 2010; Coyne 2013).

“The Trial of Galileo” still remains one of the most representative examples of the alleged incompatibility between science and religion as well as a suggestive case study of the relationship between them from the Western historical and methodological perspective. In this connection it is worth exploring the attitude of Eastern Christian (more precisely, the Russian Orthodox) Church toward the teaching of Galileo through the course of history. In order to answer the question of the peculiarity of the Orthodox position towards “the Galileo affair,” I will consider the most relevant aspects of the reception of the teaching of the Italian scholar in Russian culture. In particular, I will analyze how the creativity of Galileo was reflected in the works of Russian thinkers throughout the intervening centuries. Special attention will be paid to the analysis of the relation of the Russian Orthodox Church to the theory of Galileo. Here I should state that the term “Russian culture” is very complex and embraces various ethnic and religious traditions. In this article I mean first and foremost Orthodox Christianity, typical for some regions of the former Russian Empire, such as Russia and partially Ukraine and Belarus. The history of the reception of Galileo’s teaching on the Western parts of the Tsarist Russia with a Catholic and Protestant majority (especially the Polish and Baltic areas) is a matter of separate exploration (Slavenas 1955; Rabinovich and Apinis 1960; Yarnefel’t 1962, 241–42; Bieńkowska 1972; Bepamyatnykh 1975; Matulaytite 1975; Lawrjesh 2008; Lehti and Markkanen 2010; Kubiak and Stepien 2013).

As far as I know, there has not been any detailed research in this field, except for general works dedicated to the history of astronomy and the heliocentric worldview in Russia. This article is the first attempt to reconstruct the development of the teaching of Galileo in Russian culture, as well as the reason for its favorable reception within the Orthodox tradition. Such an approach is not only concerned with the historical significance of this reception but also allows a presentation of the positions of Eastern Christendom concerning the interface of science and religion and an analysis of its contribution and limits. The detailed consideration of the presence of the thought of the Italian scholar in Russian Orthodoxy is beyond the scope of one article: the official Russian National Corpus lists approximately 300 million uses of the name Galileo in different texts and contexts throughout the course of history of Russia. We will take into account the most important and influential cases which took place in pre revolutionary Russia as well as in the contemporary Russian Orthodox Church.

THE RECEPTION OF THE TEACHING OF COPERNICUS AND GALILEO IN THE RUSSIAN ORTHODOX CONTEXT

In the Kievan Rus, as in the West, the geocentric system was developed and predominated. This was not so much along the lines of the Ptolemaic model as much as that of Cosmas Indicopleustes. This appeared in Byzantium in the sixth century and denied the spherical nature of the Earth (Chrissidis 2004, 382–83; Svyatskiy 2007, 343–53; Nicolaidis 2011, 28–33, 141). The first acquaintance with the heliocentric system came in the seventeenth century when Copernicus' view was mapped in Russia in the *Cosmography* by the Dutch scientist Joan Blaeu (first edited in 1635 in Amsterdam) entitled *Theatrum orbis terrarum sive Atlas novus in quo tabulae et descriptiones omnium Regionum* (the Russian edition 1655–1677). The translation (initiated by Patriarch Nikon of Moscow) entitled *The Mirror of the Universe . . .* was completed by a lecturer at the Kyiv-Mohyla Academy, the monk Epifany Slavinsky (with the help of two other monks, Arseny Satanovsky and Isaiah). The first part (“Introduction to Cosmography”) contained general information about the structure of the world. The author skated over the question of which of the two models—the Ptolemaic or Copernican—was true; nevertheless, he sympathized with the latter, for the reason that the system of Copernicus “is followed by all skilled mathematicians” (Raykov 1947, 130–32; Grigor'yan 1967, 85; Matwiiszin 1974, 657).

The activity of the Kyiv-Mohyla Academy, which was opened in 1632, should be mentioned here. Even though some professors, like Innokenty Gizel, Sebastian Kleshansky, and others proclaimed geocentrism, they also taught the alternative theories of Copernicus and Galileo (Panibrattsev 2002, 216). Also at the Slavo-Greco-Latin Academy in Moscow (organized in 1685–1687), Latin and Greek cosmology coursebooks (*In Libros* and *Peri Ouranou*, both written by Ioannikios Leichoudes before 1690) contained information about the Copernican system; “*In Libros* has early on made a clear reference to Galileo's condemnation of 1633” (Chrissidis 2004, 399, 404).

In the seventeenth and at the beginning of the eighteenth centuries the ideas of Copernicus were quite well known in Russia (Zhigalova 1964, 512–13), although sometimes they did not meet with recognition and would even be condemned (for instance, by Stefan Yavorsky and Innokenty Popovsky) in view of their discordance with the Scriptures. The compromise, the hybrid geoheliocentric system of the Danish astronomer Tycho Brahe, was propagated as a more appropriate solution.

There also existed some information about the original telescopic observations by Galileo Galilei. In the Russian astrological treatise entitled *The Wisdom of Solomon . . .* we can read that “Zeus (Jupiter) goes among four stars as the fifth one”; however, the picture illustrating this data had

nothing in common with the reality (Vorontsov-Vel'yaminov 1956, 40). The telescope appeared in Russia quite early on—just five years after it had been tested by Galileo, Tsar Mikhail I purchased the first instrument from the Moscow merchant Mikhail Smyvalov in 1614 (Chenakal 1969, 97). During the reign of Tsar Alexis the telescope was used for military purposes. In his library there was also the Russian translation of *Selenography, or A Description of the Moon* by the Polish astronomer Johannes Hevelius, which had been carried out between 1672 and 1682 in Moscow and contained fragments of the most important works by Galileo. This book (there is just a single copy of the manuscript!) had played a great role in the education of the future Tsar Peter I, who was extremely interested in astronomy.

Gradually, the teaching of Copernicus and Galileo gained more recognition, also due to the fact that in 1592–1610 quite a large group (fifty-two) of Ukrainian students attended the lectures of Galileo at the University of Padua (Koltachykhina 2012, 52). Copernicanism was supported by one of the founding fathers of the Russian Academy of Sciences, Theophan Prokopovich (1681–1736), who referred to the fact that it had been proven by the experiences of Galileo and, like the Italian scholar, defended the allegorical interpretation of the Bible (Pypin 1902, 201). On the basis of the investigations of “renowned Galileo from Florence” (in particular, sunspots and the phases of Venus discovered by him), Prokopovich criticized Aristotelian physics, arguing that “the matter of heaven does not differ from the matter of sublunary bodies” and claiming that the light disseminates almost immediately. Prokopovich was the author of the Latin verse entitled *Praise of Galileo* (or *Papal Condemnation of Galileo*), in which he expressed the opinion that “the world of Galileo” is true (Prokopovich [1975], 368). During his work at the Kyiv-Mohyla Academy in 1705–1716, he delivered astronomical courses based on theories of Copernicus and Galileo (Pavlenko, Vavilova, and Kostyuk 2006, 75). In his lecture course (delivered in Latin) on *Natural Philosophy, or Physics* Prokopovich mentions Galileo’s investigations of the natural world, such as the motion of the sea, and Jupiter’s satellites, as well as considering his “hypothesis” according to which the Earth travels around the Sun (Prokopovich [1980]). He also made astronomical observations in his house and villa (Artem’eva 1999, 89).

The works of Galileo in the private library of Prokopovich, as well as in the collection of a significant literary figure of that time, Jacob Bruce (1670–1735), created favorable conditions for the popularization of the teaching of the Italian astronomer in Russia. For instance, under the supervision of Bruce in 1707, the librarian Vasily Kipriyanov published a star map with the schemas of the four models of the world proposed by Ptolemy, Tycho Brahe, Descartes, and Copernicus (Raykov 1947, 156; Collins 2012, 75). A few years later, in 1719, Bruce translated and edited the treatise of Galileo’s successor Christiaan Huygens entitled *Cosmotheoros* at the direction of Peter

I, who “opened his country to the ideas of modern science” (Vucinich 1963, 72). The Tsar personally inspected the preparation for the edition. He also probably proofread the preface written by Bruce. It is due to the authority of Peter I that the Orthodox Church did not openly oppose the new theory.

At the beginning of the eighteenth century there was conflict between the proponents of Tycho Brahe and of Copernicus. However, the model of the latter was more popular. For example, during the festive illumination dedicated to the birthday of the Empress of Russia, Anna, which took place in 1735 in St. Petersburg, two systems of the world were depicted which illustrated the teaching of Copernicus and Tycho Brahe (Artem'eva 1996, 219–20). By the 1760s the heliocentric theory became recognized by all Russian scholars. The most important role in the process of its reception was played by the Imperial St. Petersburg Academy of Sciences which was established on the initiative of Leibniz. During the first public meeting held on December 27, 1725, Professor Georg Bernhard Bilfinger (1693–1759) delivered a speech entitled *Sermones in primo soleni Academiae scientiarum imperialis conventu die XXVII Decembris anni 1725 publice recitati*, in which he pointed out the significance of Copernicus and Galileo for the development of science. The astronomical, mechanical and optical ideas of Galileo were propagated (in lectures and works) by numerous members of the Academy. These included the founder of the Petersburg astronomical school Joseph-Nicolas Delisle (1688–1768), the professors of mathematics Daniel Bernoulli (1700–1782) and Leonhard Euler (1707–1783) (who also worked at the Royal Observatory in St. Petersburg), the professor of physics Georg Krafft (1701–1754), and the professor of astronomy Christian von Winsheim (1694–1751), as well as other scientists (Nevskaya 1984). These included those invited from abroad as well those from Russia and, in particular, “the first Russian astronomer” Stepan Rumovsky (1732–1812) and the professor of mathematics Semyon Kotelnikov (1723–1806) (Vernadsky 1969). In 1732 an article *On Earth* was published and the author (probably Georg Krafft) once again stressed that the teaching of Galileo did not contradict the Bible, which needed to be interpreted correctly (Raykov 1947, 240). By the end of the eighteenth century, heliocentrism was taught also at secondary schools in some Belorussian provinces of the Russian Empire (Bespamyatnykh 1978, 133–37).

However, the new theory did not meet with the understanding of some scientists and cultural figures, such as the director of a Petersburg publishing house, Mikhail Avramov, and a botanist, Johann Georg Siegesbeck (Perel' 1966, 183, 195). As an illustration, it is worth saying that in 1728 Delisle gave the first open speech (in French) on heliocentrism, in which he posed the question of whether the proper system of the world could be established by the means of astronomy and of whether the Earth rotates or not. This he phrased as “si l'on peut démontrer par les seuls faits astronomiques,

quel est vrai système du monde? Et si la Terre tourne, ou non?” (Raykov 1947, 196). Upon Delisle’s speech Bernoulli also expressed his conviction that Copernicanism presented a true picture of the universe, but neither Delisle’s nor Bernoulli’s lectures appeared in Russian translation.

The most prominent Russian scientist of the eighteenth century was Mikhail Lomonosov (1711–1765). He not only performed astronomical observations, but also proposed their philosophical interpretation. Lomonosov explicitly mentioned the name of Galileo only once, in his translation of *Physics* by Ch. Wolff. Nonetheless, the influence of the Italian scholar on the works of Lomonosov is more than obvious. Like Galileo, he used the hypothetico-deductive method of investigation and considered mathematics as the language in which “the book of nature” had been written. Lomonosov also defended the autonomy of science, yet did not reject the role of religion. This approach can be illustrated by the following quotation:

The Creator has given two books to mankind. In one [He] has shown His majesty, in another—His will. The first one is this visible world, established by Him so that a man looking at the vastness, beauty and elegance of its buildings, acknowledges divine omnipotence, as much as he can understand. The second book is the Holy Scripture. It shows His favor to our salvation. In these prophetic and apostolic God-inspired books, the interpreters are our great teachers of the Church. In the book of creation of the visible world, the interpreters are physicists, mathematicians, astronomers and other expounders of the divine infusions into nature—much like the prophets, apostles and teachers of the church in the scripture. Unreasonable is a mathematician if he wants to measure the divine will by compass. The same is true about the theology teacher if he thinks that astronomy or chemistry can be learned from the Psalms. (Lomonosov [1761])

There is no need to add that the aforementioned words are in tune with the famous remark of Galileo derived from his Letter to the Grand Duchess Christina (1615): “The intention of the Holy Ghost is to teach us how one goes to heaven, not how heaven goes.”

According to Galileo, not all biblical truth belongs to the indisputable *depositum fidei*. He shared the opinion of St. Augustine who had distinguished immutable dogmas from the historical and cultural conditioning of Scripture. In addition, Galileo insisted that science is not “the servant of theology” since it has its own subject of investigation. “The book of nature” (the expression coined by St. Augustine) and the Bible cannot contradict each other. Both books “represent the same spiritual sense in different forms, that is, since the unity of the divine originator of nature is manifested in them” (Cassirer 2000, 55). For this reason, the principle of submission of science to theology must be replaced by the principle of the equality of both spheres. Lomonosov declared that “faith and truth are sisters: they proceed from one Almighty Father and can never come into

conflict'; and he supposed that the terms 'religious action' or 'holy action' could properly be applied, in a certain sense, to scientific thought, but that the latter must have its own separate domain" (Lappo-Danilevsky 1917, 170).

Lomonosov also demanded in the university regulations written by him "do not criticize sciences in sermons" (Shpet 2008 [1922], 63). The exploration of nature indicates the majesty of the Creator and is not at variance with biblical truths which cannot be interpreted literally "The Scripture should not always be understood literally, but often rhetorically" (Lomonosov [1761]). In the spirit of Galileo Lomonosov wrote:

Commentators and preachers of the Scripture show the way to virtue, reward of the righteous, punishment of law-breakers and preaching well-being accordant with the will of God. Astronomers discover the temple of the divine power and glory and seek the ways to our transitory bliss combined with reverence and thanksgiving to the Almighty. Together both convince us not only of the existence of God but also of His ineffable goodness to us. It is a sin to plant weeds and strife between them! (Lomonosov [1761])

Hence, both the Italian and the Russian scholars were the forerunners of the model of dialogue between science and religion.

A student of Lomonosov, Nikolay Kurganov (1725–1796), also attached much weight to the creativity of Galileo. His works, as well as the publications by Franz Aepinus (1724–1802) and Fyodor Soymonov (1682–1780), largely contributed to the spread of the teaching of the Italian scientist in the Russian academic milieu.

One of the results of the educational reform in Russia performed by Catherine the Great in 1786 was the compulsory study of heliocentrism, even in ecclesiastical seminaries. In the mid-eighteenth century there was an attempt at the publication of the first biography of Galileo in Russia. It was a part of the book *Histoire des mathématiques* by Jean-Étienne Montucla, translated by Peter Bogdanovich and printed in *The Academic News* in 1779–1781 (the edition had never been completed). At the same time the other works (and translations) dedicated to the author of *Dialogue Concerning the Two Chief World Systems* came out (Chenakal 1969, 110–11).

Galileo was the center of interest of many scholars in Russia in the nineteenth century. The groundbreaking work of the first director of Pulkovo Observatory, Friedrich-Georg-Wilhelm (called in Russian Vasili Iakovlevich) Struve (1793–1864), entitled *Études d'Astronomie Stellaire*, should be mentioned, as well as the writings of the science popularizer Vasily Assonov (1843–1918) and other authors. It is worth mentioning the Russian translation of the book by François Jean Arago, *Biographies of Scientific Men* in three volumes, which was published in Petersburg in 1859–1861 due to a member of Academy of Sciences, Dmitri Perevoshchikov

(1788–1855), who supplied the comments and additional materials. It is noteworthy that the renowned Ukrainian poet Taras Shevchenko (1814–1861) in 1860 wrote a verse *Both Archimedes and Galileo*—Galileo, together with Archimedes, was considered by him to be a first seeker of truth (Shevelov 1980, 330).

In the Soviet period, the name of Galileo and especially his trial was largely used for atheistic propaganda purposes. Nevertheless, there were exceptions. For instance, an outstanding biologist and philosopher, Alexander Lubishchev (1890–1972), in his book *Science and Religion* (published only in 2000) carefully analyzed “the Galileo affair,” disproving the stereotype of Galileo as a martyr for science. Another example can be found in the creativity of St. Luke the Physician (Voino-Yassenetsky, 1877–1961), an archbishop of Simferopol and an extraordinary surgeon, who mentioned Galileo as a deeply religious man (Buxhoeveden 2011, 22).

At this time almost all of Galileo’s substantive works were translated into Russian (sadly, in the 1930s the translator, Alexander Dolgov, was arrested and executed). At that time a number of valuable works were also published (based on the archive documents) dedicated to the history of astronomy and physics in Russia; history of science remained a relatively free pursuit, whereas the only admissible philosophical interpretation of scientific theories were based on Marxist theory (Josephson 1991), and any theological investigations were prohibited. One can also admit that Galileo’s thought experiment was an object of the methodological and logical investigations conducted by the Moscow Methodological Circle, organized in the early 1950s by Alexander Zinovev, Merab Mamardashvili, Boris Grushin, and Georgy Shchedrovitskij (Ogurtsov, Neretina, and Assimakopoulos 2005, 36).

In the 1990s the image of Galileo as a martyr for science was gradually replaced with the image of the precursor of the dialogue between science and religion. An important event in this regard was the Russian edition (*Galiley: V zashchitu ucheniya Kopernika i dostoinstva Svyatoy Tserkvi*) of the book by Annibale Fantoli *Galileo: per il Copernicanesimo e per la Chiesa*. At the presentation of this edition held in Moscow in June of 1999, the director of the Vatican Observatory, George Coyne, SJ, and another Catholic priest, Professor Michael Heller from Poland, were present.

Nowadays the standard Soviet interpretation of the Galileo affair as the prime example of persecution of scientists by the Church is an object of critique by numerous Orthodox figures, both lay and clerical. The modern discussions go beyond the frame of pure academic investigations and are also taking place in the blogosphere. Detailed analysis of “the Galileo trial” was conducted in the Orthodox journal *Foma* (“Thomas”), among others. In 2004 the editor-in-chief of this journal, the popular Orthodox journalist Vladimir Legoyda, together with Sergei Vereykin, published an article entitled “‘The Martyrs’ of Science: Galileo and Inquisition,” in which

they stressed that the Catholic Church was even more tolerant towards Galileo than many scientists of that time. The Italian astronomer “*never was and could not be* forced to choose between the teaching of Copernicus on the one hand and the Church on the other” (Legoyda and Vereykin, 2004). The authors cited the famous Russian scholar Vladimir Vernadsky (1863–1945), who wrote that Galileo had not sought conflict with the old (Ptolemaic) astronomical views for supposed anti-religious reasons. On the contrary, it was purely a scientific matter. This publication by Legoyda and Vereykin was one of the numerous voices declaring that the Orthodox faithful intended to overcome the heritage of atheistic propaganda in Russia.

The topic of “the Galileo trial” was also followed by the clergy student Sergei Amiantov, who in 2007 admitted that the great astronomer by no means gave up his religious convictions. Galileo did not suffer for scientific theory and enjoyed quite comfortable conditions for his work even after the final verdict of the Holy Office (Amiantov 2007). Amiantov paid attention to the political and philosophical factors of the Galileo affair with good reason.

Quite recently, the Galileo affair has been in the center of public debate in the Russian Orthodox milieu. In 2015 the celebrated reporter Alexander Nevzorov published (in the online journal *The Snob*) a provocative text entitled “Especially Dangerous Thinking: The History of Freaks” (sic!). This author maintained that, scientists such as Galileo or Copernicus had a reputation of being “freaks,” something ridiculous and exotic that contradicted “the true knowledge” represented by the Church. Therefore, the drama of Galileo did not concern the relationship between science and religion, but simply a “freaky, new way of cognition” and “the academic, well-established way of cognition.” To put it differently, it was the conflict within science itself, with the stipulation that the only “good” science was reserved to the Catholic Church in the shape of scholasticism. According to this line of reasoning, “the condemnation of Galileo . . . is a brilliant example of academic honesty and nobility” (Nevzorov 2015b). The history of such an opposition between different scientific hypotheses and theories as well as the boldness and persistence of scholars like Galileo one could also observe in the twentieth century, concluded Nevzorov.

Immediately after this publication Igor Dmitriyev, a prominent historian of science and author of *The Stubborn Galileo* (2015b), pointed out numerous errors of which Nevzorov was guilty. Indeed, the Galileo affair is more complex and multifaceted. That drama was played “in the complicated polyphony” of “different factors and contexts (logical, physical, philosophico-natural, patronal, theological, political and personal-psychological) (Dmitriyev 2015a). Dmitriyev warns of ignorance of history of science, claiming that such a position has far-reaching consequences in the educational and cultural life of Russia. In turn, Nevzorov explained

that he writes from the publicist's perspective and is not concerned about historical, archival facts. The author confessed that he "teased" his opponent deliberately (Nevzorov 2015a). In any case, this current debate is a clear witness to the enduring interest in the trial of Galileo among Russian Orthodox believers.

Another example is the creativity of the famous cinematographer Efim Reznikov (Granat film studio). In 2014, together with Alena Badyagina, he made a documentary film (supported by the Ministry of Culture of the Russian Federation) called *The Galileo Case: The Variations*. The film directors carefully interviewed the most relevant persons dealing with the Galileo affair (including Cardinal Paul Poupard, the aforementioned Igor Dmitriyev, other scientists, members of the Church, and cultural figures) and also used the video from the international conference "Galileo Galilei: Context for Interpreting" which took place in Moscow in 2014. As we can see, in Russia the Galileo affair is not just of historical significance, but an ongoing polemic and investigation. The question of the freedom of science in the context of religious conviction is still vital and essential.

GALILEO IN RUSSIAN RELIGIOUS PHILOSOPHY

Numerous Russian philosophers since the eighteenth century have been interested in the ideas of heliocentrism and, above all, in the works of Galileo. For instance, Gregory Skovoroda (1722–1794) not only provided readers with information on the heliocentric system of the universe, but also—in the spirit of Galileo—used the famous methodological principle of Ockham and taught about allegorical meaning of Scriptures that did not meet with the acceptance of the Church authorities (Bayuk 1994, 128–29). Another alumnus and then professor and rector of Kyiv-Mohyla Academy and Mogilev Ecclesiastical Seminary in Belarus, Georgy Konissky (1717–1795), talked about modern astronomical observations in his lectures, paying special attention to Galileo's discovery of Jupiter's moons, even though he "presented the Copernican system in a rather neutral fashion" (Drozdek 2014, 13).

The rector of the Slavic Greek Latin Academy in Moscow, Theoflact Lopatinsky (1670–1741), who taught the course of cosmography, took the opposite position. He also wrote about Galileo but was nevertheless very attached to the system of Tycho Brahe. What is interesting is that Lopatinsky, in favor of the latter model, referred to the opinion of Cardinal Bellarmine who had accepted the new theory simply as a "more useful method of the mathematical expression of the star's movements, but had categorically refused to acknowledge that it could deal with the reality" (Panibrattsev 1997, 89). Hence, Lopatinsky, like the opponents of Galileo, considered mathematical analysis as a "hypothesis" which only "saves the

phenomena” (using the slogan of Pierre Duhem) and is this useless for the explanation of the world.

Galileo was also mentioned by the translator of Bernard Fontenelle’s *Conversations on the Plurality of Worlds* (*nota bene*, condemned by the Orthodox Church), Antiochus Kantemir (1708–1744). In his commentary to the text he wrote: “Galileo Galilei . . . from his childhood tended to mathematics and due to his diligence developed this science. He improved and almost made perfect the telescope. He was the first who discovered Jupiter’s moons and sunspots and thoroughly proved the Copernican system. He suffered for this from the Rome Inquisition so that he was forced to retract all his opinions about the world system in order to receive freedom. He died in 1642, at the age of 78” (Fontenel’ 1740, 58).

Also Vasily Tatishchev (1686–1750), in his *Conversation of Two Friends About the Benefit of Sciences and Academies* written in 1733 but printed only in the nineteenth century, declared: “Copernicus and Galileo, despite papal persecution, and not fearing condemnation, proved the truth in mathematics, and especially in astronomy. What is more, they approved the truth so strongly, so that even ashamed Papists were obliged to acknowledge their rightness” (Tatishchev 1887, 54). One can notice the clearly anti-papal character of the remark of Tatishchev about Copernicus whose teaching, as is known, was not condemned by the Church during his lifetime.

In turn, Alexander Radishchev (1749–1802), who tended towards so-called natural religion (Zenkovsky 2006, 89), referred to Galileo in his ode *Liberty* as well as in the work entitled *On Man, His Mortality, His Immortality*, which was written during his exile in Siberia. The author compared his lot with the Italian scientist: “Galileo is dragged to prison, and your friend banished to Ilimsk” (Radishchev 1941 [1809], 129). The courage of Galileo was mentioned also by the writers and historians Mikhail Shcherbatov (1733–1790) and Nikolay Karamzin (1766–1828), as well as by the early Russian journalist Nikolai Novikov (1744–1818) who in one of his articles presented the Italian scientist as an uncompromising fighter for truth (Vucinich 1963, 177).

The image of Galileo as educator and martyr for truth was known in Russian philosophy from the eighteenth century. Similar to the Western tradition, “the Galileo affair” became a symbol of the conflict between science and religion, between independent thinking and the authority of the Holy Scriptures. It was stressed that this conflict took place in the Roman Catholic, not in the Orthodox Church. As an illustration, one might hold up the statement of the Slavophile Ivan Kireyevsky (1806–1856). Considering the relationship between the Eastern Christian theology and science, he wrote:

In the [Orthodox] Church, the relationship between reason and faith is completely different from their relationship in the Latin and Protestant

confessions. The difference is this: In the [Orthodox] Church, Divine Revelation and human thought are not confused. The boundaries between the Divine and the human are transgressed neither by science nor by Church teaching. However much believing reason strives to reconcile reason and faith, it would never mistake any dogma of Revelation for a simple conclusion of reason and would never attribute the authority of revealed dogma to a conclusion of reason. The boundaries stand firm and inviolable. No patriarch, no synod of bishops, no profound consideration of the scholar, no authority, no impulse of so-called public opinion at any time could add a new dogma or alter an existing one, or ascribe to it the authority of Divine Revelation—representing in this manner the explanation of man's reason as the sacred teaching of the Church or projecting the authority of eternal and steadfast truths of Revelation into the realm of systematic knowledge subject to development, change, errors, and the separate conscience of each individual. Every extension of Church teaching beyond the limits of Holy Tradition leaves the realm of Church authority and becomes a private opinion—more or less respectable, but still subject to the verdict of reason. . . . This inviolability of the limits of Divine Revelation is an assurance of the purity and firmness of faith in the Church. It guards its teaching from incorrect reinterpretations of natural reason on the one hand, and, on the other, guards against illegitimate intervention by Church authority. Thus, for the Orthodox Christian it will forever remain equally incomprehensible how it was possible to *burn Galileo* for holding opinions differing from the opinions of the Latin hierarchy, and how it was possible to reject the credibility of an apostolic epistle on the ground that the truths it expressed were not in accord with the notions of some person or some epoch. (Kireyevsky 1856)

It is worth emphasizing the expression “burn Galileo.” This is obviously not in accordance with the facts, but should be considered as a rhetorical figure which emphasizes the severity of the conflict between faith and reason in the Catholic Church.

In contrast, Kireyevsky, as an advocate of the Slavophile movement, insisted that the Eastern Church was not burdened by the ballast of hostility to scientific research. We will return to this question later.

A more moderate opinion about “the Galileo trial” was presented by a professor of the Moscow Ecclesiastical Academy, Sergey Glagolev (1856–1937), who wrote the entry on the Italian astronomer in *The Orthodox Theological Encyclopedia*. After an enumeration of the most crucial achievements of Galileo, Glagolev maintains that

each confessional theology always had and shall have its own views on nature and will never cede its right—to *some extent*—to control, dispute or accept these or those scientific views. For this reason collisions between theologians and the proponents of natural sciences are inevitable. The lot of Galileo was one of those tragic collisions, (Glagolev 1903, 40; Glagolev 1905, 209)

Glagolev continues:

the tragic case of Galileo took place amongst Catholics, but something like that also happened amongst Protestants and in all likelihood it can happen also in Orthodoxy. . . . The modern explorations of the lot of Galileo definitely brought about that his passions and sufferings were conditioned not by collisions between theology and empirical knowledge, but were a result of a clash between a scientist who shared new views with the proponents of the old peripatetic tradition as well as of personal collisions. (1903, 41; 1905, 209–10)

Glagolev considered the question of the relationship between science and religion in his various works. He dedicated special attention to the careful and unprejudiced analysis of “the Galileo affair,” many results of which have been recognized by contemporary researchers. However, Glagolev regards the theory of heliocentrism as well as other modern discoveries (i.e., Darwin’s theory of evolution and Mendel’s experiments) entirely from the perspective of so-called scientific and natural apologetics according to which one of the reasons for the conflict between faith and reason was the ignorance of the “overzealous” apologists of Christianity, who, “having the best intentions, usually possessed only a very superficial knowledge about science and nature” (Strakhov 1908, 258). Scientific and natural apologetics was taught (also by Glagolev) in the ecclesiastical academies. The professors were supposed to demonstrate the insufficiency of the “scientific faith,” understood as the conviction about the rightness of the scientific doctrines, which—contrary to the invariable, irrefutable, or, to use more modern language, unfalsifiable dogmas of faith—have barely the character of working hypotheses and not the ultimate explanations of the universe. Abandoning the strategy of isolation or conflict between science and religion in favor of cooperation between them was to facilitate—in the opinion of scientific and natural apologists—the realization of the grand, noble purpose of comprehending God and the universe created by Him.

The name of Galileo is also sporadically mentioned by prominent Russian religious philosophers of the so-called Silver Age (the end of the nineteenth and the first half of the twentieth century). Some remarks on Galileo can be found in the works of Vladimir Solovyov (1853–1900), Vasily Rozanov (1856–1919), Leo Lopatin (1855–1920), Semyon Frank (1877–1950), Nikolay Lossky (1870–1965), Sergei Hessen (1887–1950), Alexei Losev (1893–1988) and other thinkers. A special focus on the Galileo affair was provided by Victor Nesmelov (1863–1937). In his famous work *Faith and Knowledge from the Point of View of Epistemology* (1913), he noticed that Galileo seemed to be torn between his scientific and religious convictions: as a Christian he believed that the Earth was the central point of the world’s history, whereas as an astronomer he claimed that our planet is just one of the satellites of the Sun. As a matter of fact,

there is no conflict between these two positions: religion, even if speaks about the empirical world, concerns only its relation to the Creator, therefore the Scripture cannot be a source of scientific knowledge (Nesmelov 1913, 14–15). What is more, in Nesmelov's opinion, natural science leads to the theistic understanding of reality (Nesteruk 2015, 44).

Last but not least, it is worth mentioning the brilliant studies (first published in Russian only in 1985) of the émigré philosopher and historian of science, Alexandre Koyré (1892–1964), who delivered a thorough analysis of the philosophical presumptions of the works of Galileo.

THE RELATION OF THE RUSSIAN ORTHODOX CHURCH TO THE TEACHING OF GALILEO

Let us return to the opinion of Kireyevsky, according to which the relation of the Orthodox Church to science was more tolerant and open than in the West. Is there any basis to this claim?

In order to answer this question we should analyze some facts. As we have already seen, the heliocentric system of the world had been studied in Kyiv and Moscow since the seventeenth century, whereas in the West in 1616 the treatise of Copernicus *De revolutionibus* had been put into the Index of Forbidden Books; the prohibition was only definitively overturned—also for *Dialogue Concerning the Two Chief World Systems*—in 1835 (Fantoli 2003, 358). At the same time, as already mentioned, the teaching of Copernicus and Galileo in Russia met with hostility even in the nineteenth century. As an illustration, we can notice the anonymous book (Moscow, 1815) entitled *The Breakdown of the System of Copernicus* and dedicated to Archbishop Augustine. It is interesting that the author “sympathized with Catholicism in its treatment of Galileo” and interpreted the words attributed to the Italian astronomer “yet it moves” as “a rare example of stubbornness” (Raykov 1947, 370).

Hence, we can notice that the Russian Orthodox Church had an ambivalent position towards the teaching of Galileo. On the one hand, it did not openly condemn the heliocentric model of the world or other scientific theories. On the other hand, Orthodoxy remained cautious and tried to avoid “awkward” situations which could have resulted in the “secularization” of science, that is driving it from the religious context. There were no apparent conflicts and conspicuous “trials” condemning these or other scientific theories. One can add that a similar situation took place also in the contemporary Greek Orthodox Church, where there was “almost no reaction and certainly no debate” over Galileo's teaching (Nicolaidis 2011, 137).

Nevertheless, Russian scientists could not always defend their ideas openly.

Science in Russia did not go through the long and complicated process of secularization which was typical for European thought. The Orthodox Church did not claim that it had full and detailed knowledge about the physical world. Consequently, it did not and could not pose any obstacle to the new knowledge which was, in a sense, authorized by the state. As for the possible consequences for worldview, the Orthodox Church could not defend the biblical perspective. That is why the spiritual censorship fought with heliocentrism as well as the teaching about “plurality of the worlds.” . . . It was a situation of internal contradictions: The state Church tried to resist to the state ideology, although *de facto* it was situated within it. However, this confrontation was not of a basic character and was never as sharp as in Western Europe (Artem’eva and Mikeskin 1998, 335).

What is the reason for the *relative*—it needs to be stressed—freedom of scientific views in Orthodoxy? One can list a number of circumstances. One is the fact that science and theology were not considered equal and, subsequently, potentially competitive spheres of knowledge. Moreover, the Orthodox approach—to a degree—is akin to the postulate of Galileo who insisted on the separation of competences between science and theology. In such a perspective, the results of science cannot be treated as “dangerous” for faith. Theology (that is, according to the Eastern Christian tradition, “contemplation” or vision of God) and science lie in different planes, and therefore between them there could not be any confrontation (or, in any case, confrontations are not as great as in the Western Church). Science by its own nature cannot refute truths about God-in-Himself which remain beyond reason. “From the perspective of Orthodox Christianity, the scientific discoveries or philosophical truths that became known to human beings belonged to reason or mind and thus remained inferior to the spiritual knowledge or divine truth inspired by God” (Wirtschafter 2014, 37). True knowledge of reality does not end in natural science, but in the inner mystical bond with God given in the religious experience and leading to the transformation (deification) of man. Every scientific theory, including heliocentrism, is of a limited character: it is nothing more than a sequel of different hypotheses or models, whereas the Truth transcends the human possibility of perception (Florovsky 1989, 152): “the knowledge of God is never something that can be framed as a hypothesis tested in the language of science” (Buxhoeveden 2009, 39). As has been mentioned above, Galileo’s teaching had been considered merely as a mathematical hypothesis by his Catholic adversaries (and Lopatinsky in Russia). However, the understanding of the status of hypothesis was quite different. For Cardinal Bellarmine and other critics of Galileo, the hypothetical character of heliocentrism meant that it is merely a *mathematical tool* which does not grasp *physical reality*, whereas from the Orthodox point of view recognition of science as hypothesis was equal to the statement that *the whole of reality* (of a divine character) *surpasses the empirical (physico-mathematical) structures*, although manifested itself—to a degree—through them.

Consequently, even though in history there were cases when the Russian Orthodox hierarchies took a hostile position towards various theories, science had a certain independence because religious experience had never been “in competition with scientific knowledge as a method” (Buxhoeveden 2009, 43). As Alexei Nesteruk put it:

Orthodox theology was never heavily engaged in discussions with science, because, according to this theology, science, seen as a human enterprise, that is, as the specific and concrete realization of existential events, could not contradict the facticity and contingency of every personal existence (even less could it control it). . . . Orthodox theology was not afraid of any scientific developments and their application, simply because all scientific achievements could not address the mystery of the incarnate subjectivity, which is, in a way, a major preoccupation of theology. . . . It is then not accidental that Orthodox theology is called *existential theology*. (Nesteruk 2008, 3)

It is worth mentioning that theology and natural sciences almost did not meet at the educational level either: no Russian university had a faculty of theology, which was reserved for the ecclesiastical academies controlled by the Holy Synod. Essentially, Orthodox theology “is able to accommodate itself very easily to any scientific theory of the universe, provided that this does not attempt to go beyond its own boundaries and begin impertinently to deny things which are outside its own field of vision” (Lossky 1991, 106). This means that the apophaticism of Eastern Christian theology is a necessary and sufficient condition of its dialogue with science (Obolevitch 2008). That is why the distinguished Russian theologian Vladimir Lossky (1903–1958) could say (following another prominent figure, Fr. Pavel Florensky) that “the cosmology of revelation is necessarily geocentric” (Lossky 1991, 105). This statement does not suppose that the Earth actually is the center of the universe from the cosmological perspective, but pointed out the soteriological dimension of the mystery of Salvation, which encloses human beings rather than the inanimate universe. Rather, the heliocentric worldview, “from the psychological or rather spiritual point of view, corresponds to a state of religious dispersion or off-centeredness, a relaxation of the soteriological attitude, such as is found in the gnostics or the occult religion” (Lossky 1991, 105). Again, as Lossky himself stressed, the latest account had not expressed the scientific fact concerning the Copernicanian system, but only described the spiritual situation of the distracted man, or sinners. In both cases reference to the cosmological hypothesis is but a suggestive metaphor which conveys this or other theological (not physical) truth.

The next reason for the comparatively tolerant relationship of the Orthodox Church to science and, in particular, to the teaching of Galileo, was connected with the fact that science in Russia had been less “burdened” by the tradition of Aristotelian physics, the presumptions of which needed to

be overcome—not without a struggle—by the scientists of the Renaissance in the West. Aristotelianism began to spread in Russia (the Kyiv-Mohyla Academy and the Slavic Greek Latin Academy in Moscow) at about the same time as modern scientific theories, and was not perceived as something “dangerous” for the physics of the Stagirite. Besides, the textbooks written in the spirit of the so-called second Scholastic were replaced by the manuals of Ch. Wolff, a student of Ch. F. Baumeister. What is more, in an article published in 1787, the opinion was expressed that “the travelling man [who is spinning together with the Earth] is at higher risk than he who sits motionless, hence, the first needs the protection of God more than the last one. . . . As a consequence, the world of Copernicus and Newton favors piety to a greater extent than the comfortable and bounded Aristotelian-Ptolemaic world” (Raykov 1947, 359).

As Tat'yana Artem'eva noticed,

“the geocentric” and “the heliocentric” views were not perceived as symbols, neither ideological nor political struggle between the state and the Church, as took place in the Western Europe. . . . The development of speculative cosmology was determined rather by scientific achievements than by the necessity of abolishing the worldview stereotypes. For this reason, it was free from antireligious load; quite the opposite, elaboration of the new views does not contest the theocentric image of the world, but enhances it. . . . Naturalists saw in the phenomenon observed by them proofs of the Wisdom of the Creator (Artem'eva 1996, 225).

Yet we have to point out the character of the principle of autonomy of science and religion proclaimed by Russian Orthodox thinkers. As has been already mentioned above, science had taken up the lowest level in the hierarchy of the branches of knowledge and had not been perceived as a serious rival to religion. As in the Western Church, it was theology which had the unquestionable priority. Whereas Galileo postulated an acknowledgement of the competence of science, defending it from the intervention of the Church authorities, the Orthodox Church was simply not seriously interested in scientific data. In this regard, “the hierarchs of the Russian Orthodox Church before the Revolution [1917] did not speak about the relationship between science and religion at all. The reaction of the Church and the Orthodox intellectuals even toward the ideas of evolution which had been widely discussed after publication of famous works of Darwin, was quite moderate” (Nesteruk 2006, xii).

We can pose a final question: To what degree is it possible to retain the autonomy of science and theology? It is easy to notice that both the subordination of scientific data to the truths of faith (which took place in the Catholic Church at Galileo's time) and the attitude of independence of science and religion (in Orthodoxy) were *de facto* based on the explicit or implicit “supremacy” of theology. Thereafter the intensive development of modern science (free from any religious authorities) resulted in the

appearance of a positivism which totally rejected the significance of theology. In this case we are dealing with “supremacy”—to be more precise, the supremacy of science. As a consequence, any interaction of religion and science is either excluded or very limited. The radical way of separation does not solve the problem of the relationship between science and religion. Hence, there is a permanent need for constructive dialogue between scientists and theologians of the type which was taken by Galileo.

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