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THE CONTRIBUTIONS OF THE CHURCH IN BYZANTIUM TO THE NATURAL SCIENCES BYZANTINE ASTRONOMERS AND SCIENTISTS

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Abstract

In this paper, the Natural sciences in Byzantium and the contribution of distinguished scholars are considered. Since they usually were monks, famous schools were in monasteries, and works of antiquity were preserved in monastic libraries, the importance of the Church in Byzantium for Natural sciences is analyzed and demonstrated.

Keywords: Orthodox Church, Eastern Church, Byzantium, Natural sciences, Byzantine monks, mathematicians, astronomers

1. Introduction

A large period of Greek history is occupied by the thousand-year Byzantine Empire. This empire was the Eastern Medieval Christian Empire, which Hélène Glykatzi-Ahrweiler calls *Empire of the Christian East* or *Greek Middle Ages Empire* [1].

The Byzantine period is the connecting link between Greek antiquity and the modern era, as in this period can be found the roots of the modern Greek nation and Orthodoxy. It is customarily approached mainly through Theology, religious art and religious literature; however, Byzantium was an empire whose scholars, mainly men of the Church, contributed also in the Natural sciences and Mathematics. In the following publications we will mention and examine in detail scientists of the Byzantine period and their work in Mathematics, Physics, Astronomy and generally in Science. In this work we shall mention some selected but still largely unknown scholars who cultivated and served the study of Science and especially Astronomy. We also want to underline the role of Church in Byzantium for Natural sciences of that tine, since, as we will

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demonstrate in the following sections, practically all important scholars working in Mathematics, Astronomy and Physics, were monks, or in general men of Church and monasteries and monastic libraries were of greatest importance for activity of scholars, as well as for preserving the scientific legacy of antiquity.

According to modern Greek historian Anna Lazarou: "The contribution of Byzantium lies not so much in the increase of the corpus of knowledge delivered by Greek Antiquity, but rather in the preservation of many of its achievements, by both copying and saving ancient texts, and by their collection, writing of commentaries and interpreting them." [2]

The truth is that within the period from the 2nd century AD (the age of Claudius Ptolemy) to the 16th century (the age of Copernicus) the general progress of Science including Astronomy is standing rather than advancing. The reasons for such situation were basically the following three:

1. The tremendous authority, almost with a status of a religious dogma, of the two great scientific personalities: Aristotle, in all sciences, and astronomer Ptolemy. Their works, theories and unquestionable scientific presence were the quintessence of science for more than 15 centuries in both East and West. Whoever dared to question one of these two scientific authorities risked of being characterized as ignorant or illiterate, or of facing the mockery and open hostility of the whole scientific community and later on of the Christian Church.

2. The condemnation by the new religion of all who were practicing astrology and star-worship, whose borders with scientific Astronomy were often difficult to discern. So, scientific astronomy was hard to find a critical mass of followers in order to flourish.

3. The general orientation of Byzantium to theological studies rather than to scientific ones. The Byzantine savants preferred to study the teachings of Christianity and to try to pass over messages of tuning the human life according to the divine example of the life of Jesus.

Nevertheless, it is especially interesting to research and record the work of the Byzantine monks and other scholars who, despite the various difficulties discovered ways to cultivate Mathematics, Physics and Astronomy living in an empire that did not favour this kind of studies.

The study of Mathematics and Astronomy in particular experienced a growth during the last period of the empire, in the age of Paleologoi (1261-1453); however even before many scholars, whose names we can mention only selectively, dedicated a part of their time to the study of the sciences, collecting their material from the famous works of the ancient Greek mathematicians and astronomers that had been rescued and preserved in the libraries of the monasteries. At the same time, they were introducing and incorporating knowledge from other nations, by studying Indian, Persian or Arabic books, most of which were also based on ancient Greek sources.

The Byzantine scholars, often in monasteries, were successful in preserving and transmitting positive knowledge and this is the great and neglected contribution to the sciences and especially to Astronomy. They painstakingly studied, wrote commentaries, annotated, copied in new manuscripts in monasteries and finally they rescued and preserved the precious legacy of the ancient Greek philosophers and scientists. For this reason alone their contribution to the sciences would be worthy of every respect. The Byzantine Church and scholars, mainly connected with it, kept for the sake of all humankind the masterpieces of ancient Greek wisdom and science.

Of course there is the counterargument that the Eastern Orthodox Church impeded the research on Astronomy. This argument stems from the writings of the Fathers of the Church; they, however, mainly were expressing their opposition towards the astrologers and not to the mere observation of the celestial bodies. In reality the Orthodox Church depended on Astronomy and on the Alexandrine astronomers for the calculation of the Easter date, while a great number of Byzantine scholars, clergy members and monks were spending many hours on diverse kinds of arts and sciences, from Philosophy-Theology to Mathematics and Astronomy [3].

During the last few centuries of the Empire, Astronomy was cultivated to a great extent in both Constantinople and Trapezous (modern Trebizond); the echoes of the prominence of the Trapezous school of sciences reach our days [4].

It is probable that science was studied by some Byzantine monks and priests with a further aim to compose and to classify knowledge into a harmonic picture in order to serve spiritual cultivation and the exaltation-elevation of man towards God, a task for Theology as well. However, if we study more carefully the work of most scholars we notice that this knowledge, taken from ancient Greek philosophical writings with additions and commentaries by Byzantine savants, was directed towards the shaping of a unified science consisting of the 'septet of courses': Grammar, rhetoric and dialectics on one side and the quadrivium on the other, higher side: Arithmetic, Geometry, Astronomy and Music. All these should essentially serve Theology [5].

The interest and preference for Natural sciences and Mathematics in Byzantium should be placed in this framework. Commentaries were written for many works of ancient mathematicians, astronomers and natural philosophers, such as the Aristotelian *Meteorologics*, *De Caelo* and *Physica Minores*, the Euclidean *Elements* or the *Great Mathematical Syntaxis* of Claudius Ptolemy [6]. It is very probable that this explains the appearance of numerous scientific natural terms into historical (mainly) works, but also even in theological treatises. These terms refer to nature and the natural causes of phenomena such as thunderstorms, thunders, lightning, earthquakes and other [5, p. 219].

2. The philosophical schools and their representatives

The Alexandrine School excelled in sciences such as Medicine, Botany, pharmacology, zoology and agrarian science. Geography continued to be practically important for the Christians, as its knowledge was necessary for the determination of roads to the Holy Places and of the boundaries between ecclesiastical regions of jurisdiction. Thus, using as starting points the work of the ancient cartographer and geographer Marinos of Tyre (60-130 AD), and the famous *Geographike Hyphegesis* by Ptolemy [7] (2nd century AD), Byzantine scholars wrote their own treatises. Geographical studies were carried on almost exclusively in monasteries and the perceptions of Byzantine geographers about Earth (especially those of Cosmas Indicopleustes in the 6th century) were imaginary or copied by the Scriptures and religious ideas, while geographical books had been limited to lists of place names and city guides for school use, on the one hand, and written travelogues on the other; this clearly indicates the difference between ancient Greek geography and what the Byzantines were thinking of as 'geography'.

As a first Byzantine geographer appears the traveller, merchant, monk and author Cosmas Indicopleustes. As a monk, he wrote, on 547 AD, a 12 volumes book work under the title *Christian Topography* [8], in which he attempted to create a new geographical system that would be in accordance with the teachings of the *Bible*.

In Constantinople, a university was established immediately after the founding of the city itself. This institution was known under different names in various centuries, such as Mega or Ecumenical Didascaleion, School of Capitolium, Imperial Auditorium and Pandidacterion [9]. In the 5th century, due to the need for new church buildings, there was a development of Architecture and Civil engineering, something that led to the appearance of good mathematicians, geometricians and engineers, such as Anthemius of Tralles, Isidorus of Miletus and Isidorus of Miletus the Younger, who designed and constructed the famous church of Hagia Sophia (the Holy Wisdom of God) in Constantinople, while Eutocius (6th century AD) from Askalona of Palestine, student of Isidorus of Miletus, knew the first book of Heron's *Mechanics*, now lost [9, p. 175].

From the School of Constantinople emerged the noted Monophysite monk Ioannes (John) Philoponus (490-570), a religious author, philosopher, grammarian, mathematician, physicist, astronomer and one of the most distinguished scientists of the 6th century. Philoponus, who taught in Constantinople in the first half of the 6th century, developed original ideas in Physics, such as the notion of momentum, which opposed the then dominant Aristotelian positions; we will pursue a detailed investigation of his contribution to Physics in a future paper.

3. The Fathers of the Church and the wise bishops

From the 4th until the 8th century the thought of the Fathers of the Church was prevalent with the great Cappadocian Fathers who shaped Christian dogma: Saint Basil the Great, Gregorius of Nazianzos, Gregorius of Nyssa, Saint John Chrysostom; and then Epiphanius of Cyprus, Asterius of Amasseia, Cyril I of Alexandria, Caesarius, Nemesius (bishop of Emessa in Syria) and Dionysius Exiguus, who presented original work in the sciences while at the same time they fought against astrology and foretelling.

Selectively mentioning only Gregorius of Nyssa, we can say that he is considered an expert in the Mathematics and Astronomy of his age, as well as a great cosmologist; it is well known that he wrote that the origin of the Universe was a "seed-like power, offered (by God) towards the creation of everything" [10]. This "seed-like power" speaking in modern terminology, could very well be considered the ultra-dense mass of the Big Bang theory. Finally, the phrase "towards the creation of everything" hints at the dynamics of the cosmic explosion and the movement from the 'potentially' to 'empowered' [11].

In addition, as professor of Philosophy and author G. Zographides writes: "Many Christian church leaders were seeking the compatibility between Greek and Christian thought. To that end, they discovered a great number of passages from ancient texts that were compatible with the Christian teaching and they formulated the theory of the 'seed of the Word' i.e. the presence of seeds of the Christian truth in Greek philosophy." [12]

4. The science in the Alexandrine School

The School of Alexandria was still dominant in the first centuries of the Byzantine Empire, as the former 'world capital of science' in the Hellenistic and the Roman periods. There, scientists such as Serenus of Antinoopolis (Egypt) flourished, or mathematician Theon of Alexandria (330-395 AD), an astronomer who recorded all solar and lunar eclipses from 365 to 372 AD, wrote comments on what Aratos had written about lunar and solar halos, as well as a commentary on Ptolemy's *Mathematical Syntaxis*. This Theon was the father of mathematician, astronomer and philosopher Hypatia, whose student, later bishop of Cyrene Synesius, constructed an astrolabe following her advice.

In the Academia, the School of Athens, in the early 6th century, just before emperor Justinian closed its philosophical school, flourished Simplicius, the famous commentator of Aristotle [13, 14]. Simplicius also wrote commentaries and annotations to works of Euclid, while he rescued parts of works by Parmenides, Empedocles and Anaxagoras. In about the same period the works of Stephanus of Alexandria are placed [15].

5. The middle Byzantine period (610-1204 AD)

In the middle Byzantine period flourished Ioannes of Damascus or Chrysorrhoas (676-754), who knew well Aristotle's works and considered Philosophy as a knowledge that served Theology. From this idea stemmed the dominant perception in Western mediaeval thought that Philosophy is the servant of Theology.

According to the late professor of Astronomy at the University of Athens D. Kotsakis, Ioannes of Damascus occupied himself with Astronomy and the other natural sciences: "Ioannes of Damascus (1st half of VIII century) occupies himself with Astronomy and more general with Nature, while he fights against astrology and foretellers with great zeal." [16]

Ioannes of Damascus, in his work – as it has been treasured up in *Patrologia Greca* (volume 94) – offers excellent descriptions for various natural and celestial phenomena, such as the eclipses of the Sun and the Moon, which he describes in detail [6, vol. 94, p. 896]. At the same time he fights against astrology [6, vol. 94, p. 892-903], while he also describes natural phenomena like the thunderbolt, for which he offers a truly scientific description: "the thunderbolt is a helical spirit moving as fire, which travels downwards by flaming fire and lightning all around" [6, vol. 94, p. 1601]. However, the access to the natural phenomena and to their explanation was impossible. Basically in Byzantium the dominant way of thought was the theological one, which from its subject of study was directed towards the transcendental world. Ioannes of Damascus himself writes: "The things of nature seem senseless, because whatever relates to God is beyond nature, rational thinking and arguing. The knowledge of these things is knowledge of the soul and demon-like." [6, vol. 94, p. 895]

Essentially, this scholar leader of the Church with his previous views differentiated theological thought from apocryphal knowledge, which (Neo-Platonic in its essence) was based on the correspondence between the powers of a 'cosmic soul' (in which participates the human soul) and the powers of nature and material beings [2].

Of course, these views were based on the 'reborn' Platonism, which, as Neo-Platonism after the 4th century AD, offered the belief that life is not real and that God is by no means a part of this earthly world.

Leon the Philosopher or the Mathematician flourished as a scientist about 820-869 and later he became bishop of Thessalonica. Leon was a real polymath, with knowledge of Philosophy, Arithmetic, Geometry, Astronomy and Music, which he taught in Constantinople, while his fame reached the Caliph Al Mamoun in Bagdad, who invited him to teach in his capital [17]. Leon was an excellent teacher in many disciplines, so his contemporaries gave him the appellations 'the Philosopher', 'the Mathematician', 'the Geometrician' and 'the Astronomer', which they were using alternatively. He was also called 'the myriad-math among philosophers'.

This Leon constructed an optical telegraph or 'horonomium', which reinforced his reputation considerably. It was an optical mechanical system of information transmission that was used extensively by the Byzantine armed forces as a method of fast warning for Arab invasions in the empire. The horonomium, which today could be named 'optical military telegraphy', was based on synchronized clock mechanisms and a system of suitably located fire-signaling posts. Leon also constructed several automata that decorated the imperial palace. Also, we will pursue a detailed investigation of his contribution to Astronomy in a future paper.

During the Macedonian Dynasty, about 890, flourished Photios, the Patriarch. This was the period when the study of the holy books of Christianity is properly combined with the eternal texts of Greek antiquity. The scholars of the age discovered in monasteries the manuscripts of the classics and studied them, commented on them, copied them and classified them into codices. It was then that the first awakening of Science in the form of an official regeneration took place, with the polymath Photios, the author of *Myriobiblos*, as its main representative: when he became Ecumenical Patriarch with the support of his protector Caesar Vardas (†865), he re-established in Constantinople the study of ancient Greek philosophers. "The preparatory stage for metaphysics was offered by the writings of Plato, Plotinus and Proclus. In its final stage, the philosophical teaching of Metaphysics was reduced in Theology, the first philosophy." [18].

The monk and scholar Michael Psellus (1018-1078/1096) served as *logothetes* (minister) of the emperor, while his unsurpassed teaching at the university led to his characterization as the 'supreme philosopher'. His works were innumerable and of diverse content: philosophical, mathematical, geographical, medical, theological, and even about folklore. This polymath wrote also a historical work, the *Chronographia*, where he describes the events from 976 up to 1077 as they were interwoven around the lives of the emperors of that age [19].

Michael Psellus wrote a commentary on Aristotle's *Physica* and the meaning Psellus gave to the term 'physis' (nature) was followed by many subsequent philosophers. However, the restoration of a rationalistic spirit in the examination of natural phenomena did not accord with the dominant religious world view, for which the meteorological or other natural phenomena merely denoted God's intervention in the world. Of course here the philosophical thinking was more than necessary. According to Anna Lazarou: "The need for rational explanation led to the search for a scientific method, which could be offered only by the Greek philosophical tradition. According to Psellus, in order to explain things there was no other way apart from the search of their natural cause." [2]

This view resulted in Psellus following the Aristotelian practice, which stated that every being is governed by the laws of its own nature. In this point he was trying to reconcile the two different world views: while he did not want to abandon the Aristotelian position on the research of natural phenomena, he also did not want to question God's omnipotence upon the beings and the phenomena

of nature. Of course, this led him to Neo-Platonic principles, since Neo-Platonism accepted that nature is the last link of a continuous causal chain, which started with a transcendental first cause.

Both Michael Psellus and the scholar Joseph Bryennios (1350-1431), based on the texts of ancient Greek philosophers, are considered the first Greek folklorists, who attempted to record popular superstitions, to explain or to disapprove them. They were basically trying to relieve the world from superstition.

In Geography was distinguished the bishop of Thessalonica Efstathios Katafloros (1125-1194) with his work *Extensions (Parekvolai) to Dionysius the Traveler* (1170) and the monk Ioannes Fokas with his *Itinerary* (1177).

Professor Helias Pontikos writes that: "The prerequisite that favoured considerably the study of the natural phenomena, the study of Astronomy, Meteorology, Geography and Medicine, was the acceptance by Byzantine and Church-father tradition of the differentiation of human wisdom into three distinct parts: i) practical, aiming at the moral improvement of the individual, ii) natural, aiming at the study of nature as God's creation, and iii) theological, aiming at the enlightenment and the union of the individual with the divine." [20]

Astronomers in the 11th century were Symeon Seth or Sethes (2nd half of 11th century) and Eleftherios Zevelenos (he was born in 1040), while after them the prolific author Efstratios of Nice (1092-1120) wrote several philosophical works, mainly commentaries and annotations on Aristotle's *Analytics*, and the *Philosophical Definitions*. In his later works he turns his interest to the sciences, especially Meteorology and Astronomy; these works include a treatise on Natural sciences under the title *Meteorologics*. Both this treatise and his commentary on two books of Aristotle *The Nicomachean Ethics* [21] and two books on *Posterior Analytics* [22] were translated in the West and were known to both Albert the Great (1193 or 1206-1280) and Thomas Aquinas (1225-1274), while during 19th century the famous theologian and classical philologist Friedrich Ernst Daniel Schleiermacher (1768-1834) believed that they were an excellent piece of work [23].

Efstratios of Nice (1050-1120) and Michael of Ephesus (11th-12th century) – who wrote on Natural history and Zoology – represent the rationalistic movement of theologians-commentators of Aristotelian works, who used Aristotelian reasoning on theological problems. This movement influenced a lot the Western thought towards Aristotelian thought.

A great number of educated monks and priests who wrote on sciences follows, from Constantine Manasses (1130-1187), who describes in his work the 'horonomium', the invention of Leon the Mathematician that we have described already, to Prodromos Monachos (12th century).

Prodromos Monachos (*monachos* = monk) studied Mathematics and Astronomy in Constantinople. Then he moved to Bithynia, in Asia Minor, where he became a monk. Being a notable teacher, he founded a school in Scamander of the Trojan fame. Among his students – sometime after 1222 – we find the

great theologian, astronomer, mathematician, geographer and medical doctor Nicephoros Vlemmydes (1197-1272) with a pioneering work on the sciences and author of books such as the *Epitome of Physics* [24]. Louis Bréhier refers to him as "the most famous savant of his age" [25].

Then came Georgios Akropolites and his students Georgios of Cyprus (*c.* 1241-1290), who was subsequently ordained Patriarch under the name Gregory II, and Georgios Pachymeres (1242-1310), a teacher and philosopher who wrote rhetorical works, letters and above all his famous *Syntagma of the four courses, Arithmetic, Music, Geometry and Astronomy* or *Tetrabiblos* (Quadrivium). The late professor of Astronomy D. Kotsakis writes about this work and its author: *"This work alone would suffice to raise Pachymeres to the first grade of mathematicians of his age in both East and West, because it is written in a higher scientific spirit. Pachymeres easily uses the ancient and later authors, but he subjects their views in critic and stresses his personal views, which persuade the reader."* [26]

6. The 'new' Byzantine empire (1261-1453)

Contrary to the adverse political situation, the arts and letters flourish during the third and last Byzantine period, to the point that historians speak of a 'Paleologian Renaissance' in a severely territorially restricted empire. After the repatriation of 1261, emperor Michael VIII Paleologos ordered the restoration of all schools and appointed Georgios Akropolites as the director of the re-organized public university in the church of Hagia Sophia.

In this period flourished many savants, such as the scholar philologist, mathematician and astronomer Manuel Planoudis (1260-1310), who was born in Nicomedia of Bithynia (today Isnik) and was educated in Constantinople. Planoudis is considered one of the greatest philologists of his age and one of the Byzantine scholars who heralded the renaissance of classic studies in the West. In 1285, when he became a monk, he changed his name to Maximos and became known under this first name. Planoudis was teaching since the age of 20, in 1280, at two monastery schools in Constantinople. His Latin was excellent and he translated works of the Latin literature in Greek, works by Boethius (Boethius Anicius Manlius Torquatus Severinus), Cato the Elder, Ovid, Cicero, Julius Caesar, pseudo-Augustine, Thomas Aquinas, etc., starting with *De consolatione philosophiae* of Boethius, thus preparing the connection between the Byzantine civilization and the West.

Finally, Astronomy was served in that period by Theodoros Metochites (1260/61-1331), "one of the most important polymaths of the last centuries of the Byzantine empire" according to Karl Krumbacher [27]. He was succeeded by his student, Nicephoros Gregoras (1295-1360), arguably the greatest astronomer of all periods of the Byzantine empire [28]. Isaac Argyros (1310-1375), the student of Nicephoros Gregoras, is considered the most important expert on Ptolemy's astronomy. Both Gregoras and Argyros insisted on the need for a reformation of the Julian calendar. The contemporary astronomer

Theodoros Melitiniotes (1310-1388) is probably the second greatest Byzantine astronomer after Nicephoros Gregoras, with his work *Three Books on Astronomy* or *Astronomical Tribiblos* (*Tribiblos Astronomique* [29, 30]) being the most comprehensive and well-edited Byzantine astronomical work.

7. Scientific activity in Trapezous

In Trapezous a small tradition in Astronomy is created with Gregorios Chioniades (1240/50-1320), who knew Arabic and Persian astronomy and established the 'Trapezous Academy', Georgios Chrysococca, Constantinos Loukites or Lykites, Andreas Livadenos and the monk Manuel.

The late professor of History and Philosophy of Natural Sciences at the University of Athens Michael Stefanides mentions [31] Gregorios Chioniades as a 'myst' of the Persian astronomy together with Constantinos Loukites (1938, 217). The scholar Constantinos Loukites (13^{th}-14^{th} century) was professor at the Trapezous Academy. Appreciating his value and abilities, king Alexios II MegaComnenos (1297-1330) honored him with state offices.

Scholar Andreas Livadenos (14^{th} century) was honoured with the offices of *prototabularius* and *chartophylax* of the Trapezous Church. His work was mainly geographical, while he also wrote letters and poems. Both Livadenos and Loukites had a correspondence with Chioniades and Nicephoros Gregoras.

According to Herbert Hunger: *The monk and clergyman Manuel, who knew Farsi, is reported as the man who taught astronomy to Georgios Chrysococca* [32]. He became an astronomer by studying all the books on Physics, Mathematics, Astronomy and Medicine brought by Chioniades in Trapezous from Tabriz, a city in northwestern Iran that was then a centre of science.

In parallel monk Manuel taught in the schools of the monasteries of Saint Eugenios and Hagia Sophia in Trapezous. These 'schools' were probably the Trapezous Academy, which was hosted in the beginning in the monastery of Saint Eugenios, who was the patron saint of the city; this monastery was outside of the city's walls and after its destruction by fire (1340) the Academy was transferred in the Hagia Sophia monastery, about half an hour away from the city by foot [4, p. 365].

Finally, the Byzantine scholar, medical doctor and astronomer Georgios Chrysococca (14^{th} century), student of monk Manuel, published a famous astronomical work with the title *Synopsis tabularum persiacarum ex syntaxi Persarum Georgii medici Chrysococcae* (1347). It was published by Ishmael Bullialdus in Paris in 1645 [33]. R.H. Allen [34] refers to this work as 'Chrysococca's *Tables*.

8. The empire's last years

In the last decades of the Empire the view that the Earth is spherical is expressed by Georgios Yemistos or Plethon (1355-1452), who also proposed the introduction of a complete lunisolar calendar, not unlike the ancient Attic calendar, useful for the new religion he was preaching as suitable for the Greek (not Christian) nation, based on a Neo-Platonic morality.

The siege of Constantinople by the Ottoman Turks and finally its capture marks the start of a wave of emigration of scholars and scientists to the West. The Aristotelians Theodoros Gazis (1400-1476), Andronicos Callistos (1400-1486), Georgios of Trapezous (1396-1486), Theophanes of Medeia (†1480), as well as the Platonic Michael Apostolios (1420-1480), Ioannes Argyropoulos (1415-1487) and the subsequent Cardinal Bessarion (1403-1472) influenced in a positive way the Italian thought and the renaissance of sciences. Already Manuel Chryssoloras (1350-1415) had played a catalytic role by establishing in the University of Florence chair of Greek literature (1397-1400), the first such chair in the educational history of Europe. Manuel Chryssoloras is considered the first important pioneer of the Renaissance. In 1434 with the ascent of the House of Medici a new era begins in the intellectual life of Florence. Georgios Yemistos settled in this city and began to teach Plato, followed by Ioannes Argyropoulos, Demetrios Chalcocondyles (1423-1511), the Italian poet and humanist Angelo Politano (1454-1494), Janus Laskaris (1445-1534) and Michael Marullos of Tarchania (1499), who are the most well-known scholars who transferred in Italy not only the contest between Aristotelian and Platonic philosophers, but also a genuine intellectual activity, thus contributing to the Renaissance of the arts and letters in Italy and from there in the whole Western Europe.

All the above philosophers and scientists also contributed decisively to the so-called 'awakening of science' in the West; this element is added to the many others that indicate the important role Byzantine scholars played in 'firing' the Renaissance in Europe. Fortunately for the European civilization the intellectuality of Byzantium continued in the West and did not expire with the capture of its capital city. This way, through the Byzantine civilization a whole period, that of the Renaissance based its essence in the ancient Greek legacy. Moreover, the following centuries in Europe, even the 18th and the 19th, were immersed in the ancient Greek spirit.

At the same time, in the occupied by the Turks Greece the life of the nation was on the hands of the Church. Gennadios Scholarios, the first Ecumenical Patriarch after the Capture, an Orthodox 'Aristotelian' thinker and an admirer of the Western Scholasticism, was given by the capturer sultan Muhammad II the Church privileges over the captured nation that would save its identity.

The Orthodox Church would stay through all the following difficult centuries until the Greek independence as a steady column that covered not just the religious needs of the enslaved nation but also its cultural and educational needs. The independence, four centuries later, would also spring from within it.

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