

Acceptance of the implementation of dissections in the Byzantium

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Abstract

Studying specific collections of great Byzantine authors as Oribasius from Pergamum, Theophilus Protospatharius, Meletius the Iatrosophist and others, it can be understood that in Byzantine era (330 – 1453 AD), there was not stagnation in the research for anatomy and physiology of the human body. At the same time from the Orthodox Church was not forbidden the use of anatomies for the research, teaching or other purposes, because the Church did not want to have a conflict with its own doctrine. On the other hand, many Byzantine doctors, even priests as Saint Basil the Great (4th cent. AD) and his brother Saint Gregory of Nyssa (4th cent. AD), urge the scientists to perform anatomies in order to research the structure and the function of human body. In contrast to what was happening in the West, the Byzantines were considering the anatomic research a major and integral factor for the progression of medicine and the understanding of structure and function of the human body.

Introduction

The Byzantine era (330-1453 A.D.) constitutes an integral part of the History of Greek Medicine, and is of particular interest, since it is through the work of Byzantine medical practitioners and writers that the invaluable knowledge of Ancient Greek Medicine was passed on to us. Byzantine medicine constitutes the natural evolution of Ancient Greek Medicine, which it promoted and further developed, while in the meantime, producing original points of view derived from the interaction of the Christian faith with the Ancient Greek cultural heritage. The development of patient health care and the organization of hospitals in the Byzantium made significant progress due to Christian teachings, the basic principle of which is to take care of the weak and to love your fellow man [1]. The Byzantine "hostels" represented the first public health care institutions which provided medical care to patients, constituting the standard for the development of hospitals in the Middle Ages (medieval times). The health care system and more generally the operational model adopted by the Byzantine hospitals, were adopted not only by the Medieval West, but also by the Islamic Middle East (Arabian medicine) [2].

However, even today, a number of writers state that the Byzantine era did not constitute an innovative part of the History of Medicine. They state that the main characteristic of the writers of the Byzantine era was the complete imitation of the work of great Ancient Greek physicians, such as for example, the work of Hippocrates and Galen, from whom they were greatly influenced. A more detailed study however, of the medical texts of Oribasius of Pergamum, Paul of Aegina, Aetius of Amida and other Byzantine writers will reveal evidence of originality, such as for example the referral to capillaries and the description of the systemic and pulmonary circulation provided by Oribasius, as well as the magnificent description of the physiology of the heart by Gregory of Nyssa. [3]. As regards the human anatomy, a number of researchers investigating the history of anatomy have highlighted the undisputed power of Galen, characterizing all writers after Galen as those who merely used excerpts from his work, mimicking Galen.[4]

Nevertheless, during the Byzantine era, significant improvements were made in medicine and in surgical techniques in particular, improvements which were noted even from the pre-Byzantine era (4th – 7th Century A.D.). Physicians during this time were already very familiar with various medical techniques, and they were greatly influenced by the works of Ancient Greek physicians. This influence, in conjunction with their experience in everyday medical practice, led to the development and portrayal of new surgical techniques [5]. Examples of these are the first lithotripsy procedure for bladder stones and the surgical separation of Siamese twins in the 10th century A.D., during the reign of Constantine VII Porphyrogenitus (913-959 A.D.) [6].

Byzantine medicine was the successor of the Ancient Greek medical heritage. Byzantine physicians were very familiar with the works of the leading names of Ancient Greek medicine. This not only applies to names of the early Byzantine era, such as Oribasius of Pergamum (4th century A.D.), Nemesius of Emesa (4th century A.D.) and Alexander of Tralles (6th century A.D.), but also to its latest representatives, such as Nikolaos Myrepsos (13th century A.D.), John Aktouarios (14th century A.D.), John Argyropoulos (15th century A.D.), and others. Byzantine physicians played a definitive role in the development of medicine in the West, as their work, through Arabic translated texts, brought their views of ancient Greek medicine and heritage to the West [7]. Hippocrates and Galen were considered authorities of Byzantine medicine, and thus their works were replicated continuously [8].



Codex Parisinus (gr 2144) Hippocrates and Alexios Apokaukos

A characteristic example is the Paris Codex (handwritten) (Codex Parisinus, gr. 2144) which is kept at the National Library of France. This Codex, which features the works of Hippocrates and was prepared upon the order of the Byzantine statesman, Alexios Apokaukos (end of the 13th century A.D.), features among others, two unique images: that of Hippocrates in Byzantine attire (f. 10v), seated on a throne, as did high-ranking Byzantine statesmen; and that of Alexios Apokaukos in a conversation with him (f. 11r) [9].

The Orthodox Church was ahead of its time as it did not prohibit the implementation of dissections for the study of the functions of the human body, contrary to Western practices, which were under the influence of the Roman Catholic Church. In the Medieval West, the knowledge and theories of the human anatomy of Galen were the sole source of information regarding the anatomical structure of the human body. In medieval times, the theories of the human anatomy of Galen, who was considered a master in his field, were not questioned, and as a result, they remained unaltered until the Renaissance. Anyone who dared to question the theories of Galen, many of which included several errors, as the dissections had been performed solely on animals, would receive the same response of *"He said it himself" (ipse dixit)*.

In early medieval times in Western Europe, human dissections were carried out solely for forensic purposes; however, dissections for educational purposes were gradually integrated into the educational programs of the first Universities (School of Salerno) [10].

In contrast to the West, in the Byzantine era, even from the 4th century A.D., Oribasius of Pergamum and other bishops/saints of the Eastern Orthodox Church, such as St. Basil the Great and Gregory of Nyssa, highlighted the importance of carrying out dissections for scientific purposes, in order to better understand the structure of the human body, as well as the functions of the human organs. Presented below are some excerpts of the works of Byzantine writers, which substantiate our views as per the accepted implementation of dissections in the Byzantine era.

Oribasius of Pergamum (4th century A.D.):

The first Byzantine physician to highlight the importance of performing dissections for scientific development was Oribasius of Pergamum (4th century A.D.). A number of researchers of the history of medicine state that he was the leading physician of the early Byzantine era. It was through his work, that the invaluable medical knowledge of Galen and other ancient classical writers was passed on to the medieval physicians. Oribasius was born in the city of Pergamos, which was also the origin of Galen. He studied medicine in Alexandria, and his teacher was the medical philosopher, Zeno of Citium [11].

He continued his studies in Athens, where he met the then young student of philosophy, Flavius Claudius Julianus (332-363 A.D.), nephew of Constantine the Great, who later became Byzantine emperor. They were both pagans and admired ancient Greek civilization [12].

Oribasius believed in the implementation of dissections for the development of science, dissections which he performed himself, as evidenced by his detailed description of capillaries, including many elements from the work of Galen entitled "On the anatomy of veins and arteries" (*Περί φλεβών και αρτηριών ανατομής*) [13]. In addition, of great significance is his very detailed description of inflammation, which can be found in the first chapter entitled "Galenus on inflammation" (*Εκ των Γαληνού περί φλεγμονής*) of his book "Medical Collections". Here, as suggested by the title of the chapter, he uses elements from the corresponding work of Galen [14]. Indeed, in the 15th chapter entitled "About the Heart" (*Περί καρδιάς*) of the book "Medical Collections", Oribasius mentions that there were physicians who specialized in performing dissections [15].

St. Basil the Great and Gregory of Nyssa (4th century A.D.):

Even leading ecclesiastical figures of the Byzantine era, such as St. Basil the Great and Gregory of Nyssa, who lived in the 4th century A.D., and were bishops, referred in their works to the anatomical structure and physiology of the human body,

also mentioning the implementation of dissections. St. Basil the Great, bishop of Caesarea (4th century A.D.), in his work "On the fabric of the human body" (*Περί της του Ανθρώπου Κατασκευής*), notes the importance of conducting dissections for scientific purposes in order to acquire knowledge of the anatomy and physiology of the human body [16]. He claimed that the study of physiology was about the study of the balance and harmony in the functioning of the human body [17].

His brother, Gregory of Nyssa (4th century A.D.), in his work entitled "On the making of man" (*Περί Κατασκευής Ανθρώπου*) also noted the importance of the free implementation of anatomical research in order to understand the physiology of the human body. He claimed that it was through dissections that scientists obtained knowledge of the position of each organ in the body, while others investigated the purpose of the human organs [18]. In this work, Gregory of Nyssa expresses his own personal anthropological views, combining theology, philosophy, physiology and medicine in one impressive and powerful composition. Furthermore, there are many similarities to the work of Nemesius, Bishop of Emesia, entitled "On Human Nature" (*Περί Φύσεως Ανθρώπου*), from which he was obviously influenced. In fact, many subsequent writers authored works with either the same or similar title [19].

St. Eustathius, Archbishop of Antioch (4th century A.D.):

St. Eustathius of Antioch lived during the reign of the Byzantine emperor Constantine the Great and took part in the First Council of Nicaea (325 A.D.), where together with other bishops of the Orthodox Church, they overpowered the heretical beliefs of Arius. St. Eustathius is a saint of the Orthodox Church, and he is commemorated on 21st February [20]. St. Eustathius of Antioch, in his work entitled "Commentary on the Hexameron" (*Σχόλια εις την Εξαήμερον*), which is included in the Greek series of "Patrologia Graeca" of Jacques Paul Migne, refers to the importance of physicians performing dissections in order to understand human nature [21].

He claimed that leading physicians, in order to obtain information and provide useful knowledge to man, aimed to perform dissections on humans sentenced to death. This was a prevailing practice in the Byzantium. Physicians would perform dissections on the bodies of convicts in order to obtain anatomical knowledge, which led to advancements being made in anatomical and physiological research [22].

Theophilus Protospatharius (6th or 7th century A.D.):

Theophilus Protospatharius (6th or 7th century A.D.) also refers to the human anatomy in his work "On the Fabric of the Human Body" or "De Corporis Humani Fabrica" (*Περί της του Ανθρώπου Κατασκευής*), where he follows the example of Nemesius of Emesia, St. Basil the Great and Gregory of Nyssa and writes a book on medical physiology and anatomy, with evident religious influences. Theophilus Protospatharius was heavily influenced by the works of Hippocrates and Galen, which he was very familiar with. Notably, he refers to Hippocrates as "Prometheus of Medicine", and he continuously refers to the works of Hippocrates, urging readers to look at these for further study of the works of Galen. Indeed, in the 1st edition of his work "On the Fabric of the Human Body" (*Περί της του Ανθρώπου Κατασκευής*), he notes that the main aim of this work was the understanding of how many and which organs comprise the human body and to determine their function [23].

Furthermore, in the 4th edition of his work "On the Fabric of the Human Body" or "De Corporis Humani Fabrica" (*Περί της του Ανθρώπου Κατασκευής*), Theophilus Protospatharius notes the importance of carrying out dissections for scientific purposes, in order to understand the anatomy and physiology of the human brain. From this statement of his, it is evident that there was no prohibition of the implementation of dissections by the Orthodox Church. If there was any such prohibition, then Theophilus Protospatharius would not have made any such direct referrals to dissections in his work, as he was deeply religious. In his work, he claimed that by performing dissections, we would then be able to identi-

fy the home of the psyche, namely the skull, which includes the brain. Consequently, he carefully begins to perform a dissection of the skull and brain, describing the meninges (the protective layers of the brain) and the ventricles [24].

Meletius the Monk (8th century A.D.):

Another Byzantine scholar, Meletius the Monk or Medical Philosopher (8th century A.D.), in his work entitled "On the Fabric of the Human Body" or "De Corporis Humani Fabrica" (*Περί της του Ανθρώπου Κατασκευής*), also refers to anatomy and physiology. Literary investigations have proven that Meletius was familiar with the related works of Nemesius of Emesa, Gregory of Nyssa and St. Basil the Great, from which he draws valuable information. However, his own work of anatomy and physiology is characterized by a more anthropological-theological nature rather than a medical one, when compared to the works of other above-mentioned writers [25].

Specifically, Meletius, in the prologue of his work "On the Fabric of the Human Body" (*Περί της του Ανθρώπου Κατασκευής*), which includes the Greek series of "Patrologia Graeca" of J.P.Migne [26], states that many philosophers/physicians of ancient times wrote about the structure of the human body with wisdom and mindfulness, where they confirm the correctness of their views by performing dissections [27].

This referral of Meletius to anatomical research, through which physicians discover the structure of the human body, is evidence of the importance given by the Byzantines to anatomical studies. This was in contrast to practices in the Medieval West, where dissections were mainly performed for forensic purposes. From the works of Meletius the philosopher, we can comprehend the views of the Orthodox Church towards dissections, as not only did it not prohibit them, but it even considered them to be necessary for the promotion of science and for the understanding of the structure and function of the human body.

Lessons of anatomy performed on a prisoner of war:

Further evidence of the implementation of dissections is provided in the chronicles of Theophanis (Theophanis Chronographia). In these chronicles, there is a referral to an incident of a dissection being executed on a prisoner of war, while he was still alive, which was carried out upon the order of the Byzantine emperor, Constantine V Copronymus [28]. Herein, Theophanis informs us of a secret mission in Bulgaria, which was organized and carried out by the Byzantine military upon the order of the emperor, with the aim of eradicating his enemies. Following what seemed to be peace with the Bulgarians, the Byzantine emperor then sent his military to Bulgaria, where they captured and then transferred to Constantinople two prisoners of war, where was leaders of Slavic Tribes, namely Sclavouno (*Σκλαβούνον*) and Christian (*Χριστιανός*).

Also Christian was an apostate and a renouncer of Christianity. Theophanis then goes on to describe the violent torture of Christian in the hands of the Byzantines, who, in order to punish him for being a renouncer of Christianity, cut off his legs and arms on the podium of St. Thomas in Constantinople, and then proceeded in performing a dissection of his body while he was still alive. Indeed, Theophanis states that this act, apart from its being an act of vengeance, was carried out with the aim of obtaining a better understanding of the structure of the human body. For this reason, it was in the presence of physicians that Christian was dissected while he was still alive, from his genitals to his chest, and was consequently thrown into the fire [29].

Conclusion:

From the study of the above-mentioned works, it is evident that in the Byzantium, anatomical and physiological research did not remain stagnant. In addition, the Orthodox Church, did not exhibit a negative or prohibitory stance against the implementation of dissections for scientific, educational or other purposes.

Furthermore, a number of Byzantine physicians, and even

priests, such as for example, St. Basil the Great (4th century A.D.) and his brother Gregory of Nyssa (4th century A.D.), promote the free implementation of dissections for the study of the structure and functions of the human body and organs. Contrary to Medieval Western practices, the Byzantines considered dissections to be an integral part of and necessary for the promotion of medical science, as well as for the understanding of the structure and function of the human body.

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