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Edouard Hamman (1819–1888). Andrija Vežal kao profesor u Padovi 1537. pri disekciji ljudskog tijela. Litografija prema slici, 1848.

Edouard Hamman (1819–1888). Andreas Vesalius as professor in Padua from 1537 dissecting a human body. Lithograph after the painting, 1848.

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ANDREAS VESALIUS (1514-1564) - AN UNFINISHED LIFE

ANDRIJA VEZAL (1514.-1564.) - NEDOVRŠENI ŽIVOT

Charles T. Ambrose*

SUMMARY

The fame of Andreas Vesalius (1514-1564) rests on his anatomy text, *De humani corporis fabrica*, regarded as a seminal book in modern medicine. It was compiled while he taught anatomy at Padua, 1537-1543. Some of his findings challenged Galen's writings of the 2c AD, and caused *De fabrica* to be rejected immediately by classically trained anatomists. At age 29, Vesalius abandoned his studies and over the next two decades served as physician to Emperor Charles V of the Holy Roman Empire (HRE) and later to King Philip II of Spain in Madrid. In 1564, he sought to resume teaching anatomy in Padua, but release from royal service obliged him first to make a pilgrimage to Palestine. During the return voyage to Venice, he became ill and was put ashore alone on an Ionian island Zakynthos, where he died days later at age 50.

Key Words: History of medicine; human anatomy; 16th century; Andreas Vesalius, *De humani corporis fabrica*, Emperor Charles V; King Philip II of Spain.

INTRODUCTION

The year 2014 marks the quincentennial anniversary of the birth of the Belgium anatomist Andreas Vesalius. His fame rests on his anatomy text, *De humani corporis fabrica*, which has been praised as one of the great books

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of the world not only in science but in the history of book printing.¹ It is regarded as the first medical book to integrate the text with illustrations so effectively. According to historians, *De fabrica* was significant in the evolution of medicine because it presented the first challenge to the many of the erroneous anatomical notions of Galen (2nd-century AD). His voluminous writings were regarded as infallible and unassailable and were accepted almost as dogma by the Catholic Church. His ideas so dominated medical thinking for 1300 years that the new observations in human anatomy contrary to them were rejected and sometimes severely condemned. Indeed, adherence to Galen's "classical authority" suppressed advances in anatomy much as Ptolemy's geocentric celestial system (2nd-century AD) had impeded acceptance of new findings in astronomy.

The main focus of this paper is Vesalius' career in anatomy and medicine. It was closely tied to two empires – that of Spain and the Holy Roman Empire (HRE). How both powers were linked for a time and determined Vesalius' later medical life is interwoven in this essay.

VESALIUS' EARLY LIFE AND HIS 3 YEARS IN PARIS

Andreas Vesalius / Andrieu de Weselle / Andries van Wesele, was born in Brussels in the medieval duchy of Brabant (central and north Belgium) in 1514. The Netherlands/Holland, Belgium, and Luxembourg, and were then under the dual rule of both the Spanish Empire and the Holy Roman Empire (HRE). Spain controlled not only most of the Iberian Peninsula and the three Low Countries but also the Kingdom of Naples, Sicily, Sardinia, and the Spanish colonies in America. Concurrently and at a supra-national level, the HRE dominated much of Central Europe apart from France. For a time both the Spanish Empire and the HRE were led by one man when Charles I (b.1500), King of Spain (1517-1546), became also Emperor Charles V of the HRE (1519-1546). For managing both widespread empires, it was strategically expedient for the common royal court to be located in Brussels. Vesalius' family had medical ties to the earlier Burgundian/Hapsburg court, for his great-grandfather (Johannes) and grandfather (Everard) had been royal physicians and his father (Andries) was an imperial apothecary.²

¹ Osler W. *Bibliotheca Osleriana*. Francis WW, Hill RH, Malloch A (eds.) Montreal: McGill-Queen's University Press, 1969., p. 58

² O'Malley CD. *Andreas Vesalius of Brussels, 1514-1564*. Berkeley: University of California Press, 1964, pp. 24-25.

Andreas' early university education was in nearby Louvain. His medical training began in Paris in 1533 under the most celebrated anatomist of the time - Jacques Dubois (1478-1555) - better known in medical history by his Latin name, Jacobus Sylvius. He spent 6 months reading the anatomical works of Galen but omitting passages deemed by Sylvius as "too difficult" for students.³

In 1536, hostilities broke out between France under King Francis I (1494-1547) and the Holy Roman Empire under Charles V (1500-1558) and obliged Vesalius, owing allegiance to the latter, to depart Paris and return to Louvain. During the next year he worked at anatomy, collected bones from town gibbet to assemble an articulated skeleton, and was invited to conduct a public dissection of an executed criminal. He published his first academic medical work – *Paraphrasis in nonum librum Rhazae*. In it he emended the 1481 Latin translation of an Arabic treatise on therapeutics, written by Rhazes, a 9th-10th-century Persian physician. Vesalius attempted to smooth the rough Latin and simplify some medical terminology. Decades before, his grandfather had written a scholarly commentary on the books of Rhazes.⁴ At the university in Louvain, Andreas was awarded a baccalaureate medicine.

VESALIUS' 6 YEARS IN PADUA

Because the above war was still continuing, in 1537 Vesalius moved to Padua to pursue his medical education and career. Although his university years at Louvain and Paris sufficed in part for a medical degree, he needed to comply with the Paduan faculty requirement that medical candidates spent one year with a physician treating patients.⁵ During the summer and fall, Vesalius visited hospitals with physicians in nearby Venice. In December, he readily passed the several oral examinations given by the faculty and was granted a medical degree. The need to fill the Chair of Surgery may be the reason that the faculty relaxed the year-long clinical requirement for Vesalius. He promptly commenced teaching human anatomy while serving as dissector, demonstrator, and lecturer.

At that time, the Chair of Surgery was ranked as inferior to that of medicine. Vesalius received a succession 1-2-year long university appointments as *Explicator Chirurgiae* with a starting of 40 florins/year (1537) and ultimately

³ O'Malley CD, p. 51.

⁴ O'Malley CD, p. 25.

⁵ O'Malley CD, p. 75



Figure 1 - Engraving from a picture by Tintoretto of Andreas Vesalius about 1540.

Slika 1. Gravura Tintorettove slike Andreeasa Vesaliusa, oko 1540.

revulsive bleeding was so firmly held by most European doctors that the University of Salamanca issued a decree condemning bleeding from the affected side. And Emperor Charles V was alleged to have said that derivative bleeding “was as prejudicial to the community as Luther’s heresy itself”.⁸ Vesalius penned a small tract called the *Venesection Letter* (*Epistola de Vena Secunda*, 1539), in which he somewhat ambiguously stated that for inflammations in the thorax, “the right axillary (*basilica*) vein must be opened”.⁹

The general interest in this controversy may have prompted him to prepare six large anatomical illustrations for his students, later published collectively in Venice under the title *Tabulae anatomicae sex* (1538).¹⁰ They depicted the venous and portal systems, the liver & other viscera, and, of course, the skeleton. The drawings were by John Stephen of Calcar / Joannes

rising to 200/yr. (1543). In contrast, the chair of medicine had a salary of 1000 florins/yr.⁶ There are no records of his official appointment as professor, although in his own later writings, he sometimes titled himself as such.

In 1538-39, Vesalius entered into a medical controversy concerning which side of the body it was best to draw blood from in various diseases. Arabist and medieval physicians favored bleeding from the side opposite the ailment (“revulsive”). A young Paris physician, Pierre Brissot (1478-1522), had claimed that Hippocrates bled from the same side as the ailment (“derivative”) and that this method was more effective.⁷ But

⁶ O’Malley CD, pp. 77

⁷ O’Malley CD, pp. 67

⁸ Smith JT. An Historical Sketch of Blood-letting. Johns Hopkins Hospital Bulletin 1910; 21: 311-316. Note: Charles’s father, Philip I, died in 1506 several days after revulsive bleeding by Spanish doctors.

⁹ O’Malley CD, pp. 95-96

¹⁰ O’Malley CD, pp. 96

Stephanus (1499-1547), born a Fleming in northern Belgium and then a pupil of Titian in Venice. The young artist apparently paid for the wood block carvings and the woodcuts (the printings) and received whatever earnings the thin volume generated.¹¹

During his five years in Padua, Vesalius' compiled a massive new anatomy, which was completed in 1542 when he was age 28. He spent six months of 1543 in Basel at the shop of Joannes Oporinus (1507-1568), overseeing the printing of *De Fabrica* with its 278 anatomical woodcuts and a polished, prolix Latin text – yielding a total of 716 pages.¹² This was too large and expensive a book for the ordinary student or physician. So Vesalius published at the same time an abridged version, the *Epitome*, which contained 9 large anatomical woodcuts (20" x 14") but only 11 pages of text. It's not known now how many of the drawing in the two 1543 volumes were by John Stephen.¹³

The immediate medical response to *De Fabrica* in some quarters was negative. Vesalius' new findings in human anatomy were promptly rejected by many academic anatomists. Vesalius had written that often he was not able to confirm in his human dissections certain anatomical structures described by Galen. These discrepancies were so numerous that he came to believe



Figure 2 - Frontispiece ANDREAE VESALII BRUXELLENSIS, INVICTISSIMI CAROLI V. Imperatoris medici, de humani corporis fabrica libri septem. (Basileae, per Ioannem Oporinum)

Slika 2. Naslovnica ANDREAE VESALII BRUXELLENSIS, INVICTISSIMI CAROLI V. Imperatoris medici, de humani corporis fabrica libri septem. (Basileae, per Ioannem Oporinum)

¹¹ Cushing H. A Bio-Bibliography of Andreas Vesalius. New York: Schuman's, 1943, p. 11
¹² Ivins Jr WM. What About the "Fabrica" of Vesalius? In Lambert SW, Wiegand W, Ivins, Jr WM (eds.): Three Vesalian Essays to Accompany the Icones Anatomicae of 1934. New York: Macmillan Co., 1952, pp. 45-99.
¹³ Cushing H, p. 83



Figure 3 - Vesalius, the only authentic portrait (Fabrica, 1543)

Slika 3. Vesalius, jedini autentični portret (Fabrica, 1543.)

that the Greek anatomist had never dissected human beings but had extrapolated to people from his finding in pigs and Barbary apes. This indictment of Galen angered Sylvius and other anatomists, who revered Galen and extolled his writings as sacrosanct. Sylvius argued that deviations from Galenic anatomy noted by Vesalius were possibly due to the human body having changed over the 1300 years since Galen's time.¹⁴ Sylvius also disparaged the many woodcuts in *De fabrica*, arguing that anatomical illustrations are a poor substitute for working at the dissecting table -- thus being oblivious to his own blindness there. Years later Sylvius ridiculed Vesalius via a Latin pun on his name when he wrote about "the calumnies of a certain madman" (*Vaesani cuiusdam calumniarum*).¹⁵



Figure 4 - Fabrica, pp. 164 and 165.

Slika 4. Fabrica, str. 164 i 165.

¹⁴ O'Malley CD, p52

¹⁵ Cushing H, p. XXX.

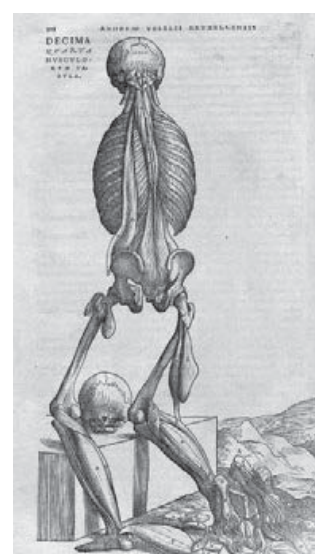
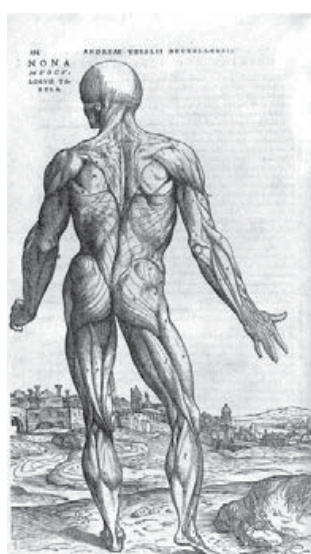


Figure 5 - Fabrica, pp. 163, 170, 174, 178, 181, 184, 194, 200, 208.

Slika 5 - Fabrica, str. 163, 170, 174, 178, 181, 184, 194, 200, 208.

Even before *De fabrica* was printed, Vesalius apparently had decided to join the court of Emperor Charles V as one of several physicians. Perhaps he anticipated being well received there with the new fame *De fabrica* might bring him. Accordingly, he resigned his teaching position at Padua. Later, greatly hurt by the hostile reception to *De fabrica*, he destroyed his various anatomical notes, including annotations on a text by Galen – thus impetuously severing his ties to the field for a time.

VESALIUS' 12 YEARS IN THE COURT OF EMPEROR CHARLES

While the court of the HRE under Charles V was primarily based in Brussels, he was only infrequently there. In 1555, when he announced his retirement after 36 years as emperor, Charles described his life as a series of voyages and listed 40 with 10 to the Low Countries, 9 to Germany, 7 to Italy, 4 to France, 6 to Spain, 2 to England, and 2 to Africa.¹⁶ His main goal was to bring unity to the countries of Europe through the power of the Catholic Church. He also sought to establish his family line as long term rulers of

¹⁶ McGuigan DG. *The Habsburgs*. New York: Doubleday & Co. 1966, pp. 1-164. Note: During his travels with the Emperor, Vesalius stayed successively for periods in Speyer, Worms, Mainz, San Dizier, Ghent, Worms, Cologne, Utrecht, Juliers, Maestricht, Louvain, Arnheim, Cologne, Frankfurt, Neurenberg, Ratisbon (Regensburg), Heilbronn, Marbac, Esslings, Ulm, Mühlberg, Augsburg, Innsbruck, Villach, and other too numerous to note here; O'Malley CD, pp187-268



Figure 6 - Also while in Basel, Vesalius assembled this human skeleton (1543), which can be seen today in the University's Anatomical Museum.

Slika 6. Dok je boravio u Baselu, Vesalius je sklopio ovaj ljudski kostur (1543.), koji je danas izložen u Anatomskom muzeju sveučilišta.

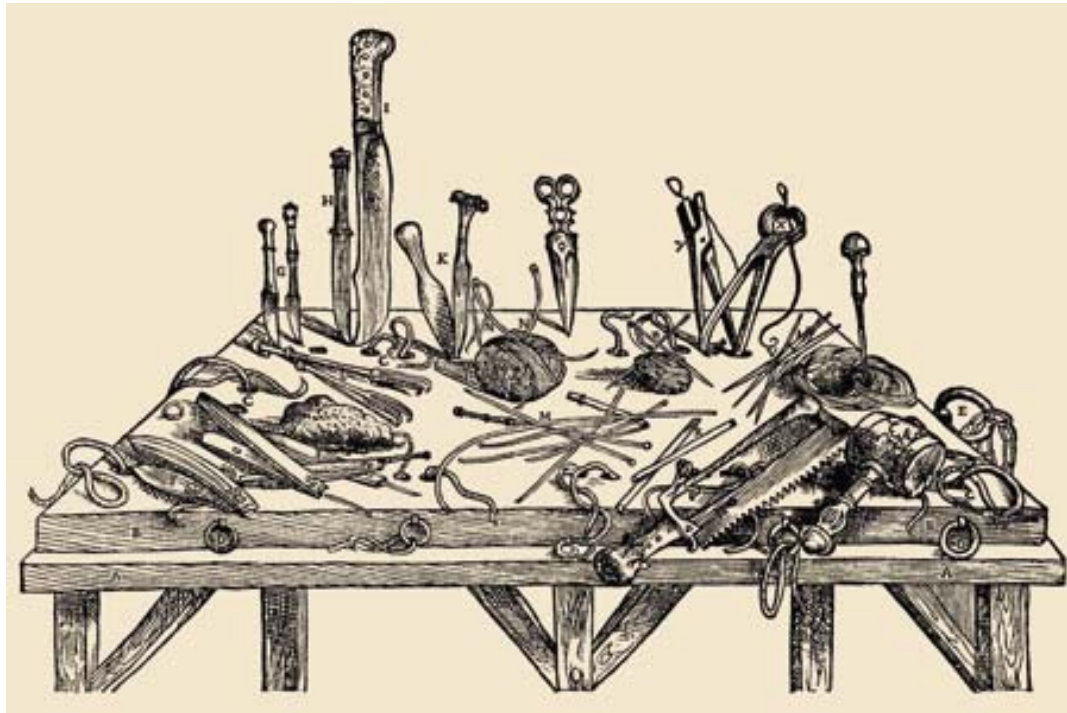


Figure 7 - Illustration of dissecting instruments from Andreas Vesalius, *De Humani Corporis Fabrica*. Enlarged from the 1568 Venice edition.

Slika 7. Ilustracija instrumenata za disekciju iz Andreas Vesalius, *De Humani Corporis Fabrica*. Povećanje iz Venecijanskog izdanja iz 1568.

Europe and to regain lands of his Burgundy inheritance lost to France under Louis XI. At frequent intervals he left Brussels and traveled throughout his empire in Europe and abroad to cement his position and to confront various rebellious factions - e.g., the Duke of Cleves in the Rhineland, the N. German Protestant League, etc.

He was also concerned about the Turkish threat to Eastern Europe. And he sought to defend the Catholic Church against the spreading Lutheran heresy by his presence at the Diet of Worms in 1521, the Diet of Augsburg in 1530, the Council of Trent in 1547, etc.

Vesalius was but one of several physicians attending Charles V during his last 12 years as emperor. He was appointed *Medicus Familiaris Ordinarius* and for much of the time ranked third but was highly regarded by the Emperor, who was frequently in pain from gout, asthma, piles, and rheumatism.¹⁷ One biographer chronicled twelve acute episodes of gout, for which various herbal remedies were tried, some based on Vesalius' advice.¹⁸ Gout in particular prevented travel during his last three years as emperor.

¹⁷ O'Malley CD, p189.

¹⁸ Tyler R. The Emperor Charles the Fifth. London: George Allen and Unwin, 1956.



Figure 8 - Emperor Charles V. Portrait by Christoph Amberger, 1532, showing the pronounced prognathism, open mouth, and enlarged under lip. (CJ. *Gedanken Uber Karl V.* Munich: Hermann Rinn, 1950, p. 20)

Slika 8. Car Karlo V. Portret Christophera Ambergera iz 1532., prikazuje izraženi prognatizam, otvorena usta i povećanu gornju usnu. (CJ. *Gedanken Uber Karl V.* Munich: Hermann Rinn, 1950., str. 20)

Apart from the various ailments, Charles V had inherited from his paternal grandfather, Maximilian I (1459-1519), the distinctive facial trait of prognathism – a protruberant lower jaw and prominent under lip. This congenital condition often becomes exaggerated with age and in some persons may impair eating and talking. The former was not true of the Emperor. His voracious appetite for rich meats and spicy foods may have contributed to his many attacks of gout. However, the attendant malocclusion affected his speech and may have accounted for Charles' noted public reserve and taciturn nature.¹⁹ In a letter inviting Francis I to a meeting, Charles wrote that it

¹⁹ Hart GD. The Habsburg Jaw. CMA Journal, 1971; 601-603.; O'Malley CD, p. 191

was true that “his mouth sometimes hung open – ‘but not to bite people,’ so the French king need have no fear”.²⁰

Vesalius accompanied the Emperor’s retinue during his “voyages” in central Europe but not those to Spain, England, or Africa. He followed the Emperor to scores of cities, towns, and battle sites and only irregularly returned to Brussels.²¹ But when there, he pursued other concerns beyond his court duties. He married a Flemish lady (Anne van Hamme), had a daughter, built a stately house, and developed a lucrative medical practice. He had gained international notice by virtue of his being physician to the Emperor. Many doctors wrote to him on medical matters and received detailed responses later termed *consilia* (advice). One such letter was the 97-page long *China Root Epistle*, which was published in 1546 as a small monograph.²² It concerned in part a newly imported agent, the China root, recommended for treating various ailments, including gout, rheumatism, and syphilis. Vesalius’ clinical fame also led to his being called in medical consultation for prominent European royalty, including the French king, Henry II, when he was fatally injured during a jousting tournament in Paris in 1559.

Meanwhile, Vesalius also resumed his interest in anatomy. He made extensive revisions in the text of *De fabrica* and arranged publication of the second edition in 1555 - parenthetically, the year Sylvius died. This volume was somewhat longer than the first edition because each page contained 49 lines instead of 57. The frontispiece was modified in many places and the text identified 200 or so errors of Galenic anatomy – many more than in the first edition. Vesalius may have contemplated a subsequent edition, for his own copy of a 1555 printing was recently discovered and found to be heavily annotated in his hand.²³

Vesalius’ career at the court of the HRE concluded in 1556, when the details of Charles’ abdication as Emperor were completed. At age 58 he was weary and worn out by his constant travels and administrative concerns. He retired to a comfortable house built attached to the Monastery of Yuste in western Spain, where he was supported by a small court of two dozen attendants, including a young doctor from Bruges, Henri Mathys.²⁴ Charles

²⁰ Tyler R, p. 290.

²¹ O’Malley CD, pp. 187-268

²² *Epistola rationem propinandi radice Chynae decocti*, Venus, 1546.

²³ Nutton V. Vesalius Revised. His Annotations to the 1555 *Fabrica*. *Med Hist* 2012; 56: 415-443.

²⁴ Lewis DBW. *Charles of Europe*. New York: Coward-McCann, 1931, p. 309. Note: O’Malley wrote that Cornelius Baersdorp attended Charles V until his death; O’Malley CD, p. 194.

died in 1558. His only son became King Philip II of Spain in 1556. The Spanish Court continued in Brussels for several years, but in 1559 it moved to Madrid, where Vesalius, accompanied by his family, served both the new King of Spain and the representatives to the court from the Habsburg Netherlands.

VESALIUS' 5 YEARS AT THE SPANISH COURT IN MADRID

Early during his sojourn in Spain (1559-1564), Vesalius complained that there was not a single human skull to study. He performed no dissections except an occasional forensic autopsy. He became unhappy for another reason. The Spanish doctors at the court felt that nothing new could be learned about human anatomy that hadn't been stated in Galen's works. In various petty ways they showed their disdain for the Belgium foreigner among them who had so challenged the revered ancient Greek anatomist. If Vesalius' position was unpleasant, why didn't he simply leave? At that time, when a person entered royal service, he could not resign or retire except by the ruler's consent, and this was rarely given if the attendant was valuable, like a physician of Vesalius' stature.

There were several versions of Vesalius' last year in Madrid. The one commonly related was likely fictitious but is so prevalent in the literature that it needs be disavowed here. It contended that Vesalius had performed an autopsy on a Spanish nobleman whose heart was found to be still beating, prompting hostile Spanish court doctors to accuse him of vivisection. Supposedly, Vesalius was tried and condemned to death by the Spanish Inquisition but was pardoned by King Philip with the proviso that he undertake a pilgrimage to the Holy Land. The more probable story is that Vesalius finally sought escape from the chauvinistic court with its hostile Spanish doctors and contrived to gain his freedom by feigning a chronic illness, whereupon the pious Philip proposed the pilgrimage.

Whatever the true story, Vesalius traveled to Venice in order to take a ship to Palestine. While in Venice, he learned that the officials there who controlled university appointments at Padua would entertain his return as Professor of Surgery. His successor, Gabriello Fallopius (1523-1562), had died of tuberculosis two years earlier. But before accepting the offer, Vesalius needed to complete the pilgrimage.

VESALIUS' DEATH IN 1564

The usual route from Venice to the Holy Land was down the Adriatic Sea past the Ionian Islands (controlled by Venice) to Crete, onto Rhodes, Cyprus & the port of Jaffa (a suburb of modern Tel Aviv) and then 35 miles overland to Jerusalem. No records exist of Vesalius' visit to the Holy Land, but several reports by his contemporaries describe his return voyage to Venice. Being anxious to resume his anatomical studies at Padua, he took an early return passage at Jaffa aboard a small boat for pilgrims rather than wait for a sounder ship of the Venetian fleet, on which he had official passage. Because the boat was beset by contrary winds and was delayed, its supplies ran out and some passengers became ill.

Upon reaching the southern-most *Ionian* island of Zante / Zacynthus, which is due west of the Peloponnese, the sickened Vesalius was put ashore alone.²⁵ He was shunned by the islanders he first encountered, for they feared that he might have the plague. But in time he was recognized by a visiting Venetian, who nursed the anatomist until his death several days later. One report told of Vesalius being buried outside the island's main church. Another recorded his burial within it. In any case, the church was destroyed by an earthquake in 1820 and was rebuilt, only to be destroyed yet again in 1953. So it seems unlikely that the precise burial site of Vesalius will ever be located.

Vesalius died at age 50. Many other 16th-century anatomists lived on to old age – Leonardo da Vinci to 67, Sylvius to 77, Paré to 80, Fabricius to 82, etc. One wonders what additional contributions Vesalius might have made to medicine had he returned to the university at Padua and lived out a full, natural life. A poetical epitaph for Vesalius may be found in Virgil's *Aeneid*, which relates the death of Aeneas many years after the Trojan War: "but he may fall before his time and be unburied in the midst of a sandy shore."

... sed cadat ante diem mediaque inhumatus harena.

(*Virgil: Aeneid IV 26*)

²⁵ Zante was mentioned by Homer in *The Iliad* and *The Odyssey* as "the wooded Zacynthos" of Ulysses. Homer, *The Iliad*. Fagles R, trans. New York: Penguin Books, 1990, p. 120. Homer, *The Odyssey*. Rouse WHD, trans. New York: Mentor Books, 1949, p. 16. Thucydides, Herodotus, Pliny, and Strabo wrote about the island. In 1902 Edith Wharton composed a poem entitled "Vesalius in Zante," in which she perpetuated the myth that Vesalius had vivisected a girl "pinioned hand and foot / In catalepsy." Wharton, E., "Vesalius in Zante, 1564." *North American Review* 1902; 175: 625-621.

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SAŽETAK

Slava Andrije Vežala (1514. – 1564.) počiva na anatomskom djelu *De humani corporis fabrica*, kojeg smatramo jednom od najutjecajnijih knjiga moderne medicine. Knjiga je nastala tijekom njegova boravka u Padovi gdje je od 1537. do 1543., predavao anatomiju na tadašnjem Medicinskom fakultetu. Obzirom da su neki od navoda knjige osporavali Galenove opise iz II. st., klasični anatomia odmah su odbacili Vežalovo djelo. S dvadeset i devet godina, Vežal prekida svoja atomska istraživanja te se tijekom sljedeća dva desetljeća posvećuje liječničkoj praksi, služeći kao osobni liječnik Karlu V. caru Svetog Rimskog Carstva., a nakon toga španjolskom kralju Filipu II u Madridu. Godine 1564. odlučio se vratiti u Padovu i nastaviti s podučavanjem anatomije. No, napuštanje kraljevske službe obvezalo ga je da prije toga obavi hodočašće u Palestinu. Na povratku u Veneciju je zbog bolesti bio ostavljen na otoku Zakynthos u Jonskom moru, gdje je uskoro i umro u dobi od 50 godina.

Ključne riječi: povijest medicine; anatomija čovjeka; XVI. stoljeće; Andrija Vežal; *De humani corporis fabrica*; car Karlo V.; kralja Filip II.