

## Andreas Vesalius — the reformer of anatomy

Holomanova A, Ivanova A, Brucknerova I, Benuska J

### Andreas Vesalius — reformátor anatómie

#### Abstract

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This paper deals with two main topics. The first part provides data on the life of Andreas Vesalius, a scholar and anatomist of the 16th century, and describes the environment in which he lived and worked. It highlights his personality of a great doctor and teacher and points out the importance of his scientific methods and techniques as opposed to speculative methods that were prevalent in the scientific research in those days. The second part of the paper is devoted to the characteristics and description of his famous and, given the times he lived in, grand work called “De Humani Corporis Fabrica”, which opened a new epoch in the history of anatomy. Andreas Vesalius is considered to be the founder of the science of anatomy which is based on observation and experience gained by using scalpel on dead bodies of humans. This is how he proved the then valid statements wrong. This complex view of life and work of Andreas Vesalius is aimed at highlighting the milestone which he represents in this traditional science of anatomy that has been conscientiously developed since the Classical times. (Fig. 4, Ref. 6.)

**Key words:** date of his life, characteristics of his personality, description of his grand work *De humani corporis fabrica*.

The name of Andreas Vesalius appears in annals of medical literature on one of the most famous place. Andreas Vesalius belonged among so scholars – scientists as was Bacon, Gallileo, Descartes, Newton or Lavoisier. Andreas Vesalius – young, enthusiastic, full of vitality and strenuous, made correction of the mistakes in anatomy, which had continued more than 13 centuries. He made up and publicated perfectly illustrated document “De Humani Corporis Fabrica”, work, which is one of the most elaborated work in the whole range of medical literature. This book “about the construction of the human body” belongs among the

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#### Abstrakt

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Predkladaná práca obsahuje dve ťažiská. V prvej časti sa zaoberá životopidnými dátami Andrea Vesalia a okolnosťami, v ktorých tento učenec, anatóm 16. storočia žil a tvoril. Vyzdvihuje jeho osobnostné črty ako veľkého lekára a učiteľa. Poukazuje na význam jeho vedeckej metódy a prístupu v protiklade k špekulatívnym metódam, ktoré v tom čase ovplyvňovali vedecké bádanie. V druhej časti nášho príspevku sa venujeme charakteristike a opisu jeho slávneho a na svoju dobu veľkolepého diela, nazvaného *De humani corporis fabrica*, ktorým otvoril novú epochu v histórii anatómie. Andreas Vesalius sa pokladá za zakladateľa anatómie ako prírodnej vedy, ktorú buduje na podklade pozorovaní a skúseností získaných skalpelom na ľudských mŕtvolách. Celkovým pohľadom na život a dielo Andrea Vesalia poukazujeme na míľnik, ktorý Andreas Vesalius v tejto tradičnej a už od antických čias vedome pestovanej anatomickej vedy sám predstavuje. (Obr. 4, lit. 6.)

**Kľúčové slová:** životopis, charakteristika osobnosti Andrea Vesalia, opis diela *De humani corporis fabrica*.

Meno Andreas Vesalius sa v kronikách medicínskej literatúry objavuje na jednom z popredných miest. Andreas Vesalius patrila medzi takých učencov — vedcov, akými boli Bacon, Gallileo, Descartes, Newton či Lavoisier. Andreas Vesalius — mladý, entuziasticky naladený, plný elánu a usilovnosti urobil korektúru chýb v anatómii, ktoré pretrvávali viac ako 13 storočí. Zostavil a vydal vynikajúco ilustrovaný a spracovaný dokument *De humani corporis fabrica*, dielo aké kedy vôbec na svete vzniklo. Táto kniha *O stavbe ľudského tela* patrí medzi najvzácnejšie skvosty tých najstarších univerzitných knižníc sveta. Patrí medzi Uncunabula, základné prá-

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most rare jewel of the oldest universities's library of the world. It belongs among Uncunabula, the basic works not only in a branch of anatomy or in the medical literature, but because of it's elaboration takes the foreground place also in the history of the art.

### Family of Andreas Vesalius

Andreas Vesalius was born the last day of the year 1514 in Brussels. From astrological observations we learn that this event occurred about six o'clock in the morning, and under favorable stellar auspices. He came from German family, which was originally named Witting and was lived in Vesel. The name Vesalius was adopted from this town, which has three weasels in its coat of arms. The evidence of it, is that in the Vesalius coat were found three weasels and this also testifies this origin.

The interest of medicine and the medical learning about natural science ran in the blood of the Vesalius family. His great-great grandfather, Peter Vesalius, wrote a treatise of works of Avicenna and published manuscripts of several medical authors.

His son, John Vesalius, held at the beginning the responsible position of physician to Mary of Burgundy, later taught medicine in the University of Louvain. From that time the Vesalius family was in a German Emperor and was closely associated with the Austro-Burgundian dynasty.

Eberhard, son of John Vesalius, grandfather of Andreas, served as physician to empire court. He died very young, before attaining his thirty-sixth year.

Eberhard's son, Andreas – the father of anatomist, was a personal apothecary to Charles the Fifth, he accompanied him upon his journeys and military expeditions. In 1538 he presented "Andreas's first anatomical plates" to the Emperor, and thus opened the way to the court to his son.

Andreas's mother, Isabella Crabbe, was very solicitous, she had a great influence upon the young Andreas, but mainly she believed, to be destined to accomplish great things. She lived till high age and she was witness of intellectual triumph of her son.

Little is known about the youth of Vesalius. The tradition of his ancestors, their accomplishments in the field of letters and responses on medical works, their accomplishments and loyalty to their sovereigns, were themes, which his mother recounted with pleasure.

### Andreas Vesalius's life

Andreas Vesalius began the study of foreign languages (Greek, Latin, Hebrew languages) in Louvain on *Pedagogium Gastri* and *Collegium trilingue Buslidianum*. He was a talented student and he was excellent also in French language. The knowledge about ancient languages, which he obtained here, in later years astonished his hearers and adversaries and served him well in numerous presentations, argumentations and literary works.

His credo was to follow the profession of his ancestors. 19 year old (in the year 1533) he travelled to Paris for the purpose of obtaining a medical education. At that age he firmly decided to devote himself to anatomy of human body. He had a very excellent observation ability and very soon he found out, that the true road to anatomy as a science, leads through the actual handling of the dead tissues. He began the practical study of anatomy by dissecting the bodies of mice, moles, rats, dogs and cats.



Fig. 1. Andreas Vesalius (1514-1564).

ce nielen v odbore anatómia, či v lekárskej literatúre, ale pre svoje spracovanie zaujíma popredné miesto aj v histórii umenia.

### Rodina Andrea Vesalia

Andreas Vesalius sa narodil 31. decembra 1514 v Bruseli. Podľa astrologických pozorovaní sa dozvedáme, že k tejto udalosti prišlo pod priaznivou konšteláciou hviezd o 6. hodine ráno. Pochádzal z nemeckej rodiny, ktorá sa pôvodne volala Witting a bývala vo Veseli. Priezvisko Vesalius si privlastnila podľa tohto mesta, ktoré má vo svojom erbe tri lasičky. Dôkaz o tom je, že tento znak je súčasťou rytiny na titulnej strane Vesaliovho diela (ale aj na ramenách Vesaliovho kabáta sa našli tri lasičky).

Záujem o medicínu a vedomosti o prírodných vedách prúdili v krvi rodiny Vesaliových. Jeho praprastarý otec Peter Vesalius písal posudky na Avicenove práce a vydával rukopisy viacerých medicínskych autorov.

Jeho syn John Vesalius mal najskôr zodpovedné poslanie ako lekár Marie Burgundskej, neskôr vyučoval medicínu na Univerzite v Louvaine. Od tých čias bola rodina Vesaliových v službách cisára a bola úzko spätá s austro-burgundskou dynastiou.

Eberhard, syn Johna Vesalia a starý otec Andrea Vesalia, slúžil ako lekár na cisárskom dvore. Zomrel však mladý, pred dosiahnutím 36. roku života.

His first teachers were Jacobus Sylvius, Jean Tagault and Johann Winther von Andernach, to work of which "Institutiones Anatomicae" (Paris, 1536) he contributed. The teachers after a short time recognized his talent and feeling for anatomy and they made possibility for it's performance. Andreas Vesalius found out mistakes in lectures of his teachers, mainly in anatomy of Claudius Galen. He criticized them in public and he became to opposition, mainly to Jacobus Sylvius, who affirmed that Galen's anatomy is infallible. Vesalius did not give up, but he fought and problems, which increased stimulated him to more strenuous work.

In 1536 he returned back to the University of Louvain, where he performed the first public dissection. Vesalius was so ardoured for anatomy, that the each part of dissection on cadaver he explained and demonstrated. He used his knowledge from comparative anatomy also for comparison or he made attention to anatomical differences.

*His great effort for recognition of human body does not have analogy in history of anatomy. During night, accompanied by his faithful friend, famous mathematician and physician, he visited the gallows near the outside walls of Louvain. Here he found a skeleton, which was held together simply by the ligaments and had possessed the origins and insertions of the muscles. The body belonged to the famous robber, who since he deserved more than the ordinary hanging, had been chained to the top of a high stake and roasted alive. He had been roasted by a slow fire made of straw, that was kept burning at some distance below his feet. In that way there had been a dish for the birds, which sweet flesh of roasted robber considered as a special dainty. His bones, therefore had been elaborately picked and there was left suspended on the stake a skeleton dissected out and cleaned by many peaks of birds. This way prepared skeleton, had been for anatomist the great offer, because he had been striving to piece together such a skeleton. Vesalius climbed the gallow, took the skeleton and secured it to his home. "The treasure" was not complete. One finger, patella and a foot were missing. In supplying the missing parts he had to incur many dangers. He stole out of the city in the nighttime, searched through the mass of decaying bodies the missing bones and through another city gate he stole home.*

In 1537 went young anatomist to Venice, where he entered into various medical activities: he practiced minor surgery, he experimented with new remedy – the China root, he solicited anatomical material and prepared himself to anatomical dissection.

Later, in this year, in order to gain all the rights and privileges of a fullfledged physician, Andreas Vesalius settled in Padua.

On december 6th, 1537, (23 year old), shortly after having received his degree as Doctor of Medicine, Andreas Vesalius of Brussels was appointed Professor of surgery with the right to teach anatomy in the famous University of Padua. On the next day he started with the anatomical dissection in this university, which called a great attention. His anatomical demonstrations were attended by more than 500 persons, many times by very famous ones. Andreas Vesalius shown a consistent anatomical dissection and at the same time he explained and taught each step, what has been in that time a big new. The beginning of modern anatomy has been dating since this time.

*The aula in which Andreas Vesalius conducted course of anatomical dissection was built of wood and was capable of 500 places. In the centre of the room was a table under which was a receptacle for bones and joints. The skeleton was placed in on upright position at one end of the table. The course was very strenuous,*

Eberhardov syn, Andreas — otec anatóma, bol osobným lekárnikom Karola V., sprevádzal ho na cestách a vojenských expediáciách. Roku 1538 predstavil cisárovi Andreasove *Prvé anatomické listy*, a tým otvoril svojmu synovi cestu na cisársky dvor.

Matka Isabella Crabbe bola veľmi starostlivá, mala veľký vplyv na mladého Andreeasa, ale najmä verila, že jej syn je predurčený na „vykonanie veľkej veci“. Dožila sa vysokého veku a bola svedkom intelektuálneho víťazstva svojho syna.

### Život Andrea Vesalia

Andreas Vesalius začal štúdium cudzích jazykov (gréčtina, latinčina, hebrejčina) v Louvaine na Pedagogium Castri a Collegium Buslidianum. Bol talentovaným žiakom a vynikal aj vo francúzštine. Vzdelanie a vedomosti o starých jazykoch, ktoré tu získal, prekvapili neskôr jeho poslucháčov i protivníkov a slúžili mu pri mnohých vystúpeniach, argumentáciách a literárnych prácach.

Životným krédom Andrea Vesalia bolo pokračovať v profesii svojich predkov. 19-ročný sa vydal do Paríža s cieľom získať lekárske vzdelanie. Už v tomto veku bol pevne rozhodnutý venovať sa anatómii ľudského tela. Mal veľmi dobré pozorovacie schopnosti a skoro zistil, že pravá cesta k anatómii ako vede vedie cez skutočnú manipuláciu s mŕtvymi tkanivami. Začal praktické štúdium anatómie pitvaním tiel myši, krtkov, potkanov, psov a mačiek.

Jeho prvými učiteľmi boli Jacobus Sylvius, Jean Tagault a Johann Winter von Andernach, k dielu ktorého *Institutiones anatomicae* (Paríž, 1536) svojimi objavmi v mnohom prispel. Učitelia po krátkom čase spoznali jeho nadanie a cit pre anatómiu a umožnili mu, aby ju mohol aj vykonávať. Andreas Vesalius však zistil chyby v prednáškach svojich učiteľov, najmä v anatómii Galena. Verejne ich začal kritizovať a dostal sa do opozície najmä s J. Sylviom, ktorý tvrdil, že Galenova anatómia je neomylná. Vesalius sa nevzdával, ale bojoval a problémy, ktoré sa v tomto smere stupňovali, ho len stimulovali k usilovnejšej práci.

Roku 1536 sa vrátil na Univerzitu v Louvain, kde vykonal aj prvú verejnú anatomickú pitvu. Vesalius bol taký zanietený pre anatómiu, že každý úkon na mŕtvoľe vysvetľoval a demonštroval a využíval svoje vedomosti z porovnávacej anatómie, aby porovnával alebo upozorňoval na anatomické rozdiely.

*Jeho obrovská snaha po poznaní ľudského tela nemá v histórii anatómie obdobu. V noci, sprevádzaný verným priateľom, známym matematikom a lekárom, navštívil šibenice pri vonkajších múroch Louvainu. Tu našiel kostru, ktorá držala pospolu len pomocou väzov a mala zachované odstupky a úpony svalov. Telo patrilo známemu zlodejovi, ktorý, pretože si zaslúžil viac ako obesenie, bol spútaný na vrchole vysokého kola a zaživa pálený. Spaľoval ho pomalý oheň zo slamy, ktorý sa udržiaval v určitej vzdialenosti od jeho nôh. Takto vznikla potrava pre vtákov, ktoré sladké mäso upečeného zlodeja považovali za špeciálnu pochúťku. Preto boli jeho kosti dôkladne ozobané a na kole zostala zavesená a vtáčimi zobákmi vyčistená, vypitvaná kostra. Takto vypreparovaná kostra bola pre anatóma obrovskou ponukou, pretože sa sám usiloval kostru z jednotlivých kostí zložiť. Vesalius vyliezol na šibenicu a kostru vzal a potajme ju preniesol domov. „Poklad“ však nebol úplný. Kostre chýbal prst, patella a noha. Pri obstarávaní chýbajúcich častí musel Vesalius prekonávať mnohé nebezpečenstvá. Vykrádal sa z mesta o polnoci, hľadal v masách hnjúcich tiel chýbajúce kosti a potom sa inou mestskou bránou zakrádal domov.*



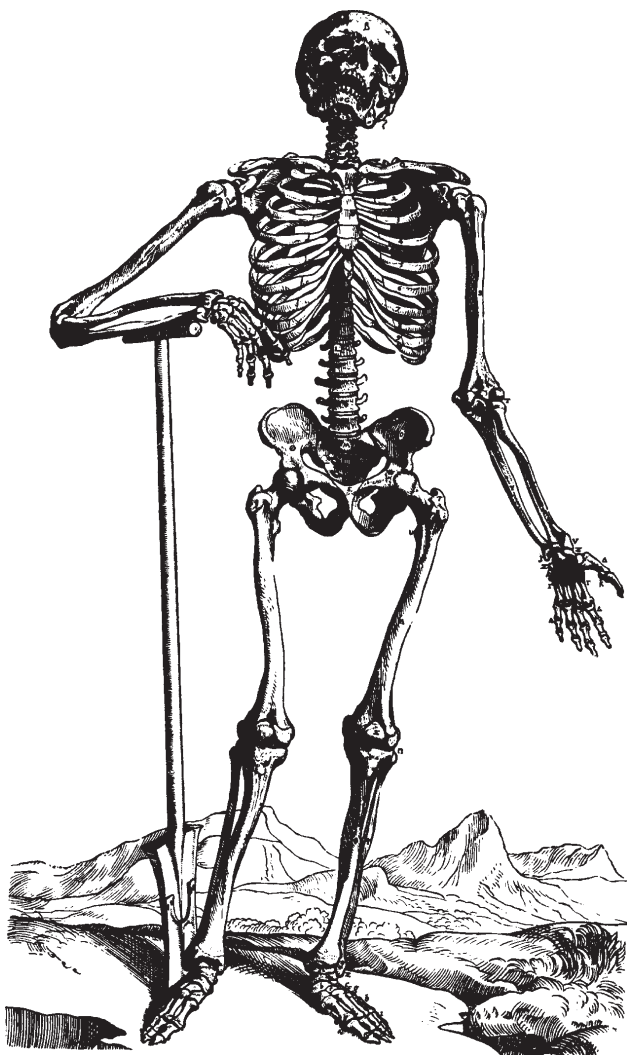


Fig. 2. Skeleton by Vesalius.  
Obr. 2. Ľudská kostra podľa Vesalia.

*durated the whole day for a period of three weeks. It comprising not only anatomy, but also comparative anatomy. The vivisection of dogs, pigs and rarely of cats, was a part of the dissection. Drawings were used to elucidate the dissection. He marked the outlines of joints upon the skin of the subject. He made dissection with extreme neatness and dexterity. He used only few instruments, many separation he made by hands.*

### De Humani Corporis Fabrica

Andreas Vesalius, thanks to strenuous labor of anatomy, had recognized, that a great Galenus in his lectures hadn't described anatomy of the human body, but anatomy of the animals, namely of a monkey. He decided according to his personal observations, to elaborate from the base the anatomy of the human body and to illustrate with exact pictures. A big manuscript with illustrations he sent to Basel in 1542, to his friend, printer, Joannes Oporinus. In latin letter, which he wrote, he asked him to take care that the



Fig. 3. Second Vesalian plate of the muscles.  
Obr. 3. Tabulae anatomicae – Svaly II. podľa Vesalia

Roku 1537 odišiel mladý anatóm do Benátok, kde vstúpil do rôznych lekárskejších aktivít: praktizoval malú chirurgiu, experimentoval s novým liekom, čínskym koreňom, zbieral anatomický materiál a pripravoval sa na anatomickú pitvu.

Neskôr, v tom istom roku, sa A. Vesalius presťahoval do Padovy, aby získal všetky práva a privilégia lekára.

6. decembra 1537 (23-ročný), krátko potom ako získal titul doktora medicíny, bol Andreas Vesalius z Bruselu menovaný za profesora chirurgie s právom vyučovať anatómiu na Padovskej univerzite. Hneď nasledujúci deň začal na tejto slávnej univerzite anatomickú pitvu, ktorá vzbudila okamžite veľkú pozornosť. Jeho anatomické demonštrácie navštevovalo viac ako 500 účastníkov, často veľmi významné osobnosti. Vesalius predviedol dôslednú anatomickú pitvu, každý krok na mŕtvoľe súčasne vysvetľoval a učil, čo bola v tom čase novinka. Od tohto obdobia sa dá tuje začiatok modernej anatómie.

*Aula, v ktorej Andreas Vesalius viedol kurz anatomickej pitvy, bola postavená z dreva a mala kapacitu 500 miest. V centre miestnosti stál stôl, pod ktorým bola polička na kosti a kĺby. Kostra bola*

printed illustrations corresponded with the proofs, because “every detail must be distinctly visible, that each cut shall have the effect of a picture”. The book had to serve as a study material and its illustrations had to be a compensation of a real body for those, who had not it for disposition (Simpson, 1994).

One year later he traveled alone to Basel, to superintend the printing of the book. Andreas Vesalius took lectures in Basel also and he dedicated to University a skeleton of human body, the first anatomical preparation of its branch, which is up today located in Basel.

The work “De Humani Corporis Fabrica Libri septem”, which Andreas Vesalius dedicated to Charles the Fifth, has saw the light of the world in 1543 in Basel.

*The beautiful engraving on the title-page represents Vesalius at work dissecting a female subject. He is surrounded by interested spectators, people of different rank. The great teacher is explaining to his listeners, who crowd the amphitheatre to the last place.*

*To the left is a naked man, who is climbing a pillar; while to the left and below is a monkey which appears to enjoy the demonstration. Above, in the architecture is a monogram of the publisher, Joannes Oporinus and in the centre there are the three weasels as a sign of Vesalius family. In the lower part of the shield is a sign of privilegium.*

This beautiful engraving is one of the nicest and most elaborated work to be found on medical literature.

De Humani Corporis Fabrica consists of 659 pages of text, on 6 pages is written a preface and on 34 pages in three columns to the page is written an index. Each page has 57 lines, which are completed by the marginal notes. The text is written clearly, understandable and logically. Anatomical terminology and style are excellent. The artistic drawing of initial letters at the beginning of each chapter emphasized the text. Vesalius's book about construction of the human body is more than an anatomy. The knowledge of anthropology and the first illustrations from comparative anatomy (As for an evidence Vesalius portrayed a human skull resting upon the skull of a dog, he compared os sacrum of monkey, dog and of the human body, to make attention on Galen's mistakes in anatomy, and another) are presented there. In a short and clear formulated sentences the author gave also the meaning and function of each organ. The book “De Humani Corporis Fabrica” is built upon a practical plan. It is composed of 7 books, which describe the following parts of human body: bones and cartilages (1), ligaments and muscles (2), veins and arteries (3), nerves (4), organs of nutrition and generation (5), heart and lungs (6), brain and organs of sense (7).

Corrections of up to that time valid anatomical structures are so numerous, that it is difficult to introduce them shortly. For interest we introduce: the osseous system as a whole is described on 168 pages, it is written anatomically correct, but in numerous instances Vesalius placed himself in direct opposition to the opinions of Galen (for example: unlike Galen, he correctly described maxilla, 7 bones of the sternum he reduced to three ones, he accented the description of os sphenoidale and a function of the symphysis pubis, and other).

Vesalius's plates of the superficial muscles belong among the most beautiful, they have been copied in all later books of anatomy. The plates of deep muscles, while naturally not so pleasing to the eye, are drawn as they were prepared and they shown function and structure.

From the today's point of view, there are also mistakes and discrepancies in Vesalius work, but they don't decrease his importance of certain priorities in anatomy.

*umiestnená vo vzpriamenej polohe na jednom konci stola. Kurz bol veľmi rušný, trval celý deň po dobu troch týždňov. Obsahoval nielen anatómiu, ale aj porovnávaciu anatómiu. Súčasťou pitvy bola aj pitva psov, prasiat a niekedy aj mačiek. Na sprehladnenie pitvy používal Vesalius kresby. Obrisy kĺbov kreslil na povrch tela. Pitvu robil s výraznou čistotou a obratnosťou. Používal len pár jednoduchých inštrumentov, mnoho preparácií robil rukami.*

### De humani corporis fabrica

Andreas Vesalius dospel vďaka usilovnému štúdiu anatómie k poznaniu, že veľký Galenus vo svojich prednáškach opisoval anatómiu zvierat a nie človeka. Na základe vlastných pozorovaní sa rozhodol spracovať od základu anatómiu človeka a ilustrovať ju vernými obrazmi. Obrovský manuskript so zobrazeniami posielal roku 1542 do Bazileja, priateľovi – tlačiarovi, Johannesovi Oporinovi. V latinskom liste, ktorý mu napísal, ho žiadal, aby dozel na to, aby vytlačené ilustrácie korešpondovali s obsahom, pretože „každý detail musí byť zreteľne viditeľný, každý zárez má na obrázku svoj význam“. Kniha mala slúžiť ako študijná pomôcka a ilustrácie v nej sa mali stať náhradou skutočného tela pre tých, ktorí ho nemali k dispozícii (Simpson, 1994).

O rok neskôr A. Vesalius odcestoval do Bazileje, aby dohliadol na tlačenie knihy. V Bazileji aj prednášal a tamojšej univerzite venoval kosť človeka, prvý anatomický preparát tohto druhu, ktorý sa dodnes v Bazileji nachádza.

Dielo *De humani corporis fabrica libri septem*, ktoré venoval Andreas Vesalius Karolovi V., uzrelo svetlo sveta roku 1543 v Bazileji.

*Nádherná rytina na titulnej strane diela predstavuje Vesalia pri pitve ženského tela. Okolo neho stoja pozorovatelia, ľudia rôzneho postavenia, ktorí zaplnili amfiteáter do posledného miesta.*

*Vľavo je aj nahý muž, ktorý sa vyšplhal na stĺp, zatiaľ čo vpravo dolu je pes, vľavo opica, ktorá sa tiež teší z demonštrovania. Hore na obraze je monogram tlačiarťa Johanna Oporina a v centre štítu sú tri lasičky ako znak Vesaliovskej rodiny. V dolnej časti štítu je znak privilegia.*

Táto krásna rytina je jednou z najkrajších a najvypracovanejších diel, ktoré sa v medicínskej literatúre zachovali.

*De humani corporis fabrica* má 659 strán textu, na 6 stranách je napísaný Úvod a na 34 stranách je v troch stĺpcoch napísaný Index. Text je písaný jasne, zrozumiteľne a štylisticky správne. Umelecké kresby počiatkových písmen na začiatku každej kapitoly zväzujú text. Vesaliova kniha *O stavbe ľudského tela* je viac ako anatómia. Sú v nej uvedené aj poznatky z antropológie a prvé ilustrácie z porovnávej anatómie (Ako dôkaz Vesalius nakreslil ľudskú lebku, ktorá oddychuje na lebke psa, porovnal os sacrum u opice, psa a človeka, aby upozornil na omyly v Galenovej anatómii a iné). V krátkych a presne formulovaných vetách uvádza autor aj význam a funkciu každého orgánu. Kniha *De humani corporis fabrica* je zostavená podľa praktického plánu. Tvoria ju sedem kníh, ktoré opisujú nasledovné časti ľudského tela: kosti a chrupky (1), väzy a svaly (2), tepny a žily (3), nervy (4), orgány výživy a pohlavné orgány (5), srdce a pľúca (6), mozog a zmyslové orgány (7).

Korektúry dovtedy platných anatomických štruktúr, ktoré kniha uvádza, sú také početné, že ich v stručnosti nemožno uviesť. Pre zaujímavosť uvádzame: Kostrová sústava ako celok je napísaná anatomicky správne na 168 stranách. Vesalius upresnil opis kostí lebky, najmä opis sánky a klinovej kosti, sedem kostí mostí-





Fig. 4. Dissection. First page of the *De humani corporis fabrica*.  
Obr. 4. Anatomická pitva. Titulná strana diela *De humani corporis fabrica*.

After considering the time, in which Vesalius lived, the results of his observations are remarkable and they form a foundation of our knowledge.

#### Life in Madrid

After having finishing the work, Andreas Vesalius had returned to Padua, where he found, that the university for which he had stre-

ka zredukoval na tri, upozornil na funkciu spony lonových kostí a iné. Opis svalov a svalových skupín, tak ako ich vidíme na Vesaliových tabuliach, je verný a anatomicky správny a navyše poukazuje aj na funkciu svalov. Obrazy svalov kopirovali do všetkých neskorších anatómií.

Z pohľadu dnešnej anatómie sú v diele Andrea Vesalia aj chyby a nezrovnalosti, ale tie neznižujú jeho význam z hľadiska určitých priorit v anatómii. Pri zvažení doby, v ktorej Vesalius žil, sú

uously labored was a hot bed of opposition. His faithful friends and students, defenders of Galen, had turned against him, in an effort to besmirch the great anatomist they joined themselves against him.

Disgusted Andreas Vesalius went to Bologna and later he declined a chair in the University of Pisa. Tired of the apparently useless effort, sick of disputes and arguments, persecuted by members of his own profession, in a fit of passion Vesalius threw his manuscript into the fire and ended his career as a scientist. Thus he destroyed a huge amount of annotations upon Galen, a whole book of Medical formulae and many original notes upon drugs and many notes, which he has written during the dissection as well as notes, which intercepted the comparison of knowledge of Arabians, Greeks and others.

Andreas Vesalius accepted the appointment as a personal physician (Archiatrus) to Charles the Fifth, he accompanied him on journeys. Later he was continued in an office of his son Philip the Second, with whom he went to Spain and took place in a Madrid. He became very popular, he was famous also as a physician-surgeon, he was a favorite at the Spanish court, he had amassed a fortune and seemingly he was destined to pass his remaining days under his favorable surroundings. The jealousy and envy of Madrid physicians as well as numerous members from his profession, who ignored his talents and all the time they regarded him as a foreigner, it has worried him. During the twenty years that he had filled the post of Archiatrus, his scalpel was rusting, but the controversy concerning the infallibility of Galen was still raging. The life at the Spanish court was not favourable for the study and of science.

*The hand of the Church was heavy on the land; the dagger of the inquisition was stabbing at all mental life, and it's torch was a sterilizing flame sweeping over all intellectual activity. The pursuit of natural knowledge had become a crime, and to search with the scalpel was accounted sacrilege (Ball, 1910).*

That was a life in ignorant and superstitious Madrid, for which Vesalius had left the academic circles of Padua.

### Pilgrimage and death

Suddenly, early in the year 1564, for a reason which has never been explained satisfactorily, Andreas Vesalius left Madrid. He travelled to Venice and from this place he passed on a pilgrimage to Jerusalem to the Holy Land. Vesalius never returned from that journey. Information of his death reached Brussels towards the end of the year 1564 (probably October 15<sup>th</sup>, 1564). Such was the miserable end of Andreas Vesalius of Brussels, a man, who, before he had attained his thirtieth year, had become the greatest anatomist that the world has ever seen.

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výsledky jeho pozorování pozoruhodné a tvoria základ anatomických poznatkov.

### Pobyt v Madride

Po ukončení diela *De humani corporis fabrica* sa Andreas Vesalius vrátil do Padovy, kde však zistil, že univerzita, pre ktorú usilovne pracoval, sa stala pareniskom opozície voči nemu. Napádali ho jeho predtým verní priatelia a žiaci, ochrancovia Galena sa v snahe očierniť veľkého anatóma, spojili proti nemu.

Znechutený Vesalius odišiel do Bologne a neskôr odmietol aj miesto v Pize. Unavený z očividne márneho úsilia, chorý zo sporov a argumentov, prenasledovaný členmi vlastnej profesie, v záchvate zlosti hodil svoj rukopis do ohňa a skončil kariéru vedca. Takto zničil obrovské množstvo komentárov o Galenovi, celú knihu lekárskech výrazov, veľa originálnych zápisov o liekoch a množstvo poznámok, ktoré písal počas pitiev, ako aj poznámky, ktoré zachytávali porovnanie vedomostí Arabov, Grékov a iných.

Andreas Vesalius prijal menovanie za osobného lekára cisára Karola V. Neskôr bol v službách jeho syna Filipa II., s ktorým odišiel do Španielska a usadil sa v Madride. Bol veľmi slávny, bol známy ako lekár-chirurg, bol obľúbencom španielskeho dvora, zhromaždil majetok a mal zdanlivo predurčené stráviť posledné dni vo svojom obľúbenom prostredí. Žiarlivosť a závisť madridských lekárov, ako aj mnohých členov jeho profesie, ktorí ignorovali jeho nadanie a neustále ho považovali za cudzinca, ho veľmi trápilo. Počas 20 rokov, čo vykonával funkciu osobného lekára, jeho skalpel hrdzavel, kontroverzné uznania neomylnosti Galena zúrilo ďalej. Život na španielskom dvore nebol priaznivý pre štúdium a vedu.

*„Aj ruka cirkvi bola ťažká na zemi, dýka inkvizície bola hlboko vrazená do duševného života a jej pochodeň bola čističím ohňom, ktorý zmietol všetku rozumovú aktivitu. Získavanie vedomostí bolo zločinom a hľadanie so skalpelom bolo vysloveným znesvätením“ (Ball, 1910).*

Taký bol život v ignorujúcom a poverčivom Madride, pre ktorý Andreas Vesalius opustil akademické kruhy v Padove.

### Putovanie a smrť

Náhodne, na začiatku roku 1564, z príčiny, ktorá nebola nikdy dostatočne vysvetlená, opustil Andreas Vesalius Madrid. Ocestoval do Benátok, odkiaľ sa vydal na púť do Jeruzalema, do Svätej zeme. Vesalius sa z tejto cesty nikdy nevrátil. Správa o jeho smrti zasiahla Brusel koncom roka 1564 (údajne zomrel 15.10.1564). Taký bol nešťastný koniec Andrea Vesalia z Bruselu — muža, ktorý skôr, ako dosiahol 30 rokov života, sa stal najväčším anatómom, akého kedy svet videl.

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